Base Load Power Hub (BLPH)

Weld procedure qualification records (WPQRs & PQRs) – Structure

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Document Class: 2

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04	21/06/2024	Accepted for Construction (AFC)	D.CENACCHI	A.KHALIFA	M.BRUNELLI
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Revision / Change Log

Rev.	Description
00	Issue for Review (IFR)
01	Accepted for Construction , revised as per comments received
02	Accepted for Construction , Added new PQRs for Buttering and non structural items
03	Accepted for Construction , revised as per comments received
04	Accepted for Construction , added new supporting PQRs

HOLDS LIST

No.	Description
1	
2	
3	
4	

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

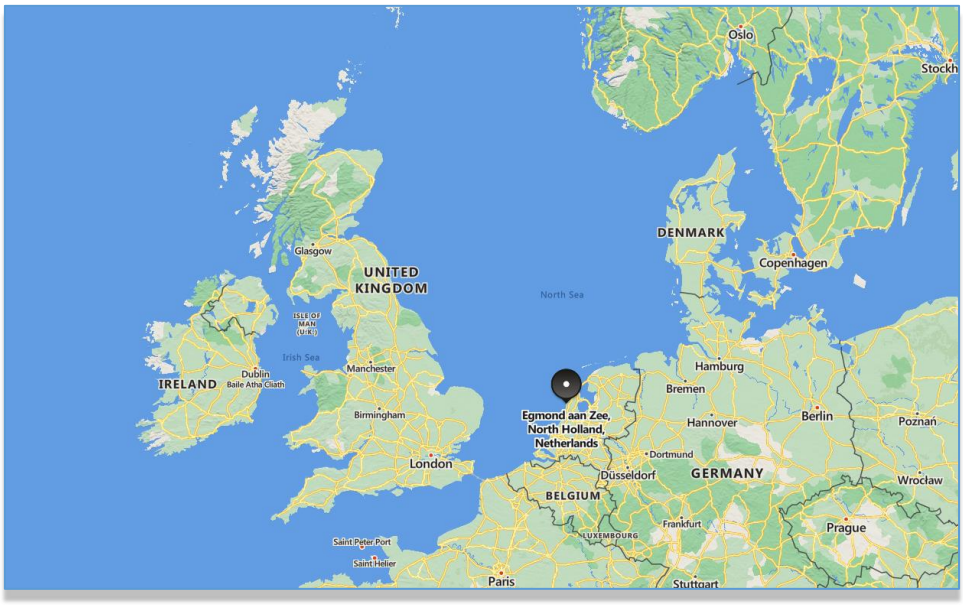


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map

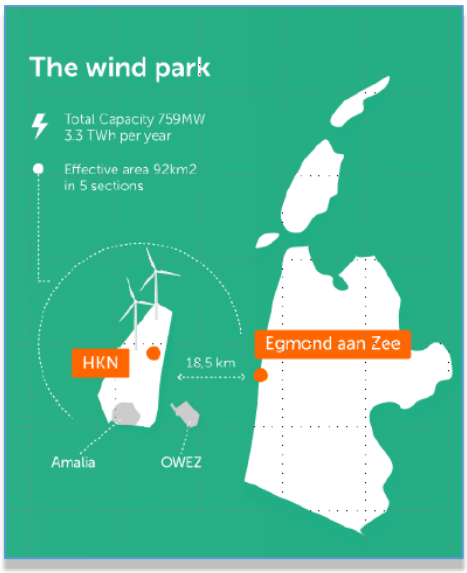


Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

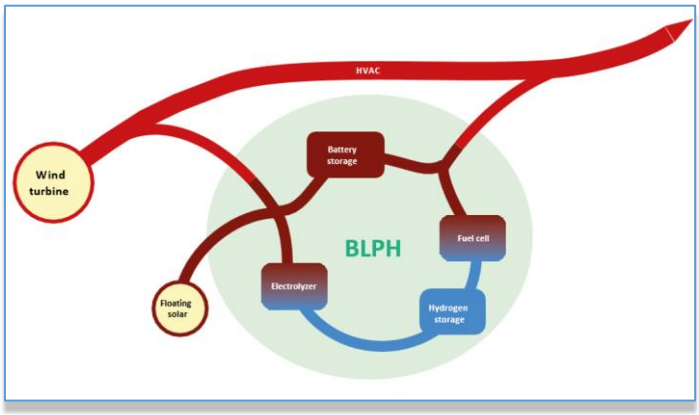


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

2 DOCUMENT SCOPE

The scope of this procedure is to list and collect the Welding Procedure Qualification Records supporting production WPSs on structural steelworks of Base Load Power Hub (BLPH).

2.1 REFERENCES

Doc. No.	Rev.	Date	Description - Title
K559-2254-MT-SPE-001	01	06/03/2023	Structural Fabrication Specification
EEMUA 158	Third ededition	2014	Construction Specification for Fixed Offshore Structures.
ISO 19902	Second edition	2020-11	Petroleum and Natural Gas Industries - Fixed Steel Offshore Structures.
ISO 19901-3	Dec-2014	Dec-2014	Petroleum and Natural Gas Industries - Specific Requirements for Offshore Structures - Topsides Structure.

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project
CA	Certifying Authority
DP	Dye Penetrant
ITP	Inspection and Test Plan
MPI	Magnetic Particle Inspection
NDT	Non-Destructive Testing
QA	Quality Assurance
QC	Quality Control
RT	Radiographic Testing
UT	Ultrasonic Testing
WPQ	Welder Performance Qualification
WPQR (aka PQR)	Welding Procedure Qualification Record
WPS	Welding Procedure Specification
CJP	Complete Joint Penetration
PJP	Partial Joint Peneteration
FW	Fillet weld joint
WI	Welding Inspector
WS	Welding Supervisor
WT	Wall Thickness

Table 2 - Definitions and Abbreviations

4 LIST OF APPLICABLE WPSS

WPS	DELIVERY CONDITION	TYPE	Description and range of application	MAT. Grades	Process	NOTES	range of qualified Thk (mm)	range of qualified diam. (mm)	PQR
1A	+N	CJP, BW	CIRC. TUBULARS AND SINGLE SIDE NODES WELDS	S420 AND LOWER GRADE	GTAW+GS FCAW 141+136	NONE	3 ÷ 50	≥ 100	22/16+24/16+26/16 45A/10+45B/10
1C	TM	CJP, BW	LONG.CIRC. TUBULARS	S460 AND LOWER GRADE	GS FCAW+SAW 136+121	NONE	15 ÷ 45	≥ 600	06/21+07/21+54/18+40/18
1D	TM	CJP, BW	LONG.CIRC. TUBULARS	S460 AND LOWER GRADE	GMAW+SAW 135+121	NONE	15 ÷ 45	≥ 600	54/18
2A	TM/+N	CJP	PLATE, BEAMS,TUBOLARS COLUMNS / NODES	S460 AND LOWER GRADE	GS FCAW 136	NONE	3 ÷ 80	≥ 300	06/21+07/21+13/21+40/18+ +23/10
2B	TM	CJP, BW	PLATES CONNECTIONS	S460 AND LOWER GRADE	GS FCAW+SAW 136+121	NONE	15 ÷ 80	≥ 600	06/21+07/21+54/18+40/18+13/21
2T	+N/AR	CJP	PLATE, BEAMS,TUBOLARS COLUMNS / NODES	S460 AND LOWER GRADE	GTAW 141	NONE	3 ÷ 19	16,5 ÷ 485	01/21 + 02/21
4A	TM/TM+N	TKY	TUBOLARS/TUBOLARS-PLATES BRACINGS SINGLE SIDE	S460 AND LOWER GRADE	GS FCAW 136	NONE	3-51	≥ 100	6/21+7A/21+7B/21+13/21+27/19+ 30/22+31/22
4B	TM/TM+N	TKY	TUBOLARS/TUBOLARS-PLATES BRACINGS SINGLE SIDE	S460 AND LOWER GRADE	SMAW + GS FCAW 111+136	NONE	9-28	≥ 255	49/18+42/18+47/18 45/18
7A	TM/TM+N	BUTTERING	TUBOLARS/TUBOLARS-PLATES BRACINGS SINGLE SIDE	S460 AND LOWER GRADE	GS FCAW 136	NONE	3 mm – 80 mm (Incoming member on TEE joint Weld)	≥ 110 mm	06/21-07/21-13/21-27/19+21/22+22/22+23/22+40/18 +23/10
WPS for 316L & dissimilar CS/316L alloy attachments									
WPS	**DELIVERY CONDITION (2nd , NS)**	**Bevel Type**	**Description and range of application**	**MAT. Grades**	**Process**	**CONSUMABLES***	**range of qualified Thk (mm)**	**range of qualified diam. (mm)**	**PQR**
E6A	ALL	ALL	Welds dissimilar	316L to CS	FCAW	E309LT1-4	3-25	≥ 75mm	42/19 +44/19+ 46/19
E6B	ALL	ALL	Fillet welds dissimilar	316L to S460 AND LOWER GRADE	SMAW	E309L-17	3-25	≥ 60mm	03/19+25/98
E6C	ALL	ALL	Earthing lugs	316L to C.S.	GTAW	ER 309L	3-7	≥ 12mm	49/06+03/03
E6D	ALL	ALL	Stainless steel details	316L	GMAW	ER 316LSi	3-22,22	≥8”	76/98
E6E	ALL	ALL	Handrails-Stairs-Ladders	CS	GMAW	OK AUTROD 12.64	3-24	≥30,15	13/98
E6F	ALL	ALL	Handrails-Stairs-Ladders	CS	FCAW	OK TUBROD 15.17	3-14.28	≥30,15	02/19

Table 3 – list of applicable WPSs

5 WPQR/PQR'S LIST

YEAR	#	WPQR	PARAMETERS	IVB
1998	25	WPQR 25/98	STRUCTURE	LLOYD REGISTER
1998	76	WPQR 76/98	STRUCTURE	IIS
2003	3	WPQR 03/03	STRUCTURE	BBUREAU VERITAS
2006	49	WPQR 49/06	STRUCTURE	RINA
2010	45	WPQR 45A/10	STRUCTURE	RINA
2010	45	WPQR 45B/10	STRUCTURE	RINA
2016	22	WPQR 22/16	STRUCTURE	RINA
2016	24	WPQR 24/16	STRUCTURE	RINA
2016	26	WPQR 26/16	STRUCTURE	RINA
2018	40	WPQR 40/18	STRUCTURE	RINA
2018	54	WPQR 54/18	STRUCTURE	RINA
2018	49	WPQR 49/18	STRUCTURE	RINA
2018	42	WPQR 42/18	STRUCTURE	RINA
2018	47	WPQR 47/18	STRUCTURE	RINA
2018	45	WPQR 45/18	STRUCTURE	RINA
2019	3	WPQR 03/19	STRUCTURE	RINA
2019	42	WPQR 42/19	STRUCTURE	RINA
2019	44	WPQR 44/19	STRUCTURE	RINA
2019	46	WPQR 46/19	STRUCTURE	RINA
2019	27	WPQR 27/19	STRUCTURE	RINA
2021	1	WPQR 01/21	STRUCTURE	RINA
2021	2	WPQR 02/21	STRUCTURE	RINA
2021	6	WPQR 06/21	STRUCTURE	RINA
2021	07A	WPQR 07A/21	STRUCTURE	RINA
2021	07B	WPQR 07B/21	STRUCTURE	RINA
2021	13	WPQR 13/21	STRUCTURE	RINA
2022	30	WPQR 30/22	STRUCTURE	BUREAU VERITAS
2022	31	WPQR 31/22	STRUCTURE	BUREAU VERITAS
2022	21	WPQR 21/22	STRUCTURE	BUREAU VERITAS
2022	22	WPQR 22/22	STRUCTURE	BUREAU VERITAS
2022	23	WPQR 23/22	STRUCTURE	BUREAU VERITAS
2010	23	WPQR 23/10	STRUCTURE	RINA
2019	2	WPQR 02/19	STRUCTURE	RINA
1998	13	WPQR 13/98	STRUCTURE	RINA

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6 WPQRS/PQRS ATTACHED

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 01/21	Sheet/Foglio 1/3

Manufacturer's Welding Procedure. Ref. no.	01/21 REV. 0		
Manufacturer	ROSETTI MARINO S.p.A.		
Address	VIA TRIESTE 230 - 48121 RAVENNA		
Code, Testing Standard	EEMUA 158:2014 (Third Edition); EN ISO 15614-1:2019 Lev. 2		
	Location of test specimen according to EEMUA 158:2014 (Third Edition) Section 4.4.4, Fig. 7 to 11 Essential variables according to EEMUA 158:2014, Section 4.5 and EN ISO 15614-1:2019, Chapter 8		
Date of welding	Start: January 27th , 2021 Complete: January 27th, 2021		
Examiner of examining body	Rina Services S.p.A.		
RANGE OF QUALIFICATION			
Welding process	141 - GTAW		
Type(s)	Manual		
Welding Equipment Type	HF inverter type		
Actual parent Material side A	Pipe: API 5L X52N modified/PSL2 (EN 10225: S355 G15+N) (Heat: 288114) ISO 15608 Gr. 11.1		
Actual parent Material side B	Pipe: API 5L X52N modified/PSL2 (EN 10225: S355 G15+N) (Heat: 288114) ISO 15608 Gr. 11.1		
Parent Material grade	Carbon steel with maximum strength of 460 MPa		
Supply condition	Normalized		
Carbon equivalent/Pcm/C	Heat Values: 0,40/0,23/ 0,13		
Groove design/configuration	Single V Butt Joint (one side welding, without backing), for groove dimension and details see page 4 of 5		
Parent material thickness (mm)	12,7 mm		
Weld metal thickness (mm)	141 - GTAW 12,7 mm		
Single or Multi-pass	141 - GTAW MULTIPLE		
Outside diameter	12" (323,9 mm)		
Filler material Designation	**141 GTAW** EN ISO 636-A: W 46 4 4Si1 (AWS 5.18: ER70S-6)		
Filler material Maker	141 - Esab OK Tigrod 12.64		
Filler material Size	141 - GTAW ∅ 2,4 mm		
Shielding gas/Flux	ISO 14175 :2008 I1 (>99,99% Ar)		
Shielding gas flow rate	15 l/min.		
Backing gas (purging)	None		

Type of welding current & polarity	DC - SP	Heat input / Apporto termico (kJ/mm)		Diameter	2G (PC)	5G (PH)
			Pass	mm		
			Root	∅ 2,4	0,73	1,73
			Hot	∅ 2,4	0,78	1,61
			Filll	∅ 2,4	0,86-1.24	1,01-1,56
			Cap	∅ 2,4	1,12	1,53
			Note: The Heat Input values shown above have been calculated with formula Hi: k*(I*V)/Travel Speed, with k=0,6 for GTAW- 141			

Welding position	All, vertical down progression excluded		
Preheat (°C)	20	Interpass temperature / Temp. di interpass (°C)	250
Post-Weld Heat Treatment and/or ageing	NONE		
Weld bead width	Max. 13 mm for 2G position ; Max. 16 mm for 5G position		
Welder's detail	Simion Costinel Ciprian AX47 (2G Test Coupon); Simion Costinel Ciprian AX47 (5G Test Coupon)		
Time lapse between root and hot pass	N.A.		
Other information / Altre informazioni	- Preheat performed by propane torch - Accelerate weld cooling not permitted; - Base material origin: pipe		

IIW
A.KHALIFA
IWT 070154A
INTERNATIONAL WELDING TECHNOLOGIST

Manufacturer's Welding Procedure. Ref. no.	01/21 REV. 0		
Test result (WPQR) N°	01/21	Date/Data	12/02/2021
Manufacturer's WPS No.	pWPS 01/21 REV. 0	Date/Data	26/01/2021

TESTS CARRIED OUT ON SAMPLE 01/21 WELDED IN 2G POSITION (PC)

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 01/21
Penetrant test	N.A.	/
Magnetic particle test	Acceptable	19265 MT 01
Radiographic test	Acceptable	19265 RT 01
Ultrasonic test	Acceptable	19265 UT 01

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2]	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 460	A [%]	Z [%]	Fracture Location	Remarks
054/2021 A TWT	/	/	552	/	/	Broken out of weld	/
054/2021 B TWT	/	/	555	/	/	Broken out of weld	/

BEND TEST

Type & N.	Bend angle	Remarks	Results
4 Side bend	180°	Former Ø 40 mm	Satisfactory

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] ≥ 27J			Average value [J] ≥ 36J	Remarks
10x10x55	WM 2 mm from Cap	KV2	-46°C	46	163	150	120	/
10x10x55	FL 2 mm from Cap	KV2	-46°C	165	82	38	95	/
10x10x55	FL+2 2 mm from Cap	KV2	-46°C	178	40	173	130	/
10x10x55	FL+5 2 mm from Cap	KV2	-46°C	190	183	207	193	/

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
1 Macro examination+Hardness test	Satisfactory-See Inspecta Certificate No. 045-00100-21 Rev. 0, max. Hardness (284 HV10)
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Inspecta S.r.l. - Ravenna (RA)
Laboratory report reference N.	Report No. 045-00100-21 Rev. 0 dated FEBRUARY 12th 2021
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of EEMUA 158:2014 (Third Edition) and EN ISO 15614-1:2019 Lev. 2 Standards

Date/Data
12-02-2021

IIW
A.KHALIFA
IWT 0701544
INTERNATIONAL WELDING TECHNOLOGIST

ROSETTI MARINO S.p.A.

Examiner or Examination Body
RINA Services S.p.A.

RINA
F. Lago
RINA Services S.p.A.

Name and signature / Nome e firma

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 01/21	Sheet/Foglio 3/3

Manufacturer's Welding Procedure. Ref. no.	01/21 REV. 0		
Test result (WPQR) N°	01/21	Date/Data	12/02/2021
Manufacturer's WPS No.	pWPS 01/21 REV. 0	Date/Data	26/01/2021

TESTS CARRIED OUT ON SAMPLE 01/21 WELDED IN 5G POSITION (PH)

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 01/21
Penetrant test	N.A.	/
Magnetic particle test	Acceptable	19265 MT 01
Radiographic test	Acceptable	19265 RT 01
Ultrasonic test	Acceptable	19265 UT 01

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2]	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 460	A [%]	Z [%]	Fracture Location	Remarks
054/2021 A TWT	/	/	566	/	/	Broken out of weld	/
054/2021 B TWT	/	/	539	/	/	Broken out of weld	/

BEND TEST

Type & N.	Bend angle	Remarks	Results
4 Side bend	180°	Former Ø 40 mm	Satisfactory

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] ≥ 27J			Average value [J] ≥ 36J	Remarks
10x10x55	WM 2 mm from Cap	KV2	-46°C	93	164	114	124	/
10x10x55	FL 2 mm from Cap	KV2	-46°C	185	107	185	159	/
10x10x55	FL+2 2 mm from Cap	KV2	-46°C	198	212	185	198	/
10x10x55	FL+5 2 mm from Cap	KV2	-46°C	199	176	172	182	/

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
2 Macro examination (H6 & h12)+Hardness test	Satisfactory-See Inspecta Certificate No. 046-00100-21 Rev. 0, max. Hardness (269 HV10)
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Inspecta S.r.l. - Ravenna (RA)
Laboratory report reference N.	Report No. 046-00100-21 Rev. 0 dated FEBRUARY 12th 2021
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of EEMUA 158:2014 (Third Edition) and EN ISO 15614-1:2019 Lev. 2 Standards

Date/Data
12-02-2021

IWE A.KHALIFA IWT 070154A INTERNATIONAL WELDING TECHNOLOGIST

ROSETTI MARINO S.p.A.

Examiner or Examination Body
RINA Services S.p.A.

RINA F. Lago RINA Services S.p.A.

Name and signature / Nome e firma

ROSETTI MARINO

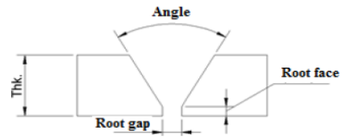
AS- RUN PARAMETER SHEET

pWPS 01/21	
PQR 01/21	
Coupon Nr. 01/21	
Date: 27/01/2021	Page: 1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: **EEMUA 158:2014, EN ISO 15614-1:2019 Lev.2**

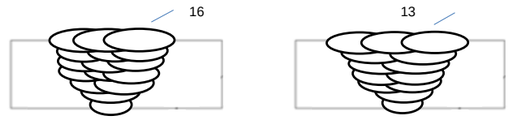
Welder Name(s):	**Simion Costinel Ciprian**	Welder Id No(s):	**AX47**		
Welding Process(es):	**141 GTAW**	Type(s):	**MANUAL**		
Welding Position:	**5G & 2G**	Progression:	**VERTICAL UPHILL FOR 5G**		
Base Materials:	**API 5L X52N modified/PSL2 - EN 10225: S355 G15+N**	Wall Thickness:	**12,7mm**	Diameter:	**323,9mm**
Heat No(s):	**288114**	Joint Type:	**PIPE TO PIPE SINGLE-V BUTT JOINT; ONE SIDE WELDING WITHOUT BACKING**		

WELD PREPARATION:



Root face: 1±0,5mm ; Root gap: 4,5±2mm ; Angle: 50°±2

WELDING SEQUENCE / PASS LOCATION:



Pos. 2G Pos. 5G

WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
WIRE	2,4	**PVU26633828**	**ESAB OK TIGROD 12.64**

GAS:

Shielding Gas:	**Ar**
Composition:	**99,99%**
Flow:	**15 LPM**
Gas Backing:	**None**
Flow:	**NA**
Gas Size Nozzle:	**NA**
Tungsten Type:	**NA**
O2 Content of Back Purge:	**NA**

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
16 mm on 5G / 13mm on 2G	**5G: weave**	**2G: string**	**MULTIPLE**	**SINGLE**

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required		Holding Temperature °C	Holding Time °C	Heating Rate °C	Cooling Rate °C
20°C	**PROPANE TORCH**	**250°C**	**CONTACT DIGITAL THERMOMETHER**	**NA**	**NA**	**NA**	**NA**	**NA**

WELDING PARAMETERS

ITEM	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (mm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
5G	1	GTAW	1	-	ER 70S-6	2,4	DC EN	126	130	128,0	14	16	15,0	-	-	40	1,73	0,60	20	
5G	2	GTAW	2	-	ER 70S-6	2,4	DC EN	138	142	140,0	15	17	16,0	-	-	50	1,61	0,60	80	
5G	3	GTAW	3-4	-	ER 70S-6	2,4	DC EN	138	142	140,0	15	17	16,0	-	-	52	1,55	0,60	90	
5G	4	GTAW	5-6	-	ER 70S-6	2,4	DC EN	138	142	140,0	15	17	16,0	-	-	80	1,01	0,60	129	
5G	5	GTAW	7-8	-	ER 70S-6	2,4	DC EN	178	182	180,0	17	19	18,0	-	-	75	1,56	0,60	168	
5G	6	GTAW	9-10	-	ER 70S-6	2,4	DC EN	179	183	181,0	17	19	18,0	-	-	75	1,56	0,60	250	
5G	7	GTAW	11-12-13	-	ER 70S-6	2,4	DC EN	176	178	177,0	17	19	18,0	-	-	75	1,53	0,60	210	
2G	1	GTAW	1	-	ER 70S-6	2,4	DC EN	119	121	120,0	10	12	11,0	-	-	65	0,73	0,60	20	
2G	2	GTAW	2	-	ER 70S-6	2,4	DC EN	124	126	125,0	12	14	13,0	-	-	75	0,78	0,60	68	
2G	3	GTAW	3	-	ER 70S-6	2,4	DC EN	127	129	128,0	13	15	14,0	-	-	75	0,86	0,60	87	
2G	3	GTAW	4	-	ER 70S-6	2,4	DC EN	129	131	130,0	14	16	15,0	-	-	78	0,90	0,60	116	
2G	4	GTAW	5	-	ER 70S-6	2,4	DC EN	129	131	130,0	14	16	15,0	-	-	78	0,90	0,60	166	
2G	4	GTAW	6-7	-	ER 70S-6	2,4	DC EN	133	135	134,0	16	18	17,0	-	-	74	1,11	0,60	198	
2G	5	GTAW	8-9-10	-	ER 70S-6	2,4	DC EN	161	163	162,0	17	19	18,0	-	-	85	1,24	0,60	207	
2G	6	GTAW	11-12-13	-	ER 70S-6	2,4	DC EN	161	163	162,0	17	19	18,0	-	-	85	1,24	0,60	250	
2G	7	GTAW	14-15-16	-	ER 70S-6	2,4	DC EN	155	157	156,0	17	19	18,0	-	-	90	1,12	0,60	245	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name: Davide Cimatti	Name:
Signature:	Signature:	Signature:	Signature:
Date: 28/01/2021	Date:	Date:	Date:

RINA Services SpA No. Bo. 0474 Date 27/01/2021 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature

RAPPORTO PROVA DI QUALIFICA DI PROCEDIMENTO DI SALDATURA/BRASATURA

N° PRATICA	N° SAGGIO	NORMA
2020 VE 92 PW	01/21 2G, 01/21 5G	EEMUA 158:2014, EN ISO 15614-1:2019 Lev.2

Società ROSETTI MARINO SPA Localit RAVENNA (RA)

Processo GTAW (141) à Tipo MANUAL

Posizione Saldatore/ Brasatore _____ Spessore (mm) _____ Diametro (mm) _____

_____ Stamp _____ WPS/BPS 01/21

_____ _____ _____

Materiale base: Gruppo/i	Norma e designazione / tipo backing	*Materiale d'apporto o flusso:* Nome commerciale	Norma / designazione
_____	_____	_____	_____
_____	_____	_____	_____
Backing _____		_____	_____

Gas al dritto:	*Gas al rovescio:*
Composizione _____ L/min _____ Ø ugello (mm) _____	Composizione _____ L/min _____

Ø Elettrodo Tungsteno (mm) e tipo _____ Temperatura preriscaldo (°C) _____

PWHT (temperatura, tempo e rampe) _____ Temperatura interpass max (°C) _____

Molatura fra le passate _____ Molatura al rovescio _____ Ripresa al rovescio _____

Passate	Processo	Materiale d'apporto Ø [mm]	Corrente [A]	Tensione [V]	Tipo corrente	Velocità [cm/min]

Preparazione giunto e sequenza saldatura
Per processi multipli indicare spessore depositato (mm/processo)

For all details See As Run Sheets attached

Esito esame visivo: ☒ Positivo ☐ Negativo

Prove di qualifica effettuate a: Ravenna (RA) Data 27/01/2021 Firma _____

Esito prove laboratorio: ☒ Positivo ☐ Negativo

Rapporti laboratorio allegati n° e data: INSPECTA report nr. 045-00100-21 Rev. 0 e 046-00100-21 Rev. 0 del 12/02/2021

A seguito dell'esito positivo delle prove di laboratorio, si propone il rilascio del certificato di qualifica n° ROSETTI FORM PQR 01/21 Data 04/03/2021 Firma _____

Decisione DM– Con riferimento al documento RINA IS-CRT-SAL-01, si autorizza il rilascio dei certificati di qualifica Data _____ Firma DM _____

PQR attachments index:

Base material certificate (Pipe API 5L X52N modified/PSL2 - EN 10225: S355 G15+N)

Consumables certificate

preliminary WPS

NDE certificate

Mechanical test report

Base material certificate
Pipe API 5L X52N modified/PSL2 - EN 10225: S355 G15+N)

item: 003

Certificate no: DTM1620727/1
Page 1 of 2

Inspection Certificate

Project: --

Client:

Office: Hamburg

Client's Order Number: 993-5403728778

Date: 30 August 2016

Order Status: incomplete

Inspection Dates
First: 20 June 2016

Final: 19 August 2016

This certificate is issued to **the above client to certify that a surveyor to Lloyd's Register did, at their request, attend the undermentioned manufacturer for the purpose of inspecting and witnessing tests on the product listed below.**

References

Manufacturer: Vallourec Deutschland GmbH, works Düsseldorf-Rath / Germany
Manufacturer's order no.: 852/2875 8

Description: Hot finished seamless line pipe

Material: X52N modified (Grade L360N Mod, PSL2) / S355G15 N
Specification: API Spec. 5 L, PSL 2, 12.2012 / ISO 3183:2012, PSL 2, VAD-SKH-X52N MOD., REV 1, 17.04.2015, *

*For further details please refer to manufacturer's works test certificate 79920RS16, 79921RS16.

Method of manufacture: hot rolled
Stage of manufacturing: as rolled
Heat treatment: normalized

Item nos.	Quantity (pcs.)	Dimensions (mm)	Total Length (m)	Total Weight (kg)	Heat nos.	Test nos.
02	-08-	323,80 o.d. x 15,88 w.th.	92,72	11.224	288395	21B
03	-09-	323,80 o.d. x 12,70 w.th.	101,15	10.004	288114	31B

EN/MM

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The following examinations were carried out with satisfactory results in accordance with the above listed order number and specification:

- **Selected and marked test specimen.**
- **Witnessed mechanical material tests.**
- **Hydraulic Test monitored continuously.**
- **Ultrasonic Test monitored continuously.**
- **Visual Examination.**
- **Verified dimensional examinations.**
- **Reviewed chemical analysis and works test certificates stamped and signed accordingly.**

Identification (hard stamped on both ends):
LR DTM MM, Heat no., Works brand, Material, Month/Year, Specification

For Energy applications only!

EN/MM

Maik Mielke
Inspector to Lloyd's Register EMEA

Maik Mielke

A subsidiary of Lloyd's Register Group Limited

Hamburg, Germany

Lloyd's Register EMEA

LR1101_2014.10

Vallourec Deutschland GmbH (A01) Werk Rath-Stopfen Rather Kreuzweg 106 40472 DÜSSELDORF GERMANY	vallourec	INSPECTION CERTIFICATE (A02) ABNAHMEPRUEFZEUGNIS 3.2 EN 10204:2004 No. / Nr.: 79921RS16 (A03) Page/Seite: 1 / 7 Date/Datum: 11.08.2016

(A01) **Vallourec Deutschland GmbH**	(A08.1) **Vallourec Order-No. / Vallourec-Auftrags-Nr./** 85228757 (A08.2) **Suborder / Unterauftrag**
(A06.1) Customer / Kunde NICHT ERMITTELTE LAENDER	
(A06.2) **Orderer / Besteller**	(A07.2) **Orderer Order-No. / Besteller Bestell-Nr.** 993-5403728778 **Date / Datum** 04.05.2016

(B01, B02, B04) **Description of the product** **Erzeugnisbeschreibung**	HOT FINISHED SEAMLESS LINE PIPE SEAMLESS IF POSSIBLE 11000 - 12000 MM ENDS BEVELLED, ANGLE 30 DEGREES (TOLERANCE +5/-0 DEGREES), ROOT FACE 1,6 +/- 0,8 MM TUBE ENDS CLOSED WITH PLASTIC CAPS RESP. PLASTIC PLUGS (AT MANUFACTURER'S CHOICE) INSIDE WITHOUT RUST PROTECTION OUTSIDE DRY VARNISH TUBES LOOSE ITEM NO LTN3238127036 NAHTLOSE STAHLROHRE, WARMGEFERTIGT (LEITUNGSROHRE) NAHTLOS MOEGLICHST 11000 - 12000 MM ENDEN ABGESCHRAEGT, WINKEL 30 GRAD (TOLERANZ +5/-0 GRAD), STEGHOEHE 1,6 +/- 0,8 MM ROHRENDEN MIT KUNSTSTOFFKAPPEN BZW. -STOPFEN (IN WERKSWAHL) VERSCHLOSSEN INNEN OHNE ROSTSCHUTZ AUSSEN KLARLACK ROHRE LOSE ITEM NO. LTN3238127036 API SPEC. 5 L, PSL 2, 12.2012 / ISO 3183:2012, PSL 2 VAD - SKH - X52N MOD. REV. 1.REV. DATE 17.04.2015 AND ELEMENTS OF EN 10225:2009 / NORSOK MDS Y22 REV. 5, 06-2007 NACE MR 0175/ISO 15156-2:2009 PARAGRAPH A.2.1.2 X52N MODIFIED / PSL2 (GRADE L360N MOD, PSL2) / S355G15+N NORMALIZED NORMALGEGLUEHT

(A10)
Inspection by / Abnahme durch LLOYD'S REGISTER EMEA DTM 1620727

Vallourec Deutschland GmbH (A01) Werk Rath-Stopfen Rather Kreuzweg 106 40472 DÜSSELDORF GERMANY		INSPECTION CERTIFICATE (A02) ABNAHMEPRUEFZEUGNIS 3.2 EN 10204:2004 No. / Nr.: 79921RS16 (A03) Page/Seite: 2 / 7 Date/Datum: 11.08.2016

(A13) Vallourec Item Position	(A09) Cust. Item Position	(B14) Item text Positionstext	(B09) Dimensions Abmessung	(B10) Single length Einzellänge
3			O.D. 323,8 MM X WTH. 12,7 MM A.D. 323,8 MM X WD. 12,7 MM	IN RANDOM MILL LENGTH 10000 - 12000 MM HL 10000 - 12000 MM

(A13) Vallourec Item Position	(A09) Cust. Item Position	(B08) Quantity Stück	(B11) Total length Gesamtlänge m	(B13) Weight Gewicht kg
3		9	101,15	10.004

Vallourec Item Position	Delivery Note-No Lieferschein-Nr.	Packing list-No Packlisten-Nr.
3	22770	

(C71)

HEAT CHEMICAL ANALYSIS / SCHMELZANALYSE

(B07.1) Heat Schmelze	(B15) Process Erschmelz.	C %	Si %	Mn %	P %	S %	Al %	Cu %	Cr %	Ni %	Mo %
min	-	-	0.150	-	-	-	-	-	-	-	-
max	-	0.160	0.450	1.60	0.025	0.0070	0.060	0.350	0.250	0.300	0.080
288114	Oxygen (BOF)	0.130	0.360	1.47	0.013	0.0010	0.029	0.030	0.040	0.030	0.010

(B07.1) Heat Schmelze	V %	As %	Sn %	Ti %	Nb(Cb) %	N %	Pb %	B %	Ca %	Bi %	CQ 03 %	CQ 08 %
min	-	-	-	-	-	-	-	-	-	-	-	-
max	0.100	0.0200	0.0200	0.020	0.050	0.0140	0.010	0.0005	0.0050	0.0100	43	25
288114	0.046	0.0030	0.0020	0.005	0.036	0.0050	0.001	0.0002	0.0014	0.0030	40	23

Vallourec Deutschland GmbH (A01) Werk Rath-Stopfen Rather Kreuzweg 106 40472 DÜSSELDORF GERMANY	vallourec	INSPECTION CERTIFICATE (A02) ABNAHMEPRUEFZEUGNIS 3.2 EN 10204:2004
		No. / Nr.: 79921RS16 (A03) Page/Seite: 3 / 7 Date/Datum: 11.08.2016

(C71)

HEAT CHEMICAL ANALYSIS / SCHMELZANALYSE

(B07.1) Heat Schmelze	EF 02 %	EF 10 %										
min max	- 0.12	- 0.8										
288114	0.09	0.1										

CQ 03	CEV/CE = C + MN/6 + (CR+MO+V)/5 + (NI+CU)/15
CQ 08	CE(PCM)= C + SI/30 + (MN+CU+CR)/20 + NI/60 + MO/15 + V/10 + 5B
EF 02	EF = V + TI + NB
EF 10	EF = CR + MO + NI + CU

Heats fully killed
Beruhigter Stahl

AL >= 2,2 X N

EF 3: V + NB = MAX. 0,100%
HEAT NO.:288114
LADLE ANALYSIS:0,082%
CHECK ANALYSIS:0,079%

(C72)

PRODUCT CHEMICAL ANALYSIS / PRODUKT CHEMISCHE ANALYSE

(B07.1) Heat Schmelze	(C00.1) Test Piece Prüfstück	C %	Si %	Mn %	P %	S %	Al %	Cu %	Cr %	Ni %	Mo %
min max		- 0.160	0.150 0.450	- 1.60	- 0.025	- 0.0070	- 0.060	- 0.350	- 0.250	- 0.300	- 0.080
288114	31B	0.126	0.370	1.47	0.012	0.0005	0.029	0.032	0.036	0.034	0.004

Vallourec Deutschland GmbH (A01) Werk Rath-Stopfen Rather Kreuzweg 106 40472 DÜSSELDORF GERMANY	vallourec	INSPECTION CERTIFICATE (A02) ABNAHMEPRUEFZEUGNIS 3.2 EN 10204:2004 No. / Nr.: 79921RS16 (A03) Page/Seite: 4 / 7 Date/Datum: 11.08.2016

(C72)

PRODUCT CHEMICAL ANALYSIS / PRODUKT CHEMISCHE ANALYSE

(B07.1) Heat Schmelze	(C00.1) Test Piece Prüfstück	V %	As %	Sn %	Tl %	Nb(Cb) %	N %	Pb %	B %	Ca %	Bi %
min		-	-	-	-	-	-	-	-	-	-
max		0.100	0.0200	0.0200	0.020	0.050	0.0140	0.010	0.0005	0.0050	0.0100
288114	31B	0.045	0.0020	0.0010	0.003	0.034	0.0071	0.001	0.0001	0.0019	0.0010

(B07.1) Heat Schmelze	(C00.1) Test Piece Prüfstück	CQ 03 %	CQ 08 %	EF 02 %	EF 10 %						
min		-	-	-	-						
max		.43	.25	0.12	0.8						
288114	31B	.39	.22	0.08	0.1						

CQ 03	CEV/CE = C + MN/6 + (CR+MO+V)/5 + (NI+CU)/15
CQ 08	CE(PCM)= C + SI/30 + (MN+CU+CR)/20 + NI/60 + MO/15 + V/10 + 5B
EF 02	EF = V + TI + NB
EF 10	EF = CR + MO + NI + CU

TENSILE TEST RESULTS / ERGEBNISSE DES ZUGVERSUCHS

Type / Form (C10.1)	TUBE STRIP TEST SPECIMEN / ROHRSTREIFENPROBE
Test temperature / Prüftemperatur (C03)	ROOM TEMPERATURE / RAUMTEMPERATUR
Direction / Richtung (C02)	longitudinal / längs

(B07.1) Heat Schmelze	(C00.1) Test Piece Prüfstück	(C10) Dimension Abmessung	(C11) YS Streckgr.	(C12) TS Zugfest.	(C13) Elong. Dehnung	(C14.1) Ratio Verhältn.					
		mm	ReH MPa	R_m MPa	$5,65\sqrt{So}$ %	R/R_m -					
min		-	355	460	22.0	-					
max		-	-	620	-	0.88					
288114	31B	19.95X12.64	388	513	33.0	0.76					

TENSILE TEST RESULTS / ERGEBNISSE DES ZUGVERSUCHS

Type / Form (C10.1)	TUBE STRIP TEST SPECIMEN / ROHRSTREIFENPROBE
Test temperature / Prüftemperatur (C03)	ROOM TEMPERATURE / RAUMTEMPERATUR
Direction / Richtung (C02)	longitudinal / längs

Vallourec Deutschland GmbH (A01) Werk Rath-Stopfen Rather Kreuzweg 106 40472 DÜSSELDORF GERMANY	vallourec	INSPECTION CERTIFICATE (A02) ABNAHMEPRUEFZEUGNIS 3.2 EN 10204:2004
		No. / Nr. : 79921RS16 (A03) Page/Seite: 5 / 7 Date/Datum: 11.08.2016

TENSILE TEST RESULTS / ERGEBNISSE DES ZUGVERSUCHS

(B07.1) Heat Schmelze	(C00.1) Test Piece Prüfstück	(C10) Dimension Abmessung	(C11) YS Streckgr.	(C12) TS Zugfest.	(C13) Elong. Dehnung	(C14.1) Ratio Verhältn.					
		mm	$R_{t0,5}$ MPa	R_m MPa	2" %	R/R_m -					
min		-	360	460	27.0	-					
max		-	530	760	-	0.93					
288114	31B	38.10X13.20	373	511	46.5	0.73					

IMPACT TEST RESULTS / ERGEBNISSE DES KERBSCHLAGBIEGEVERSUCHS

Type / Form (C40)	Charpy-V / Charpy-V
Test temperature / Prüftemperatur (C03)	- 50 DEGREES C
Direction / Richtung (C02)	transverse / quer

(B07.1) Heat Schmelze	(C00.1) Test Piece Prüfstück	(C41)	(C42.1) Impact1 Arbeit1	(C42.1) Impact2 Arbeit2	(C42.1) Impact3 Arbeit3	(C43.3) Mean Mittelw.	(C42.2) Shear fr1 Scherbr1	(C42.2) Shear fr2 Scherbr2	(C42.2) Shear fr3 Scherbr3		
		qcm	J	J	J	J	%	%	%		
min		-	38.0	38.0	38.0	50.0	-	-	-		
max		-	-	-	-	-	-	-	-		
288114	31B	0.800	221	270	258	250	80	90	85		

HARDNESS TEST RESULTS / ERGEBNISSE DER HAERTEPRUEFUNG

Location / Lage (C01.1)	MIDDLE CONCERNING WALL / MITTE BEZOGEN AUF DIE ROHRWAND

(B07.1) Heat Schmelze	(C00.1) Test Piece Prüfstück	(C31) Value	(C31) Value								
		HV 10	HV 10								
min		-	-								
max		248.0	248.0								
288114	31B	155.0	153.0								

(D55)

OTHER TESTS ON PIPE / SONSTIGE PRUEFUNGEN

Vallourec Deutschland GmbH (A01) Werk Rath-Stopfen Rather Kreuzweg 106 40472 DÜSSELDORF GERMANY	vallourec	INSPECTION CERTIFICATE (A02) ABNAHMEPRUEFZEUGNIS 3.2 EN 10204:2004 No. / Nr. : 79921RS16 (A03) Page/Seite: 6 / 7 Date/Datum: 11.08.2016

(D55)

OTHER TESTS ON PIPE / SONSTIGE PRUEFUNGEN

Test Prüfung	Conditions Prüfbedingungen	Test rate Prüfumfang	Result Ergebnis
HEAT TREATMENT WAERMEBEHANDLUNG	NORMALIZED NORMALISIERT	5 MIN 920 DEGREES C AIR 5 MIN 920 GRAD C LUFT	
HYDROSTATIC TEST INNENDRUCKVERSUCH MIT WASSER	205 BAR (1BAR=100KPA), HOLDING TIME 5 SEC. 205 BAR (1BAR=100KPA), HALTEZEIT 5 SEC.	EACH PIPE/ TUBE JE ROHR	NO LEAKAGE BESTANDEN
APPEARANCE AND DIMENSIONS (D01) OBERFLAECHENBESCHAFFENHEIT UND MASSE (D01)		EACH PIPE/ TUBE JE ROHR	SATISFACTORY BESTANDEN

NON DESTRUCTIVE TESTING BY ULTRASONIC INSPECTION
FOR LONGITUDINAL AND TRANSVERSE IMPERFECTIONS
IN ACC. TO EN ISO 10893-10: 2011
ACCEPTANCE CATEGORY U2, SUB-CATEGORY C,
CONSIDERING ANNEX A TABLE A.1,
RECTANGULAR NOTCH; LENGTH MIN. 50 MM, WIDTH MAX. 1,0 MM
DEPTH 5% OF WALL THICKNESS, MIN. 0,3 MM & MAX. 1,5 MM
INSIDE & OUTSIDE, FULL LENGTH, EACH PIPE/TUBE SATISFACTORY

NON DESTRUCTIVE TESTING BY ULTRASONIC INSPECTION
DETECTION FOR LAMINAR IMPERFECTIONS
IN ACC. TO EN ISO 10893-8: 2011, ACCEPTANCE CATEGORY U3,
FULL LENGTH, EACH PIPE/TUBE SATISFACTORY

(A04, B06)

MARKING, IDENTIFICATION / KENNZEICHNUNG, IDENTIFIKATION

VALLOUREC	DIE STAMPED BOTH SIDES ROUND NOSE TOOLS VALLOUREC LOGO MANUFACTURER'S NAME MANUFACTURER'S MARK MONTH/YEAR X52N MOD PSL 2 ISO 3183 L360N MOD PSL 2 EN 10225 S355G15+N HEAT-NO. WA INSPECTORS BRAND LR DTM MM PAINT STENCILED ON ONE SIDE VALLOUREC LOGO MANUFACTURER'S NAME MANUFACTURER'S MARK PROCESS OF MANUFACTURE SMLS MONTH/YEAR 323,8 X 12,7 X52 B MOD PSL 2 ISO 3183 L360N MOD PSL 2 EN 10225 S355G15+N HEAT-NO. TUBE/PIPE LENGTH M 85228757 VLR ITEM-NO 3 WA INSPECTORS BRAND LR DTM MM CUSTOMER ORDER-NO. 993-5403728778 COUNTRY OF ORIGIN GERMANY PIPE NO. (TALLY-NR.)
VALLOUREC	BEIDSEITIG STAHLGESTEMPELT ABGERUNDETE STEMPEL VALLOUREC LOGO HERSTELLERNAME HERSTELLERZEICHEN MONAT/JAHR X52N MOD PSL 2 ISO 3183 L360N MOD PSL 2 EN 10225 S355G15+N SCHMELZEN-NR. WA ZEICHEN DER FREMDABNAHME LR DTM MM EINSEITIG SCHABLONIERT VALLOUREC LOGO HERSTELLERNAME HERSTELLERZEICHEN HERSTELLVERFAHREN SMLS MONAT/JAHR 323,8 X 12,7 X52 B MOD PSL 2 ISO 3183 L360N MOD PSL 2 EN 10225 S355G15+N SCHMELZEN-NR. ROHREINZELLAENGE M 85228757 POSITIONS-NR. 3 WA ZEICHEN

Vallourec Deutschland GmbH (A01) Werk Rath-Stopfen Rather Kreuzweg 106 40472 DÜSSELDORF GERMANY	vallourec	INSPECTION CERTIFICATE (A02) ABNAHMEPRUEFZEUGNIS 3.2 EN 10204:2004 No. / Nr. : 79921RS16 (A03) Page/Seite: 7 / 7 Date/Datum: 11.08.2016

(A04, B05)

MARKING, IDENTIFICATION / KENNZEICHNUNG, IDENTIFIKATION

DER FREMDABNAHME LR DTM MM BESTELL-NR. BESTELLER 993-5403728778 URSPRUNGSLAND GERMANY LFD. ROHR-NR.

Enclosures / Anlagen

TALLY LIST SEE APPENDIX
ROHRLISTE SIEHE ANLAGE

(Z01)

The supplied products are in compliance with the requirements of the order
Die gelieferten Erzeugnisse stimmen mit den Anforderungen des Auftrages überein

(A05, Z02, Z03, Z04)

Date / Datum	11.08.2016	
Validated by Bestätigt durch	Inspection Representative Abnahmebeauftragter	Third Party Representative Beauftragter Fremdabnehmer
	DOGAN	Maik Mielke Dortmund Office Lloyd's Register EMEA
☎	+49(0)2119603852	
🖷	+49(0)2119602216	
@	CERTIFICATES-RS-DUC@VALLOUREC.COM	
Stamp / Stempel	vallourec Vallourec Deutschland GmbH Inspection Department	

Indication in parentheses correspond to attributes according to EN 10168

Die Bezeichnungen in Klammern entsprechen den Kennnummern gemäss EN 10168

This testimonial and certification respectively may neither be modified nor used for other products. Offences are regarded as falsification of documents and will be subject to criminal prosecution

Dieses Zeugnis bzw. diese Bescheinigung darf weder verändert noch für andere Erzeugnisse verwendet werden. Zuwiderhandlungen werden als Urkundenfälschung und Betrug strafrechtlich verfolgt

0000015-00016/00016

vallourec

Mill / Werk / Usine de Düsseldorf - Rath

VAD Order No.: VAD Auftrag VAD No. de Commande	852 / 2875 7	**Item-No.:** Pos. Nr. No. de Poste	3

Customer:
Kunde/Client
Client

P.O. No.: 993-5403728778

User: NICHT ERMITTELTE LAENDER
Verwender
Utilisateur

P.O. No.:

Consignee:
Warenempfänger
Destinataire

Destination: NICHTERMITTELTE LAENDER
Bestimmungsland
Pays de destination

Tally - List
Rohrliste / Liste de Colisage

PROJECT

Dimension
323,80 x 12,70 mm

Grade
X52N

No of pieces Anzahl Nombre de pieces	Length (m) Länge Longueur	Weight (kg) Gewicht Poids	Length (ft) Länge Longueur	Weight (lbs) Gewicht Poids
9	101,150	10.004	331,86	22055

VAD Order 852 / 2875.7		Item no. 3	Grade X52N			Dimension 323,80 x 12,70 mm	
Tally-no. Tally-Nr. Tally-no.	Pipe-no. Rohr-Nr. No. de tube	Piece Anzahl Piece	Heat-no. Schmelze No. de Coulee	Length Länge Longueur (m)	Weight Gewicht Poids (kg)	Length Länge Longueur (ft)	Weight Gewicht Poids (lbs)
10	38	1	288114	11,300	1102	37,073	2429
11	36	1	288114	11,420	1118	37,467	2465
12	34	1	288114	11,400	1112	37,402	2452
13	37	1	288114	11,340	1108	37,205	2443
14	33	1	288114	11,330	1210	37,172	2668
15	32	1	288114	11,230	1104	36,844	2434
16	31	1	288114	10,780	1062	35,367	2341
17	35	1	288114	11,220	1102	36,811	2429
18	39	1	288114	11,130	1086	36,516	2394
Total:		**9**		**101,150**	**10004**	**331,857** (summed over single tubes)	**22055**

Consumables certificate

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2020-07-29

Numero certificato/Cert no: EC26103601 rev. 0

Nostro ordine/Our order:	0100083700	Vostro ordine/Your order:	0241
Nostro riferimento/Our ref:	MECUSER	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB01056	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20200704	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address
TECHNO SERVICE S.R.L.
.
VIA DELLA MERENDA,32 FOR.ZARATTINI
48124 RAVENNA
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
TECHNO SERVICE S.R.L.
VIA DELLA MERENDA,32 FOR.ZARATTINI
48124 RAVENNA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PVU26633828 Quantità/Quantity: 200 KGM

PRODOTTO/PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK Tigrod 12.64 2.4x1000mm 5kg
Codice/Item no:	126424R150

CLASSIFICAZIONE/CLASSIFICATIONS

EN ISO 636-A: W 46 4 4Si1
EN ISO 636-A: W4Si1
SFA/AWS A5.18: ER70S-6

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

Wire/strip

Altro/Auxiliary:

C		0.08%
Si		0.89%
Mn		1.63%
P		0.011%
S		0.011%
Cr		0.03%
Ni		0.01%
Mo	<	0.01%
Cu		0.05%
V	<	0.01%
Al	<	0.01%
Ti+Zr		0.02%

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:	EN
Altro/Auxiliary:	I1
Condizione/Condition:	

TRAZIONE/TENSILE

ReL	Rm	A4-A5
525 MPa	595 MPa	26 %

RESILIENZA/IMPACT

Temp	-40 °C
KV	150 J

COPIA CONFORME ALL'ORIGINALE

TECHNO SERVICE S.R.L.
QUESTO CERTIFICATO E' VALIDO PER
UNA QUANTITA' DI KG/PZ 40
VEDI DDT N. 1578 DEL 10/08/20

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura S.p.A. | Str. Provinciale 34, n.37 - 20010 Ossona MI, Italy

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis
Josef Moravek Quality Manager

Validazione - altro/Validation - Others
Jose Abal Lopez,H. Rasmuson Product Manager,

preliminary WPS

PQR ref.:	01-21 TBQ	WPS	01-21	REV.:	0	Data /date	26/01/2021

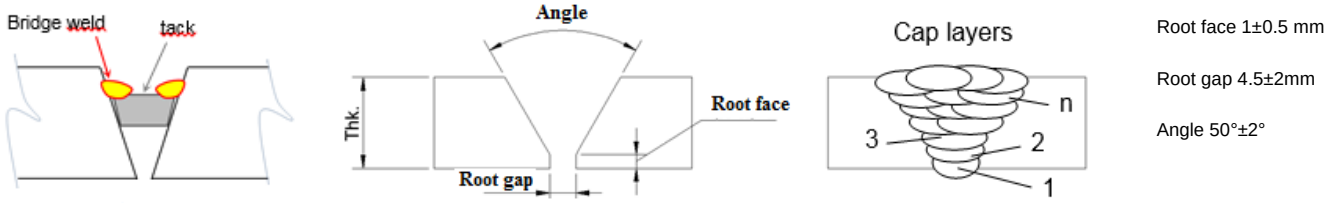
Procedimento di saldatura / Welding process: **GTAW - 141** Tipo / Type: **MANUAL**

GIUNTO – JOINT (QW-402)

Tipo di giunto / Joint Design: **V** Supporto / Backing: ☐ Si / Yes ☒ No

Materiale di supporto (tipo) / Backing material (type): ☐ Metallico / Metal ☐ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:



Root face 1±0.5 mm

Root gap 4.5±2mm

Angle 50°±2°

Note:

1) The bullets for tacking shall be take from Carbon steel pipe. Minimum tack welds 2 times of wall thickness or 50 mm whichever is less / *Usare per i tacchetti materiale in acciaio al carbonio. Minima lunghezza delle puntature 2 volte lo spessore o 50 mm, quale dei due è più piccolo.*
2) The alignment of pipe ends shall be such as to minimize the internal offset between surfaces/ *L'allineamento dei tubi deve essere tale da minimizzare il disallineamento.*
3) Surfaces cleaned from moisture, oil, grease, paint. The cleaning shall be extend 75 mm from bevel end on internal and external surface. /*Pulire le superfici da sporcizia, oli e grassi. La pulizia deve essere estesa per 75 mm dal bordo del tubo sia sulla superfice esterna che interna.*

MATERIALE BASE – BASE MATERIAL (QW-403)

Da / from P-N°: / Group N°: / A / to P-N°: / Group N° /

DA Tipo e grado / From type and grade: **S355G14+N CEQ 0.40**

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove: **From 6,35 mm to 19,05 mm (WT 12.7mm)**

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove: **6" and over**

METALLO D'APPORTO – FILLER METAL (QW-404)

	GTAW 141
Spec. N° (SFA)	5.18
AWS N° (CLASS)	ER70S-6
F-N°	6
A-N°	See brand name
Diametro mat. D'apporto / Size of filler metal	2,4
Gamma spessori /Thick. Range (mm)	Up to filling
Accoppiamento filo-flusso / Electrode-flux (CLASS)	NA
Denom. Comm. Flusso / FLUX trade name	NA
Inserto consumabile / Consumable insert	NA
Altro / other	ESAB OK TIGROD 12.64

4)Preheat shall be performed by prophane torch, preheat and interpass temperature shall be checked by digital thermometer /
Il preriscaldo deve essere eseguito con la torcia al propano,il preriscaldo ed interpass devono essere controllati con il termometro digitale.

5)Welding may be interrupted and cooled to ambient temperature after filling pass are finished. Restore preheat before welding restart/
La saldatura può essere interrotta ultimate le passate di riempimento. Ripristinare il preriscaldo prima di eseguire le passate di finitura.

POSIZIONI – POSITION (QW 405)

giunto / Joint: **Cianfrino / groove** Posizione / position: **All** Progressione / weld progression: **Ascendente / UP hill**

PRERISCALDO – PRE-HEAT (QW406)

Temp.preriscaldo minima / Min. pre-heat temp: **20 °C** Max temp. Di interpass / Max interpass temp.: **250 °C** Mantenimento interpass / Interpass maintenance: **N.A.** Tempo di mantenimento prerisc.: / Maintenance timing: **N.A.**

TRATTAMENTO TERMICO DOPO SALDATURA – POST WELD HEAT TREATMENT(QW 407)

Riscaldamento / Heating rate (°C/Hrs): **N.A.** Temperatura di stasi / Holding temperature °C: **N.A.** Tempo di stasi / Holding time (min.): **N.A.** Velocità di raffreddamento: / Cooling rate (°C/Hrs): **N.A.**

GAS DI PROTEZIONE – GAS (QW 408)

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar	99,998%	10-16 LPM
Protezione al seguito / Trailing:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS (QW –409)

Corrente / Current: **DC** Polarità / Polarity: **SP**

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: **AWS 5.12EWTh2 dia.2,4mm**

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: **N.A.**

Velocità alimentazione filo / Electr. Wire feed speed range: **N.A.**

TECNICA – TECHNIQUE (QW-410)

Passata / Bead: **Larga/Weave (Max 13 mm)** Dimensione bocchello gas / Orifice of gas cup size: **3/8"** Pulizia iniziale e fra le passate / Initial and interpass cleaning: **Spazzolatura/Brushing**

Metodo di solcatura a rovescio / Method of back gouging: **N.A.** Oscillazione / Oscillation: **N.A.** Distanza tra zona di contatto e pezzo / Contact zone to work distance: **N.A.**

N°Passate / Passes nr.: **Multipla/Multiple** Elettrodo multiplo o singolo / Multiple or single electrodes: **Singolo/Single** Martellatura / Peening: **N.A.**

Altro / Other: **K factor=0,6 for GTAW**

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range	Vel. Avanzamento / Travel speed range (mm/min)	Apporto termico / Heat input (KJ/mm)
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. Range			
Welding position 2G								
1 Root	GTAW	ER 70S-6	2,4	SP	90-120	9-11	50-65	0.4-0.9
2 Hot	GTAW	ER 70S-6	2,4	SP	120-140	10-13	80-120	0.4-0.8
3-n Filling	GTAW	ER 70S-6	2,4	SP	140-170	11-15	100-140	0.4-0.9
Cap layers	GTAW	ER 70S-6	2,4	SP	140-170	11-15	100-140	0.4-0.9
Welding position 5G								
1 Root	GTAW	ER 70S-6	2,4	SP	80-110	9-11	45-65	0.4-1.0
2 Hot	GTAW	ER 70S-6	2,4	SP	100-130	10-12	70-90	0.4-0.8
3-n Filling	GTAW	ER 70S-6	2,4	SP	110-150	11-14	80-100	0.4-0.9
Cap layers	GTAW	ER 70S-6	2,4	SP	110-150	11-14	80-100	0.4-0.9

ROSETTI - prepared by:

A.KHALIFA

NDE certificate

ROSETTI MARINO	VERBALE DI CONTROLLO VISIVO/DIMENSIONALE visual/dimensional inspection report	VDR N° 01-21 data: 31/01/2021
progetto project: TOLMOUNT	cliente client: PMO	commessa job: 118A50

oggetto – item

Procedure Qualification Record (WPQR) 01/21

Certificato di Qualifica di Procedimento di Saldatura (WPQR) 01/21

WE CERTIFY THAT:

ITEMS INDICATED ABOVE HAVE UNDERGONE A VISUAL INSPECTION AND HAVE BEEN ACCEPTED ACCORDING TO THE SPECIFICATION / PROCEDURE MENTIONED AND TO ACCEPTANCE CRITERIA DEFINED IN IT

SI CERTIFICA CHE LE SALDATURE DEI SAGGI SOPRA CITATI SONO STATI SOTTOPOSTI AD ESAME VISIVO AL 100% ALLO STATO COME SALDATO IN ACCORDO ALLE SPECIFICHE E STANDARD CITATI.

note – remarks

INSPECTION ON 2 WELDS 12”X12.7MM WELDED GTAW, AS WELDED CONDITION, SAMPLES 2G & 5G
MATERIAL C.S. S355G15+N / API 5L X52
NO VISIBLE DEFECTS HAVE BEEN DETECTED.

ISPEZIONE SU 2 GIUNTI ALLO STATO COME SALDATO 12”X12.7MM, CAMPIONI 2G & 5G
MATERIALE C.S. S355G15+N / API 5L X52
NON SONO STATI RILEVATI DIFETTI VISIBILI.

RINA Services SpA No. Bo. 0474 Date 03/02/2021 File Noted ☐ Reviewed ☒ Witnessed ☐ Approved ☐ Signature Cimatti Davide

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

ISO 15614-1, EEMUA 158 TABLE 14, ISO 5817 B, AB-TO-ROS-PM-QA-PR-0006

Operatore – Operator	Controllo Qualita’ - Quality Control	Cliente - Client
CSWIP A.K. KHALIFA 69505 WI 3.1 Abdulkarim Khalifa		

QUALITY TEST srl Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n°	
	19265 MT 01 RN Rev. 00	
RAPPORTO D'ESAME MAGNETOSCOPICO Magnetic Particle Test Report	DATA / Date 31/01/2021	FOGLIO / Sheet 1

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	/	118A50	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	FASE Step
/	WPQR	/	AB-TO-ROS-PM-QA-PL-0002_C01	8.1

ESECUZIONE / Execution		ACCETTABILITA' / Acceptance	
AB-TO-ROS-PM-QA-PR-0007_C02		AB-TO-ROS-PM-QA-PR-0007_C02	
MATERIALE/Material	TEMP. SUPERFICI Surface temperature	INTENSITA' LUMINOSA/ Light intensity	
S355G15+N	08°C	☑ LUCE BIANCA >1276 Lux	☐ LUCE NERA 1000 µW/cm²

STATO DELLA SUPERFICIE – Surface condition			
☑ COME SALDATO As welded	☐ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined	
☐ GREZZO – Forged	☐ LAMINATO – Rolled	☐ MOLATO – Ground	☐ SABBIATO – Blasted

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☑ GIOGO/Yoke	☐ PUNTALI/Prods	☐ BOBINA/Coil	☐ CONDUTTORE CENTRALE/Central conduttor

METODO / Method		SMAGNETIZZAZIONE/Demagnetization	
☑ CONTINUO/Continuous	☐ RESIDUO /Residual	☐ RICHIESTA/Required	☑ NON RICHIESTA/Not Required
TIPO DI MAGNETIZZAZIONE/magnetization type		DIREZIONE CAMPO MAGNETICO/magnetic field direction	
☑ MAGNETICO/magnetic	☐ ELETTRICO/electric	☐ CIRCOLARE/Circular	☑ LONGITUDINALE/longitudinal
TIPO APPARECCHIO/Type of equipment	Magneticontrol HR230	DISTANZA PUNTALI/Pole spacing	180 mm
NUMERO DI SERIE/Serial number	04.230-15		
TIPO DI CORRENTE/Current Type		POTERE DI SOLLEVAMENTO GIOGO / Lifting power	
☑ A.C.	☐ D.C.	☑ 4,5 kg	☐ 18 kg
MEZZO DI ISPEZIONE / Examination medium		INTENSITÀ DI CORRENTE / Intesity	
☑ UMIDO/Wet	☐ SECCO/Dry	☐ A/ mm	☐ / spira

PARTICELLE UTILIZZATE/Particle Type			
CONTRASTO DI COLOR/Color contrast	☑	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	☑ NDT BW2 ☐ NDT DRY	MARCA TIPO/Mark Type	NDT FW1
LOTTO/BACH	7249s	LOTTO/BACH	/
VERNICE DI CONTRASTO / Contrast Paint		☑ NDT WBL5	LOTTO/BACH U200625s

SALDATURE CONTROLLATE / Welds Verified

Coupon ID	Stamp	Process	Joit Type	Position	Bevel	Scan plan
WPQR-01-21-2G	AX-47	GTAW	But weld	2G	V	IDL-QCI-UT-02
WPQR-01-21-5G	AX-47	GTAW	But weld	5G	V	IDL-QCI-UT-01

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITÀ Quality Control	ISPETTORE CLIENTE Company Repr.
RICCARDO NOCERA 2° Livello ISO 9712 / SNT-TC-1A		

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta.
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Partial reproduction of this certificate mu
Test results relate only to examined items

Z:\Qualita\5 modulistica\01 moduli cnd\validi\01 moduli 2020\convenzionali superficiali

RINA Services SpA No. Bo. 0474 Date 03/02/2021 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ File Signature Cimatti Davide

QUALITY TEST srl Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n°	
	19265 UT 01 SZ Rev. 00	
RAPPORTO D'ESAME CON ULTRASUONI Ultrasonic Examination report	DATA / Date 31/01/2021	FOGLIO / Sheet 1

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	/	118A50	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C./Q.C.P.	Fase/Step
/	WPQR	/	AB-TO-ROS-PM-QA-PL-0002_C01	8.1

ESECUZIONE / Execution	ACCETTABILITA' / Acceptance
AB-TO-ROS-PM-QA-PR-0011_C07	AB-TO-ROS-PM-QA-PR-0011_C07

MATERIALE / Material	DIMENSIONI / Dimension	SPESSORE NOMINALE / Thk
S355G15+N	DIAMETER 12 INCH	WALL THICKNESS 12,7

STATO DELLA SUPERFICIE – Surface condition

☑ COME SALDATO As welded	☐ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined	
☐ GREZZO – Forged	☐ LAMINATO – Rolled	☐ MOLATO – Ground	☐ SABBIATO – Blasted

APPARECCHIO / Equipment GILARDONI	TIPOType RDG 700	No. SERIE / Serial Number I003937

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	AMPLIFICAZIONE dB value	ONDE Waves
Krautkramer	KNF	4	10	0°	42	L
Doppler	AP	4	8X9	60°	44	S
Doppler	AP	4	8X9	45°	44	S
Union Test	NDT	4	8X9	70°	44	S

BLOCCO DI CALIBRAZIONE Calibration block	IIW V2	BLOCCO DI RIFERIMENTO Reference block	RM-CAL-BLOCK-B-124
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity	SDH 3 mm

SALDATURE CONTROLLATE / Welds Verified

Coupon ID	Stamp	Process	Joit Type	Position	Bevel	Scan plan
WPQR-01-21-2G	AX-47	GTAW	But weld	2G	V	IDL-QCI-UT-217
WPQR-01-21-5G	AX-47	GTAW	But weld	5G	V	IDL-QCI-UT-217

RINA Services SpA Date 03/02/2021
No. Bo. 0474 File
Noted ☐
Reviewed ☑ Signature
Witnessed ☐
Approved ☐

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITÀ Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zauli 2° Livello		

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta. - Partial reproduction of this certificate must be written authorized.
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Z: Qualita\5 modulistica\01 moduli cnd\validi\01 moduli 2020\convenzionali volumetrici

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n° 19265 RT 01 RN Rev. 00
RAPPORTO D'ESAME RADIOGRAFICO RADIOGRAPHIC TEST		DATA / Date 31/01/2021 FOGLIO / Sheet 1

CLIENTE / Client	ORDINE / Order	PROGETTO / Project	COMMESSA / Job	
ROSETTI MARINO	/	/	118A50	
CLIENTE FINALE /Customer	**OGGETTO / Object**	**DISEGNO / Dwg**	**P.F.C. / Q.C.P.**	**Fase / Step**
/	WPQR	/	/	/

Schizzo Sketch	Saldatura Weld	Diametro Diameter	Spessore Thikeness	Punzone Welder	Posizione Position	Difetto Defect	Giudizio Judgement
WPQR 01-21-2G	/	12"	12.70 mm	AX-47	0-1	/	A
					1-2	/	A
					2-0	/	A
WPQR 01-21-5G	/	12"	12.70 mm	AX-47	0-1	/	A
					1-2	/	A
					2-0	/	A

DIFETTI / Defects							
101	Longitudinal crack	2014	Linear porosity	3041	Tungsten inclusion	501	Undercut
104	Crater crack	2016	Wormholes	3042	Copper inclusion	504	Excess penetration
2011	Porosity	301	Slag inclusion	401	Lack of fusion	507	misaligment
2013	Clustered	DF	Difetto film Film defect	402	Lack of penetration	515	Root concavity

ESITO / Results							
A	Accettabile Acceptable	NR	Riparare Repair	NX	Ripetere Film Repeat Film		

PROCEDURA /Procedure AB-TO-ROS-PM-QA-PR-0009_C03	Schermi / Lead screen PB 0,10 Front and Back	Pellicole / Film type KODAK T200 (C4)
Tipo macchina Rɣ / Type machine Rɣ TELETRON IR192 matr.881801	Densità / Density Range ≤ 4 base material	Densità / Density Range > 2.3 welded area

TECNICA DI ESPOSIZIONE / Exposure Technique: SINGOLA PARETE SINGOLA IMMAGINE SWSI

Tipo di sorgente / source type			Tipo di IQI / IQI type	
☐ RX	☑ IR 192	☐ SE 75	☐ ASTM	☑ EN
Macchia focale focal spot		3	Posizione / position	
Attività activity			☑ Lato film film side	☐ Lato sorgente Source side
Ci	kV	mA	Esposizione / esposition	
26	/	/	☑ Film singolo Single film	☐ Film doppio Double ilm
Tempo di esposizione exposure time			Tecnica di sviluppo / Film processing	
67 sec			☐ Manuale / manual	☑ Automatico / Automatic

Spessore attraversato Crossed thickness w	Dist. Sorgente film *Source film distance* (SFD)	Dist. oggetto film *Film object distance* (b)	Distanza minima Minimum distance (f min)	Filo visibile n° Visible Wire n°	Lastre n° *Films n°*
12 ÷ 20 mm	149.25 mm	12.70 mm	125 mm	13	3

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
RICCARDO NOCERA 2° Livello ISO 9712 / SNT-TC-1A		

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta. - Partial reproduction of this certificate must
I risultati delle prove si riferiscono unicamente ai particolari esaminati. - Test results relate only to examined items.
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RINA Services SpA No. Bo. 0474 Date 03/02/2021 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ File Signature Cimatti Davide

ROSETTI MARINO

PQR 01/21

Mechanical test report

INSPECTA S.R.L.	**TEST REPORT** ***RAPPORTO DI PROVA*** **N° 045-00100-21** **Rev.00** **Data: 12/02/2021**	ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO **LAB N°1607 L**

Object: *Oggetto:*	**MECHANICAL TEST ON WPQR 01-2021 (POS.2G)**					Pag. 1 di 8
Specimen: *Saggio:*	**054/21**	**#Base Material:** *Materiale Base:*	**EN 10225-S355G15+N** **API 5L X52**	**PIPE Ø 12'' THK. 12,70 mm**		
		# Informazione fornita dal cliente/ Information provided by the customer				
Customer: *Committente:*	**ROSETTI MARINO S.p.A.**					
Address: *Indirizzo:*	**Via Trieste, 230 - 48122 Ravenna (RA)**					
Final customer:. *Cliente finale:*	//					
Your delivery note n°: *Vs. DDT di consegna*	**n°** // *n°*	**Date:** *Data:* //		**MD52** *MD 52*	**016/2021**	**Date:** *Data:* **29/01/2021**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **08/02/2021**	**End of activities:** *Fine prove:*		**Date:** *Data:* **08/02/2021**		

PROVE RICHIESTE

☒ **TENSILE TEST**/*Trazione*	☒ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*	
☒ **BEND TEST**/*Piega*	☒ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root */Dritto/Rovescio* ☒ Side/ *Laterale*	
☒ **IMPACT TEST**/*Resilienza*	☒ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*	
☒ **MACROEXAMINATION TEST /** *Macrografia*			
☒ **HARDNESS TEST**/ *Durezza*	☐ HV 5	☒ HV 10	
☐ **FRACTURE TEST**/ *Frattura*	☐ Plate with/on Plate/ *Piastra con/su Piastra* ☐ Pipe with/on Pipe/*Tubo con/ su Tubo*	☐ Pipe on Plate/*Tubo su Piastra*	
☐ **CHEMICAL ANALYSIS**/*Analisi Chimica*			
☐ **MICROEXAMINATION TEST /** *Micrografia*			
☐ **OTHER (Specify)**/*Altro/(Specificare)*			

Allegati /Attachments:

NOTE/ Remarks: **REFERENCE CODE FROM CUSTOMER REQUEST: UNI EN ISO 15614-1 + EEMUA 158 Ed.3**

Informazioni aggiuntive fornite dal cliente:
Additional information provided by the customer

*** PROVA NON ACCREDITATA DA ACCREDIA**

Laboratory Responsible *Responsabile Laboratorio* *Sig. Giulio Bagnara*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
INSPECTA srl Service Responsible 12-02-2021		RINA Services SpA No. Bo. 0474 Date 12/02/2021 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I risultati di prova si riferiscono al campione così come ricevuto,essendo il campionamento eseguito dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%.The results in this test report refers only to the specimen that has been tested.The customer undertakes to print out /reproduce the test report. Any partial reproduction is prohibited.Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory.The test results refer to the sample as received, since the sampling is performed by the customer..Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku = 2 equivalent to a level of confidence of 95 % .

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

Date of Testing::08/02/2021
Data esecuzione prova:

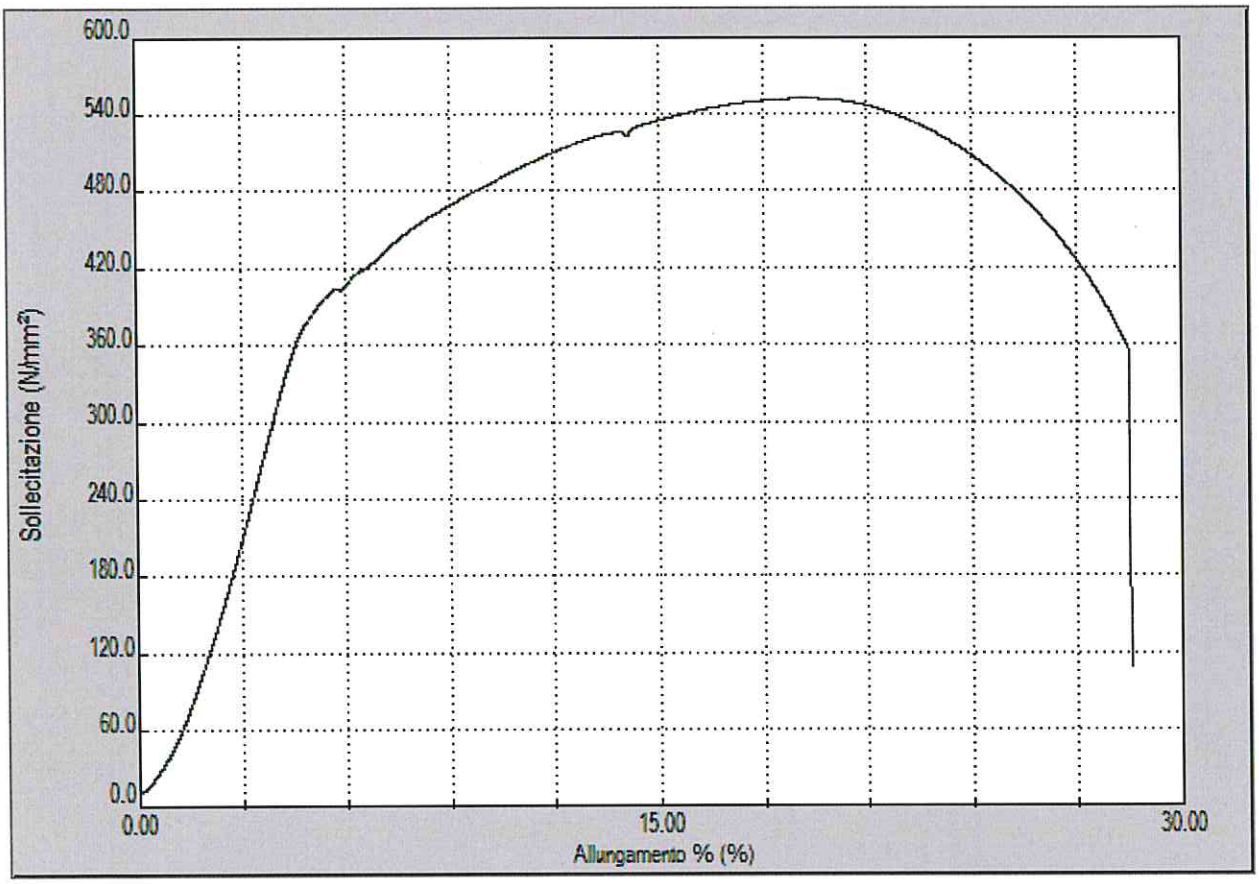
☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2020 method B* ☐ *ASTM A370-20*
☐ *ASME IX QW–150:2019* ☐ *ASTM E8 / E8M 16ae1* ☐ _____

Serial N. VAUP 01

* **PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA**

Internal procedure *Procedura interna :* ***PP08 rev.11***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
054/2021 A TWT	12,05x25,02	301,52	20,9°C	//	//	/	//	/	166383	552	/	//	//	FOW



Remarks / *Note:*

Legend / *Legenda*

TT = Transverse Tension/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura*
TWT = Transverse Weld Tension/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Chiara Bugiardi		
Laboratory Technician 12/02/2021	INSPECTA 12-02-2021 Service Responsible		

RINA Services SpA No. Bs. 0474 Date 12/02/2021 File Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Signature Cimarosti Davide

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

Date of Testing::08/02/2021
Data esecuzione prova:

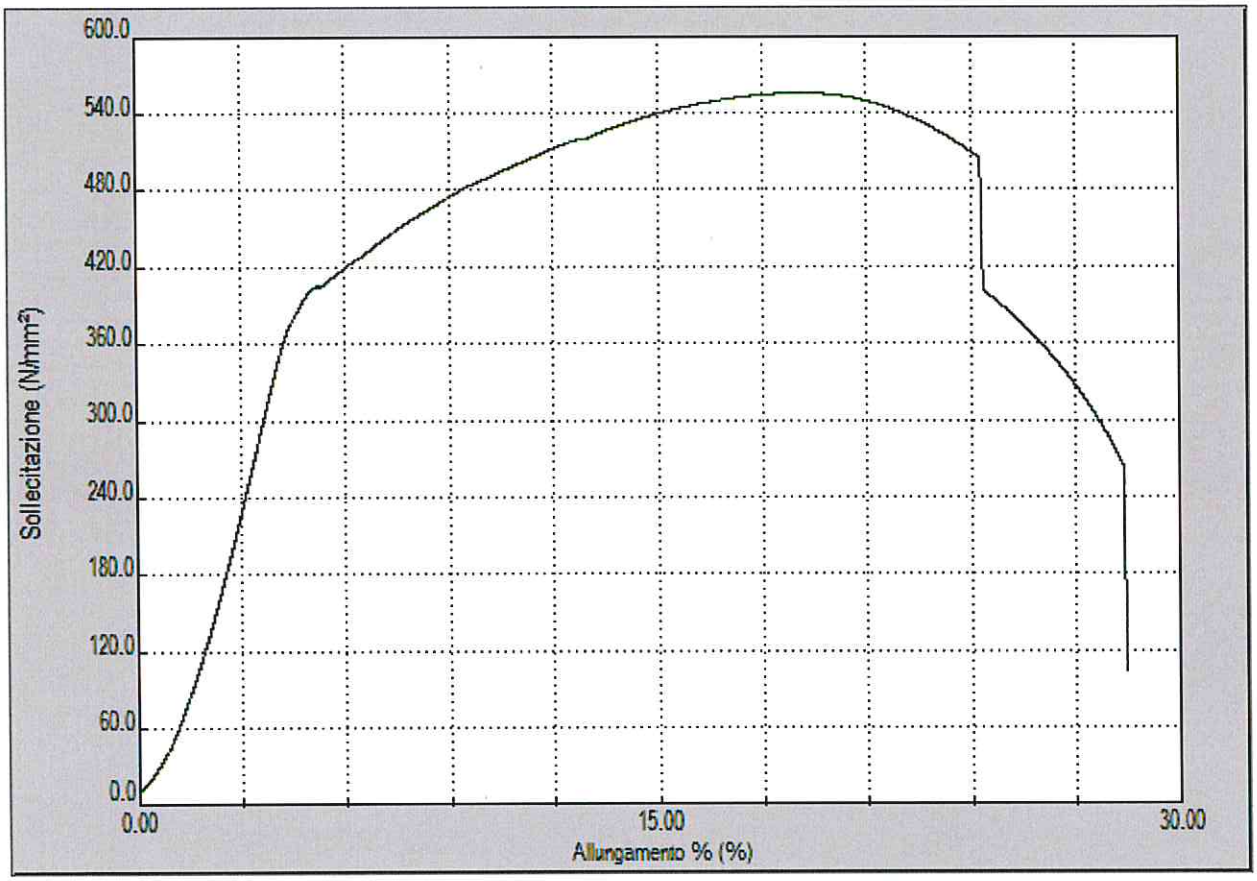
☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2020 method B* ☐ *ASTM A370-20*
☐ *ASME IX QW–150:2019* ☐ *ASTM E8 / E8M 16ae1* ☐ _____

Serial N. VAUP 01

* **PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA**

Internal procedure *Procedura interna :* ***PP08 rev.11***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
054/2021 B TWT	**12,32x25,01**	**308,12**	**20,9°C**	//	//	/	//	/	**171125**	**555**	/	//	//	**FOW**



Remarks / *Note:*

Legend / *Legenda*

TT = Transverse Tension/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura*

TWT = Transverse Weld Tension/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara		
Laboratory Technician 12/02/2021	INSPECTA srl 12-02-2021 Service Responsible		

RINA Services SpA No. Bo. 0474 Date 12/02/2021 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Cimatti Davide

BEND TEST
Prova di piega

Date of Testing:08/02/2021
Data esecuzione prova:

☒ *UNI EN ISO 5173: 2012* | ☐ *ASME IX QW-160: 2019* | ☐ _____

Serial N. VAUP / 01

*** PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA**

Internal procedure *Procedura interna* : ***PP11 rev.05***

Specimen id. *Identificazione provino*		**Dimension** *Dimensioni (mm)*	**Test Temp.** *Temp.test °C*	**Bend Angle** *Angolo di piega*	**Ø Former** *ø Mandrino (mm)*	**Distance between rollers** *Distanza appoggi (mm)*	**Remarks** *Note*
054/2021 SBB	A	12,70x10,00	20,9°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone
054/2021 SBB	B	12,70x10,00	20,9°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone
054/2021 SBB	C	12,70x10,00	20,9°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone
054/2021 SBB	D	12,70x10,00	20,9°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone

Remarks *Note:* //

Legend *Legenda*

SBB. = Transverse Side Bend/*Piega Trasversale laterale*
TRB. = Transverse Root Bend/*Piega Trasversale al rovescio*
TFB. = Transverse Face Bend/*Piega Trasversale al dritto*
LRB = Longitudinal Root Bend / *Piega Longitudinale al rovescio*
LFB. = Longitudinal Face Bend / *Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara		RINA Services SpA No. Bo. 0474 Date 12/02/2021 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Cimarelli Davide
Laboratory Technician 12/02/2021	INSPECTA srl 12-02-2021 Service Responsible		

IMPACT TEST
Prova di resilienza

Date of Testing:08/02/2021
Data esecuzione prova:

☐ *UNI EN ISO 148-1: 2016* ☒ *UNI EN ISO 9016: 2012* ☐ *ASTM E23: 18* ☐ *ASME IX QW-170: 2019* ☐ *ASTM A923-14 Method B*

Serial N. VAUP / 02

☐ *AWS D1.1/D1.1M:2020*

*** PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA**

Internal procedure *Procedura interna* **: *PP09 rev.07***

Specimen id. *Identificazione provino*	Direction *Direzione*	Dimension *Dimensioni (mm)*	Test Temp. *Temp .test*	Notch Type *Intaglio*	Knife / *coltello*	Requirement / Requisiti: Energy absorbed/ / Energia assorbita — Individual *Individuale Joule* 1	2	3	Average *Media Joule*	U	Lateral Expansion *Espansione laterale (mm)* 1	2	3	Shear Area *Area fragile %* 1	2	3	Remarks *Note*
054/21 VWT 0/2	T	10x10x55	-46°C	V	2	46	163	150	120	/	//	//	//	//	//	//	//
054/21 VHT 0/2	T	10x10x55	-46°C	V	2	165	82	38	95	/	//	//	//	//	//	//	//
054/21 VHT 2/2	T	10x10x55	-46°C	V	2	178	40	173	130	/	//	//	//	//	//	//	//
054/21 VHT 5/2	T	10x10x55	-46°C	V	2	190	183	207	193	/	//	//	//	//	//	//	//

Remarks *Note:*

Legend *Legenda*

L= Longitudinal / Longitudinale
T= Trasversal / Trasversale
VWT 0/2 = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
VHT 0/2 = Impact Test on Fusion Line / *Resilienza Trasversale in linea di fusione*
VHT 1/2 = Impact Test at 1mm from Fusion Line / *Resilienza trasversale a 1 mm dalla linea di fusione*
VHT 2/2 = Impact Test at 2 mm from Fusion Line / *Resilienza trasversale a 2 mm dalla linea di fusione*
VHT 5/2 = Impact Test at 5 mm from Fusion Line / *Resilienza trasversale a 5 mm dalla linea di fusione*
WM = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
HAZ = Impact Test on Heat Affected Zone / *Resilienza Trasversale in zona termicamente alterata*
BM = Impact Test on Base Metal / *Resilienza Trasversale in materiale base*

FL = Fusion Line/ *Linea di fusione*
FL+1 = Fusion Line + 1mm/ *Linea di fusione+ 1mm*
FL+2 = Fusion Line + 2mm/ *Linea di fusione+2mm*
FL +5= Fusion Line + 5mm/ *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*		RINA Services SpA No. Bo. 0474 Date 12/02/2021
- INSPECTA srl -	- INSPECTA srl -		Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ File Signature Cimatti Davide
Laboratory Technician 12/02/2021	12-02-2021 Service Responsible		

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing:08/02/2021
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* ☒ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

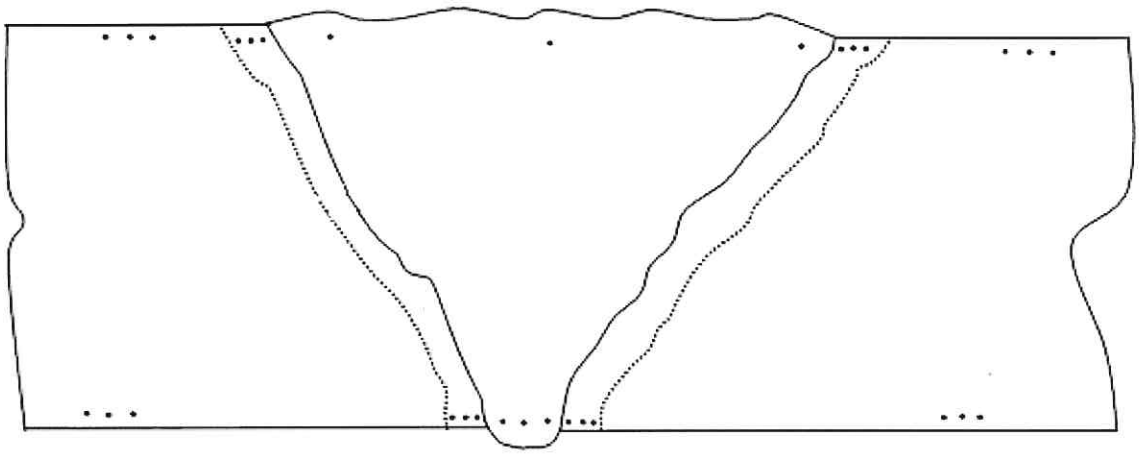
Serial N. 43030614C

* PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA

Internal procedure *Procedura interna*	PP10 rev.04	**Sample Identification** *Identificazione provino*	054/21	**Hardness test type** *Tipo di durezza*	HV10	**Test Temp.** *Temp.test*	20,9°C

Sketch for reference points
Schema punti di riferimento

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6	7 – 8 – 9	10 – 11 – 12	13 – 14 – 15
16 – 17 – 18	19 – 20 – 21	22 – 23 – 24	25 – 26 – 27	28 – 29 – 30



Reference points *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U
1 – 2 - 3	**174-171-174**	/	16 – 17 - 18	**198-200-202**	/	31 – 32 - 33	//	/
4 - 5 - 6	**241-265-284**	/	19 - 20 - 21	**231-246-252**	/	34 - 35 - 36	//	/
7 – 8 - 9	**222-207-209**	/	22 – 23 - 24	**227-228-225**	/	37 – 38 - 39	//	/
10 - 11 - 12	**243-228-229**	/	25 - 26 - 27	**226-222-215**	/	40 - 41 - 42	//	/
13 – 14 - 15	**175-175-173**	/	28 – 29 - 30	**187-183-187**	/	43 – 44 - 45	//	/

Remarks/ *Note:* //

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi Laboratory Technician 12/02/2021	Sig. Giulio Bagnara - INSPECTA srl - 12-02-2021 Service Responsible		RINA Services SpA No. Bo. 0474 Date 12/02/2021 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Cimatti Davide

VICKERS HARDNESS TEST METHOD

Prova di durezza Vickers

Date of Testing:08/02/2021
Data esecuzione prova:

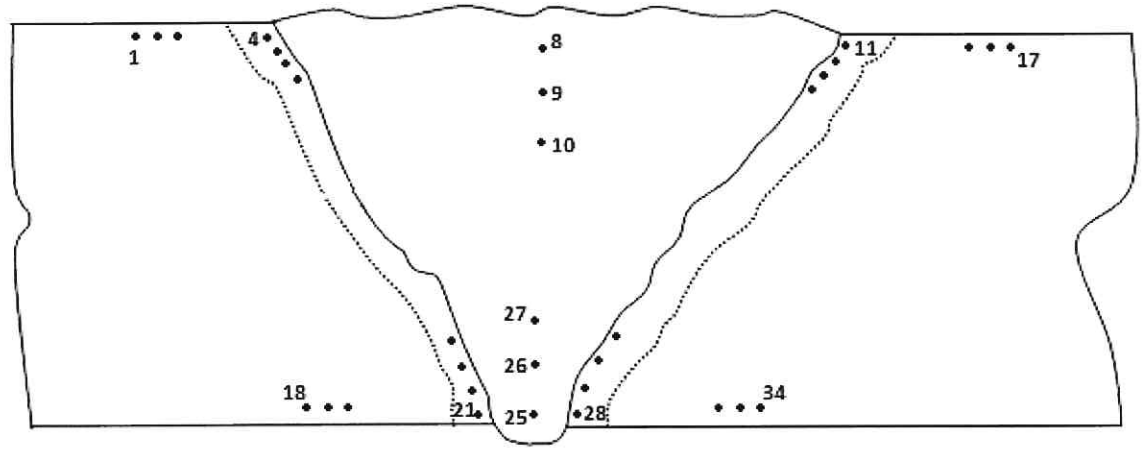
☐ *UNI EN ISO 6507-1: 2018* ☐ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☒ *EEMUA 158 Ed.3** *Serial N. 43030614C*

*** PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA**

Internal procedure *Procedura interna*	PP10 rev.04	**Sample Identification** *Identificazione provino*	054/21	**Hardness test type** *Tipo di durezza*	HV10	**Test Temp.** *Temp.test*	20,9°C

Sketch for reference points
Schema punti di riferimento

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6 – 7	8 – 9 – 10	11 – 12 – 13 – 14	15 – 16 – 17
18 – 19 – 20	21 – 22 – 23 – 24	25 – 26 – 27	28 – 29 – 30 – 31	32 – 33 – 34



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 – 3	174-171-174	/	18 – 19 – 20	201-202-203	/	//	//	/
4 – 5 – 6 – 7	284-239-227-224	/	21 – 22 – 23 – 24	255-239-233-231	/	//	//	/
8 – 9 – 10	225-201-198	/	25 – 26 – 27	220-212-199	/	//	//	/
11 -12 – 13 – 14	239-226-223-219	/	28 – 29 – 30 – 31	237-232-229-224	/	//	//	/
15 – 16 – 17	174-174-171	/	32 – 33 – 34	183-181-181	/	//	//	/

Remarks/ *Note:* //

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*		RINA Services SpA No. Bo. 0474 Date 12/02/2021 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ File Signature Cimatti Davide
- INSPECTA srl - Laboratory Technician 12/02/2021	- INSPECTA srl - Service Responsible 12-02-2021		

MACRO EXAMINATION TEST
Prova Macrografica

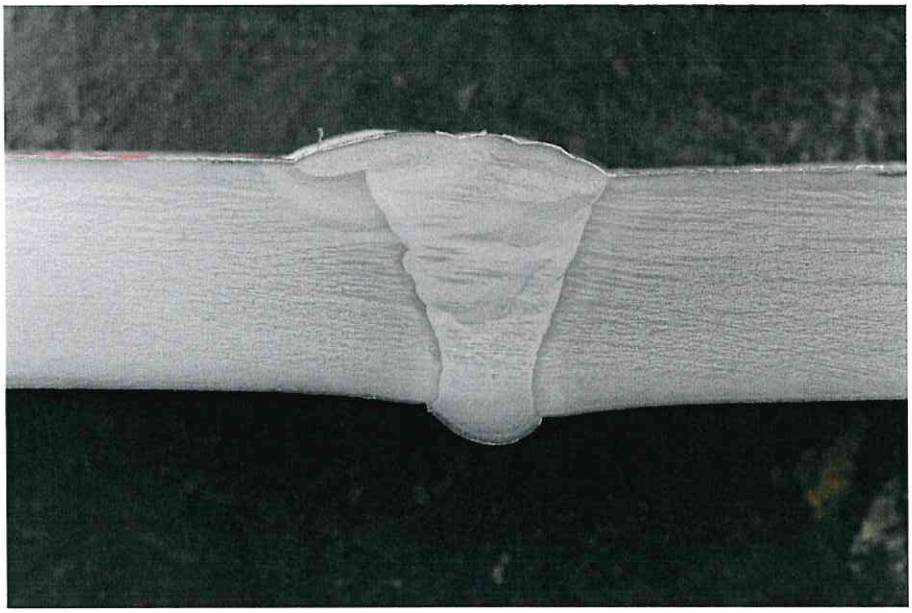
Date of Testing::08/02/2021
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2019* ☐ _____

Serial N.. EOS 650D/EFS

*** PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA**

Internal procedure *PP12 rev.03* *Procedura internal*		**Test temperatura** *Temperature Test*	**20,9°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**054/2021**	**Magnification:** *Ingrandimento:*	**Photo at: 2.70** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639-A-E-1.2-1.2 / A1**		



Remarks / *Note:* **No defects have been found in macro examination.**

Laboratory Technician *Tecnico di Laboratorio* *Dott. Ing. Mauro Boccheschi*	**Laboratory Responsible** *Responsabile Laboratorio* *Sig. Giulio Bagnara*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - Laboratory Technician 12/02/2021	- INSPECTA srl - Service Responsible 12-02-2021		RINA Services SpA No. Bo. 0474 Date 12/02/2021 Noted ☐ File Reviewed ☐ Signature Witnessed ☑ Approved ☐ Cimatti Davide

END OF TEST REPORT
FINE DEL RAPPORTO DI PROVA

INSPECTA S.R.L.	**TEST REPORT** ***RAPPORTO DI PROVA*** **N° 046-00100-21** **Rev.00** **Data: 12/02/2021**	ilac-MRA ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO **LAB N°1607 L**

Object: *Oggetto:*	**MECHANICAL TEST ON WPQR 01-2021 (POS.5G)**					Pag. 1 di 11
Specimen: *Saggio:*	**055/21**	**#Base Material:** *Materiale Base:*	**EN 10225-S355G15+N** **API 5L X52**	**PIPE Ø 12'' THK. 12,70 mm**		
		# Informazione fornita dal cliente/ Information provided by the customer				
Customer: *Committente:* **Address:** *Indirizzo:*	**ROSETTI MARINO S.p.A.** **Via Trieste, 230 - 48122 Ravenna (RA)**					
Final customer:. *Cliente finale:*	//					
Your delivery note n°: *Vs. DDT di consegna*	**n°** //	**Date:** *Data:* //	**MD52** *MD 52*	**016/2021**	**Date:** *Data:*	**29/01/2021**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **08/02/2021**	**End of activities:** *Fine prove:*			**Date:** *Data:*	**08/02/2021**

PROVE RICHIESTE

☒ **TENSILE TEST**/*Trazione*	☒ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*
☒ **BEND TEST**/*Piega*	☒ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root /*Dritto/Rovescio* ☒ Side/ *Laterale*
☒ **IMPACT TEST**/*Resilienza*	☒ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*
☒ **MACROEXAMINATION TEST /** *Macrografia*		
☒ **HARDNESS TEST**/ *Durezza*	☐ HV 5	☒ HV 10
☐ **FRACTURE TEST**/ *Frattura*	☐ Plate with/on Plate/ *Piastra con/su Piastra* ☐ Pipe with/on Pipe/*Tubo con/ su Tubo*	☐ Pipe on Plate/*Tubo su Piastra*
☐ **CHEMICAL ANALYSIS**/*Analisi Chimica*		
☐ **MICROEXAMINATION TEST /** *Micrografia*		
☐ **OTHER (Specify)**/*Altro/(Specificare)*		

Allegati /Attachments:

NOTE/ Remarks: **REFERENCE CODE FROM CUSTOMER REQUEST: UNI EN ISO 15614-1 + EEMUA 158 Ed.3**

Informazioni aggiuntive fornite dal cliente:
Additional information provided by the customer

*** PROVA NON ACCREDITATA DA ACCREDIA**

Laboratory Responsible *Responsabile Laboratorio* *Sig. Giulio Bagnara*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - 12-02-2021 Servizio Assicurativo		RINA Services SpA No. Bo. 0474 Date 12/02/2021 Noted ☐ Witnessed ☑ Reviewed ☐ Approved ☐ File Signature Cimatti Davide

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I risultati di prova si riferiscono al campione cosi come ricevuto,essendo il campionamento eseguito dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%.The results in this test report refers only to the specimen that has been tested.The customer undertakes to print out /reproduce the test report. Any partial reproduction is prohibited.Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory.The test results refer to the sample as received, since the sampling is performed by the customer..Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku = 2 equivalent to a level of confidence of 95 % .

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

Date of Testing::08/02/2021
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2020 method B* ☐ *ASTM A370-20*
☐ *ASME IX QW–150:2019* ☐ *ASTM E8 / E8M 16ae1* ☐ _____

Serial N. VAUP 01

* **PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA**

Internal procedure *Procedura interna :* ***PP08 rev.11***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
055/2021 A TWT	12,02x25,01	300,62	20,9°C	//	//	/	//	/	170101	566	/	//	//	FOW



Remarks */ Note:*	//
Legend */ Legenda*	**TT = Transverse Tension**/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura* **TWT = Transverse Weld Tension**/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Bacchieschi INSPECTA S.R.L. 12/02/2021 Laboratory Technician	Sig. Giulio Bagnara INSPECTA srl 12-02-2021 Service Responsible		

RINA Services SpA No. Bo. 0474 Date 12/02/2021 File Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Signature Cimarosti Davide

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

Date of Testing::08/02/2021
Data esecuzione prova:

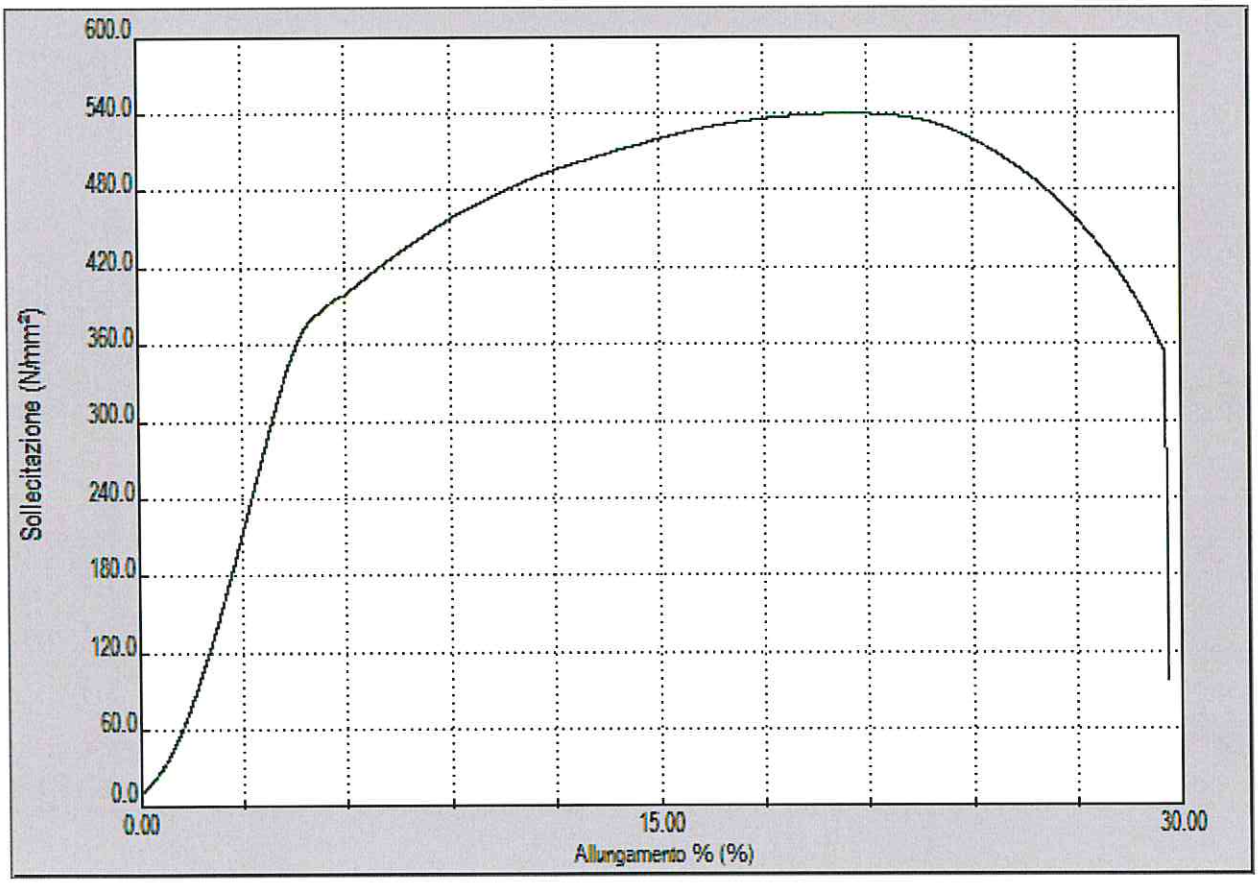
Serial N. VAUP 01

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2020 method B* ☐ *ASTM A370-20*
☐ *ASME IX QW–150:2019* ☐ *ASTM E8 / E8M 16ae1* ☐ _____

* **PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA**

Internal procedure *Procedura interna :* ***PP08 rev.11***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
055/2021 B TWT	12,01x24,98	300,01	20,9°C	//	//	/	//	/	161828	539	/	//	//	FOW



Remarks / *Note:*	//
Legend / *Legenda*	**TT = Transverse Tension**/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura* **TWT = Transverse Weld Tension**/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Bacheschi	Sig. Giulio Bagnara		
12-02-2021	12-02-2021		
Laboratory Technician	Service Responsible		

INSPECTA srl

RINA Services SpA No. Bo. 0474 Date 12/02/2021 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature

BEND TEST
Prova di piega

Date of Testing:08/02/2021
Data esecuzione prova:

☒ *UNI EN ISO 5173: 2012* | ☐ *ASME IX QW-160: 2019* | ☐ _____

Serial N. VAUP / 01

*** PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA**

Internal procedure *Procedura interna* **:*PP11 rev.05***

Specimen id. *Identificazione provino*		**Dimension** *Dimensioni (mm)*	**Test Temp.** *Temp.test °C*	**Bend Angle** *Angolo di piega*	**Ø Former** *Ø Mandrino (mm)*	**Distance between rollers** *Distanza appoggi (mm)*	**Remarks** *Note*
055/2021 SBB	A	12,70x10,00	20,9°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone
055/2021 SBB	B	12,70x10,00	20,9°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone
055/2021 SBB	C	12,70x10,00	20,9°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone
055/2021 SBB	D	12,70x10,00	20,9°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone

Remarks *Note:*	//
Legend *Legenda*	**SBB. = Transverse Side Bend/***Piega Trasversale laterale* **LRB = Longitudinal Root Bend** */ Piega Longitudinale al rovescio* **TRB. = Transverse Root Bend/***Piega Trasversale al rovescio* **LFB. = Longitudinal Face Bend** */ Piega Longitudinale al dritto* **TFB. = Transverse Face Bend/***Piega Trasversale al dritto*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi Laboratory Technician 12/02/2021	Sig. Giulio Bagnara INSPECTA srl 12-02-2021 Service Responsible		RINA Services SpA No. Bo. 0474 Date 12/02/2021 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Cimatti Davide

IMPACT TEST
Prova di resilienza

Date of Testing:08/02/2021
Data esecuzione prova:

☐ *UNI EN ISO 148-1: 2016* ☒ *UNI EN ISO 9016: 2012* ☐ *ASTM E23: 18* ☐ *ASME IX QW-170: 2019* ☐ *ASTM A923-14 Method B*

Serial N. *VAUP / 02*

☐ *AWS D1.1/D1.1M:2020*

*** PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA**

Internal procedure *Procedura interna* : ***PP09 rev.07***

Specimen id. *Identificazione provino*	Direction *Direzione*	Dimension *Dimensioni (mm)*	Test Temp. *Temp .test*	Notch Type *Intaglio*	Knife / *coltello*	Requirement / Requisiti: Energy absorbed/ / Energia assorbita – Individual *Individuale Joule* 1	2	3	Average *Media Joule*	U	Lateral Expansion *Espansione laterale (mm)* 1	2	3	Shear Area *Area fragile %* 1	2	3	Remarks *Note*
055/21 VWT 0/2	**T**	**10x10x55**	**-46°C**	**V**	**2**	**93**	**164**	**114**	**124**	/	//	//	//	//	//	//	//
055/21 VHT 0/2	**T**	**10x10x55**	**-46°C**	**V**	**2**	**185**	**107**	**185**	**159**	/	//	//	//	//	//	//	//
055/21 VHT 2/2	**T**	**10x10x55**	**-46°C**	**V**	**2**	**198**	**212**	**185**	**198**	/	//	//	//	//	//	//	//
055/21 VHT 5/2	**T**	**10x10x55**	**-46°C**	**V**	**2**	**199**	**176**	**172**	**182**	/	//	//	//	//	//	//	//

Remarks *Note:* //

Legend *Legenda*

L= Longitudinal / Longitudinale
T= Trasversal / Trasversale
VWT 0/2 = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
VHT 0/2 = Impact Test on Fusion Line */ Resilienza Trasversale in linea di fusione*
VHT 1/2 = Impact Test at 1mm from Fusion Line */ Resilienza trasversale a 1 mm dalla linea di fusione*
VHT 2/2 = Impact Test at 2 mm from Fusion Line */ Resilienza trasversale a 2 mm dalla linea di fusione*
VHT 5/2 = Impact Test at 5 mm from Fusion Line */ Resilienza trasversale a 5 mm dalla linea di fusione*
WM = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
HAZ = Impact Test on Heat Affected Zone */ Resilienza Trasversale in zona termicamente alterata*
BM = Impact Test on Base Metal */ Resilienza Trasversale in materiale base*

FL = Fusion Line/ *Linea di fusione*
FL+1 = Fusion Line + 1mm/ *Linea di fusione+1mm*
FL+2 = Fusion Line + 2mm/ *Linea di fusione+2mm*
FL +5= Fusion Line + 5mm/ *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*		RINA Services SpA No. Bo. 0474 Date 12/02/2021 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature
Laboratory Technician 12/02/2021	INSPECTA srl Service Responsible 12-02-2021		

VICKERS HARDNESS TEST METHOD

Prova di durezza Vickers

Date of Testing:08/02/2021
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* ☒ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

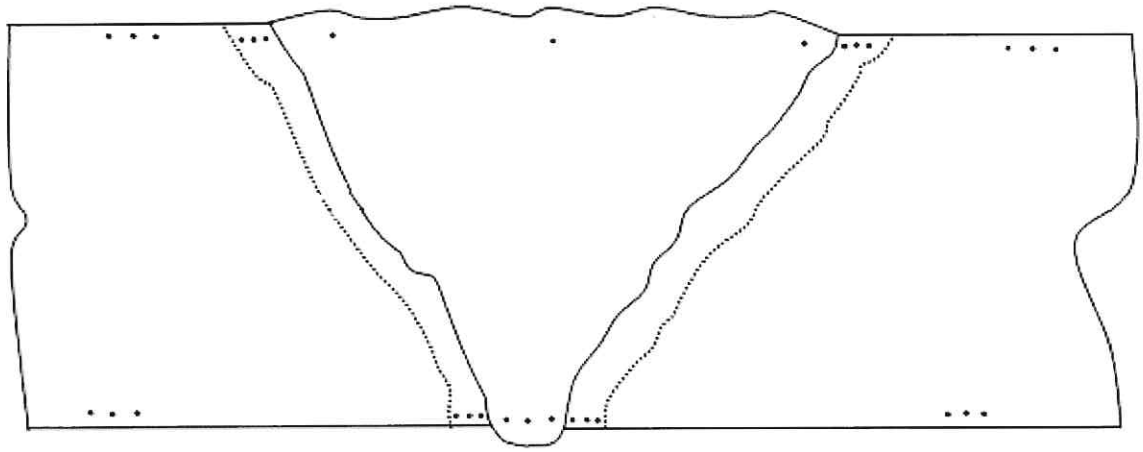
Serial N. 43030614C

* PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA

Internal procedure *Procedura interna*	PP10 rev.04	Sample Identification *Identificazione provino*	055/21	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	20,9°C

Sketch for reference points
Schema punti di riferimento

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6	7 – 8 – 9	10 – 11 – 12	13 – 14 – 15
16 – 17 – 18	19 – 20 – 21	22 – 23 – 24	25 – 26 – 27	28 – 29 – 30



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	168-166-170	/	16 – 17 - 18	198-202-201	/	31 – 32 - 33	//	/
4 - 5 - 6	202-210-215	/	19 - 20 - 21	220-223-246	/	34 - 35 - 36	//	/
7 – 8 - 9	241-261-221	/	22 – 23 - 24	219-224-223	/	37 – 38 - 39	//	/
10 - 11 - 12	257-241-224	/	25 - 26 - 27	238-227-215	/	40 - 41 - 42	//	/
13 – 14 - 15	170-169-169	/	28 – 29 - 30	205-198-196	/	43 – 44 - 45	//	/
Remarks/ *Note:*	TAKEN H6							

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi INSPECTA srl Laboratory Technician 12/02/2021	Sig. Giulio Bagnara INSPECTA srl Service Responsible 12-02-2021		RINA Services SpA No. Bo. 0474 Date 12/02/2021 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ File Signature Cimatti Davide

VICKERS HARDNESS TEST METHOD

Prova di durezza Vickers

Date of Testing:08/02/2021
Data esecuzione prova:

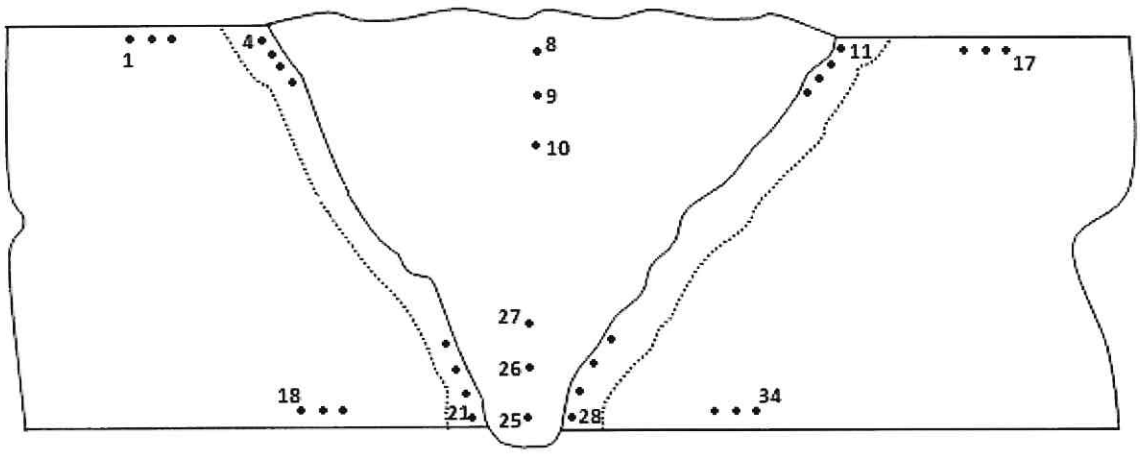
☐ *UNI EN ISO 6507-1: 2018* ☐ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☒ *EEMUA 158 Ed.3** *Serial N. 43030614C*

*** PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA**

Internal procedure *Procedura interna*	PP10 rev.04	**Sample Identification** *Identificazione provino*	055/21	**Hardness test type** *Tipo di durezza*	HV10	**Test Temp.** *Temp.test*	20,9°C

Sketch for reference points
Schema punti di riferimento

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6 – 7	8 – 9 – 10	11 – 12 – 13 – 14	15 – 16 – 17
18 – 19 – 20	21 – 22 – 23 – 24	25 – 26 – 27	28 – 29 – 30 – 31	32 – 33 – 34



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 – 3	**168-166-170**	/	18 – 19 – 20	**198-202-201**	/	//	//	/
4 – 5 – 6 – 7	**215-251-253-247**	/	21 – 22 – 23 – 24	**246-241-239-236**	/	//	//	/
8 – 9 – 10	**261-213-195**	/	25 – 26 – 27	**224-211-207**	/	//	//	/
11 -12 – 13 – 14	**257-233-225-223**	/	28 – 29 – 30 – 31	**238-247-246-233**	/	//	//	/
15 – 16 – 17	**170-169-169**	/	32 – 33 – 34	**205-198-196**	/	//	//	/

Remarks/ *Note:* **TAKEN H6**

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi Laboratory Technician 12/02/2021	Sig. Giulio Bagnara - INSPECTA srl - Service Responsible 12-02-2021		RINA Services SpA No. Bo. 0474 Date 12/02/2021 Noted ☐ Witnessed ☑ Reviewed ☐ Approved ☐ File Signature Cimatti Davide

VICKERS HARDNESS TEST METHOD

Prova di durezza Vickers

Date of Testing:08/02/2021
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* | ☒ *UNI EN ISO 9015-1: 2011* | ☐ *ASTM E 92-17* | ☐ _____

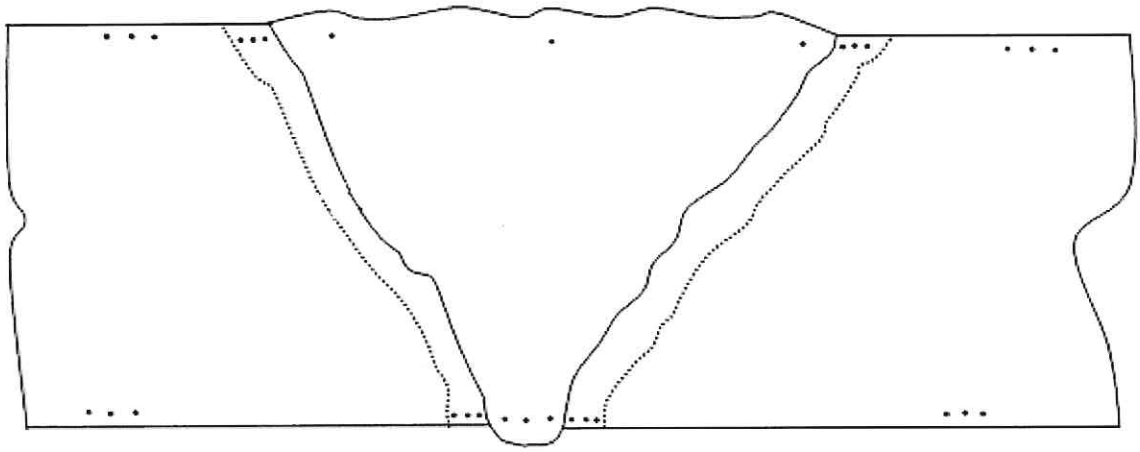
Serial N. 43030614C

* PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA

Internal procedure *Procedura interna*	PP10 rev.04	Sample Identification *Identificazione provino*	055/21	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	20,9°C

Sketch for reference points
Schema punti di riferimento

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6	7 – 8 – 9	10 – 11 – 12	13 – 14 – 15
16 – 17 – 18	19 – 20 – 21	22 – 23 – 24	25 – 26 – 27	28 – 29 – 30



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	174-178-176	/	16 – 17 - 18	198-194-199	/	31 – 32 - 33	//	/
4 - 5 - 6	228-243-251	/	19 - 20 - 21	221-231-241	/	34 - 35 - 36	//	/
7 – 8 - 9	253-269-244	/	22 – 23 - 24	211-219-211	/	37 – 38 - 39	//	/
10 - 11 - 12	256-242-231	/	25 - 26 - 27	251-222-208	/	40 - 41 - 42	//	/
13 – 14 - 15	174-174-177	/	28 – 29 - 30	199-196-195	/	43 – 44 - 45	//	/

Remarks/ *Note:* TAKEN H12

Laboratory Technician *Tecnico di Laboratorio* *Dott. Ing. Mauro Baccheschi*	Laboratory Responsible *Responsabile Laboratorio* *Sig. Giulio Bagnara*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
- INSPECTA srl - Laboratory Technician 12/02/2021	- INSPECTA srl - 12-02-2021 Service Responsible		RINA Services SpA No. Bo. 0474 Date 12/02/2021 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Cimatti Davide

VICKERS HARDNESS TEST METHOD

Prova di durezza Vickers

Date of Testing:08/02/2021
Data esecuzione prova:

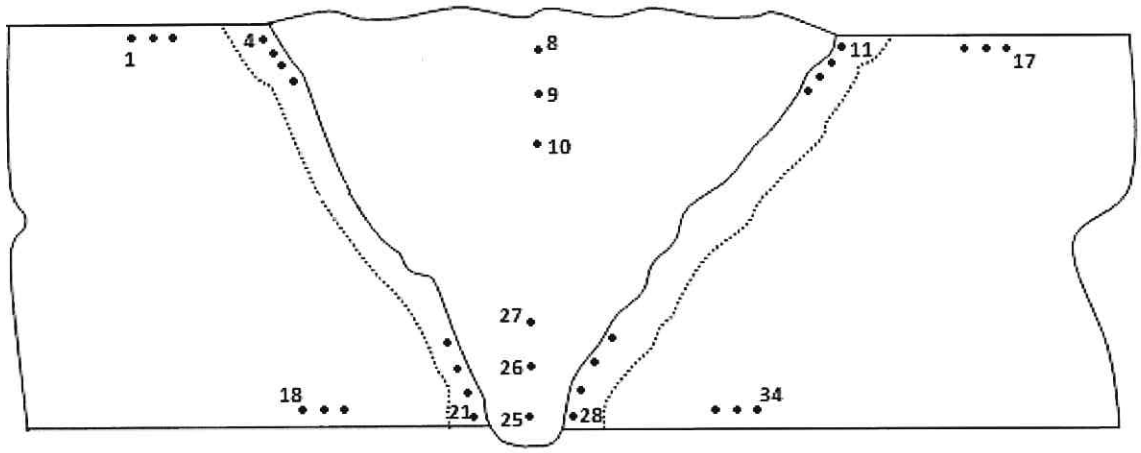
☐ *UNI EN ISO 6507-1: 2018* ☐ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☒ *EEMUA 158 Ed.3** — *Serial N. 43030614C*

* PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA

Internal procedure *Procedura interna*	PP10 rev.04	Sample Identification *Identificazione provino*	055/21	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	20,9°C

Sketch for reference points
Schema punti di riferimento

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6 – 7	8 – 9 – 10	11 – 12 – 13 – 14	15 – 16 – 17
18 – 19 – 20	21 – 22 – 23 – 24	25 – 26 – 27	28 – 29 – 30 – 31	32 – 33 – 34



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 – 3	174-178-176	/	18 – 19 – 20	198-194-199	/	//	//	/
4 – 5 – 6 – 7	251-245-238-226	/	21 – 22 – 23 – 24	241-239-237-234	/	//	//	/
8 – 9 – 10	269-190-187	/	25 – 26 – 27	219-215-206	/	//	//	/
11 -12 – 13 – 14	256-237-220-219	/	28 – 29 – 30 – 31	251-247-243-236	/	//	//	/
15 – 16 – 17	174-174-177	/	32 – 33 – 34	199-196-195	/	//	//	/
Remarks/ *Note:*	TAKEN H12							

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi Laboratory Technician 12/02/2021	Sig. Giulio Bagnara INSPECTA srl Service Responsible 12-02-2021		RINA Services SpA No. Bo. 0474 Date 12/02/2021 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ File Signature

MACRO EXAMINATION TEST
Prova Macrografica

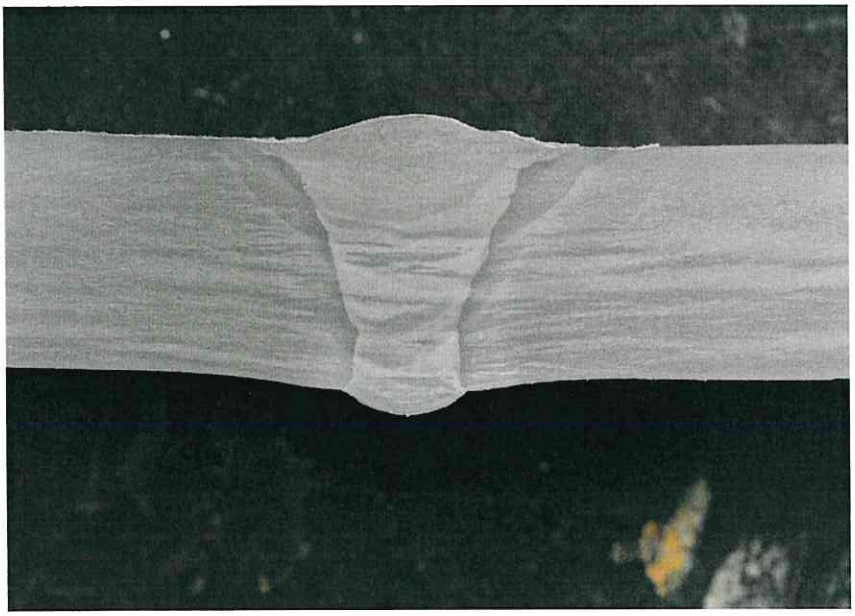
Date of Testing::08/02/2021
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2019* ☐ _____

Serial N.. EOS 650D/EFS

*** PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA**

Internal procedure *PP12 rev.03* *Procedura internal*		**Test temperatura** *Temperature Test*	**20,9°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**055/2021**	**Magnification:** *Ingrandimento:*	**Photo at: 2.70** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639-A-E-1.2-1.2 / A1**		



Remarks / *Note:*	**TAKEN H6** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio *Dott. Ing. Mauro Baccheschi* Laboratory Technician 12/02/2021	*Responsabile Laboratorio* *Sig. Giulio Bagnara* - INSPECTA srl - Service Responsible 12.02.2021	*Ispettore del cliente*	*Ispettore Terza parte* RINA Services SpA No. Bo. 0474 Date 12/02/2021 Noted ☐ File Reviewed ☐ Signature Witnessed ☑ Approved ☐ Cimatti Davide

MACRO EXAMINATION TEST
Prova Macrografica

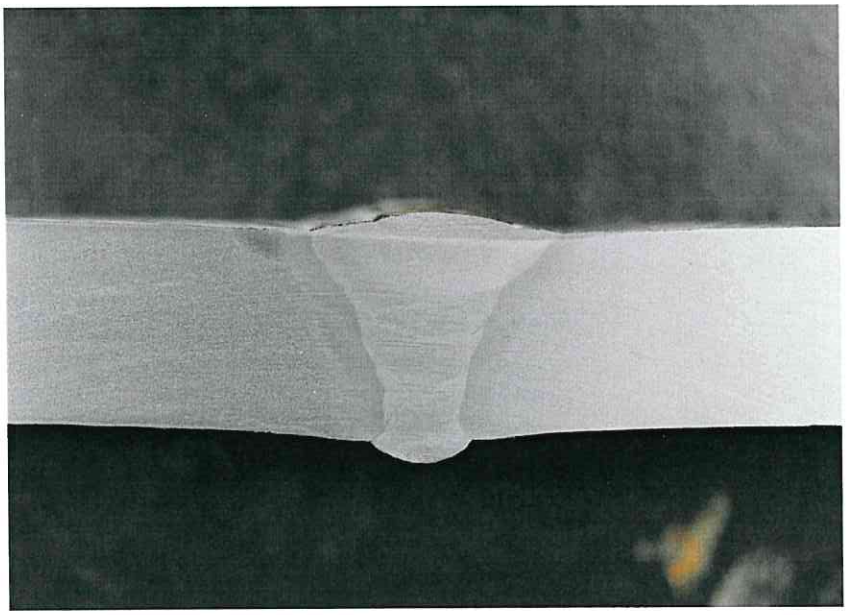
Date of Testing::08/02/2021
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2019* ☐ _____

Serial N.. EOS 650D/EFS

*** PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA**

Internal procedure *PP12 rev.03* *Procedura internal*		**Test temperatura** *Temperature Test*	**20,9°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**055/2021**	**Magnification:** *Ingrandimento:*	**Photo at: 2.50** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639-A-E-1.2-1.2 / A1**		



Remarks / *Note:*	**TAKEN H12** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio *Dott. Ing. Mauro Bacheschi* Laboratory Technician 12/02/2021	*Responsabile Laboratorio* *Sig. Giulio Bagnara* INSPECTA srl Service Responsible 12-02-2021	*Ispettore del cliente*	*Ispettore Terza parte* RINA Services SpA No. Bo. 0474 Date 12/02/2021 Noted ☐ File Reviewed ☐ Signature Witnessed ☑ Approved ☐ Cimatti Davide

END OF TEST REPORT
FINE DEL RAPPORTO DI PROVA

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 02/21	Sheet/Foglio 1/3

Manufacturer's Welding Procedure. Ref. no.	02/21 REV. 0		
Manufacturer	ROSETTI MARINO S.p.A.		
Address	VIA TRIESTE 230 - 48121 RAVENNA		
Code, Testing Standard	EN ISO 15614-1:2019 Lev. 2 ; MOTS 12 Rev. 5.0		
	Location of test specimen according to MOTS 12 Rev.5.0 Sec. 5.4.5 and EN ISO 15614-1:2019 Sec. 7.2; Essential variables according to EN ISO 15614-1:2019, Chapter 8		
Date of welding	Start: March 15th , 2021 Complete: March 17th, 2021		
Examiner of examining body	Rina Services S.p.A.		
RANGE OF QUALIFICATION			
Welding process	141 - GTAW		
Type(s)	Manual		
Welding Equipment Type	HF inverter type		
Actual parent Material side A	Pipe: API 5L X52 PSL1 (Heat: 125629) ISO 15608 Gr. 11.1		
Actual parent Material side B	Pipe: API 5L X52 PSL1 (Heat: 125629) ISO 15608 Gr. 11.1		
Parent Material grade	Carbon steel with maximum strength of 460 MPa		
Supply condition	Hot rolled		
Carbon equivalent/Pcm/C	Heat Values: 0,40/0,23/ 0,14		
Groove design/configuration	Single V Butt Joint (one side welding, without backing), for groove dimension and details see page 4 of 4		
Parent material thickness (mm)	9,09 mm		
Weld metal thickness (mm)	141 - GTAW 9,09 mm		
Single or Multi-pass	141 - GTAW MULTIPLE		
Outside diameter	1" (33,4 mm)		
Filler material Designation	**141 GTAW** AWS A5.28: ER80S-Ni1		
Filler material Maker	141 - Esab OK Tigrod 13.23		
Filler material Size	141 - GTAW ∅ 2,4 mm;		
Shielding gas/Flux	ISO 14175 :2008 I1 (>99,99% Ar)		
Shielding gas flow rate	15 l/min.		
Backing gas (purging)	None		

ROSETTI MARINO SpA
A. Khalifa
Welding Dept.

Type of welding current & polarity	DC - SP	Heat input / Apporto termico (kJ/mm)		Diameter	2G (PC)	5G (PH)
			Pass	mm		
			Root	∅ 2,4	1,34	1,53
			Hot	∅ 2,4	0,66	1,27
			Filll	∅ 2,4	0,89 - 1,22	1,41 - 1,55
			Cap	∅ 2,4	0,94	1,31 - 1,38
			Note: The Heat Input values shown above have been calculated with formula Hi: k*(I*V)/Travel Speed, with k=0,6			

Welding position	All, vertical down progression excluded		
Preheat (°C)	15	Interpass temperature / Temp. di interpass (°C)	300
Post-Weld Heat Treatment and/or ageing	NONE		
Weld bead width	Max. 12 mm for 2G position ; Max. 14 mm for 5G position		
Welder's detail	Rende Eduardo AX86 (2G Test Coupon); Rende Eduardo AX86 (5G Test Coupon)		
Time lapse between root and hot pass	N.A.		
Other information / Altre informazioni	- Preheat performed by propane torch; - Accelerate weld cooling not permitted; - Base material origin: seamless pipe; - Nr. 9 Test Coupons welded in 2G position and nr. 9 Test Coupons welded in 5G position		

Manufacturer's Welding Procedure. Ref. no.	02/21 REV. 0		
Test result (WPQR) N°	02/21	Date/Data	09/04/2021
Manufacturer's WPS No.	pWPS 02/21 REV. 0	Date/Data	11/03/2021

TESTS CARRIED OUT ON SAMPLE 02/21 WELDED IN 2G POSITION (PC)

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 02/21
Penetrant test	N.A.	/
Magnetic particle test	Acceptable	21083 MT 02, 03
Radiographic test	Acceptable	21083 RT 03, 04, 05
Ultrasonic test	N.A.	/

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2]	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 460	A [%]	Z [%]	Fracture Location	Remarks
178/2021 A TWT	/	/	570	/	/	Broken in weld	/
178/2021 B TWT	/	/	564	/	/	Broken out of weld	/

BEND TEST

Type & N.	Bend angle	Remarks	Results
2 Face bend	180°	Former Ø 30 mm	Satisfactory
2 Root bend	180°	Former Ø 30 mm	Satisfactory

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] ≥ 14J			Average value [J] ≥ 18J	Remarks
5x10x55	WM 2 mm from Cap	KV2	-57,1°C	108	75	79	87	/
5x10x55	FL 2 mm from Cap	KV2	-57,1°C	107	62	32	67	/
5x10x55	FL+2 2 mm from Cap	KV2	-57,1°C	84	102	97	94	/
5x10x55	FL+5 2 mm from Cap	KV2	-57,1°C	97	105	93	98	/

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
1 Macro examination+Hardness test (acc. to ISO 9015)	Satisfactory-See Inspecta Certificate No. 145-00100-21 Rev. 0, max. Hardness (230 HV10)
Hardness test (acc. to NACE MR0175)	Satisfactory-See Inspecta Certificate No. 145-00100-21 Rev. 0, max. Hardness (229 HV10)
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Inspecta S.r.l. - Ravenna (RA)
Laboratory report reference N.	Report No. 145-00100-21 Rev. 0 dated APRIL 9th 2021
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of EN ISO 15614-1:2019 Lev. 2 Standard and MOTS 12 Rev. 5.0 Specification

Date/Data
09-04-2021



Examiner or Examination Body
RINA Services S.p.A.



ROSETTI MARINO S.p.A.

Name and signature / Nome e firma

Manufacturer's Welding Procedure. Ref. no.	02/21 REV. 0		
Test result (WPQR) N°	02/21	Date/Data	09/04/2021
Manufacturer's WPS No.	pWPS 02/21 REV. 0	Date/Data	11/03/2021

TESTS CARRIED OUT ON SAMPLE 02/21 WELDED IN 5G POSITION (PH)

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 02/21
Penetrant test	N.A.	/
Magnetic particle test	Acceptable	21083 MT 08, 09
Radiographic test	Acceptable	21083 RT 09, 10, 11
Ultrasonic test	N.A.	/

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2]	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 460	A [%]	Z [%]	Fracture Location	Remarks
178/2021 C TWT	/	/	577	/	/	Broken in weld	/
178/2021 D TWT	/	/	583	/	/	Broken in weld	/

BEND TEST

Type & N.	Bend angle	Remarks	Results
2 Face bend	180°	Former Ø 30 mm	Satisfactory
2 Root bend	180°	Former Ø 30 mm	Satisfactory

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] ≥ 14J			Average value [J] ≥ 18J	Remarks
5x10x55	WM 2 mm from Cap	KV2	-57,1°C	94	95	49	79	/
5x10x55	FL 2 mm from Cap	KV2	-57,1°C	98	95	108	100	/
5x10x55	FL+2 2 mm from Cap	KV2	-57,1°C	96	99	100	98	/
5x10x55	FL+5 2 mm from Cap	KV2	-57,1°C	100	104	95	100	/

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
2 Macro examination (H6 & h12)+Hardness test (acc. to ISO 9015)	Satisfactory-See Inspecta Certificate No. 145-00100-21 Rev. 0, max. Hardness (226 HV10)
Hardness test (acc. to NACE MR0175)	Satisfactory-See Inspecta Certificate No. 145-00100-21 Rev. 0, max. Hardness (226 HV10)
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Inspecta S.r.l. - Ravenna (RA)
Laboratory report reference N.	Report No. 145-00100-21 Rev. 0 dated APRIL 9th 2021
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of EN ISO 15614-1:2019 Lev. 2 Standard and MOTS 12 Rev. 5.0 Specification.

Date/Data
09-04-2021

IIW A.KHALIFA IWT 070154A INTERNATIONAL WELDING TECHNOLOGIST

Examiner or Examination Body
RINA Services S.p.A.

RINA F. Lago RINA Services S.p.A.

ROSETTI MARINO S.p.A.

Name and signature / Nome e firma

ROSETTI MARINO

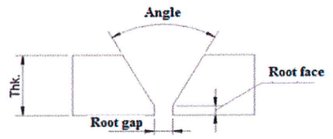
AS- RUN PARAMETER SHEET

pWPS 02/21	
PQR 02/21	
Coupon Nr. 02/21	
Date: 15-17/03/2021	Page: 1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: **EN ISO 15614-1:2019 Lev.2**

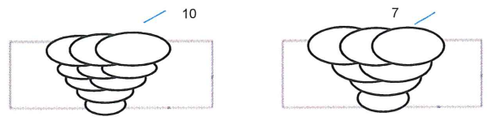
Welder Name(s):	RENDE EDUARDO	Welder Id No(s):	AX86		
Welding Process(es):	141 GTAW	Type(s):	MANUAL		
Welding Position:	PH (5G) & PC (2G)	Progression:	VERTICAL UPHILL FOR 5G		
Base Materials:	API 5L X52	Wall Thickness:	9,09	Diameter:	33,4
Heat No(s):	125629	Joint Type:	PIPE TO PIPE SINGLE-V BUTT JOINT; ONE SIDE WELDING WITHOUT BACKING		

WELD PREPARATION:



Root face: 1±0,5mm ; Root gap: 4,5±2mm ; Angle: 55°±5

WELDING SEQUENCE / PASS LOCATION:



Pos. 2G Pos. 5G

WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
WIRE	2,4	AE02020041	ESAB OK TIGROD 13.23

GAS:

Shielding Gas:	Ar
Composition:	99,99%
Flow:	15 LPM
Gas Backing:	None
Flow:	NA
Gas Size Nozzle:	NA
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
14 mm on 5G / 12mm on 2G	5G: weave	2G: string	MULTIPLE	SINGLE

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required		Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
15°C	PROPANE TORCH	300°C	CONTACT DIGITAL THERMOMETHER	NA	NA	NA	NA	NA

WELDING PARAMETERS

ITEM	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (mm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
5G	1	GTAW	1	-	ER80S-Ni1	2,4	DC EN	80	90	85,0	12	13	12,5	-	-	25	1,53	0,60	15	
5G	2	GTAW	2	-	ER80S-Ni1	2,4	DC EN	110	116	113,0	12	13	12,5	-	-	40	1,27	0,60	72	
5G	3	GTAW	3	-	ER80S-Ni1	2,4	DC EN	125	128	126,5	12,5	13,5	13,0	-	-	42	1,41	0,60	130	
5G	4	GTAW	4	-	ER80S-Ni1	2,4	DC EN	130	135	132,5	12,5	13,5	13,0	-	-	40	1,55	0,60	195	
5G	5	GTAW	5	-	ER80S-Ni1	2,4	DC EN	122	126	124,0	12,5	13,5	13,0	-	-	42	1,38	0,60	240	
5G	5	GTAW	6	-	ER80S-Ni1	2,4	DC EN	125	130	127,5	12,5	13,5	13,0	-	-	45	1,33	0,60	300	
5G	5	GTAW	7	-	ER80S-Ni1	2,4	DC EN	124	128	126,0	12,5	13,5	13,0	-	-	45	1,31	0,60	190	
2G	1	GTAW	1	-	ER80S-Ni1	2,4	DC EN	95	105	100,0	12	14	13,0	-	-	35	1,34	0,60	15	
2G	2	GTAW	2	-	ER80S-Ni1	2,4	DC EN	115	125	120,0	12	14	13,0	-	-	85	0,66	0,60	65	
2G	3	GTAW	3	-	ER80S-Ni1	2,4	DC EN	125	130	127,5	12	14	13,0	-	-	60	0,99	0,60	90	
2G	3	GTAW	4	-	ER80S-Ni1	2,4	DC EN	130	135	132,5	12	14	13,0	-	-	70	0,89	0,60	125	
2G	4	GTAW	5	-	ER80S-Ni1	2,4	DC EN	129	131	130,0	12	14	13,0	-	-	50	1,22	0,60	224	
2G	4	GTAW	6-7	-	ER80S-Ni1	2,4	DC EN	133	135	134,0	12	14	13,0	-	-	60	1,05	0,60	300	
2G	5	GTAW	8-9-10	-	ER80S-Ni1	2,4	DC EN	115	125	120,0	12	14	13,0	-	-	60	0,94	0,60	215	

SIGNED BY REPRESENTATIVE	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name: Davide Cimatti	Name:
Signature:	Signature:	Signature:	Signature:
Date:	Date:	Date:	Date:

IIW A.KHALIFA IWT 070154A INTERNATIONAL WELDING TECHNOLOGIST

RINA Services SpA No. Ro. 0474 Date 15-17/03/2021 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Client's Date

PQR attachments index:

Base material certificate (Pipe API 5L X52 PSL1)

Consumables certificate

preliminary WPS

NDE certificate

Mechanical test report

ROSETTI MARINO

PQR 02/21

Base material certificate
Pipe API 5L X52 PSL1

TUBOS REUNIDOS INDUSTRIAL, S.L.U

Barrio Sagarribai, 2 - 01470 AMURRIO (Spain)

QUALITY MANAGEMENT SYSTEM certified by LRQA

EN 10204:2004 / 3.1

CERTIFICADO DE CALIDAD
MILL TEST CERTIFICATE

THE BILLETS AND THE MATERIAL COVERED BY THIS CERTIFICATE ARE MANUFACTURED AT OUR STEEL PLANT IN AMURRIO, SPAIN.

Nº 0000352307/1 Rev. 000

CLIENTE: CUSTOMER	T.A.L. S.p.A. TUBI ACCIAIO LOMBARDA CON SOCIO UNICO	PEDIDO / PARTIDA: P.ORDER / ITEM	OF200415 30.
PRODUCTO: ARTICLE	TUBERÍA SIN SOLDADURA LAMINADA EN CALIENTE HOT FINISHED SEAMLESS TUBES	REF. FABRICA: WORK ORDER	300020789 000030
EXTREMOS: ENDS	BISELADOS BEVELLED ENDS	PROTECCIÓN SUPERF: EXT. COATING	LACA EXTERIOR EXTERNALLY DRY LACQUERED
NORMA / GRADO: APL.STANDARD AND GRADE	ASTM A333/A333M-18/ ASME II SA-333/SA-333M-19/ API 5L 2018 46TH ED. PSL1 6/X52	PROCESO FUSION: MELTING PROCESS	HORNO ELECTRICO ACERO TOTALMENTE CALMADO ELECTRIC FURNACE // FULLY KILLED FINE GRAIN PRACTICE
		DIMENSIONAL STD:	ANSI/ASME B36.10M
ESPEC. ADICIONALES: ADITIONAL SPECS.	TS 02 REV. 05 (24 ENE 2012). NACE MR0175/ISO 15156 ED. 2015 NACE MR0103/ISO 17945 ED. 2015 ASME II.PART D.TABLE Y1	FAB. DE PALANQUILLA: BILLETS MANUFACTURE	COLADA CONTINUA CONTINUOUS CASTING

DIMENSIONES: DIMENSIONS 33,4 X 9,09 MM. X 5-7 M.

MARCAS: MARKING
- ESTAMPADO: DIE STAMPING — HN (HEAT)
- PINTADO: STENCILLED — TRI API SPEC 5L 5L-0011 (SELLO API) (MM/AA) 33,4 9,1 L360 / X52 PSL1 S MLS HN (HEAT) 20,7 MPA (LENGTH IN METERS) M ASTM/ASME A/SA 333 GR.6 IS O 3183 H.F. LT -50 C (WEIGHT IN KGS) KG
- CODIGO COLOR: COLOUR CODE

TRAT. TERMICO: HEAT TREATMENT — NORMALIZADO. ENFRIADO AL AIRE / NORMALIZED. AIR COOLED 960 °C 14 MIN

DESCRIPCION SUMINISTRO / DESCRIPTION OF DELIVERY

ITEM FAB. T.R. ITEM	ITEM CLI. CLIENTS ITEM	LONG.INDIV (M) INDIVIDUAL LENGTH	COLADA CAST NR.	Nº TUBOS QUANTITY	LONG. TOTAL (M) LENGTH	PESO(KG) WEIGHT
000030		5,000 - 7,000	125629	303	1.915,510	10.488
TOTAL				303	1.915,510	10.488

Albaran/Delivery note/Lieferschein/ Bon de livraison: 80366980

TUBOS REUNIDOS INDUSTRIAL GARANTIZA QUE TODOS LOS TUBOS CUBIERTOS POR ESTE CERTIFICADO CUMPLEN LOS REQUISITOS DEL PEDIDO Y CON LAS ESPECIFICACIONES ARRIBA MENCIONADAS.
TUBOS REUNIDOS INDUSTRIAL CERTIFY THAT ALL THE TUBES COVERED BY THIS CERTIFICATE COMPLY WITH ORDER REQUIREMENTS AND ABOVE MENTIONED SPECIFICATIONS.

AMURRIO 20.07.2020

CONTROL DE CALIDAD DE TUBOS REUNIDOS INDUSTRIAL
TUBOS REUNIDOS INDUSTRIAL (QUALITY CONTROL)
Gonzalo Cejudo
P.O:. :

Approved by QUALITY1 on 04/09/20

TUBOS REUNIDOS INDUSTRIAL, S.L.U
Barrio Sagarribai, 2 - 01470 AMURRIO (Spain)

QUALITY MANAGEMENT SYSTEM certified by LRQA

EN 10204:2004 / 3.1

CERTIFICADO DE CALIDAD
MILL TEST CERTIFICATE

Nº 0000352307/1 Rev. 000

ENSAYOS NO DESTRUCTIVOS / NON DESTRUCTIVE TESTS

ENSAYO / TEST	%CONTROL / TEST RATE(%)	REQUISITOS / REQUIREMENTS	RESULTADO / RESULT
VISUAL Y DIMENSIONAL/ VISUAL & DIMENSIONAL INSP.	100%		O.K.
P.HIDROSTATICA/ HYDROTEST	100%	207,0 BAR 5 SEC.	O.K.
CORRIENTES INDUCIDAS/ EDDY CURRENTS	100%	ASTM E 309	O.K.
MAGNETISMO RESIDUAL/ RESIDUAL MAGNETISM		LESS THAN 30 GAUSS	

ENSAYOS TECNOLÓGICOS Y METALÚRGICOS / TECHNOLOGICAL AND METALLURGICAL TEST

APLASTADO /FLATTENING: AC/ A/SA333/5L2018. PSL1 -OK

TAMAÑO GRANO /GRAIN SIZE (FERRITIC): Nº ASTM> = 8

ANALISIS DE COLADA / CAST ANALYSYS

	C	Mn	Si	P	S	Cr	Ni	Mo	Cu	V	Al	Ti	Nb	B	C.E.
MIN.		0,29	0,15								0,0150				
MAX.	0,20	1,35	0,35	0,020	0,0100	0,200	0,4000	0,1200	0,3000	0,0800	0,0600	0,0400	0,0200	0,0010	**0,42**
125629	0,1400	1,28	0,20	0,010	0,0013	0,080	0,0728	0,0195	0,1588	0,0680	0,0230	0,0017	0,0016	0,0001	**0,40**

ANALISIS DE PRODUCTO / PRODUCT ANALYSIS

	C	Mn	Si	P	S	Cr	Ni	Mo	Cu	V	Al	Ti	Nb	B	C.E.
MIN.		0,29	0,15								0,0150				
MAX.	0,20	1,35	0,35	0,020	0,0100	0,200	0,4000	0,1200	0,3000	0,0800	0,0600	0,0400	0,0200	0,0010	**0,42**
125629	0,1300	1,29	0,20	0,012	0,0013	0,080	0,0700	0,0200	0,1500	0,0690	0,0250	0,0020	0,0020	0,0001	**0,39**
125629	0,1400	1,28	0,20	0,011	0,0013	0,080	0,0700	0,0200	0,1600	0,0680	0,0240	0,0020	0,0020	0,0001	**0,40**

FORMULAS

	(01)	(02)	(03)
MIN.			
MAX.	0,140	0,600	0,090
125629	0,073	0,323	0,071
125629	0,072	0,332	0,070

(01) Nb + Ti + V
(02) Cr + Mo + Cu + Nb + V + Ti
(03) Nb + V

AMURRIO 20.07.2020

CONTROL DE CALIDAD DE TUBOS REUNIDOS INDUSTRIAL
TUBOS REUNIDOS INDUSTRIAL (QUALITY CONTROL)
Gonzalo Cejudo
P.O:. :

Approved by QUALITY1 on 04/09/20

TAL SPA - THIS DOCUMENT IS REPRODUCED BY A COMPUTERIZED SYSTEM AND IS CONFORM TO THE ORIGINAL

TUBOS REUNIDOS INDUSTRIAL, S.L.U
Barrio Sagarribai, 2 - 01470 AMURRIO (Spain)

QUALITY MANAGEMENT SYSTEM certified by LRQA

EN 10204:2004 / 3.1

CERTIFICADO DE CALIDAD
MILL TEST CERTIFICATE

Nº 0000352307/1 Rev. 000

ENSAYOS DE TRACCIÓN / TENSILE TEST

COLADA CAST	Nº	L/T (1)	TP (2)	DIMENSION (mm)	L.ELAST. YIELD POINT (Mpa) (3)	R.TRACC. T.STRENGTH (Mpa)	ALARG. ELONG. (%) (4)	Estricción Reduction of Area (%)	DUREZA HARDNESS (HRB)
MIN.					360	460	14		
MAX.									99
125629	1	L	T	33,30 x 9,400	411	561	55		85
125629	2	L	T	33,20 x 9,100	402	555	54		85
125629	3	L	T	33,40 x 9,200	415	551	52		85
125629	4	L	T	33,40 x 9,200	398	548	55		84
125629	5	L	T	33,30 x 9,200	392	559	52		85
125629	6	L	T	33,30 x 9,400	407	552	52		83
125629	7	L	T	33,20 x 9,300	416	547	50		85

(1) : L = LONGITUDINAL // T = TRANSVERSAL
(2) : T = Full size tube // P = Strip specimen // C = Cylindrical // F = Flat specimen
(3) : yield point (0,5%)
(4) : Lo = 2" (50 mm)

ENSAYOS DE IMPACTO - CHARPY V / IMPACT TEST

COLADA CAST	Nº	L/T (1)	DIMENS (mm)		Tª (ºC)	RESILIENCIA IMPACT TEST (J)		AVG (J)	AREA DUCTIL SHEAR AREA (%)
			10	10,00	-50	27 /	40		90
					999				
125629	1	L	10	7,50	-50	236	231	211	226	90

(1) : L = LONGITUDINAL // T = TRANSVERSAL

ENSAYOS DE TRACCIÓN A ALTAS TEMPERATURAS (T) Y/O ENSAYOS POST SOLDADURA (P) / TENSILE TEST AT ELEVATED TEMPERATURE (T) OR / AND PWHT (POST WELDING HEAT TREATMENT) (P)

COLADA CAST	Nº	P/T (1)	L/T (2)	TP (3)	DIMENSION (mm)	Tª TRACC	L.ELAST. YIELD POINT (Mpa) (4)	R.TRACC. T.STRENGTH (Mpa)	ALARG. ELONG. (%) (5)	DUREZA HARDNESS (HRB)
MIN.										
MAX.										
125629	1	T	L	P	12,20 x 9,300	315 °C	371	522	46	

(1) : P = Ensayo Post Soldadura (Post Welding heat treatment) // T = Ensayo Tracción Alta Tª (Tensile test at elevated temperature)
(2) : L = LONGITUDINAL // T = TRANSVERSAL
(3) : T = Full size tube // P = Strip specimen // C = Cylindrical // F = Flat specimen
(4) : yield point (0,5%)
(5) : Lo = 2" (50 mm)

ANEXOS / ANNEX

FULLY KILLED
RADIATION FREE
MERCURY FREE
NO WELD REPAIR

AMURRIO 20.07.2020

CONTROL DE CALIDAD DE TUBOS REUNIDOS INDUSTRIAL
TUBOS REUNIDOS INDUSTRIAL (QUALITY CONTROL)
Gonzalo Cejoo
P.O:. :

Approved by QUALITY1 on 04/09/20

TUBOS REUNIDOS INDUSTRIAL, S.L.U
Barrio Sagarribai, 2 - 01470 AMURRIO (Spain)

QUALITY MANAGEMENT SYSTEM certified by LRQA

EN 10204:2004 / 3.1

CERTIFICADO DE CALIDAD
MILL TEST CERTIFICATE

Nº 0000352307/1 Rev. 000

ANEXOS / ANNEX

T.R.I, S.L.U. HAS A QUALITY MANAGEMENT SYSTEM APPROVED BY LRQA IN AGREEMENT WITH POINT 4.3 AND 7.5 ANNEX I OF THE PED 2014/68/EU."
ROLLING TEMPERATURE : 910ºC

KILLED OR FULLY KILLED STEEL AND FINE GRAIN WITH SIZE >=8 DE Acc to ASTM E112

AMURRIO 20.07.2020

CONTROL DE CALIDAD DE TUBOS REUNIDOS INDUSTRIAL
TUBOS REUNIDOS INDUSTRIAL (QUALITY CONTROL)
Gonzalo Cejudo
P.O:. :

Approved by QUALITY1 on 04/09/20

TAL SPA - THIS DOCUMENT IS REPRODUCED BY A COMPUTERIZED SYSTEM AND IS CONFORM TO THE ORIGINAL

Consumables certificate

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2020-09-09 Numero certificato/Cert no: EC26145422 rev. 0

Nostro ordine/Our order:	0100081844	Vostro ordine/Your order:	
Nostro riferimento/Our ref:	Roberto Bertini	Vostro riferimento/Your ref:	Giuseppe Saporetti
Codice Cliente/Cust no:	IT1056001	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:		Vostra e-mail/Your e-mail:	technoservicesrl@gmail.com

Indirizzo di fatturazione/Invoice address	Destinatario del certificato/Cert receiver	Indirizzo di spedizione/Delivery address
TECHNO SERVICE SRL VIA DELLA MERENDA,32 FOR.ZARATTINI		TECHNO SERVICE SRL VIA DELLA MERENDA,32 FOR.ZARATTINI 0 ITALY

CONSEGNA/DELIVERY Numero di lotto/Lot no: AE02020041 Quantità/Quantity:

PRODOTTO/PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK Tigrod 13.23 2.4x1000mm 5kg
Codice/Item no:	**132324R150**

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.28: ER80S-Ni1

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

Wire/strip

Altro/Auxiliary:		
C		0.09%
Si		0.60%
Mn		1.20%
P		0.005%
S		0.006%
Cr		0.05%
Ni		0.94%
Mo		0.23%
Cu		0.10%
V	<	0.01%

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:	AWS
Altro/Auxiliary:	I1
Condizione/Condition:	

TRAZIONE/TENSILE

ReL	Rm	A4-A5
500 MPa	600 MPa	25 %

RESILIENZA/IMPACT

Temp	-60 °C
KV	90 J

TECHNO SERVICE S.R.L.
QUESTO CERTIFICATO E' VALIDO PER
UNA QUANTITA' DI KG/PZ 15
VEDI DDT N. 593 DEL 11/03/21

COPIA CONFORME ALL'ORIGINALE

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura S.p.A. | Str. Provinciale 34, n.37 - 20010 Ossona MI, Italy

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis		Validazione - altro/Validation - Others	
John Hagen	Quality Manager	Jose Abal Lopez,H. Rasmuson	Product Manager,

preliminary WPS

Welding Spc	MOTS-12 WELDING AND NDE OF WELDS REV.05			STD	ISO 15614-1 QUALIFICATION, ISO 15609-1 (WPS)	
PQR ref.:	02-21 TBQ	PWPS N°	02-21	REV.:	0	Data /date 11/03/2021

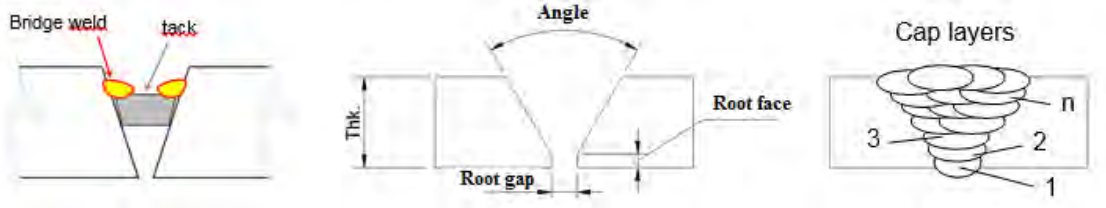
Procedimento di saldatura / Welding process: **GTAW (141)** — Tipo / Type: **MANUAL**

GIUNTO – JOINT (QW-402)

Tipo di giunto / Joint Design:	Supporto / Backing:	Joint Type	PIPING CLASSES
V	☐ Si / Yes ☒ No	**Butt Weld**	

Materiale di supporto (tipo) / Backing material (type): ☐ Metallico / Metal ☐ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

BEVEL SHALL BE DONE BY MACHINING OR GRINDING



Root face 1.0±0.5 mm

Root gap 4.5±2mm

Angle 55°±5°

Note:

1) The bullets for tacking shall be take from Carbon steel pipe. Minimum tack welds 2 times of wall thickness or 50 mm whichever is less / *Usare per i tacchetti materiale in acciaio al carbonio. Minima lunghezza delle puntature 2 volte lo spessore o 50 mm, quale dei due è più piccolo.*
2) The alignment of pipe ends shall be such as to minimize the internal offset between surfaces/ *L'allineamento dei tubi deve essere tale da minimizzare il disallineamento.*
3) Surfaces cleaned from moisture, oil, grease, paint. The cleaning shall be extend 75 mm from bevel end on internal and external surface. /*Pulire le superfici da sporcizia, oli e grassi. La pulizia deve essere estesa per 75 mm dal bordo del tubo sia sulla superfice esterna che interna.*

MATERIALE BASE – BASE MATERIAL (QW-403)

Da / from P-N°:	Group N°:	Da / from P-N°:	Group N°:
11		**11**	

Tipo e Grado / Type and Grade: **API 5L X52 / SA 333 GR6**

DIMENSIONI-DIMENSION (QW-403)		POSIZIONE DI SALDATURA - WELDING POSITION (QW 405)	
► Materiale base / Base material:	**9.09**	Welding Position	**PC & PF (2G & 5G)**
► Gamma diametri / Pipe dia. Range:	**1"**	Progression	**UP-HILL**

METALLO D'APPORTO – FILLER METAL (QW-404)

	GTAW	
Spec. N° (SFA)	A5.28	
AWS N° (CLASS)	ER 80S-Ni1	
F-N°	6	
A-N°	10	
Diametro mat. D'apporto / Size of filler metal	2,4	
Deposit Weld metal	Up to completion	
Accoppiamento filo-flusso / Electrode-flux (CLASS)	NA	
Denom. Comm. Flusso / FLUX trade name	NA	
Inserto consumabile / Consumable insert	NA	
Altro / other	ESAB OK TIGROD 13.23	

PRERISCALDO – PRE-HEAT (QW406)

Temp.preriscaldo minima / Min. pre-heat temp:	Max temp. Di interpass / Max interpass temp.:	Mantenimento interpass / Interpass maintenance :	Tempo di mantenimento prerisc. / Maintenance timing:
20 °C	**300 °C**	**N.A.**	**N.A.**

TRATTAMENTO TERMICO DOPO SALDATURA – POST WELD HEAT TREATMENT(QW 407)

N.A.

GAS DI PROTEZIONE – GAS (QW 408)

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	**Ar**	**99,99%**	**11-13 LPM**
Protezione al seguito / Trailing:	**N.A.**	**N.A.**	**N.A.**
Prot. Al rovescio / Backing:	**N.A.**	**N.A.**	**N.A.**

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS (QW –409)

Corrente / Current :	**DC**	Polarità / Polarity	**SP/**
Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type:	**AWS 5.12 EWTh2 dia.2,4mm**		
Metodo di trasferimento per GMAW / GMAW metal tranfer mode:	**N.A.**		
Velocità alimentazione filo / Electr. Wire feed speed range:	**N.A.**		

TECNICA – TECHNIQUE (QW-410)

Passata / Bead:	Dimensione bocchello gas / Orifice of gas cup size:	Pulizia iniziale e fra le passate / Initial and interpass cleaning:	
Tirata/String, max 12 mm	**3/8"**	**Spazzolatura/Brushing**	
Metodo di solcatura a rovescio / Method of back gouging:	N.A.	Oscillazione / Oscillation: N.A.	Distanza tra zona di contatto e pezzo / Contact zone to work distance: N.A.
N°Passate / Passes nr.: **Multipla/Multiple**	Elettrodo multiplo o singolo / Multiple or single electrodes: **Singolo/Single**	Martellatura / Peening: **N.A.**	

Altro / Other: Variables Not Listed Are Not Used

N° Passate Weld layers nr.	Processo Process	Materiale d'apporto Filler metal		Corrente Current		Voltaggio Volt range	Vel. Avanzamento Travel speed range (mm/min)	Apporto termico Heat input (KJ/mm)
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. Range			
Root	**GTAW**	ER 80S-Ni1	2,4	DC/SP	100-140	10-13	40-60	0.60-1.64
Hot	**GTAW**	ER 80S-Ni1	2,4	DC/SP	120-150	11-15	55-70	0.67-1.47
Fill	**GTAW**	ER 80S-Ni1	2,4	DC/SP	120-160	12-16	60-120	0.43-1.54
Cap	**GTAW**	ER 80S-Ni1	2,4	DC/SP	120-160	12-16	60-120	0.43-1.54

ROSETTI - prepared by:

A.KHALIFA

NDE certificate

ROSETTI MARINO	VERBALE DI CONTROLLO VISIVO/DIMENSIONALE visual/dimensional inspection report	VDR N° 02-21 data: 17/03/2021
progetto project: DUNGA	cliente client: KCOI FOR TOTAL	commessa job: 121S05A

oggetto – item

Procedure Qualification Record (WPQR) 02/21

Certificato di Qualifica di Procedimento di Saldatura (WPQR) 02/21

WE CERTIFY THAT:

ITEMS INDICATED ABOVE HAVE UNDERGONE A VISUAL INSPECTION AND HAVE BEEN ACCEPTED ACCORDING TO THE SPECIFICATION / PROCEDURE MENTIONED AND TO ACCEPTANCE CRITERIA DEFINED IN IT

SI CERTIFICA CHE LE SALDATURE DEI SAGGI SOPRA CITATI SONO STATI SOTTOPOSTI AD ESAME VISIVO AL 100% ALLO STATO COME SALDATO IN ACCORDO ALLE SPECIFICHE E STANDARD CITATI.

note – remarks

Inspection on welds 1”x9,09mm WT in as welded condition.

9 Samples in PC-2G and 9 samples in PH-5G

No visible defects have been detected.



risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

EN ISO 5817:2014 Lev. B, ASME IX:2019 QW 191, MOTS-12 Rev. 5.0, ISO 15614-1

Operatore – Operator	Controllo Qualita’ - Quality Control	Cliente - Client
CSWIP A.K. KHALIFA 69505 WI 3.1		

QUALITY TEST srl Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n°	
	21083 MT 02 GB Rev. 00	
RAPPORTO D'ESAME MAGNETOSCOPICO Magnetic Particle Test Report	DATA / Date 23/03/2021	FOGLIO / Sheet 1/1

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	DUNGA KCOI	121S05A	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	FASE Step
/	WPQR	/	/	

ESECUZIONE / Execution		ACCETTABILITA' / Acceptance	
DK-TEHY-PRO-000-10007		DK-TEHY-PRO-000-10007	
MATERIALE/Material	TEMP. SUPERFICI Surface temperature	INTENSITA' LUMINOSA/ Light intensity	
API 5L X52 gr.11	10°	☑ LUCE BIANCA >1076 Lux ☐ LUCE BIANCA >500 Lux	☐ LUCE NERA 1000 µW/cm²

STATO DELLA SUPERFICIE – Surface condition			
☑ COME SALDATO As welded	☑ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined	
☐ GREZZO – Forged	☐ LAMINATO – Rolled	☐ MOLATO – Ground	☐ SABBIATO – Blasted

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☑ GIOGO/Yoke	☐ PUNTALI/Prods	☐ BOBINA/Coil	☐ CONDUTTORE CENTRALE/Central conduttor

METODO / Method		SMAGNETIZZAZIONE/Demagnetization	
☑ CONTINUO/Continuous	☐ RESIDUO /Residual	☐ RICHIESTA/Required	☑ NON RICHIESTA/Not Required
TIPO DI MAGNETIZZAZIONE/magnetization type		DIREZIONE CAMPO MAGNETICO/magnetic field direction	
☑ MAGNETICO/magnetic	☐ ELETTRICO/electric	☐ CIRCOLARE/Circular	☑ LONGITUDINALE/longitudinal
TIPO APPARECCHIO/Type of equipment	HR 235	DISTANZA PUNTALI/Pole spacing	180 mm max.
NUMERO DI SERIE/Serial number	04.235-18		
TIPO DI CORRENTE/Current Type		POTERE DI SOLLEVAMENTO GIOGO / Lifting power	
☑ A.C.	☐ D.C.	☑ 4,5 kg	☐ 18 kg
MEZZO DI ISPEZIONE / Examination medium		INTENSITÀ DI CORRENTE / Intesity	
☑ UMIDO/Wet	☐ SECCO/Dry	☐ A/ mm	☐ / spira

PARTICELLE UTILIZZATE/Particle Type			
CONTRASTO DI COLOR/Color contrast	☐	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	☐ NDT BW2 ☐ NDT DRY	MARCA TIPO/Mark Type	NDT FW1
LOTTO/BACH	7249s	LOTTO/BACH	/
VERNICE DI CONTRASTO / Contrast Paint		☐ NDT WBL5	LOTTO/BACH U200625s

SALDATURE CONTROLLATE / Welds Verified

Coupon Identification	Weld	Stamp	Position	Process	Wps	Ø	Thk mm	Inspection plan
WPQR 02/21 TBQ	1	AX86	2G	GTAW	02/21	1"	9.09	IDL-MT-QT-01
WPQR 02/21 TBQ	2	AX86	2G	GTAW	02/21	1"	9.09	IDL-MT-QT-01
WPQR 02/21 TBQ	3	AX86	2G	GTAW	02/21	1"	9.09	IDL-MT-QT-01
WPQR 02/21 TBQ	4	AX86	2G	GTAW	02/21	1"	9.09	IDL-MT-QT-01
WPQR 02/21 TBQ	5	AX86	2G	GTAW	02/21	1"	9.09	IDL-MT-QT-01

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITÀ Quality Control	ISPETTORE CLIENTE Company Repr.
Gilberto Bonoli II° Livello SNT - TC - 1A / ISO 9712		

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta. P written authorized.
I risultati delle prove si riferiscono unicamente ai particolari esaminati. T
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RINA Services SpA No. Bo. 0474 Date 09/04/2021
Noted ☐ File
Reviewed ☑ Signature
Witnessed ☐
Approved ☐ Cimatti Davide

QUALITY TEST srl Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n°	
	21083 MT 03 GB Rev. 00	
RAPPORTO D'ESAME MAGNETOSCOPICO Magnetic Particle Test Report	DATA / Date 23/03/2021	FOGLIO / Sheet 1/1

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	DUNGA KCOI	121S05A	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	FASE Step
/	WPQR	/	/	

ESECUZIONE / Execution		ACCETTABILITA' / Acceptance	
DK-TEHY-PRO-000-10007		DK-TEHY-PRO-000-10007	
MATERIALE/Material	TEMP. SUPERFICI Surface temperature	INTENSITA' LUMINOSA/ Light intensity	
API 5L X52 GR.11	10°	☑ LUCE BIANCA >1076 Lux ☐ LUCE BIANCA >500 Lux	☐ LUCE NERA 1000 µW/cm²

STATO DELLA SUPERFICIE – Surface condition			
☑ COME SALDATO As welded	☑ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined	
☐ GREZZO – Forged	☐ LAMINATO – Rolled	☐ MOLATO – Ground	☐ SABBIATO – Blasted

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☑ GIOGO/Yoke	☐ PUNTALI/Prods	☐ BOBINA/Coil	☐ CONDUTTORE CENTRALE/Central conduttor

METODO / Method		SMAGNETIZZAZIONE/Demagnetization	
☑ CONTINUO/Continuous	☐ RESIDUO /Residual	☐ RICHIESTA/Required	☑ NON RICHIESTA/Not Required
TIPO DI MAGNETIZZAZIONE/magnetization type		DIREZIONE CAMPO MAGNETICO/magnetic field direction	
☑ MAGNETICO/magnetic	☐ ELETTRICO/electric	☐ CIRCOLARE/Circular	☑ LONGITUDINALE/longitudinal
TIPO APPARECCHIO/Type of equipment	HR 235	DISTANZA PUNTALI/Pole spacing	180 mm max.
NUMERO DI SERIE/Serial number	04.235-18		
TIPO DI CORRENTE/Current Type		POTERE DI SOLLEVAMENTO GIOGO / Lifting power	
☑ A.C.	☐ D.C.	☑ 4,5 kg	☐ 18 kg
MEZZO DI ISPEZIONE / Examination medium		INTENSITÀ DI CORRENTE / Intesity	
☑ UMIDO/Wet	☐ SECCO/Dry	☐ A/ mm	☐ / spira

PARTICELLE UTILIZZATE/Particle Type			
CONTRASTO DI COLOR/Color contrast	☐	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	☐ NDT BW2 ☐ NDT DRY	MARCA TIPO/Mark Type	NDT FW1
LOTTO/BACH	7249s	LOTTO/BACH	/
VERNICE DI CONTRASTO / Contrast Paint		☐ NDT WBL5	LOTTO/BACH U200625s

SALDATURE CONTROLLATE / Welds Verified

Coupon Identification	Weld	Stamp	Position	Process	Wps	Ø	Thk mm	Inspection plan
WPQR 02/21 TBQ	6	AX86	2G	GTAW	02/21	1"	9.09	IDL-MT-QT-01
WPQR 02/21 2G	7	AX86	2G	GTAW	02/21	1"	9.09	IDL-MT-QT-01
WPQR 02/21 2G	8	AX86	2G	GTAW	02/21	1"	9.09	IDL-MT-QT-01
WPQR 02/21 2G	9	AX86	2G	GTAW	02/21	1"	9.09	IDL-MT-QT-01

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITÀ Quality Control	ISPETTORE CLIENTE Company Repr.
Gilberto Bonoli II° Livello SNT - TC - 1A / ISO 9712		

RINA Services SpA No. Bo. 0474 Date 09/04/2021
Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ File Signature Cimatti Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta. …e written authorized.
I risultati delle prove si riferiscono unicamente ai particolari esaminati.
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QUALITY TEST srl Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n°	
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RAPPORTO D'ESAME MAGNETOSCOPICO Magnetic Particle Test Report	DATA / Date 23/03/2021	FOGLIO / Sheet 1/1

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/	WPQR	/	/	

ESECUZIONE / Execution		ACCETTABILITA' / Acceptance	
DK-TEHY-PRO-000-10007		DK-TEHY-PRO-000-10007	
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Gilberto Bonoli II° Livello SNT - TC - 1A / ISO 9712		

RINA Services SpA No. Bo. 0474 Date 09/04/2021
Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ File Signature Ciro Di Davide

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	21083 MT 09 GB Rev. 00	
RAPPORTO D'ESAME MAGNETOSCOPICO Magnetic Particle Test Report	DATA / Date 23/03/2021	FOGLIO / Sheet 1/1

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	DUNGA KCOI	121S05A	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	FASE Step
/	WPQR	/	/	

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API 5L X52 GR.11	10°	☑ LUCE BIANCA >1076 Lux ☐ LUCE BIANCA >500 Lux	☐ LUCE NERA 1000 µW/cm²

STATO DELLA SUPERFICIE – Surface condition			
☑ COME SALDATO As welded	☑ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined	
☐ GREZZO – Forged	☐ LAMINATO – Rolled	☐ MOLATO – Ground	☐ SABBIATO – Blasted

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☑ GIOGO/Yoke	☐ PUNTALI/Prods	☐ BOBINA/Coil	☐ CONDUTTORE CENTRALE/Central conduttor

METODO / Method		SMAGNETIZZAZIONE/Demagnetization	
☑ CONTINUO/Continuous	☐ RESIDUO /Residual	☐ RICHIESTA/Required	☑ NON RICHIESTA/Not Required
TIPO DI MAGNETIZZAZIONE/magnetization type		DIREZIONE CAMPO MAGNETICO/magnetic field direction	
☑ MAGNETICO/magnetic	☐ ELETTRICO/electric	☐ CIRCOLARE/Circular	☑ LONGITUDINALE/longitudinal
TIPO APPARECCHIO/Type of equipment	HR 235	DISTANZA PUNTALI/Pole spacing	180 mm max.
NUMERO DI SERIE/Serial number	04.235-18		
TIPO DI CORRENTE/Current Type		POTERE DI SOLLEVAMENTO GIOGO / Lifting power	
☑ A.C.	☐ D.C.	☑ 4,5 kg	☐ 18 kg
MEZZO DI ISPEZIONE / Examination medium		INTENSITÀ DI CORRENTE / Intesity	
☑ UMIDO/Wet	☐ SECCO/Dry	☐ A/ mm	☐ / spira

PARTICELLE UTILIZZATE/Particle Type			
CONTRASTO DI COLOR/Color contrast	☐	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	☐ NDT BW2 ☐ NDT DRY	MARCA TIPO/Mark Type	NDT FW1
LOTTO/BACH	7249s	LOTTO/BACH	/
VERNICE DI CONTRASTO / Contrast Paint		☐ NDT WBL5	LOTTO/BACH U200625s

SALDATURE CONTROLLATE / Welds Verified

Coupon Identification	Weld	Stamp	Position	Process	Wps	Ø	Thk mm	Inspection plan
WPQR 02/21 TBQ	6	AX86	5G	GTAW	02/21	1"	9.09	IDL-MT-QT-01
WPQR 02/21 2G	7	AX86	5G	GTAW	02/21	1"	9.09	IDL-MT-QT-01
WPQR 02/21 2G	8	AX86	5G	GTAW	02/21	1"	9.09	IDL-MT-QT-01
WPQR 02/21 2G	9	AX86	5G	GTAW	02/21	1"	9.09	IDL-MT-QT-01

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITÀ Quality Control	ISPETTORE CLIENTE Company Repr.
Gilberto Bonoli II° Livello SNT - TC - 1A / ISO 9712		

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta.
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RINA Services SpA No. Bo. 0474 Date 09/04/2021 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ File Signature

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n° 21083 RT 03 gb Rev. 00
RAPPORTO D'ESAME RADIOGRAFICO RADIOGRAPHIC TEST		DATA / Date 22/03/2021 FOGLIO / Sheet 1/1

CLIENTE / Client	ORDINE / Order	PROGETTO / Project	COMMESSA / Job
ROSETTI MARINO Spa	/	DUNGA KCOI	121S05A

CLIENTE FINALE /Customer	OGGETTO / Object	DISEGNO / Dwg	P.F.C. / Q.C.P.	Fase / Step
/	WPQR	/	/	/

Schizzo Sketch	Saldatura Weld	Diametro Diameter	Spessore Thickness	Punzone Welder	Posizione Position	Difetto Defect	Giudizio Judgement
WPQR-02-21-TBQ	1 2G	1"	9.09 mm	AX86	A	/	A
					B	/	A
					C	/	A
					D	/	A
WPQR-02-21-TBQ	2 2G	1"	9.09 mm	AX86	A	/	A
					B	/	A
					C	/	A
					D	/	A
WPQR-02-21-TBQ	3 2G	1"	9.09 mm	AX86	A	/	A
					B	/	A
					C	/	A
					D	/	A

DIFETTI / Defects

Aa	Soffiature Porosity	Ab	Tarli Worm	B	Inclusione di Scoria Slag Inclusion	C	Mancanza di Fusione Lack of fusion
D	Mancata Penetrazione Lack of penetration	E	Cricca Crack	Ex	Eccesso Penetrazione Excessive Penetration	F	Incisione Undercut
In	Insellamento Root Concavity	Sl	Slivellamento Misalignment	W	Inclusioni Tungsteno Tungsten Inclusion	Df	Difetto Film Film Defect

ESITO / Results

A	Accettabile Acceptable	NR	Riparare Repair	NX	Ripetere Film Repeat Film		

PROCEDURA /Procedure DK-TEHY-MET-PRO-00-1007	Schermi / Lead screen PB 0,10 Front and Back	Pellicole / Film type KODAK T200 (C4)
Tipo macchina Rx / Type machine Rx GILARDONI MHF-D 300	Densità / Density Range ≤ 4 base material	Densità / Density Range Range -15% + 30% welded area

TECNICA DI ESPOSIZIONE / Exposure Technique: DOPPIA PARETE DOPPIA IMMAGINE DWDI

Tipo di sorgente / source type			Tipo di IQI / IQI type	
☑ RX	☐ IR 192	☐ SE 75	☑ ASTM	☐ EN
Macchia focale focal spot		3	Posizione / position	
Attività activity			☐ Lato film film side	☑ Lato sorgente Source side
Ci	kV	mA	Esposizione / esposition	
/	280	3	☑ Film singolo Single film	☐ Film doppio Double film
Tempo di esposizione exposure time			Tecnica di sviluppo / Film processing	
36 sec			☐ Manuale / manual	☑ Automatico / Automatic

Spessore attraversato *Crossed thickness*	Dist. pezzo sorgente *Source piece distance* (D)	Dist. oggetto film *Film object distance* (d)	Penombra/Unsharpness Richiesta *Required*	 Ottenuta *Obtained*	Filo n° / *Wire n°* Richiesto *Required*	 Ottenuto *Obtained*	Lastre n° *Films n°*
range 12.7÷19.1	487	33	< 0,51	0.20	8	8	4

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Gilberto Bonoli II° Livello SNT - TC - 1A / ISO 9712		

RINA Services SpA No. Bo. 0474 Date 09/04/2021 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ File Signature Claudio Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta. - Par ritten authorized.
I risultati delle prove si riferiscono unicamente ai particolari esaminati. - Test result
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RAPPORTO D'ESAME RADIOGRAFICO RADIOGRAPHIC TEST		DATA / Date 22/03/2021 FOGLIO / Sheet 1/1

CLIENTE / Client	ORDINE / Order	PROGETTO / Project	COMMESSA / Job	
ROSETTI MARINO Spa	/	DUNGA KCOI	121S05A	
CLIENTE FINALE /Customer	OGGETTO / Object	DISEGNO / Dwg	P.F.C. / Q.C.P.	Fase / Step
/	WPQR	/	/	/

Schizzo Sketch	Saldatura Weld	Diametro Diameter	Spessore Thikeness	Punzone Welder	Posizione Position	Difetto Defect	Giudizio Judgement
WPQR-02-21-TBQ	4 2G	1"	9.09	AX86	A	/	A
					B	/	A
					C	/	A
					D	/	A
WPQR-02-21-TBQ	5 2G	1"	9.09	AX86	A	/	A
					B	/	A
					C	/	A
					D	/	A
WPQR-02-21-TBQ	6 2G	1"	9.09	AX86	A	/	A
					B	/	A
					C	/	A
					D	/	A

DIFETTI / Defects

Aa	Soffiature Porosity	Ab	Tarli Worm	B	Inclusione di Scoria Slag Inclusion	C	Mancanza di Fusione Lack of fusion
D	Mancata Penetrazione Lack of penetration	E	Cricca Crack	Ex	Eccesso Penetrazione Excessive Penetration	F	Incisione Undercut
In	Insellamento Root Concavity	Sl	Slivellamento Misalignment	W	Inclusioni Tungsteno Tungsten Inclusion	Df	Difetto Film Film Defect

ESITO / Results

A	Accettabile Acceptable	NR	Riparare Repair	NX	Ripetere Film Repeat Film		

PROCEDURA /Procedure DK-TEHY-MET-PRO-00-1007	Schermi / Lead screen PB 0,10 Front and Back	Pellicole / Film type KODAK T200 (C4)
Tipo macchina Rɣ / Type machine Rɣ GILARDONI MHF-D 300	Densità / Density Range ≤ 4 base material	Densità / Density Range Range -15% + 30% welded area

TECNICA DI ESPOSIZIONE / Exposure Technique: DOPPIA PARETE DOPPIA IMMAGINE DWDI

Tipo di sorgente / source type			Tipo di IQI / IQI type	
☑ RX	☐ IR 192	☐ SE 75	☑ ASTM	☐ EN
Macchia focale focal spot		3	Posizione / position	
Attività activity			☐ Lato film film side	☑ Lato sorgente Source side
Ci	kV	mA	Esposizione / esposition	
/	280	3	☑ Film singolo Single film	☐ Film doppio Double ilm
Tempo di esposizione exposure time			Tecnica di sviluppo / Film processing	
36 sec			☐ Manuale / manual	☑ Automatico / Automatic

Spessore attraversato *Crossed thickness*	Dist. pezzo sorgente *Source piece distance* (D)	Dist. oggetto film *Film object distance* (d)	Penombra/Unsharpness Richiesta *Required*	 Ottenuta *Obtained*	Filo n° / *Wire n°* Richiesto *Required*	 Ottenuto *Obtained*	Lastre n° *Films n°*
range 12.7÷19.1	487	33	< 0,51	0.20	8	8	4

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Gilberto Bonoli II° Livello SNT - TC - 1A / ISO 9712		

RINA Services SpA No. Bo. 0474 Date 09/04/2021
Noted ☐ File
Reviewed ☑ Signature
Witnessed ☐
Approved ☐ Cinotti Davide

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RAPPORTO D'ESAME RADIOGRAFICO RADIOGRAPHIC TEST		DATA / Date 22/03/2021 FOGLIO / Sheet 1/1

CLIENTE / Client	ORDINE / Order	PROGETTO / Project	COMMESSA / Job
ROSETTI MARINO Spa	/	DUNGA KCOI	121S05A

CLIENTE FINALE /Customer	OGGETTO / Object	DISEGNO / Dwg	P.F.C. / Q.C.P.	Fase / Step
/	WPQR	/	/	/

Schizzo Sketch	Saldatura Weld	Diametro Diameter	Spessore Thikeness	Punzone Welder	Posizione Position	Difetto Defect	Giudizio Judgement
WPQR-02-21-TBQ	7 2G	1"	9.09	AX86	A	/	A
					B	/	A
					C	/	A
					D	/	A
WPQR-02-21-TBQ	8 2G	1"	9.09	AX86	A	/	A
					B	/	A
					C	/	A
					D	/	A
WPQR-02-21-TBQ	9 2G	1"	9.09	AX86	A	/	A
					B	/	A
					C	/	A
					D	/	A

DIFETTI / Defects

Aa	Soffiature Porosity	Ab	Tarli Worm	B	Inclusione di Scoria Slag Inclusion	C	Mancanza di Fusione Lack of fusion
D	Mancata Penetrazione Lack of penetration	E	Cricca Crack	Ex	Eccesso Penetrazione Excessive Penetration	F	Incisione Undercut
In	Insellamento Root Concavity	Sl	Slivellamento Misalignment	W	Inclusioni Tungsteno Tungsten Inclusion	Df	Difetto Film Film Defect

ESITO / Results

A	Accettabile Acceptable	NR	Riparare Repair	NX	Ripetere Film Repeat Film		

PROCEDURA /Procedure DK-TEHY-MET-PRO-00-1007	Schermi / Lead screen PB 0,10 Front and Back	Pellicole / Film type KODAK T200 (C4)
Tipo macchina Rɣ / Type machine Rɣ GILARDONI MHF-D 300	Densità / Density Range ≤ 4 base material	Densità / Density Range Range -15% + 30% welded area

TECNICA DI ESPOSIZIONE / Exposure Technique: DOPPIA PARETE DOPPIA IMMAGINE DWDI

Tipo di sorgente / source type			Tipo di IQI / IQI type	
☑ RX	☐ IR 192	☐ SE 75	☑ ASTM	☐ EN
Macchia focale focal spot		3	Posizione / position	
Attività activity			☐ Lato film film side	☑ Lato sorgente Source side
Ci	kV	mA	Esposizione / esposition	
/	280	3	☑ Film singolo Single film	☐ Film doppio Double ilm
Tempo di esposizione exposure time			Tecnica di sviluppo / Film processing	
36 sec			☐ Manuale / manual	☑ Automatico / Automatic

Spessore attraversato *Crossed thickness*	Dist. pezzo sorgente *Source piece distance* (D)	Dist. oggetto film *Film object distance* (d)	Penombra/Unsharpness Richiesta *Required*	 Ottenuta *Obtained*	Filo n° / *Wire n°* Richiesto *Required*	 Ottenuto *Obtained*	Lastre n° *Films n°*
range 12.7÷19.1	487	33	< 0,51	0.20	8	8	4

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Gilberto Bonoli II° Livello SNT - TC - 1A / ISO 9712		

RINA Services SpA No. Bo. 0474 Date 09/04/2021
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RAPPORTO D'ESAME RADIOGRAFICO RADIOGRAPHIC TEST		DATA / Date 26/03/2021 FOGLIO / Sheet 1/1

CLIENTE / Client	ORDINE / Order	PROGETTO / Project	COMMESSA / Job
ROSETTI MARINO Spa	/	DUNGA KCOI	121S05A

CLIENTE FINALE /Customer	OGGETTO / Object	DISEGNO / Dwg	P.F.C. / Q.C.P.	Fase / Step
/	WPQR	/	/	/

Schizzo Sketch	Saldatura Weld	Diametro Diameter	Spessore Thikeness	Punzone Welder	Posizione Position	Difetto Defect	Giudizio Judgement
WPQR-02-21-TBQ	1 5G	1"	9.09	AX86	A	/	A
					B	/	A
					C	/	A
					D	/	A
WPQR-02-21-TBQ	2 5G	1"	9.09	AX86	A	/	A
					B	/	A
					C	/	A
					D	/	A
WPQR-02-21-TBQ	3 5G	1"	9.09	AX86	A	/	A
					B	/	A
					C	/	A
					D	/	A

DIFETTI / Defects

Aa	Soffiature Porosity	Ab	Tarli Worm	B	Inclusione di Scoria Slag Inclusion	C	Mancanza di Fusione Lack of fusion
D	Mancata Penetrazione Lack of penetration	E	Cricca Crack	Ex	Eccesso Penetrazione Excessive Penetration	F	Incisione Undercut
In	Insellamento Root Concavity	Sl	Slivellamento Misalignment	W	Inclusioni Tungsteno Tungsten Inclusion	Df	Difetto Film Film Defect

ESITO / Results

A	Accettabile Acceptable	NR	Riparare Repair	NX	Ripetere Film Repeat Film		

PROCEDURA /Procedure DK-TEHY-MET-PRO-00-1007	Schermi / Lead screen PB 0,10 Front and Back	Pellicole / Film type KODAK T200 (C4)
Tipo macchina Rɣ / Type machine Rɣ GILARDONI MHF-D 300	Densità / Density Range ≤ 4 base material	Densità / Density Range Range -15% + 30% welded area

TECNICA DI ESPOSIZIONE / Exposure Technique: DOPPIA PARETE DOPPIA IMMAGINE DWDI

Tipo di sorgente / source type			Tipo di IQI / IQI type	
☑ RX	☐ IR 192	☐ SE 75	☑ ASTM	☐ EN
Macchia focale focal spot		3	Posizione / position	
Attività activity			☐ Lato film film side	☑ Lato sorgente Source side
Ci	kV	mA	Esposizione / esposition	
/	280	3	☑ Film singolo Single film	☐ Film doppio Double ilm
Tempo di esposizione exposure time			Tecnica di sviluppo / Film processing	
36 sec			☐ Manuale / manual	☑ Automatico / Automatic

Spessore attraversato *Crossed thickness*	Dist. pezzo sorgente *Source piece distance* (D)	Dist. oggetto film *Film object distance* (d)	Penombra/Unsharpness Richiesta *Required*	Penombra/Unsharpness Ottenuta *Obtained*	Filo n° / *Wire n°* Richiesto *Required*	Filo n° / *Wire n°* Ottenuto *Obtained*	Lastre n° *Films n°*
range 12.7÷19.1	487	33	< 0,51	0.20	8	8	4

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Gilberto Bonoli II° Livello SNT - TC - 1A / ISO 9712		

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RAPPORTO D'ESAME RADIOGRAFICO RADIOGRAPHIC TEST		DATA / Date 26/03/2021 FOGLIO / Sheet 1/1

CLIENTE / Client	ORDINE / Order	PROGETTO / Project	COMMESSA / Job	
ROSETTI MARINO Spa	/	DUNGA KCOI	121S05A	
CLIENTE FINALE /Customer	**OGGETTO / Object**	**DISEGNO / Dwg**	**P.F.C. / Q.C.P.**	**Fase / Step**
/	WPQR	/	/	/

Schizzo Sketch	Saldatura Weld	Diametro Diameter	Spessore Thikeness	Punzone Welder	Posizione Position	Difetto Defect	Giudizio Judgement
WPQR-02-21-TBQ	4 5G	1"	9.09	AX86	A	/	A
					B	/	A
					C	/	A
					D	/	A
WPQR-02-21-TBQ	5 5G	1"	9.09	AX86	A	/	A
					B	/	A
					C	/	A
					D	/	A
WPQR-02-21-TBQ	6 5G	1"	9.09	AX86	A	/	A
					B	/	A
					C	/	A
					D	/	A

DIFETTI / Defects

Aa	Soffiature Porosity	Ab	Tarli Worm	B	Inclusione di Scoria Slag Inclusion	C	Mancanza di Fusione Lack of fusion
D	Mancata Penetrazione Lack of penetration	E	Cricca Crack	Ex	Eccesso Penetrazione Excessive Penetration	F	Incisione Undercut
In	Insellamento Root Concavity	Sl	Slivellamento Misalignment	W	Inclusioni Tungsteno Tungsten Inclusion	Df	Difetto Film Film Defect

ESITO / Results

A	Accettabile Acceptable	NR	Riparare Repair	NX	Ripetere Film Repeat Film		

PROCEDURA /Procedure DK-TEHY-MET-PRO-00-1007	Schermi / Lead screen PB 0,10 Front and Back	Pellicole / Film type KODAK T200 (C4)
Tipo macchina Rɣ / Type machine Rɣ GILARDONI MHF-D 300	Densità / Density Range ≤ 4 base material	Densità / Density Range Range -15% + 30% welded area

TECNICA DI ESPOSIZIONE / Exposure Technique: DOPPIA PARETE DOPPIA IMMAGINE DWDI

Tipo di sorgente / source type			Tipo di IQI / IQI type	
☑ RX	☐ IR 192	☐ SE 75	☑ ASTM	☐ EN
Macchia focale focal spot		3	Posizione / position	
Attività activity			☐ Lato film film side	☑ Lato sorgente Source side
Ci	kV	mA	Esposizione / esposition	
/	280	3	☑ Film singolo Single film	☐ Film doppio Double ilm
Tempo di esposizione exposure time			Tecnica di sviluppo / Film processing	
36 sec			☐ Manuale / manual	☑ Automatico / Automatic

Spessore attraversato *Crossed thickness*	Dist. pezzo sorgente *Source piece distance* (D)	Dist. oggetto film *Film object distance* (d)	Penombra/Unsharpness Richiesta *Required*	 Ottenuta *Obtained*	Filo n° / *Wire n°* Richiesto *Required*	 Ottenuto *Obtained*	Lastre n° *Films n°*
range 12.7÷19.1	487	33	< 0,51	0.20	8	8	4

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Gilberto Bonoli II° Livello SNT - TC - 1A / ISO 9712		

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RINA Services SpA No. Bo. 0474 Date 09/04/2021 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ File Signature Ciavatti Davide

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RAPPORTO D'ESAME RADIOGRAFICO RADIOGRAPHIC TEST		DATA / Date 26/03/2021 FOGLIO / Sheet 1/1

CLIENTE / Client	ORDINE / Order	PROGETTO / Project	COMMESSA / Job
ROSETTI MARINO Spa	/	DUNGA KCOI	121S05A

CLIENTE FINALE /Customer	OGGETTO / Object	DISEGNO / Dwg	P.F.C. / Q.C.P.	Fase / Step
/	WPQR	/	/	/

Schizzo Sketch	Saldatura Weld	Diametro Diameter	Spessore Thikeness	Punzone Welder	Posizione Position	Difetto Defect	Giudizio Judgement
WPQR-02-21-TBQ	7 5G	1"	9.09	AX86	A	/	A
					B	/	A
					C	DF	A
					D	/	A
WPQR-02-21-TBQ	8 5G	1"	9.09	AX86	A	/	A
					B	/	A
					C	/	A
					D	/	A
WPQR-02-21-TBQ	9 5G	1"	9.09	AX86	A	/	A
					B	/	A
					C	/	A
					D	/	A

DIFETTI / Defects

Aa	Soffiature Porosity	Ab	Tarli Worm	B	Inclusione di Scoria Slag Inclusion	C	Mancanza di Fusione Lack of fusion
D	Mancata Penetrazione Lack of penetration	E	Cricca Crack	Ex	Eccesso Penetrazione Excessive Penetration	F	Incisione Undercut
In	Insellamento Root Concavity	Sl	Slivellamento Misalignment	W	Inclusioni Tungsteno Tungsten Inclusion	Df	Difetto Film Film Defect

ESITO / Results

A	Accettabile Acceptable	NR	Riparare Repair	NX	Ripetere Film Repeat Film		

PROCEDURA /Procedure DK-TEHY-MET-PRO-00-1007	Schermi / Lead screen PB 0,10 Front and Back	Pellicole / Film type KODAK T200 (C4)
Tipo macchina Rɣ / Type machine Rɣ GILARDONI MHF-D 300	Densità / Density Range ≤ 4 base material	Densità / Density Range Range -15% + 30% welded area

TECNICA DI ESPOSIZIONE / Exposure Technique: DOPPIA PARETE DOPPIA IMMAGINE DWDI

Tipo di sorgente / source type			Tipo di IQI / IQI type	
☑ RX	☐ IR 192	☐ SE 75	☑ ASTM	☐ EN
Macchia focale focal spot		3	Posizione / position	
Attività activity			☐ Lato film film side	☑ Lato sorgente Source side
Ci	kV	mA	Esposizione / esposition	
/	280	3	☑ Film singolo Single film	☐ Film doppio Double ilm
Tempo di esposizione exposure time			Tecnica di sviluppo / Film processing	
36 sec			☐ Manuale / manual	☑ Automatico / Automatic

Spessore attraversato *Crossed thickness*	Dist. pezzo sorgente *Source piece distance* (D)	Dist. oggetto film *Film object distance* (d)	Penombra/Unsharpness Richiesta *Required*	Penombra/Unsharpness Ottenuta *Obtained*	Filo n° / *Wire n°* Richiesto *Required*	Filo n° / *Wire n°* Ottenuto *Obtained*	Lastre n° *Films n°*
range 12.7÷19.1	487	33	< 0,51	0.20	8	8	4

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Gilberto Bonoli II° Livello SNT - TC - 1A / ISO 9712		

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta. - Parti... tten authorized.
I risultati delle prove si riferiscono unicamente ai particolari esaminati. - Test results
Z:\Qualita\5 modulistica\Validi\01 moduli cnd\validi\01 2020 rev.2\convenzionali vo

RINA Services SpA No. Bo. 0474 Date 09/04/2021
Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ File Signature

ROSETTI MARINO

PQR 02/21

Mechanical test report

INSPECTA S.R.L.	**TEST REPORT** ***RAPPORTO DI PROVA*** **N° 145-00100-21** **Rev.00** **Data: 09/04/2021**	ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO **LAB N°1607 L**

Object: *Oggetto:*	**MECHANICAL TEST ON PQR 02-2021 (POS.PC – PH)**					Pag. 1 di 18
Specimen: *Saggio:*	**178/21**	**#Base Material:** *Materiale Base:*	**ASME SA333 Gr.6** **API 5L X52+N**	**PIPE Ø 1'' THK. 9,09mm**		
		# Informazione fornita dal cliente/ Information provided by the customer				
Customer: *Committente:*	**ROSETTI MARINO S.p.A.**					
Address: *Indirizzo:*	**Via Trieste, 230 - 48122 Ravenna (RA)**					
Final customer:. *Cliente finale:*	//					
Your delivery note n°: *Vs. DDT di consegna*	**n°** //	**Date:** *Data:* //	**MD52** *MD 52*	**42/2021**	**Date:** *Data:*	**24/03/2021**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **09/04/2021**	**End of activities:** *Fine prove:*			**Date:** *Data:*	**09/04/2021**

PROVE RICHIESTE

☒ **TENSILE TEST**/*Trazione*	☒ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*
☒ **BEND TEST**/*Piega*	☒ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☒ Face/Root */Dritto/Rovescio* ☐ Side/ *Laterale*
☒ **IMPACT TEST**/*Resilienza*	☒ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*
☒ **MACROEXAMINATION TEST /** *Macrografia*		
☒ **HARDNESS TEST**/ *Durezza*	☐ HV 5	☒ HV 10
☐ **FRACTURE TEST**/ *Frattura*	☐ Plate with/on Plate/ *Piastra con/su Piastra* ☐ Pipe with/on Pipe/*Tubo con/ su Tubo*	☐ Pipe on Plate/*Tubo su Piastra*
☐ **CHEMICAL ANALYSIS**/*Analisi Chimica*		
☐ **MICROEXAMINATION TEST /** *Micrografia*		
☐ **OTHER (Specify)**/*Altro/(Specificare)*		

Allegati /Attachments:

NOTE/ Remarks: **REFERENCE CODE FROM CUSTOMER REQUEST: UNI EN ISO 15614-1:2017 + MOTS 12 Rev:5.0**
TEST WITNESSED BY ENG CIMATTI DAVIDE (RINA SERVICES) AND KHALIFA ABDULKARIM (ROSETTI)

Informazioni aggiuntive fornite dal cliente:
Additional information provided by the customer

*** PROVA NON ACCREDITATA DA ACCREDIA**

Laboratory Responsible *Responsabile Laboratorio* *Sig. Giulio Bagnara*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - 09-04-2021 Service Responsible		

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I risultati di prova si riferiscono al campione così come ricevuto,essendo il campionamento eseguito dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%.The results in this test report refers only to the specimen that has been tested.The customer undertakes to print out /reproduce the test report. Any partial reproduction is prohibited.Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory.The test results refer to the sample as received, since the sampling is performed by the customer..Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku = 2 equivalent to a level of confidence of 95 % .

RINA Services SpA No. Bo. 0474 Date 09/04/2021
Noted ☐ File
Reviewed ☐ Signature
Witnessed ☑
Approved ☐ Cimatti Davide

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

Date of Testing::09/04/2021
Data esecuzione prova:

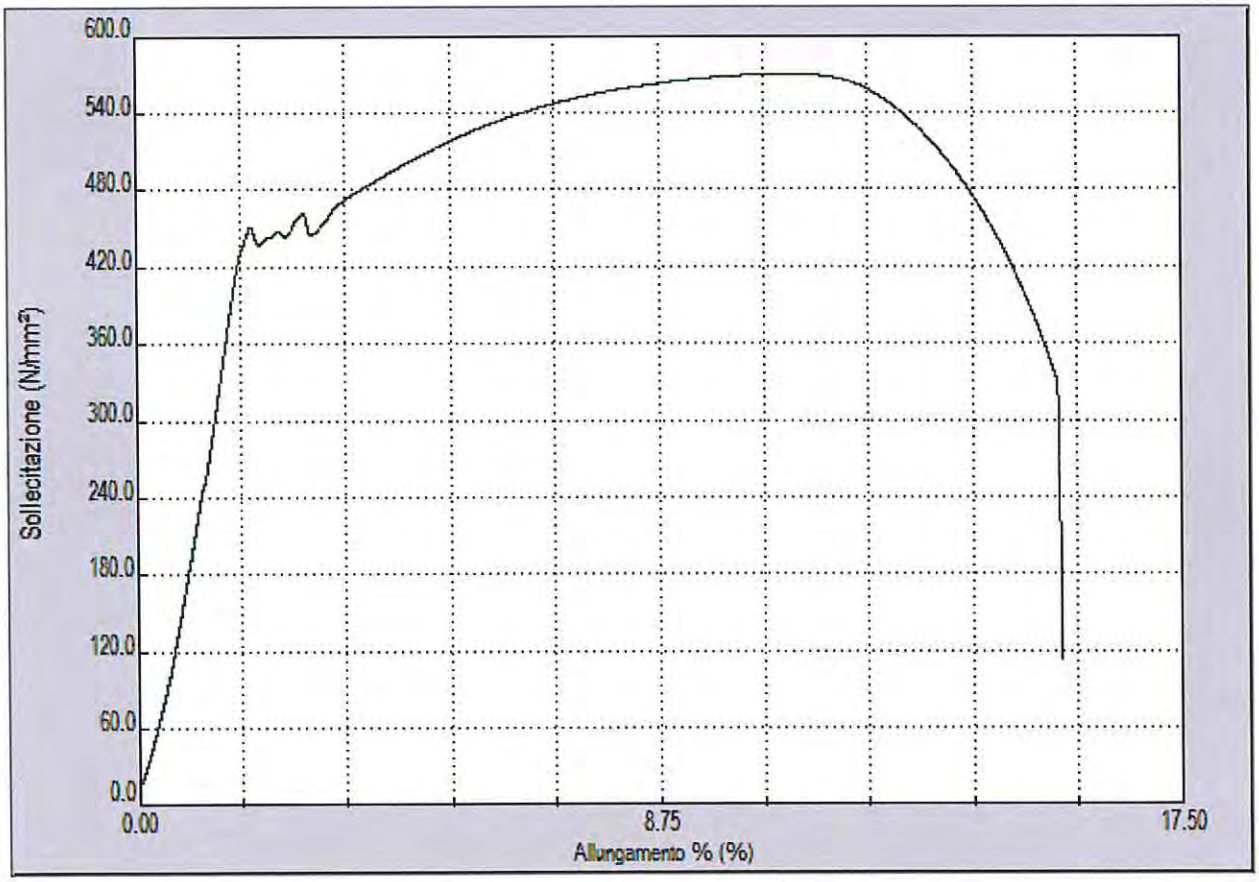
Serial N. VAUP 01

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2020 method B* ☐ *ASTM A370-20*
☐ *ASME IX QW–150:2019* ☐ *ASTM E8 / E8M 16ae1* ☐ _____

* PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA

Internal procedure *Procedura interna :* ***PP08 rev.11***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
178/2021 A TWT	8,99x6,10	54,84	23,9°C	//	//	/	//	/	31247	570	/	//	//	FIW



Remarks / *Note:*	*POSITION PC*
Legend / *Legenda*	**TT = Transverse Tension**/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura* **TWT = Transverse Weld Tension**/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*		
INSPECTA S.r.l.	INSPECTA S.r.l.		
09/04/2021 Laboratory Technician	Service Responsible 09-04-2021		

RINA Services SpA No. Bo. 0474 Date 09/04/2021
Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ File Signature

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

Date of Testing::09/04/2021
Data esecuzione prova:

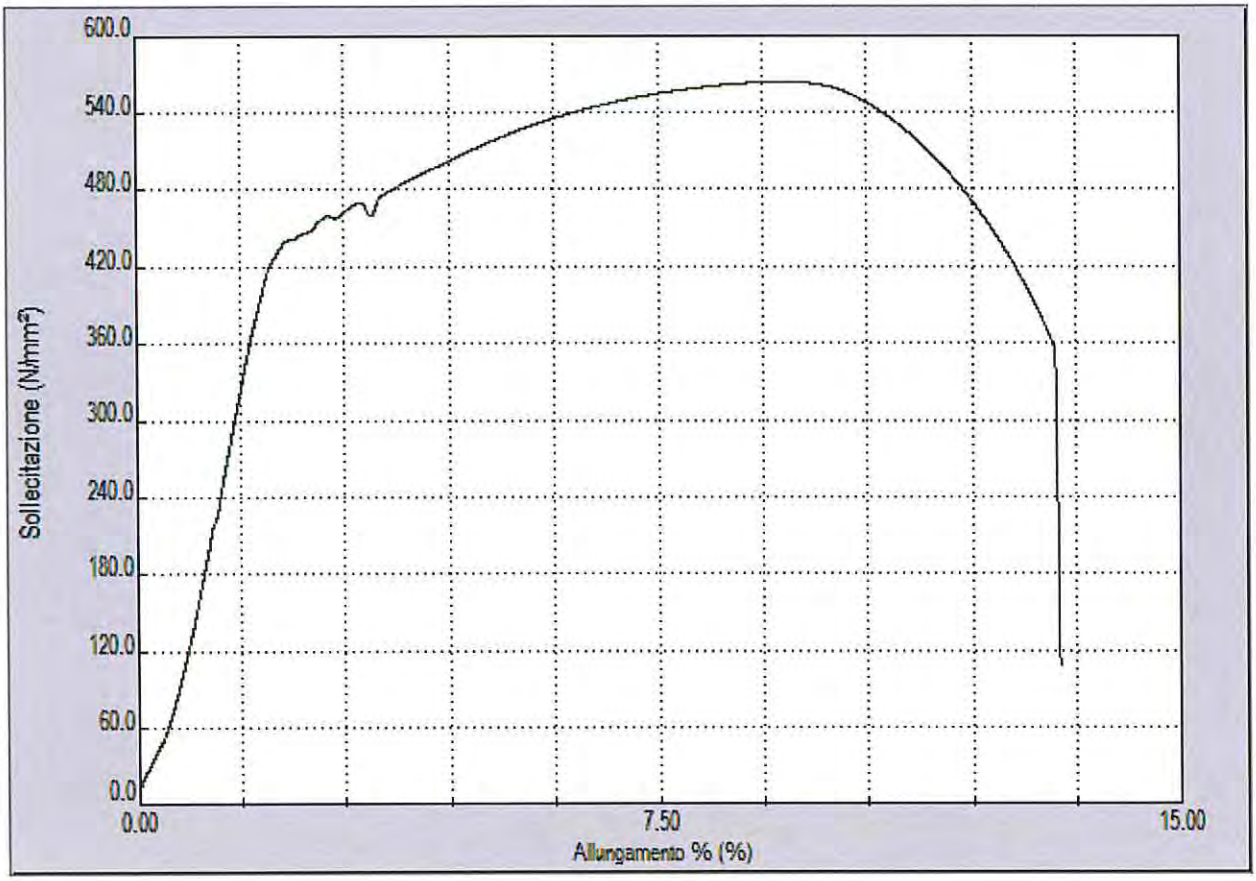
☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2020 method B* ☐ *ASTM A370-20*
☐ *ASME IX QW–150:2019* ☐ *ASTM E8 / E8M 16ae1* ☐ _____

Serial N. VAUP 01

* PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA

Internal procedure *Procedura interna :* ***PP08 rev.11***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
178/2021 B TWT	8,71x6,10	53,13	23,9°C	//	//	/	//	/	29943	564	/	//	//	FOW



Remarks / *Note:*	*POSITION PC*
Legend / *Legenda*	**TT = Transverse Tension**/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura*
	TWT = Transverse Weld Tension/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - *Dott. Ing. Mauro Bacchieschi* Laboratory Technician 09/04/2021	- INSPECTA srl - *Sig. Giulio Bagnara* Service Responsible 09-04-2021		

RINA Services SpA No. Bo. 0474 Date 09/04/2021
Noted ☐ File
Reviewed ☐ Signature
Witnessed ☒
Approved ☐

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

Date of Testing::09/04/2021
Data esecuzione prova:

Serial N. VAUP 01

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2020 method B* ☐ *ASTM A370-20*
☐ *ASME IX QW–150:2019* ☐ *ASTM E8 / E8M 16ae1* ☐ _____

* PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA

Internal procedure *Procedura interna :* ***PP08 rev.11***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
178/2021 C TWT	**8,17x6,04**	**49,35**	**23,9°C**	*//*	*//*	*/*	*//*	*/*	**28468**	**577**	*/*	*//*	*//*	**FIW**



Remarks / *Note:*	*POSITION PH*
Legend / *Legenda*	**TT = Transverse Tension**/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura* **TWT = Transverse Weld Tension**/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico del Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
INSPECTA S.R.L. Dott. Ing. Mauro Baccheschi Laboratory Technician 09/04/2021	INSPECTA S.R.L. Sig. Giulia Bagnara Service Responsible 09-04-2021		

RINA Services SpA No. Bo. 0474 Date 09/04/2021
Noted ☐ File
Reviewed ☐ Signature
Witnessed ☒
Approved ☐

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

Date of Testing::09/04/2021
Data esecuzione prova:

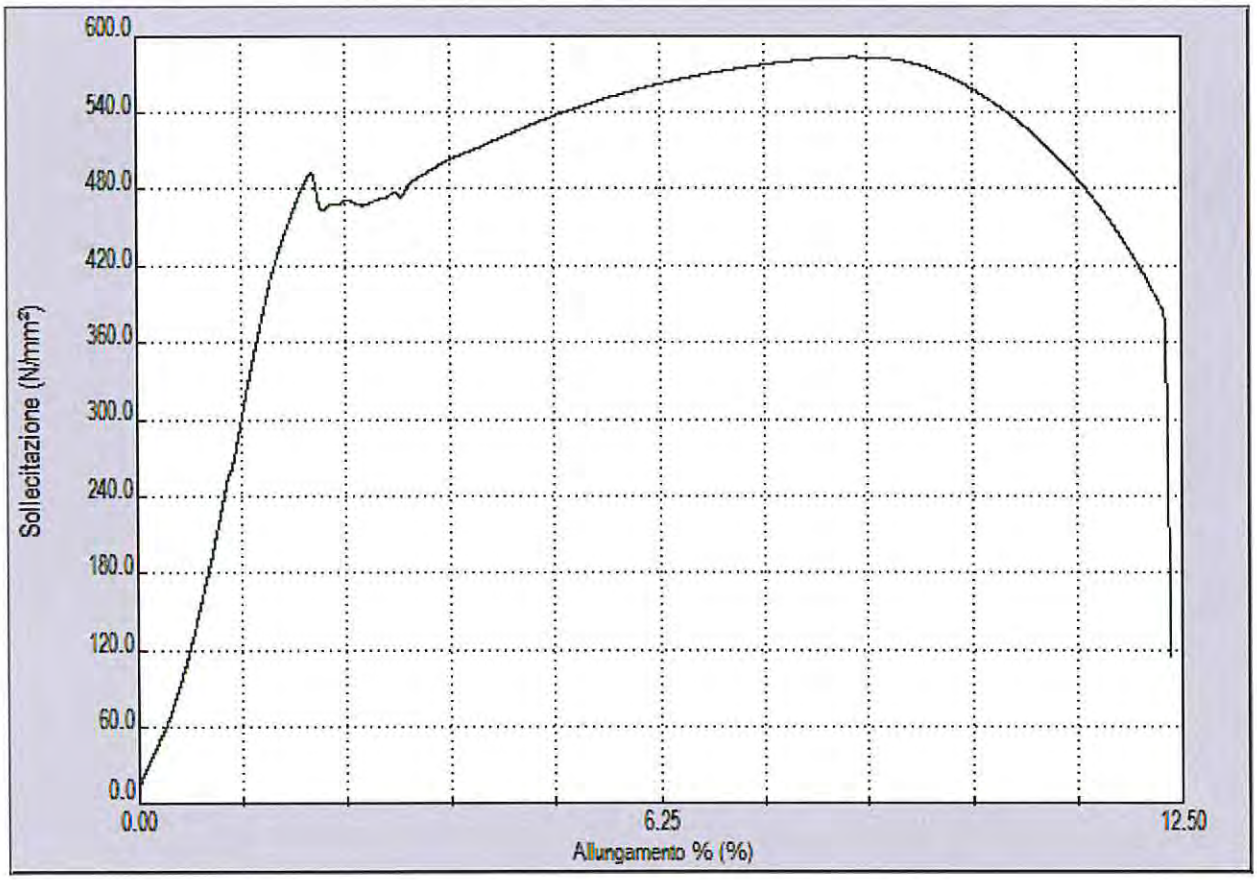
Serial N. VAUP 01

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2020 method B* ☐ *ASTM A370-20*
☐ *ASME IX QW-150:2019* ☐ *ASTM E8 / E8M 16ae1* ☐ _____

* PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA

Internal procedure *Procedura interna :* ***PP08 rev.11***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
178/2021 D TWT	**8,26x6,08**	**50,22**	**23,9°C**	**//**	**//**	**/**	**//**	**/**	**29270**	**583**	**/**	**//**	**//**	**FIW**



Remarks / *Note:*	*POSITION PH*
Legend / *Legenda*	**TT = Transverse Tension**/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura* **TWT = Transverse Weld Tension**/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
INSPECTA S.r.l. *Dott. Ing. Mauro Baccheschi*	INSPECTA S.r.l. *Sig. Giulia Bagnara*		
Laboratory Technician 09/04/2021	Service Responsible 09-04-2021		

RINA Services SpA No. Bo. 0474 Date 09/04/2021
Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ File Signature

BEND TEST
Prova di piega

Date of Testing::09/04/2021
Data esecuzione prova:

☒ *UNI EN ISO 5173: 2012* | ☐ *ASME IX QW-160: 2019* | ☐ _____

Serial N. VAUP / 01

*** PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA**

Internal procedure *Procedura interna :* ***PP11 rev.05***

Specimen id. *Identificazione provino*		**Dimension** *Dimensioni (mm)*	**Test Temp.** *Temp.test °C*	**Bend Angle** *Angolo di piega*	**Ø Former** *Ø Mandrino (mm)*	**Distance between rollers** *Distanza appoggi (mm)*	**Remarks** *Note*
178/2021 TFB	A	9,09x12,00	23,9°C	180°	30	51	No open discontinuities have been found in weld metal and heat affected zone
178/2021 TRB	B	9,09x12,00	23,9°C	180°	30	51	No open discontinuities have been found in weld metal and heat affected zone
178/2021 TFB	C	9,09x12,00	23,9°C	180°	30	51	No open discontinuities have been found in weld metal and heat affected zone
178/2021 TRB	D	9,09x12,00	23,9°C	180°	30	51	No open discontinuities have been found in weld metal and heat affected zone

Remarks *Note:*	**POSITION PC**

Legend *Legenda*	**SBB. = Transverse Side Bend**/*Piega Trasversale laterale* **TRB. = Transverse Root Bend**/*Piega Trasversale al rovescio* **TFB. = Transverse Face Bend**/*Piega Trasversale al dritto*	**LRB = Longitudinal Root Bend** / *Piega Longitudinale al rovescio* **LFB. = Longitudinal Face Bend** / *Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*		
- INSPECTA srl -	- INSPECTA srl -		
09/04/2021	09-04-2021		
Laboratory Technician	*Service Responsible*		

RINA Services SpA No. Bo. 0474 | Date 09/04/2021
Noted ☐ | File
Reviewed ☐ | Signature
Witnessed ☒
Approved ☐

BEND TEST
Prova di piega

Date of Testing::09/04/2021
Data esecuzione prova:

☒ *UNI EN ISO 5173: 2012* ☐ *ASME IX QW-160: 2019* ☐ _____

Serial N. VAUP / 01

*** PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA**

Internal procedure *Procedura interna :* ***PP11 rev.05***

Specimen id. *Identificazione provino*		**Dimension** *Dimensioni (mm)*	**Test Temp.** *Temp.test °C*	**Bend Angle** *Angolo di piega*	**Ø Former** *Ø Mandrino (mm)*	**Distance between rollers** *Distanza appoggi (mm)*	**Remarks** *Note*
178/2021 TFB	A	9,09x12,00	23,9°C	180°	30	51	No open discontinuities have been found in weld metal and heat affected zone
178/2021 TRB	B	9,09x12,00	23,9°C	180°	30	51	No open discontinuities have been found in weld metal and heat affected zone
178/2021 TFB	C	9,09x12,00	23,9°C	180°	30	51	No open discontinuities have been found in weld metal and heat affected zone
178/2021 TRB	D	9,09x12,00	23,9°C	180°	30	51	No open discontinuities have been found in weld metal and heat affected zone

Remarks *Note:*	**POSITION PH**

Legend *Legenda*

SBB. = Transverse Side Bend/*Piega Trasversale laterale*
TRB. = Transverse Root Bend/*Piega Trasversale al rovescio*
TFB. = Transverse Face Bend/*Piega Trasversale al dritto*
LRB = Longitudinal Root Bend */ Piega Longitudinale al rovescio*
LFB. = Longitudinal Face Bend */ Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Bucheschi	*Sig. Giulio Bagnara*		
Laboratory Technician 09/04/2021	- INSPECTA srl - 09-04-2021 Service Responsible		

RINA Services SpA No. Bo. 0474 Date 09/04/2021
Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ File Signature

IMPACT TEST
Prova di resilienza

Date of Testing:09/04/2021
Data esecuzione prova:

☐ *UNI EN ISO 148-1: 2016* ☒ *UNI EN ISO 9016: 2012* ☐ *ASTM E23: 18* ☐ *ASME IX QW-170: 2019* ☐ *ASTM A923-14 Method B*

Serial N. VAUP / 02

☐ *AWS D1.1/D1.1M:2020*

*** PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA**

Internal procedure *Procedura interna* **: *PP09 rev.07***

Specimen id. *Identificazione provino*	Direction *Direzione*	Dimension *Dimensioni (mm)*	Test Temp. *Temp .test*	Notch Type *Intaglio*	Knife / *coltello*	Requirement / Requisiti: Energy absorbed/ / Energia assorbita – Individual *Individuale Joule* 1	2	3	Average *Media Joule*	U	Lateral Expansion *Espansione laterale (mm)* 1	2	3	Shear Area *Area fragile %* 1	2	3	Remarks *Note*
178/21 VWT 0/2	T	5x10x55	-57,1°C	V	2	108	75	79	87	/	//	//	//	//	//	//	//
178/21 VHT 0/2	T	5x10x55	-57,1°C	V	2	107	62	32	67	/	//	//	//	//	//	//	//
178/21 VHT 2/2	T	5x10x55	-57,1°C	V	2	84	102	97	94	/	//	//	//	//	//	//	//
178/21 VHT 5/2	T	5x10x55	-57,1°C	V	2	97	105	93	98	/	//	//	//	//	//	//	//

Remarks *Note:*	**POSITION PC**

Legend *Legenda*

L= Longitudinal / Longitudinale
T= Trasversal / Trasversale
VWT 0/2 = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
VHT 0/2 = Impact Test on Fusion Line */ Resilienza Trasversale in linea di fusione*
VHT 1/2 = Impact Test at 1mm from Fusion Line */ Resilienza trasversale a 1 mm dalla linea di fusione*
VHT 2/2 = Impact Test at 2 mm from Fusion Line */ Resilienza trasversale a 2 mm dalla linea di fusione*
VHT 5/2 = Impact Test at 5 mm from Fusion Line */ Resilienza trasversale a 5 mm dalla linea di fusione*
WM = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
HAZ = Impact Test on Heat Affected Zone */ Resilienza Trasversale in zona termicamente alterata*
BM = Impact Test on Base Metal */ Resilienza Trasversale in materiale base*

FL = Fusion Line/ *Linea di fusione*
FL+1 = Fusion Line + 1mm/ *Linea di fusione+ 1mm*
FL+2 = Fusion Line + 2mm/ *Linea di fusione+ 2mm*
FL +5= Fusion Line + 5mm/ *Linea di fusione + 5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi - INSPECTA srl - Laboratory Technician 09/04/2021	Sig. Giulio Bagnara - INSPECTA srl - Service Responsible 09-04-2021		RINA Services SpA No. Bo. 0474 Date 09/04/2021 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature

IMPACT TEST
Prova di resilienza

Date of Testing:09/04/2021
Data esecuzione prova:

☐ *UNI EN ISO 148-1: 2016* ☒ *UNI EN ISO 9016: 2012* ☐ *ASTM E23: 18* ☐ *ASME IX QW-170: 2019* ☐ *ASTM A923-14 Method B*

Serial N. VAUP / 02

☐ *AWS D1.1/D1.1M:2020*

*** PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA**

Internal procedure *Procedura interna* : ***PP09 rev.07***

Specimen id. *Identificazione provino*	Direction *Direzione*	Dimension *Dimensioni (mm)*	Test Temp. *Temp .test*	Notch Type *Intaglio*	Knife / *coltello*	Requirement / Requisiti: Energy absorbed/ / Energia assorbita – Individual *Individuale Joule* 1	2	3	Average *Media Joule*	U	Lateral Expansion *Espansione laterale (mm)* 1	2	3	Shear Area *Area fragile %* 1	2	3	Remarks *Note*
178/21 VWT 0/2	T	5x10x55	-57,1°C	V	2	94	95	49	79	/	//	//	//	//	//	//	//
178/21 VHT 0/2	T	5x10x55	-57,1°C	V	2	98	95	108	100	/	//	//	//	//	//	//	//
178/21 VHT 2/2	T	5x10x55	-57,1°C	V	2	96	99	100	98	/	//	//	//	//	//	//	//
178/21 VHT 5/2	T	5x10x55	-57,1°C	V	2	100	104	95	100	/	//	//	//	//	//	//	//

Remarks *Note:*	**POSITION PH**
Legend *Legenda*	**L= Longitudinal / Longitudinale** **T= Trasversal / Trasversale** **VWT 0/2 = Impact Test on Weld Metal/** *Resilienza trasversale in saldatura* **VHT 0/2 = Impact Test on Fusion Line** */ Resilienza Trasversale in linea di fusione* **VHT 1/2 = Impact Test at 1mm from Fusion Line** */ Resilienza trasversale a 1 mm dalla linea di fusione* **VHT 2/2 = Impact Test at 2 mm from Fusion Line** */ Resilienza trasversale a 2 mm dalla linea di fusione* **VHT 5/2 = Impact Test at 5 mm from Fusion Line** */ Resilienza trasversale a 5 mm dalla linea di fusione* **WM = Impact Test on Weld Metal/** *Resilienza trasversale in saldatura* **HAZ = Impact Test on Heat Affected Zone** */ Resilienza Trasversale in zona termicamente alterata* **BM = Impact Test on Base Metal** */ Resilienza Trasversale in materiale base* **FL = Fusion Line/** *Linea di fusione* **FL+1 = Fusion Line + 1mm/** *Linea di fusione+1mm* **FL+2 = Fusion Line + 2mm/** *Linea di fusione+2mm* **FL +5= Fusion Line + 5mm/** *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Matteo Buscheschi INSPECTA s.r.l. Laboratory Technician 09/04/2021	Sig. Giulio Bagnara - INSPECTA s.r.l. - 09-04-2021 Service Responsible		RINA Services SpA No. Bo. 0474 Date 09/04/2021 Noted ☐ File Reviewed ☐ Signature Witnessed ☒ Approved ☐ Claudio Dolcide

VICKERS HARDNESS TEST METHOD

Prova di durezza Vickers

Date of Testing::09/04/2021
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* ☒ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

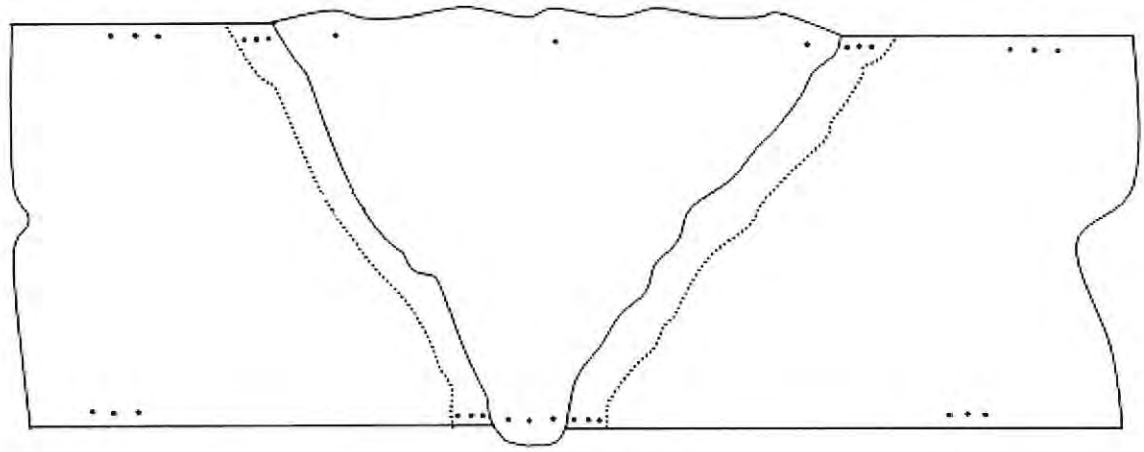
Serial N. 43030614C

* PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA

Internal procedure *Procedura interna*	PP10 rev.04	Sample Identification *Identificazione provino*	178/21	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	23,9°C

Sketch for reference points
Schema punti di riferimento

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6	7 – 8 – 9	10 – 11 – 12	13 – 14 – 15
16 – 17 – 18	19 – 20 – 21	22 – 23 – 24	25 – 26 – 27	28 – 29 – 30



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**164-167-168**	/	16 – 17 - 18	**179-181-180**	/	31 – 32 - 33	//	/
4 - 5 - 6	**230-230-229**	/	19 - 20 - 21	**180-184-186**	/	34 - 35 - 36	//	/
7 – 8 - 9	**211-204-209**	/	22 – 23 - 24	**182-184-182**	/	37 – 38 - 39	//	/
10 - 11 - 12	**223-215-201**	/	25 - 26 - 27	**186-182-179**	/	40 - 41 - 42	//	/
13 – 14 - 15	**170-167-169**	/	28 – 29 - 30	**173-170-172**	/	43 – 44 - 45	//	/

Remarks/ *Note:* **POSITION PC**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi - INSPECTA srl - Laboratory Technician 09/04/2021	Sig. Giulio Bagnara - INSPECTA srl - Service Responsible 09-04-2021		RINA Services SpA No. Bo. 0474 Date 09/04/2021 Noted ☐ File Reviewed ☐ Signature Witnessed ☒ Approved ☐

VICKERS HARDNESS TEST METHOD

Prova di durezza Vickers

Date of Testing::09/04/2021
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* ☐ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☒ *NACE MR0175**

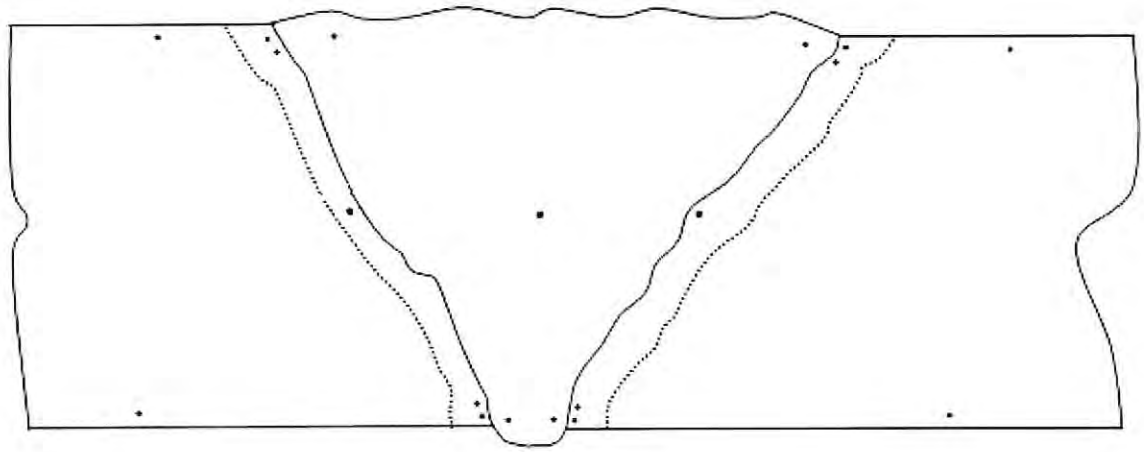
Serial N. 43030614C

* PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA

Internal procedure *Procedura interna*	PP10 rev.04	Sample Identification *Identificazione provino*	178/21	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	23,9°C

Sketch for reference points
Schema punti di riferimento

BM	HAZ	WM	HAZ	BM
1	2 – 3	4 – 5	6 – 7	8
	17	18	19	
9	10 – 11	12 – 13	14 – 15	16



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1	164	/	9	179	/	//	//	/
2 – 3	229-214	/	10 – 11	186-182	/	17	186	/
4 – 5	211-209	/	12 – 13	184-182	/	18	180	/
6 – 7	223-217	/	14 – 15	186-183	/	19	188	/
8	169	/	16	172	/	//	//	/

Remarks/ *Note:* POSITION PC

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Maura Bacchieschi INSPECTA S.R.L. Laboratory Technician 09/04/2021	Sig. Giulio Bagnara - INSPECTA s.r.l - Service Responsible 09-04-2021		RINA Services SpA No. Bo. 0474 Date 09/04/2021 Noted ☐ File Reviewed ☐ Signature Witnessed ☒ Approved ☐ Ciardi Davide

VICKERS HARDNESS TEST METHOD

Prova di durezza Vickers

Date of Testing::09/04/2021
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* ☒ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

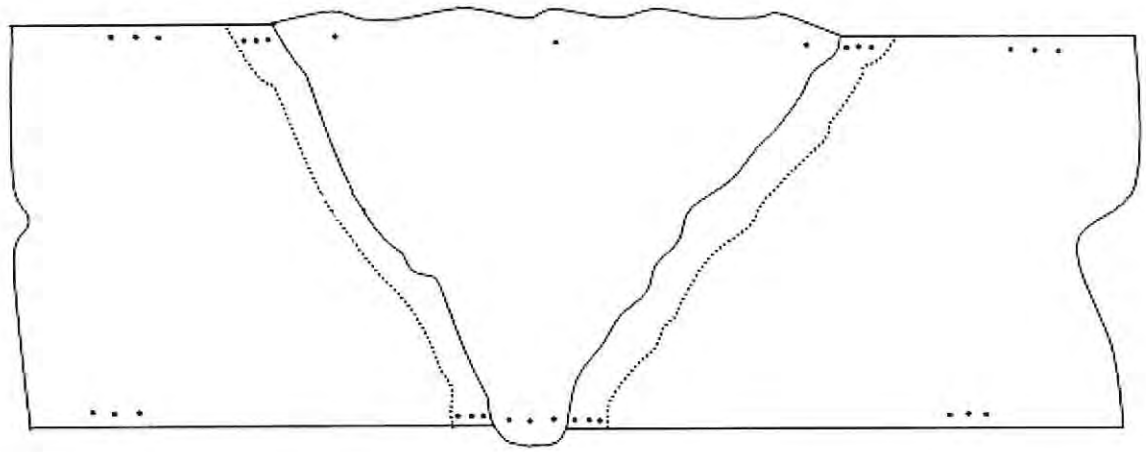
Serial N. 43030614C

* PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA

Internal procedure *Procedura interna*	PP10 rev.04	**Sample Identification** *Identificazione provino*	178/21	**Hardness test type** *Tipo di durezza*	HV10	**Test Temp.** *Temp.test*	23,9°C

Sketch for reference points
Schema punti di riferimento

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6	7 – 8 – 9	10 – 11 – 12	13 – 14 – 15
16 – 17 – 18	19 – 20 – 21	22 – 23 – 24	25 – 26 – 27	28 – 29 – 30



Reference points *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U
1 – 2 - 3	**170-171-173**	/	16 – 17 - 18	**177-180-182**	/	31 – 32 - 33	//	/
4 - 5 - 6	**202-206-216**	/	19 - 20 - 21	**183-181-178**	/	34 - 35 - 36	//	/
7 – 8 - 9	**202-199-207**	/	22 – 23 - 24	**186-183-184**	/	37 – 38 - 39	//	/
10 - 11 - 12	**200-194-178**	/	25 - 26 - 27	**188-181-178**	/	40 - 41 - 42	//	/
13 – 14 - 15	**174-172-170**	/	28 – 29 - 30	**176-178-177**	/	43 – 44 - 45	//	/

Remarks/ *Note:* POSITION PH TAKEN AT H.6

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi INSPECTA S.R.L. Laboratory Technician 09/04/2021	Sig. Giulio Bagnara - INSPECTA s.r.l. - Service Responsible 09-04-2021		RINA Services SpA No. Bo. 0474 Date 09/04/2021 Noted ☐ File Reviewed ☐ Witnessed ☒ Signature Approved ☐ Davide

VICKERS HARDNESS TEST METHOD

Prova di durezza Vickers

Date of Testing::09/04/2021
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* ☐ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☒ *NACE MR0175**

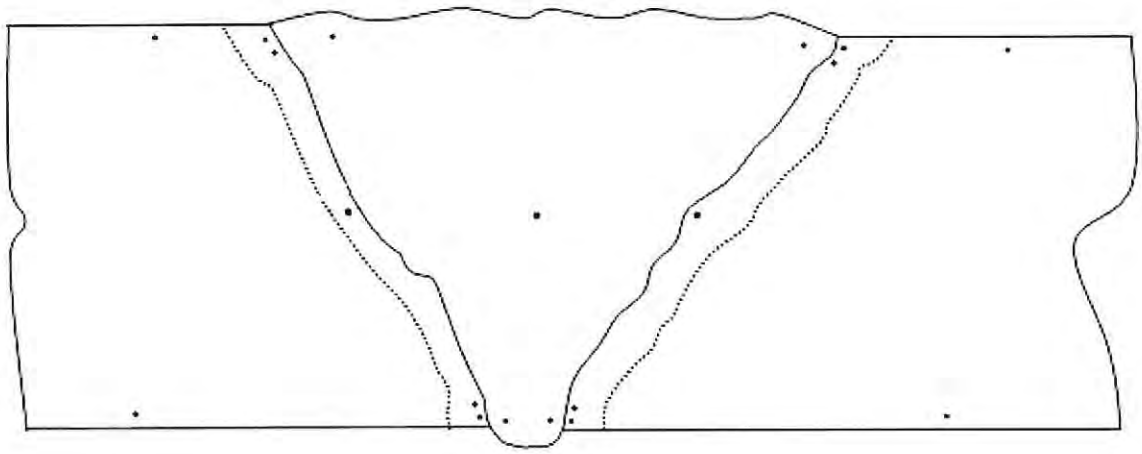
Serial N. 43030614C

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Internal procedure *Procedura interna*	PP10 rev.04	Sample Identification *Identificazione provino*	178/21	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	23,9°C

Sketch for reference points
Schema punti di riferimento

BM	HAZ	WM	HAZ	BM
1	2 – 3	4 – 5	6 – 7	8
	17	18	19	
9	10 – 11	12 – 13	14 – 15	16



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1	170	/	9	177	/	//	//	/
2 – 3	216-210	/	10 – 11	178-180	/	17	204	/
4 – 5	202-207	/	12 – 13	186-184	/	18	171	/
6 – 7	200-197	/	14 – 15	188-190	/	19	201	/
8	170	/	16	177	/	//	//	/

Remarks/ *Note:* POSITION PH TAKEN AT H.6

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara		RINA Services SpA No. Bo. 0474 Date 09/04/2021
INSPECTA srl	INSPECTA srl		Noted ☐ File
Laboratory Technician	Service Responsible		Reviewed ☐ Signature
09/04/2021	09-04-2021		Witnessed ☑ Cinelli Davide
			Approved ☐

VICKERS HARDNESS TEST METHOD

Prova di durezza Vickers

Date of Testing::09/04/2021
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* ☒ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

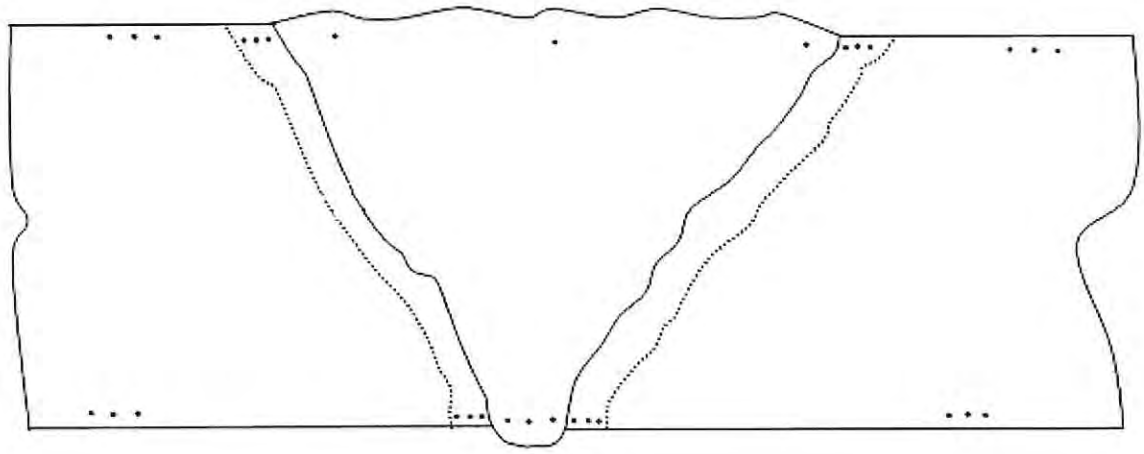
Serial N. 43030614C

* PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA

Internal procedure *Procedura interna*	PP10 rev.04	Sample Identification *Identificazione provino*	178/21	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	23,9°C

Sketch for reference points
Schema punti di riferimento

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6	7 – 8 – 9	10 – 11 – 12	13 – 14 – 15
16 – 17 – 18	19 – 20 – 21	22 – 23 – 24	25 – 26 – 27	28 – 29 – 30



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**177-174-179**	/	16 – 17 - 18	**175-177-178**	/	31 – 32 - 33	//	/
4 - 5 - 6	**197-207-216**	/	19 - 20 - 21	**181-183-190**	/	34 - 35 - 36	//	/
7 – 8 - 9	**217-211-213**	/	22 – 23 - 24	**187-184-182**	/	37 – 38 - 39	//	/
10 - 11 - 12	**216-204-200**	/	25 - 26 - 27	**183-182-178**	/	40 - 41 - 42	//	/
13 – 14 - 15	**175-173-172**	/	28 – 29 - 30	**180-178-176**	/	43 – 44 - 45	//	/

Remarks/ *Note:* **POSITION PH TAKEN AT H.12**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi - INSPECTA srl - Laboratory Technician 09/04/2021	Sig. Giulio Bagnara - INSPECTA srl - Service Responsible 09-04-2021		RINA Services SpA No. Bo. 0474 Date 09/04/2021 Noted ☐ File Reviewed ☐ Signature Witnessed ☒ Approved ☐ Claudio Dolcini

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::09/04/2021
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* ☐ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☒ *NACE MR0175**

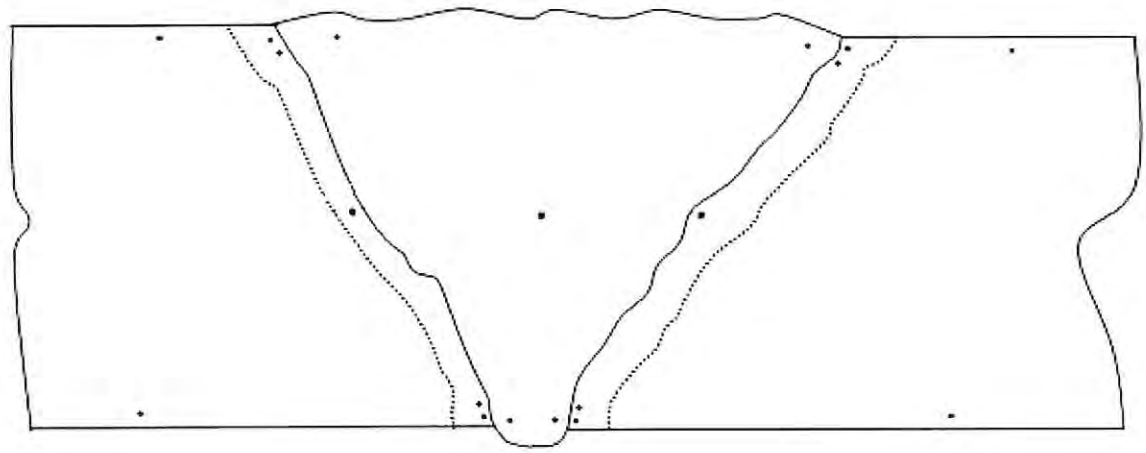
Serial N. 43030614C

* PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA

Internal procedure *Procedura interna*	PP10 rev.04	Sample Identification *Identificazione provino*	178/21	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	23,9°C

Sketch for reference points
Schema punti di riferimento

BM	HAZ	WM	HAZ	BM
1	2 – 3	4 – 5	6 – 7	8
	17	18	19	
9	10 – 11	12 – 13	14 – 15	16



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1	177	/	9	175	/	//	//	/
2 – 3	216-214	/	10 – 11	190-194	/	17	207	/
4 – 5	217-213	/	12 – 13	187-182	/	18	175	/
6 – 7	216-212	/	14 – 15	183-189	/	19	202	/
8	172	/	16	176	/	//	//	/

Remarks/ *Note:* POSITION PH
TAKEN AT H.12

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Buccheschi - INSPECTA srl - Laboratory Technician 09/04/2021	Sig. Giulio Bagnara - INSPECTA srl - Service Responsible 09-04-2021		RINA Services SpA No. Bo. 0474 Date 09/04/2021 Noted ☐ File Reviewed ☐ Signature Witnessed ☒ Approved ☐

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::09/04/2021
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2019* ☐ _____

Serial N.. EOS 650D/EFS

*** PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA**

Internal procedure *PP12 rev.03* *Procedura internal*		**Test temperatura** *Temperature Test*	**23,9°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**178/2021**	**Magnification:** *Ingrandimento:*	**Photo at: 2.30x** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639-A-E-1.2-1.2 / A1**		



Remarks / *Note:*	**POSITION PC** **No defects have been found in macro examination.**

Laboratory Technician *Tecnico di Laboratorio* *Dott. Ing. Mauro Baccheschi*	**Laboratory Responsible** *Responsabile Laboratorio* *Sig. Giulio Bagnara*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
INSPECTA S.r.l. Laboratory Technician 09/04/2021	- INSPECTA s.r.l - Service Responsible 09-04-2021		RINA Services SpA No. Bo. 0474 Date 09/04/2021 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ File Signature

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::09/04/2021
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2019* ☐ _____

Serial N.. EOS 650D/EFS

*** PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA**

Internal procedure *PP12 rev.03* *Procedura internal*		**Test temperatura** *Temperature Test*	**23,9°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**178/2021**	**Magnification:** *Ingrandimento:*	**Photo at: 2.30x** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639-A-E-1.2-1.2 / A1**		



Remarks / *Note:*	**POSITION PH** **TAKEN AT H.6** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*		RINA Services SpA No. Bo. 0474 Date 09/04/2021
INSPECTA srl Laboratory Technician 09/04/2021	- INSPECTA srl - 09-04-2021 Service Responsible		Noted ☐ File Reviewed ☐ Signature Witnessed ☒ Approved ☐ Claudio Davide

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::09/04/2021
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2019* ☐ _____

Serial N.. EOS 650D/EFS

*** PROVA NON ACCREDITATA DA ACCREDIA / TEST NOT ACCREDITED BY ACCREDIA**

Internal procedure *PP12 rev.03* *Procedura internal*		**Test temperatura** *Temperature Test*	**23,9°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**178/2021**	**Magnification:** *Ingrandimento:*	**Photo at: 2.30x** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639-A-E-1.2-1.2 / A1**		



Remarks / *Note:*	**POSITION PH** **TAKEN AT H.12** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Maura Baccheschi	Sig. Giulio Bagnara		RINA Services SpA No. Bo. 0474 Date 09/04/2021
INSPECTA srl	- INSPECTA srl -		Noted ☐ File
Laboratory Technician	Service Responsible		Reviewed ☐ Signature
09/04/2021	09-04-2021		Witnessed ☑ Cinzia Zanide
			Approved ☐

END OF TEST REPORT
FINE DEL RAPPORTO DI PROVA

Manufacturer's Welding Procedure. Ref. no. Спецификация изготовителя сварного соединения испытаний рег. №	**06/21 REV. 0**		
Manufacturer Производитель	ROSETTI MARINO S.p.A.		
Address Адрес	VIA TRIESTE 230 - 48121 RAVENNA		
Code, Testing Standard Нормы и правила, стандарты испытаний	GOST R ISO 15614-1 2009; ND No. 2-020201-015, ND No. 2-020101-138, ND No. 2-020101-139		
	Location of test specimen according to GOST R ISO 15614-1 2009 Section 7.2, Fig. 5 Essential variables according to GOST R ISO 15614-1 2009, Section 8		
Date of welding Дата сварки	Start: Aug 18th , 2021 Complete: August 25nd , 2021		
Examiner of examining body Инспектор или инспекционный орган	RINA		
RANGE OF QUALIFICATION / ПРОТОКОЛ РЕЗУЛЬТАТОВ ИСПЫТАНИЙ			
Welding process Способ сварки	136 – FCAW		
Type(s) Тип (ы)	Semiautomatic		
Welding Equipment Type Тип сварочного оборудования	Machine – see as run		
Actual parent Material side A Основной материал сторона А	Plate: EN 10225: S460G1+M (Heat: 710384)		
Actual parent Material side B Основной материал сторона Б	Plate: EN 10225: S460G1+M (Heat: 710384)		
Parent Material grade Категория основного материала	Carbon steel Gr. 2 ISO 15608		
Supply condition Состояние поставки	Thermomechanical rolled		
Cev Углеродный эквивалент топлива	Heat Value: 0,41		
Groove design/configuration Калибровка / конфигурация валиков	Single Vee Butt Joint for groove dimension and details see As-Run Sheet		
Parent material thickness (mm) Толщина основного материала (мм)	35 mm		
Weld metal thickness (mm) Толщина металла шва (мм)	136 - FCAW 35 mm		
Single or Multi-pass Один проход или много проходов	136 - FCAW (Multi pass)		
Outside diameter Внешний диаметр	900 mm		
Filler material Designation Присадочный материал обозначение	136 FCAW RS: 5Y46MS H5 (E81T1-Ni1M JH4) - EN ISO 17632-A: T 50 6 1Ni P M21 1 H5		
Filler material Maker Присадочный материал марка	136 – ESAB FILARC PZ6138		
Filler material Size Присадочный материал размер	136 – FCAW ∅ 1,2 mm		
Shielding gas/Flux Защитный газ / флюс	ISO 14175 :2008 M21 (80% Ar + 20% CO_2) for FCAW		
Shielding gas flow rate Расход защитного газа / флюса	16-22 l/min.		
Backing gas (purging) Газ для защиты обратной стороны (продувки)	None		
Type of welding current & polarity Тип сварочного тока и полярность	DC – RP		

IIW
A.KHALIFA
IWT 070154A
INTERNATIONAL WELDING TECHNOLOGIST

Welding parameters **Параметры сварки**	Pass Проход	Diameter / Диаметр Mm / мм	[A]	[V]	[mm/min] [мм/мин]	H.I. [kJ/mm]
	Root Корневой	∅ 1,2 (FCAW)	145-190	25-27	60-100	1.70-4.10
	Hot Горячий	∅ 1,2 (FCAW)	200-213	26-28	110-270	1.06-2.27
	Filll Присад.	∅ 1,2 (FCAW)	220-255	26-30	90-350	1.00-3.05
	Cap Верхний	∅ 1,2 (FCAW)	190-200	26-27	210-400	0.67-1.13

Welding position **Положение сварки**	PC-PH (136- FCAW)		
Preheat (°C) **Предварительный подогрев (°C)**	50	**Interpass temperature (°C)** **Температура между проходами (°C)**	250
Post-Weld Heat Treatment and/or ageing **Термообработка после сварки и/или старение**	None		
Weld bead width **Толщина наплавленного валика**	Max. 16 mm (136-FCAW)		
Welder's detail **Данные сварщика**	Bolognesi Giugliano, Stamp: GX11 Giulianini Dario, Stamp: GX12		
Time lapse between root and hot pass **Промежуток времени между корневым и горячим проходом**	N.A.		
Other information **Другая информация**	- Preheat performed by propane torch -Accelerated weld cooling not used; -Base material origin: plate rolled ∅ 900 mm		



Manufacturer's Welding Procedure. Ref. no. Спецификация испытаний сварного соединения изготовителя рег. №	06/21 REV. 0		
Test result (WPQR) N° Протокол результатов испытаний №	06/21	Date/Дата	28/09/2021
Manufacturer's WPS No. Спецификация испытаний сварного соединения изготовителя №	pWPS 06/21 REV. 0	Date/Дата	25-08-2021

TESTS CARRIED OUT ON SAMPLE 06/21 WELDED IN 2G+5G POSITION (PC+PH)
ИСПЫТАНИЯ, ПРОВЕДЕННЫЕ НА ОБРАЗЦЕ 06/21 СВАРКА В ПОЛОЖЕНИИ 2G+5G (PC+PH)

NON DESTRUCTIVE EXAMINATIONS
НЕРАЗРУШАЮЩИЕ ИСПЫТАНИЯ

	Judgement Результат	Report No. Отчет №
Visual examinations Визуальный контроль	Satisfactory	06-21
Penetrant test Испытания проникающей жидкостью	N.A.	/
Magnetic particle test Дефектоскопия магнитными частицами	Satisfactory	21174MT04SZ
Radiographic test Радиографическая дефектоскопия	Satisfactory	21174RT04SZ
Ultrasonic test Ультразвуковая дефектоскопия	Satisfactory	21174UT04RZ

TENSILE TEST
ИСПЫТАНИЕ НА РАСТЯЖЕНИЕ

Specimen type and No. Стандартный образец тип и №	$R_{P0,2\%}$ [N/mm2]	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 535	A [%]	Z [%]	Fracture Location Место разрушения	Remarks Примечания
TRANSVERSE 470/21 A ПОПЕРЕЧНОЕ	/	/	670	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PC
TRANSVERSE 470/21 B ПОПЕРЕЧНОЕ	/	/	651	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PC
TRANSVERSE 470/21 C ПОПЕРЕЧНОЕ	/	/	652	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PC
TRANSVERSE 470/21 D ПОПЕРЕЧНОЕ	/	/	642	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PC
TRANSVERSE 470/21 E ПОПЕРЕЧНОЕ	/	/	669	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PH
TRANSVERSE 470/21 F ПОПЕРЕЧНОЕ	/	/	650	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PH
TRANSVERSE 470/21 G ПОПЕРЕЧНОЕ	/	/	674	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PH
TRANSVERSE 470/21 H ПОПЕРЕЧНОЕ	/	/	657	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PH

BEND TEST
ИСПЫТАНИЯ НА ИЗГИБ

Type & N. Тип и №	Bend angle Угол загиба	Remarks Примечания	Results Результат
4 Side bend Pos. PC 4х сторонний загиб PC	180°	Former Ø 40 mm Исходный Ø 40 мм	Satisfactory
4 Side bend Pos. PH 4х сторонний загиб PH	180°	Former Ø 40 mm Исходный Ø 40 мм	Satisfactory

IMPACT TEST
ИСПЫТАНИЯ НА УДАРНЫЙ ИЗГИБ

Specimen Dimensions (mm) Размеры стандартного образца (мм)	Notch Locations / Direction Расположение / направление надреза	Notch Type Тип надреза	Test Temp. (°C) Температура испытания (°C)	Absorbed energy [J] Поглощенная энергия [J]			Average value [J] Среднее значение [J]	Lateral expansion [mm] Поперечное расширение [мм]	Remarks Примечания
10x10x55	Weld metal Cap PC	KV2	-60°C	51	56	78	62	/	/
10x10x55	Fusion Line Cap PC	KV2	-60°C	57	85	71	71	/	/
10x10x55	FL +2 Cap PC	KV2	-60°C	222	242	211	225	/	/
10x10x55	FL+5 Cap PC	KV2	-60°C	291	286	306	294	/	/
10x10x55	FL Root PC	KV2	-60°C	52	51	48	50	/	/
10x10x55	FL+2 Root PC	KV2	-60°C	63	48	49	53	/	/
10x10x55	Weld metal Cap PH	KV2	-60°C	61	51	50	54	/	/
10x10x55	Fusion Line Cap PH	KV2	-60°C	160	146	189	165	/	/
10x10x55	FL +2 Cap PH	KV2	-60°C	232	282	293	269	/	/
10x10x55	FL+5 Cap PH	KV2	-60°C	295	276	291	287	/	/
10x10x55	FL Root PH	KV2	-60°C	64	61	59	61	/	/
10x10x55	FL+2 Root PH	KV2	-60°C	102	64	95	87	/	/

OTHER TESTS
ДРУГИЕ ИСПЫТАНИЯ

Type of test Тип испытания	Results / Результат
Macro examination & Hardness test Осмотр макрошлифов и измерение твердости	Satisfactory-See Inspecta report No. 381-00103-21 Dated 28/09/2021
Fracture mechanics toughness test (CTOD)	Satisfactory – See Element report RPR712-1E1R0A21 of 23/09/2021
Welding test conducted by Сварочные испытания проведены	Rosetti Marino S.p.A. – Ravenna
Mechanical test conducted by Механические испытания проведены	Inspecta s.r.l. – Ravenna and Element Materials Technology Milan s.r.l.
Laboratory report reference N. Ссылка на лабораторный отчет №	Inspecta report No. 381-00103-21
Test carried out in the presence of: Испытания проводятся в присутствии:	RINA

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of GOST R ISO 15614-1 2009, RS RULES: ND No. 2-020201-015, ND No. 2-020101-138, ND No. 2-020101-139

Date/Дата
28/09/2021

IIW A.KHALIFA IWT 070154A INTERNATIONAL WELDING TECHNOLOGIST

ROSETTI MARINO S.p.A.

Examiner or Examination Body/ Инспектор или инспекционный орган
RINA Services S.p.A.

RINA F. Lago RINA Services S.p.A.

Name and signature / Имя и подпись

ROSETTI MARINO

pWPS 06/21
PRELIMINARY WELDING PROCEDURE SPECIFICATION
(EN ISO 15609-1)

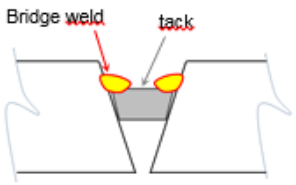
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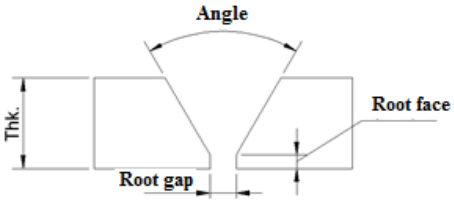
Сварочный процесс: Welding process:	136 FCAW	Тип : Type:	SEMIAUTOMATIC	scopo : scope:	CJP, BW

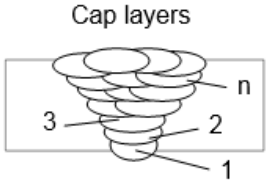
GIUNTO - JOINT

Вид соединения: Joint Design:	V	☐ DOULBE SIDED WELD	☒ Single sided weld

Детали / Details:







BEVEL GOST ISO 9692-1

Root face 1.0±0.5 mm
Root gap 4.5 ± 2.5mm
Angle 40°-45°

Note:

1) The bullets for tacking shall be take from Carbon steel pipe. Minimum tack welds 2 times of wall thickness or 50 mm whichever is less / *Usare per i tacchetti materiale in acciaio al carbonio. Minima lunghezza delle puntature 2 volte lo spessore o 50 mm, quale dei due è più piccolo.*
2) The alignment of pipe ends shall be such as to minimize the internal offset between surfaces/ *L'allineamento dei tubi deve essere tale da minimizzare il disallineamento.*
3) Surfaces cleaned from moisture, oil, grease, paint. The cleaning shall be extend 75 mm from bevel end on internal and external surface. /*Pulire le superfici da sporcizia, oli e grassi. La pulizia deve essere estesa per 75 mm dal bordo del tubo sia sulla superfice esterna che interna.*

ОСНОВНОЙ МЕТАЛЛ - BASE MATERIAL

EN 10225-S460 G2+M, CRS ISO 15608 GR.2	Material grade / Типа и сорта:	Up to PCF 460 / DC1/DC2/DC3/DC4	Max Cev 0.43

Диапазон толщин / Thickness range:	► Основной металл / Base material:	полным проплавлением / groove	35 mm
	► Диапазон диам. труб / Pipe dia. Range:	полным проплавлением / groove	900mm

METALLO D'APPORTO - FILLER METAL

	136 - GS FCAW	
Spec. N° (SFA) / Спецификация №	5Y46MS H5	
(CLASS)(класс)	T 50 6 1Ni P M21 1 H5	5.29/5.36 - E81T1-M21A8-Ni1-H4
F-N°	6	
A-N°	10	
Размер присадочного материала / Size of filler metal	1,2	
Metallo depositato / Deposit weld metal	Up to 35 mm	
Диапазон толщин /Thick. range		
Флюс, Торговая марка / FLUX trade name	NA	
Применяемая вставка / Consumable insert	NA	
прочее Торговая Марка / other TRADE NAME:	Wire: ESAB FILARC PZ 6138	

ТИП СОЕДИНЕНИЯ / JOINT	Cianfrino / groove	ПОЗИЦИЯ / position	PC+PF / 2G+5G	Сварочный прогрес / Progression	UPHILL ↑

PRERISCALDO - PRE-HEAT (QW406)

Мин. Предварительная температура : Min. pre-heat temp:	50 °C	Максимальная Межваликовая Max interpass temp.:	250 °C

ПОСЛЕСВАРОЧНАЯ ТЕРМООБРАБОТКА - POST WELD HEAT TREATMENT: NO/НЕТ

GAS DI PROTEZIONE - GAS

	GAS/ ГАЗ	МИКСТУРА Mixture	норма. / Flow rate
Защита / Shielding:	Ar+CO2	80-20	12-20lt/1'
Перемещение / Trailing:	N.A.	N.A.	N.A.
Поддержка / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Ток / Current :	DC -CV	ПОЛЯРНОСТЬ / Polarity	RP
Вольфрам Электрод Тип и размер / Tungsten elctr. Size & type:			N.A.
Металл метод GMAW / GMAW metal tranfer mode:			Spray arc
Проводной диапазон скорости подачи / Electr. Wire feed speed range:			self regulatd

TECNICA - TECHNIQUE

ВАЛИК : Bead:	Tirata/String	Диаметр сопла Orifice of gas cup size:	½"	Начальная и межпроходная Initial and interpass cleaning:	Spazzolatura e Molatura/Brushing Grinding
Метод обратной зачистки Method of back gouging:	N.A.	Колебание: Oscillation:	N.A.	Контакт и рабочее расстояние: Contact tube to work distance:	12-18 mm
Номер прохода : Passes nr.:	Multipla/Multiple	Многократные или отдельные электроды: Multiple or single electrodes:	Singolo/Single	НАКЛЕП: Peening:	N.A.

Altro / Other:

Номер прохода Weld layers nr.	Процесс Process	Присадочный металл Filler metal		Показатели Current		Вольт Volt range	Скорость сварки Travel speed range (mm/min)	Тепловложение Heat input (KJ/mm)
		Класс / Class	Dia. (mm.)	ПОЛЯРНОСТЬ / Polarity	Amp. range			
Root - Hot	GS FCAW	5Y46MS H5	1,2	RP	160-220	25-27	140-220	0.87-1.85
FILL- CAP	GS FCAW	5Y46MS H5	1,2	RP	180-230	24-27	160-300	0.60-1.86
FILL- CAP	GS FCAW	5Y46MS H5	1,2	RP	220-270	24-28	180-440	0.60-2.00

ROSETTI - prepared by:

A.KHALIFA

ROSETTI MARINO

PQR - AS- RUN PARAMETER SHEET

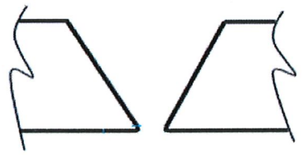
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PQR 06/21	
Coupon Nr. 06/21 PH	
Date: 23/24//25/08/2021	Page: 1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: **GOST R ISO 15614-1 2009, ND 2-020201-015-E, ND No. 2-020101-138-E Spec.**

Welder Name(s):	BOLOGNESI GIULIANO / GIULIANINI DARIO	Welder Id No(s):	GX11 / GX12
Welding Process(es):	136-FCAW	Type(s):	PARTLY MECHANIZED
Welding Position:	PH (5G)	Progression:	VERTICAL UPHILL
Base Materials:	EN 10225: S460G1+M	Wall Thickness:	35 mm
Heat No(s):	710384	Joint Type:	SINGLE V BUTT JOINTSINGLE SIDE WELDING WITHOUT BACKING

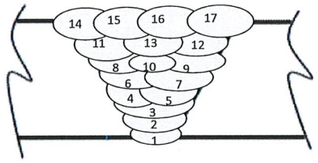
Diameter: 900 mm

WELD PREPARATION:



Angle: 40° ; Root gap: 4-5 mm ; Root face: 1,5-2 mm

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNV1710904	ESAB FILARC PZ 6138
Hot passes	1,2	PNV1710904	ESAB FILARC PZ 6138
Fill/ Cap	1,2	PNV1710904	ESAB FILARC PZ 6138

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar - 20%CO2
Flow:	16 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	1/2"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
16 mm	String		Multiple	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
50°C	PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER	NA	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			RMRS CLASS	ISO CLASS	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
N.A.	1	FCAW	1	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	185	195	190,0	26	28	27,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	6	4,10	0,80	50	INE THT 501 + INE KME 5000
N.A.	2	FCAW	2	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	195	205	200,0	25	27	26,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	11	2,27	0,80	60	Grinding between passes performed by manual tools
N.A.	3	FCAW	3	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	215	225	220,0	25	27	26,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	9	3,05	0,80	70	
N.A.	4	FCAW	4	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	225	235	230,0	26	28	27,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	20	1,49	0,80	80	
N.A.	4	FCAW	5	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	225	235	230,0	26	28	27,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	20	1,49	0,80	100	
N.A.	5	FCAW	6	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	230	240	235,0	26	28	27,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	18	1,69	0,80	110	
N.A.	5	FCAW	7	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	230	240	235,0	26	28	27,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	18	1,69	0,80	170	
N.A.	6	FCAW	8	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	235	245	240,0	26	28	27,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	19	1,64	0,80	190	
N.A.	6	FCAW	9	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	235	245	240,0	26	28	27,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	19	1,64	0,80	210	
N.A.	6	FCAW	10	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	235	245	240,0	26	28	27,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	19	1,64	0,80	220	
N.A.	7	FCAW	11	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	235	245	240,0	26	28	27,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	18	1,73	0,80	230	
N.A.	7	FCAW	12	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	235	245	240,0	26	28	27,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	18	1,73	0,80	230	
N.A.	7	FCAW	13	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	235	245	240,0	26	28	27,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	18	1,73	0,80	250	
N.A.	8	FCAW	14	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	185	195	190,0	25	27	26,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	21	1,13	0,80	150	
N.A.	8	FCAW	15	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	185	195	190,0	25	27	26,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	21	1,13	0,80	170	
N.A.	8	FCAW	16	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	185	195	190,0	25	27	26,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	21	1,13	0,80	180	
N.A.	8	FCAW	17	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	185	195	190,0	25	27	26,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	21	1,13	0,80	190	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name: O. Lashchenko
Signature: ROSETTI MARINO SpA Welding Dept E. Fornacchi	Signature:	Signature: RINA A. Landi	Signature:
Date:	Date:		Date: 28.09.2021

ROSETTI MARINO

PQR - AS- RUN PARAMETER SHEET

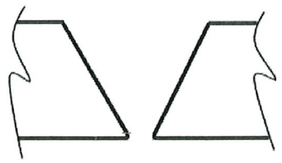
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REFERENCE CODE AND PROJECT SPECIFICATIONS: **GOST R ISO 15614-1 2009, ND 2-020201-015-E, ND No. 2-020101-138-E Spec.**

Welder Name(s):	BOLOGNESI GIULIANO / RENDE EDOARDO	Welder Id No(s):	GX11 / GX08
Welding Process(es):	136-FCAW	Type(s):	PARTLY MECHANIZED
Welding Position:	PC (2G)	Progression:	N.A.
Base Materials:	EN 10225: S460G1+M	Wall Thickness:	35 mm
Heat No(s):	710384	Joint Type:	SINGLE V BUTT JOINTSINGLE SIDE WELDING WITHOUT BACKING

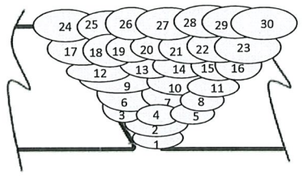
Diameter: 900 mm

WELD PREPARATION:



Angle: 40° ; Root gap: 4-5 mm ; Root face: 1,5-2 mm

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNV1710904	ESAB FILARC PZ 6138
Hot passes	1,2	PNV1710904	ESAB FILARC PZ 6138
Fill/ Cap	1,2	PNV1710904	ESAB FILARC PZ 6138

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar - 20%CO2
Flow:	16 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	1/2"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
14 mm	String		Multiple	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
50°C PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER	NA	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	RMRS CLASS	ISO CLASS	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
NA	1	FCAW	1	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	140	150	145,0	24	26	25,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	10	1,74	0,80	50	INE KME 5000 + INE KME 5000
NA	2	FCAW	2	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	208	218	213,0	27	29	28,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	27	1,06	0,80	70	Grinding between passes performed by manual tools
NA	3	FCAW	3÷5	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	250	260	255,0	29	31	30,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	33	1,11	0,80	100	
NA	4	FCAW	6÷8	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	245	255	250,0	29	31	30,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	34	1,06	0,80	140	
NA	5	FCAW	9÷11	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	245	255	250,0	29	31	30,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	33	1,09	0,80	160	
NA	6	FCAW	12÷16	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	245	255	250,0	29	31	30,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	36	1,00	0,80	200	
NA	7	FCAW	17÷23	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	245	255	250,0	29	31	30,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	35	1,03	0,80	230	
NA	8	FCAW	24÷30	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	195	205	200,0	27	29	28,0	5Y46MS H5	T 50 6 1Ni P M21 1 H5	40	0,67	0,80	250	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name: 0.4.2.1.1280
Signature: ROSETTI MARINO SpA Welding Dept D. Cenacchi	Signature:	Signature: RINA	Signature:
Date:	Date:	Date:	Date: 28.09.21

ROSETTI MARINO	**ОТЧЕТ О ПРОВЕДЕНИИ ВИЗУАЛЬНОЙ ПРОВЕРКИ И КОНТРОЛЯ РАЗМЕРОВ visual/dimensional inspection report**	VDR N° 06-21 дата: 30/08/2021
проект / project D33	Заказчик / client LUKOIL	№ проекта / job 121A00

наименование – item

Procedure Qualification Record (WPQR) 06/21

СЕРТИФИКАТ ПРОТОКОЛА АТТЕСТАЦИИ СВАРОЧНОЙ ТЕХНОЛОГИИ (WPQR) 06/21

WE CERTIFY THAT:

ITEMS INDICATED ABOVE HAVE UNDERGONE A VISUAL INSPECTION AND HAVE BEEN ACCEPTED ACCORDING TO THE SPECIFICATION / PROCEDURE MENTIONED AND TO ACCEPTANCE CRITERIA DEFINED IN IT

Настоящим

ПОДТВЕРЖДАЕТСЯ, ЧТО ВЫШЕУКАЗАННЫЕ СВАРНЫЕ ШВЫ ПРОШЛИ 100% ВИЗУАЛЬНЫЙ ОСМОТР И БЫЛИ УТВЕРЖДЕНЫ В СООТВЕТСТВИИ С УКАЗАННЫМИ ТЕХНИЧЕСКИМИ ХАРАКТЕРИСТИКАМИ И СТАНДАРТАМИ.

примечания – remarks

Inspection on welds Diameter 900 mm and 35 mm WT in as welded condition.

1 Sample in PC-2G and 1 sample in PH-5G

No visible defects have been detected.

результат - result ☒ соответствует - conforming ☐ не соответствует - not conforming

Процедура/ применяемые спецификации - applicable procedures / specifications

Appendix 1,Table 5 of 0D33-П-10-КМ-1-002-0010-09981 /EN ISO 5817:2014 Lev. B /GOST R ISO 15614-1-2009/121A00-PML-QC-PRO-00012

Оператор – Operator	Контроль качества - Quality Control	Заказчик - Client
CSWIP D.CENACCHI 305250 WI 3.1	РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА RUSSIAN MARITIME REGISTER OF SHIPPING 001	

RINA A. Landi

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n° 21174 MT 02 SZ Rev. 00	
RAPPORTO D'ESAME MAGNETOSCOPICO Magnetic Particle Test Report		DATA / Date 23/08/2021	FOGLIO / Sheet 1

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	FASE Step
LUKOIL-KMN LLC	pWPS	/	/	/

ESECUZIONE / Execution		ACCETTABILITA' / Acceptance	
121A00-PML-QC-PRO-00010		121A00-PML-QC-PRO-00010	
MATERIALE/Material	TEMP. SUPERFICI Surface temperature	INTENSITA' LUMINOSA/ Light intensity	
S460G2+M	28°C	☑ LUCE BIANCA 1250 Lux	☐ LUCE NERA 1000 µW/cm²

STATO DELLA SUPERFICIE – Surface condition			
☑ COME SALDATO As welded	☐ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined	
☐ GREZZO – Forged	☐ LAMINATO – Rolled	☐ MOLATO – Ground	☐ SABBIATO – Blasted

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☐ GIOGO/Yoke	☐ PUNTALI/Prods	☐ BOBINA/Coil	☐ CONDUTTORE CENTRALE/Central conduttor

METODO / Method		SMAGNETIZZAZIONE/Demagnetization	
☐ CONTINUO/Continuous	☐ RESIDUO /Residual	☐ RICHIESTA/Required	☐ NON RICHIESTA/Not Required
TIPO DI MAGNETIZZAZIONE/magnetization type		DIREZIONE CAMPO MAGNETICO/magnetic field direction	
☐ MAGNETICO/magnetic	☐ ELETTRICO/electric	☐ CIRCOLARE/Circular	☐ LONGITUDINALE/longitudinal
TIPO APPARECCHIO/Type of equipment	Magneticontrol HR235	DISTANZA PUNTALI/Pole spacing	XXXX mm
NUMERO DI SERIE/Serial number	18-235-19		
TIPO DI CORRENTE/Current Type		POTERE DI SOLLEVAMENTO GIOGO / Lifting power	
☑ A.C.	☐ D.C.	☑ 4,5 kg	☐ 18 kg
MEZZO DI ISPEZIONE / Examination medium		INTENSITÀ DI CORRENTE / Intesity	
☑ UMIDO/Wet	☐ SECCO/Dry	☐ A/ mm	☐ / spira

PARTICELLE UTILIZZATE/Particle Type					
CONTRASTO DI COLOR/Color contrast	☐		FLUORESCENTE/Fluorescent	☐	
MARCA TIPO/Mark Type	☑ NDT BW2	☐ NDT DRY	MARCA TIPO/Mark Type	NDT FW1	
LOTTO/BACH	7243S		LOTTO/BACH	/	
VERNICE DI CONTRASTO / Contrast Paint			☑ NDT WBL5	LOTTO/BACH	U190107S

SALDATURE CONTROLLATE / Welds Verified

Item	Welder	Joit Type	Bevel	Thk	Scan plan
pWPS 06-21	G08	BUT WELD	V	35	IDL-QCI-MT-02

RINA A. Landi

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITÀ Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zanni 2° Livello	ROSETTI MARINO SpA A. Khalifa Welding Dept.	

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		21174 MT 04 SZ Rev. 00	
RAPPORTO D'ESAME MAGNETOSCOPICO Magnetic Particle Test Report		DATA / Date 28/08/2021	FOGLIO / Sheet 1

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	FASE Step
LUKOIL-KMN LLC	pWPS	/	/	/

ESECUZIONE / Execution		ACCETTABILITA' / Acceptance	
121A00-PML-QC-PRO-00010		121A00-PML-QC-PRO-00010	
MATERIALE/Material	TEMP. SUPERFICI Surface temperature	INTENSITA' LUMINOSA/ Light intensity	
S460 G1+M	28°C	☑ LUCE BIANCA 1250 Lux	☐ LUCE NERA 1000 µW/cm²

STATO DELLA SUPERFICIE – Surface condition			
☑ COME SALDATO As welded	☐ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined	
☐ GREZZO – Forged	☐ LAMINATO – Rolled	☐ MOLATO – Ground	☐ SABBIATO – Blasted

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☑ GIOGO/Yoke	☐ PUNTALI/Prods	☐ BOBINA/Coil	☐ CONDUTTORE CENTRALE/Central conduttor

METODO / Method		SMAGNETIZZAZIONE/Demagnetization	
☐ CONTINUO/Continuous	☐ RESIDUO /Residual	☐ RICHIESTA/Required	☑ NON RICHIESTA/Not Required
TIPO DI MAGNETIZZAZIONE/magnetization type		DIREZIONE CAMPO MAGNETICO/magnetic field direction	
☑ MAGNETICO/magnetic	☐ ELETTRICO/electric	☐ CIRCOLARE/Circular	☑ LONGITUDINALE/longitudinal
TIPO APPARECCHIO/Type of equipment	Magneticontrol HR235	DISTANZA PUNTALI/Pole spacing	180 mm
NUMERO DI SERIE/Serial number	18-235-19		
TIPO DI CORRENTE/Current Type		POTERE DI SOLLEVAMENTO GIOGO / Lifting power	
☑ A.C.	☐ D.C.	☑ 4,5 kg	☐ 18 kg
MEZZO DI ISPEZIONE / Examination medium		INTENSITÀ DI CORRENTE / Intesity	
☑ UMIDO/Wet	☐ SECCO/Dry	☐ A/ mm	☐ / spira

PARTICELLE UTILIZZATE/Particle Type			
CONTRASTO DI COLOR/Color contrast	☐	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	☑ NDT BW2 ☐ NDT DRY	MARCA TIPO/Mark Type	NDT FW1
LOTTO/BACH	7243S	LOTTO/BACH	/
VERNICE DI CONTRASTO / Contrast Paint		☑ NDT WBL5	LOTTO/BACH U190107S

SALDATURE CONTROLLATE / Welds Verified

Item	Welder	Joit Type	Bevel	Thk	Scan plan
pWPS 06-21 5G	GX08-GX11	BUT WELD	V	35 mm	IDL-QCI-MT-02

RINA A. Landi

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITÀ Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zanli II Livello	ROSETTI MARINO SpA A. Khalifa Welding Dept.	

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RAPPORTO D'ESAME RADIOGRAFICO RADIOGRAPHIC TEST		DATA / Date 23/08/2021 — FOGLIO / Sheet 1

CLIENTE / Client	ORDINE / Order	PROGETTO / Project	COMMESSA / Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE /Customer	**OGGETTO / Object**	**DISEGNO / Dwg**	**P.F.C. / Q.C.P.**	**Fase / Step**
LUKOIL-KMN LLC	pWPS	/	/	/

Schizzo Sketch	Saldatura Weld	Diametro Diameter	Spessore Thikeness	Punzone Welder	Posizione Position	Difetto Defect	Giudizio Judgement
p WPS 06-21	/	/	35	AX54-AX16	0-1	/	A
					1-2	df	A
					2-3	df	A
					3-4	/	A
					4-5	/	A
					5-6	/	A
					6-7	/	A
					7-0	/	A

DIFETTI / Defects

101	Longitudinal crack	2014	Linear porosity	3041	Tungsten inclusion	501	Undercut
104	Crater crack	2016	Wormholes	3042	Copper inclusion	504	Excess penetration
2011	Porosity	301	Slag inclusion	401	Lack of fusion	507	misaligment
2013	Clustered	DF	Difetto film Film defect	402	Lack of penetration	515	Root concavity

ESITO / Results

A	Accettabile Acceptable	NR	Riparare Repair	NX	Ripetere Film Repeat Film	RX	Conferma difetto Defect confirm

PROCEDURA /Procedure 121A00-PML-QC-PRO-00013	Schermi / Lead screen PB 0,10 Front and Back	Pellicole / Film type KODAK T200 (C4)
Tipo macchina Rγ / Type machine Rγ Gilardoni MHF 300 D	Densità / Density Range ≤ 4 base material	Densità / Density Range 2÷3 welded area

TECNICA DI ESPOSIZIONE / Exposure Technique: DOPPIA PARETE SINGOLA IMMAGINE DWSI

Tipo di sorgente / source type			Tipo di IQI / IQI type	
☑ RX	☐ IR 192	☐ SE 75	☐ ASTM	☑ EN
Macchia focale focal spot		3	Posizione / position	
Attività activity			☐ Lato film film side	☑ Lato sorgente Source side
Ci	kV	mA	Esposizione / esposition	
	290	2	☑ Film singolo Single film	☐ Film doppio Double ilm
Tempo di esposizione exposure time			Tecnica di sviluppo / Film processing	
4			☐ Manuale / manual	☑ Automatico / Automatic

Spessore attraversato Crossed thickness w	Dist. Sorgente film *Source film distance* (SFD)	Dist. oggetto film *Film object distance* (b)	Distanza minima Minimum distance (f min)	Filo visibile n° Visible Wire n°	Lastre n° *Films n°*
Range 35÷45	450	35	263	10	01

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zanli 2° Livello	ROSETTI MARINO SpA A. Khalifa Welding Dept.	

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RAPPORTO D'ESAME RADIOGRAFICO RADIOGRAPHIC TEST		DATA / Date 28/08/2021 — FOGLIO / Sheet 1

CLIENTE / Client	ORDINE / Order	PROGETTO / Project	COMMESSA / Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE /Customer	OGGETTO / Object	DISEGNO / Dwg	P.F.C. / Q.C.P.	Fase / Step
LUKOIL-KMN LLC	pWPS	/	/	/

Schizzo Sketch	Saldatura Weld	Diametro Diameter	Spessore Thikeness	Punzone Welder	Posizione Position	Difetto Defect	Giudizio Judgement
p WPS 06-21 5G	/	900 mm	35	GX08	0-1	/	A
				GX11	1-2	/	A
					2-3	/	A
					3-4	Df	A
					4-5	/	A
					5-6	/	A
					6-7	2011	A
					7-0	/	A

DIFETTI / Defects

101	Longitudinal crack	2014	Linear porosity	3041	Tungsten inclusion	501	Undercut
104	Crater crack	2016	Wormholes	3042	Copper inclusion	504	Excess penetration
2011	Porosity	301	Slag inclusion	401	Lack of fusion	507	misaligment
2013	Clustered	DF	Difetto film Film defect	402	Lack of penetration	515	Root concavity

ESITO / Results

A	Accettabile Acceptable	NR	Riparare Repair	NX	Ripetere Film Repeat Film	RX	Conferma difetto Defect confirm

PROCEDURA /Procedure 121A00-PML-QC-PRO-00013	Schermi / Lead screen PB 0,10 Front and Back	Pellicole / Film type KODAK T200 (C4)
Tipo macchina Rx / Type machine Rx Gilardoni MHF 300-PO matr.045259001	Densità / Density Range ≤ 4 base material	Densità / Density Range 2÷3 welded area

TECNICA DI ESPOSIZIONE / Exposure Technique: SINGOLA PARETE SINGOLA IMMAGINE SWSI

Tipo di sorgente / source type			Tipo di IQI / IQI type	
☑ RX	☐ IR 192	☐ SE 75	☐ ASTM	☑ EN
Macchia focale focal spot		3	Posizione / position	
Attività activity			☑ Lato film film side	☐ Lato sorgente Source side
Ci	kV	mA	Esposizione / esposition	
/	290	2	☑ Film singolo Single film	☐ Film doppio Double ilm
Tempo di esposizione exposure time			Tecnica di sviluppo / Film processing	
3 min			☐ Manuale / manual	☑ Automatico / Automatic

Spessore attraversato Crossed thickness w	Dist. Sorgente film *Source film distance* (SFD)	Dist. oggetto film *Film object distance* (b)	Distanza minima Minimum distance (f min)	Filo visibile n° Visible Wire n°	Lastre n° *Films n°*
Range 35 ÷ 45 mm	450 mm	35 mm	263 mm	10	8

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zanli II° Livello	ROSETTI MARINO SpA A. Khalifa Welding Dept.	

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RAPPORTO D'ESAME CON ULTRASUONI Ultrasonic Examination report		DATA / Date 23/08/2021
		FOGLIO / Sheet 1

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
LUKOIL-KMN LLC	pWPS	/	/	/

ESECUZIONE / Execution	ACCETTABILITA' / Acceptance level
121A00-PML-QC-PRO-00009	121A00-PML-QC-PRO-00009

MATERIALE Material	DIMENSIONI mm Dimension	SPESSORE NOMINALE / Thk mm
S460G2+M	PIPE DN 900	35

STATO DELLA SUPERFICIE – Surface condition

☑ COME SALDATO As welded ☐ SPAZZOLATO - Brushed ☐ LAVORATO DI MACCHINA - Machined

☐ GREZZO – Forged ☐ LAMINATO – Rolled ☐ MOLATO – Ground ☐ SABBIATO – Blasted

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG 700	No. SERIE Serial Number	I003937

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	AMPLIFICAZIONE dB value	ONDE Waves
KRAUTKRAMER	KNF	4	10	0°	36	LONG.
UNION TEST	NDT	2	14X14	70°	42	SHEAR
UNION TEST	NDT	2	14X14	60°	42	SHEAR
UNION TEST	NDT	2	14X14	45°	42	SHEAR

BLOCCO DI CALIBRAZIONE Calibration block	IIW V1	BLOCCO DI RIFERIMENTO Reference block	QT-BLOCK-RM
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity	DAC ON SDH 3 mm

SALDATURE CONTROLLATE / Welds Verified

Item	Welder	Joit Type	Bevel	Thk	Scan plan
Pwps06-21	GX08	BUT WELD	V	35	IDL-QCI-UT-0216

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Not According to specification ☐

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zanli 2° Livello	ROSETTI MARINO SpA A. Khalifa Welding Dept.	

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		21174 UT 04 SZ Rev. 00

RAPPORTO D'ESAME CON ULTRASUONI Ultrasonic Examination report	DATA / Date 28/08/2021	FOGLIO / Sheet 1

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
LUKOIL-KMN LLC	pWPS	/	/	/

ESECUZIONE / Execution	ACCETTABILITA' / Acceptance level
121A00-PML-QC-PRO-00009	121A00-PML-QC-PRO-00009

MATERIALE Material	DIMENSIONI mm Dimension	SPESSORE NOMINALE / Thk mm
S460 G1+M	D= 900 mm	35 mm

STATO DELLA SUPERFICIE – Surface condition

☑ COME SALDATO As welded ☐ SPAZZOLATO - Brushed ☐ LAVORATO DI MACCHINA - Machined

☐ GREZZO – Forged ☐ LAMINATO – Rolled ☐ MOLATO – Ground ☐ SABBIATO – Blasted

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG 700	No. SERIE Serial Number	I003937

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	AMPLIFICAZIONE dB value	ONDE Waves
KRAUTKRAMER	KNF	4	10	0°	36	LONG.
UNION TEST	NDT	2	14X14	70°	42	SHEAR
UNION TEST	NDT	2	14X14	60°	42	SHEAR
UNION TEST	NDT	2	14X14	45°	42	SHEAR

BLOCCO DI CALIBRAZIONE Calibration block	IIW V1	BLOCCO DI RIFERIMENTO Reference block	QT-BLOCK-RM
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity	DAC ON SDH 3 mm

SALDATURE CONTROLLATE / Welds Verified

Item	Welder	Joit Type	Bevel	Thk	Scan plan
Pwps 06-21 5G	GX08-GX11	BUT WELD	V	35 mm	IDL-QCI-UT-0216

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Not According to specification ☐

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zauli 2° Livello	ROSETTI MARINO SpA A. Khalifa Welding Dept.	

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta.
I risultati delle prove si riferiscono unicamente ai particolari esaminati.
Partial reproduction of this certificate must be written authorized.
Test results relate only to examined items.

Z:\Qualita\5 modulistica\01 moduli cnd\validi\01 moduli 2020\convenzionali volumetrici

RINA

INSPECTA S.R.L.	**TEST REPORT** ***RAPPORTO DI PROVA*** **N° 381-00103-21** **Rev.00** **Data: 28/09/2021**	ilac-MRA ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO **LAB N°1607 L**

Object: *Oggetto:*	**MECHANICAL TEST ON WPQR 06-2021**					Pag. 1 di 21
Specimen: *Saggio:* **470/21**	**#Base Material:** *Materiale Base:*	**EN 10225 S460G1+M**	**PIPE Ø 900 mm THK 35 mm**			
	# Informazione fornita dal cliente/ Information provided by the customer					
Customer: *Committente:*	**ROSETTI MARINO S.p.A.**					
Address: *Indirizzo:*	**Via Trieste, 230 - 48122 Ravenna (RA)**					
Final customer:. *Cliente finale:*	//					
Your delivery note n°: *Vs. DDT di consegna*	**n°** //	**Date:** *Data:* //	**MD52** *MD 52* **104/2021**	**Date:** *Data:* **24/08/2021**		
Start of activities:: *Inizio prove :*	**Date:** *Data:* **13/09/2021**	**End of activities:** *Fine prove:*		**Date:** *Data:* **28/09/2021**		

PROVE RICHIESTE

☒ **TENSILE TEST**/*Trazione*	☒ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*	
☒ **BEND TEST**/*Piega*	☒ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root /*Dritto/Rovescio* ☒ Side/ *Laterale*	
☒ **IMPACT TEST**/*Resilienza*	☒ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*	
☒ **MACROEXAMINATION TEST /** *Macrografia*			
☒ **HARDNESS TEST**/ *Durezza*	☐ HV 5	☒ HV 10	
☐ **FRACTURE TEST**/ *Frattura*	☐ Plate with/on Plate/ *Piastra con/su Piastra* ☐ Pipe with/on Pipe/*Tubo con/ su Tubo*	☐ Pipe on Plate/*Tubo su Piastra*	
☐ **CHEMICAL ANALYSIS**/*Analisi Chimica*			
☐ **MICROEXAMINATION TEST /** *Micrografia*			
☐ **OTHER (Specify)**/*Altro/(Specificare)*			

Allegati /Attachments: NONE

NOTE/ Remarks: **REFERENCE CODE FROM CUSTOMER REQUEST: RINA RULES + RMRS ND No.2-020101-015 + RMRS ND No.2-020101-138 + RMRS ND No.2-020101-139 + GOST R ISO 15614-1-2009**
TEST WITNESSED BY CENACCHI DAVIDE (ROSETTI MARINO SPA) AND LANDI ANDREA (RINA) AND ALEKSEY LAZAREV (RS-CLASS)
Informazioni aggiuntive fornite dal cliente:
Additional information provided by the customer

Laboratory Responsible *Responsabile Laboratorio* *Sig. Giulio Bagnara*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - 28-09-2021 Service Responsible	ROSETTI MARINO S.p.A. Welding Dept. D. Cenacchi	RS 2801 001 O. Lazarev

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova. Il committente si impegna a riprodurre integralmente il rapporto di prova. È vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I risultati di prova si riferiscono al campione così come ricevuto, essendo il campionamento eseguito dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%. Quando emesso il Report in revisione, l'oggetto revisionato è identificabile mediante barra verticale posta sul lato sinistro e dal testo in formato corsivo sottolineato.
The results in this test report refers only to the specimen that has been tested. The customer undertakes to print out/reproduce the test report. Any partial reproduction is prohibited. Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory. The test results refer to the sample as received, since the sampling is performed by the customer. Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku=2 equivalent to a level of confidence of 95 %. When the Report under review is issued, the revised object can be identified by the vertical bar on the left side and by the text in italics underlined.

RINA A. Landi

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE
Prova di trazione trasversale a temperatura ambiente

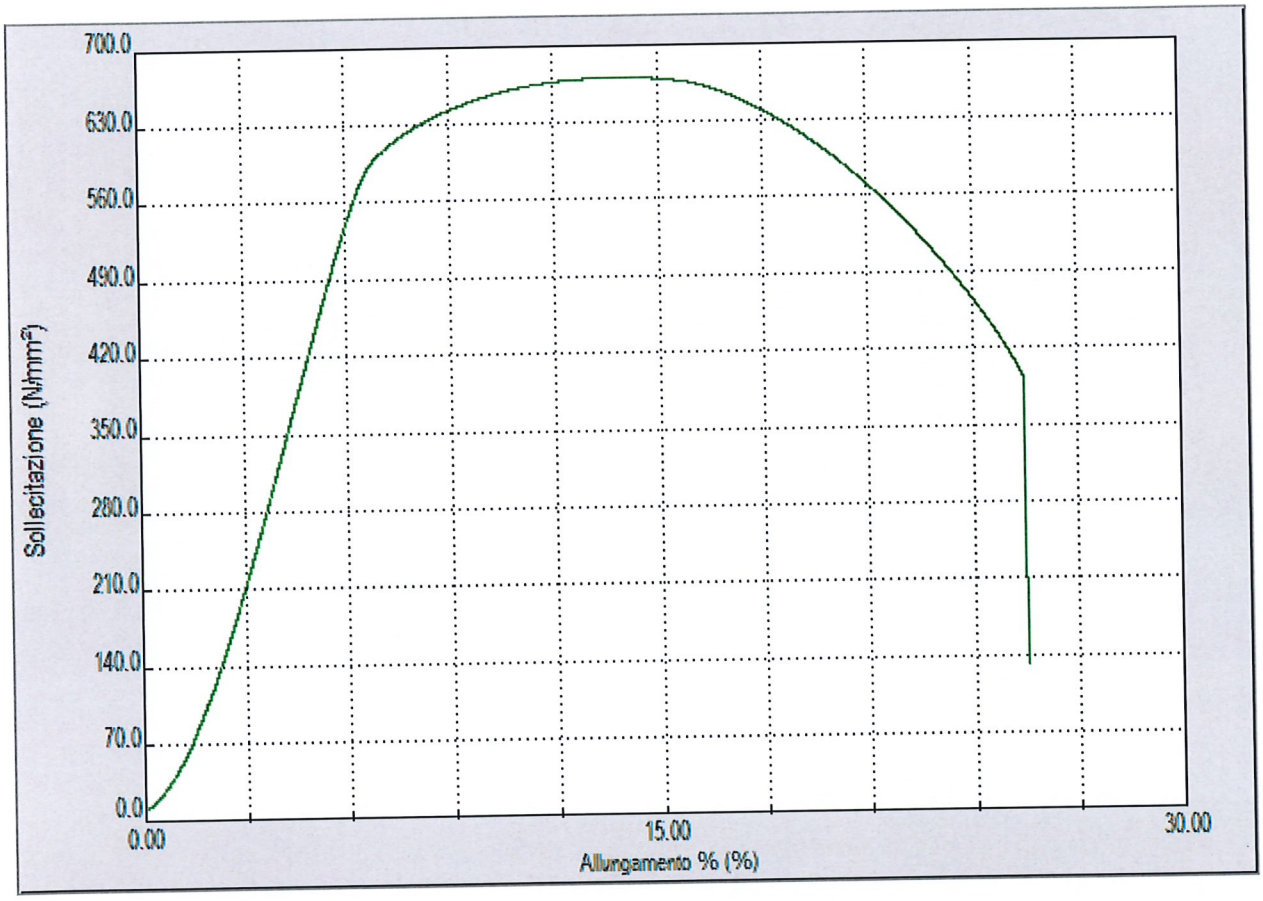
Date of Testing::28/09/2021
Data esecuzione prova:

performed in accordance with the standard / eseguita in conformità alla norma UNI EN ISO 4136:2012

The test was performed using the Galdabini testing materials machine, model Quasar 600, s.n. VAUP/01 (2014)
La prova è stata eseguita utilizzando la macchina per prove materiali Galdabini, modello Quasar 600, s.n. VAUP/01 (2014)

Internal procedure *Procedura interna :* ***PP08 rev.13***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
470/21 A TWT	19,80x25,05	495,99	23,4°C	//	//	/	//	/	332283	670	/	//	//	FOW



Remarks / *Note:*	*UPPER SIDE – POSTION PC*
Legend / *Legenda*	**TT = Transverse Tension**/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura*
	TWT = Transverse Weld Tension/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Bacheschi Laboratory Technician 28/09/2021	Sig. Giulio Bagnara - INSPECTA srl - 28-09-2021 Service Responsible	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	280 001

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Prova di trazione trasversale a temperatura ambiente

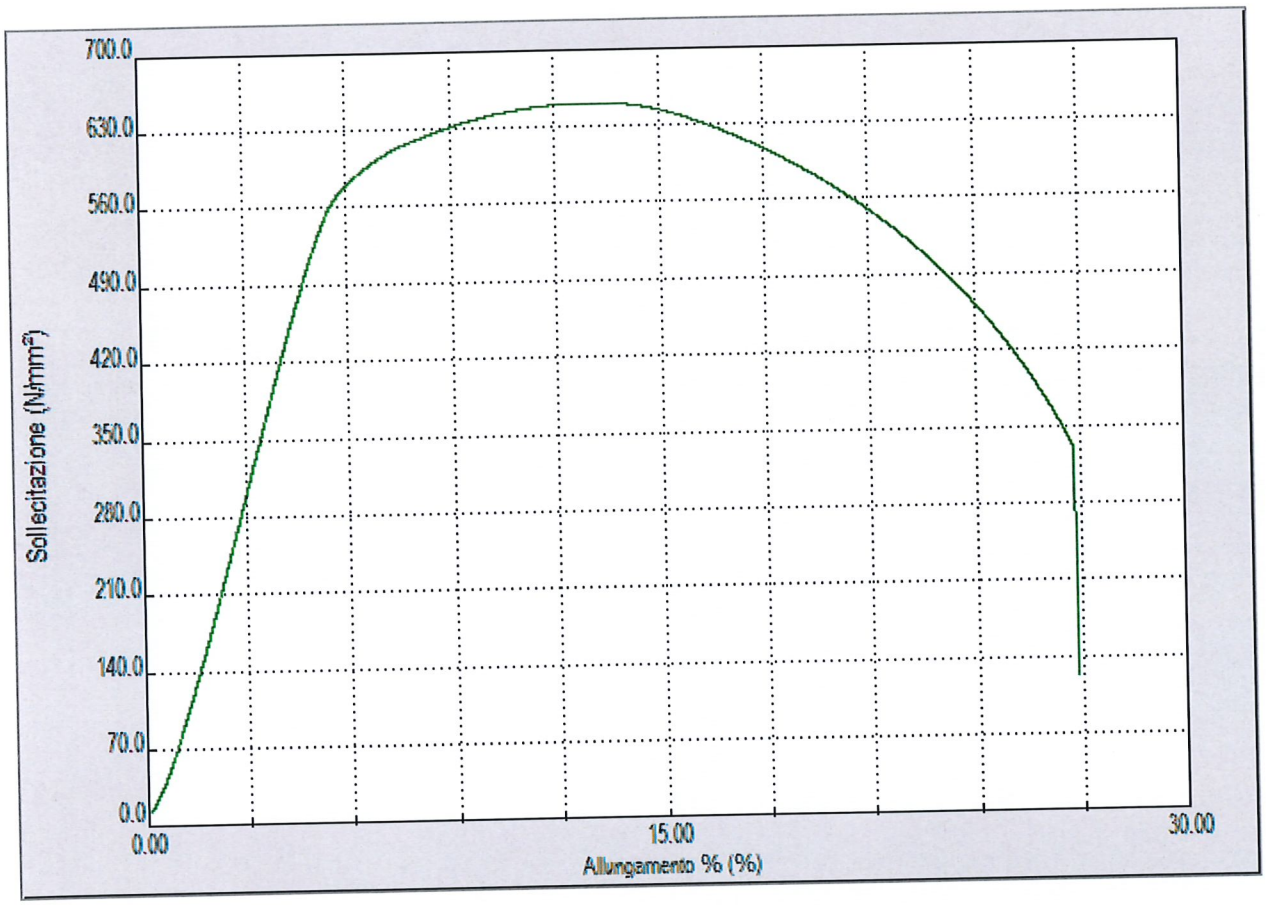
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Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
470/21 B TWT	20,25x25,07	507,67	23,4°C	//	//	/	//	/	330309	651	/	//	//	FOW



Remarks / *Note:*	*LOWER SIDE – POSTION PC*
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Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO S.p.A. Welding Dept. D. Cenacchi	RS SURVEYOR РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА RUSSIAN MARITIME REGISTER OF SHIPPING 001
- INSPECTA srl -	- INSPECTA srl -		
28/09/2021	28-09-2021		
Laboratory Technician	Service Responsible		

Headquarter: Via Giolitti 10 – 48123 Ravenna (RA) Italy – Phone /Fax + 39 0544 451424
Registered Office: Via Ravegnana 379/A - 47122 Forlì (FC) Italy - Phone +39 0543 559027 - Phone/Fax +39 0543 724366
Mobile +39 393 9374013 - e-mail: inspectasrl@inspectasrl.com - www.inspectasrl.com - P.iva 03944480403
Capital Stock € 50.000 - Chamber of Commerce registration Forlì/Cesena No. [illegible]403 - R.A. N° 223499

RINA A. Landi

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE
Prova di trazione trasversale a temperatura ambiente

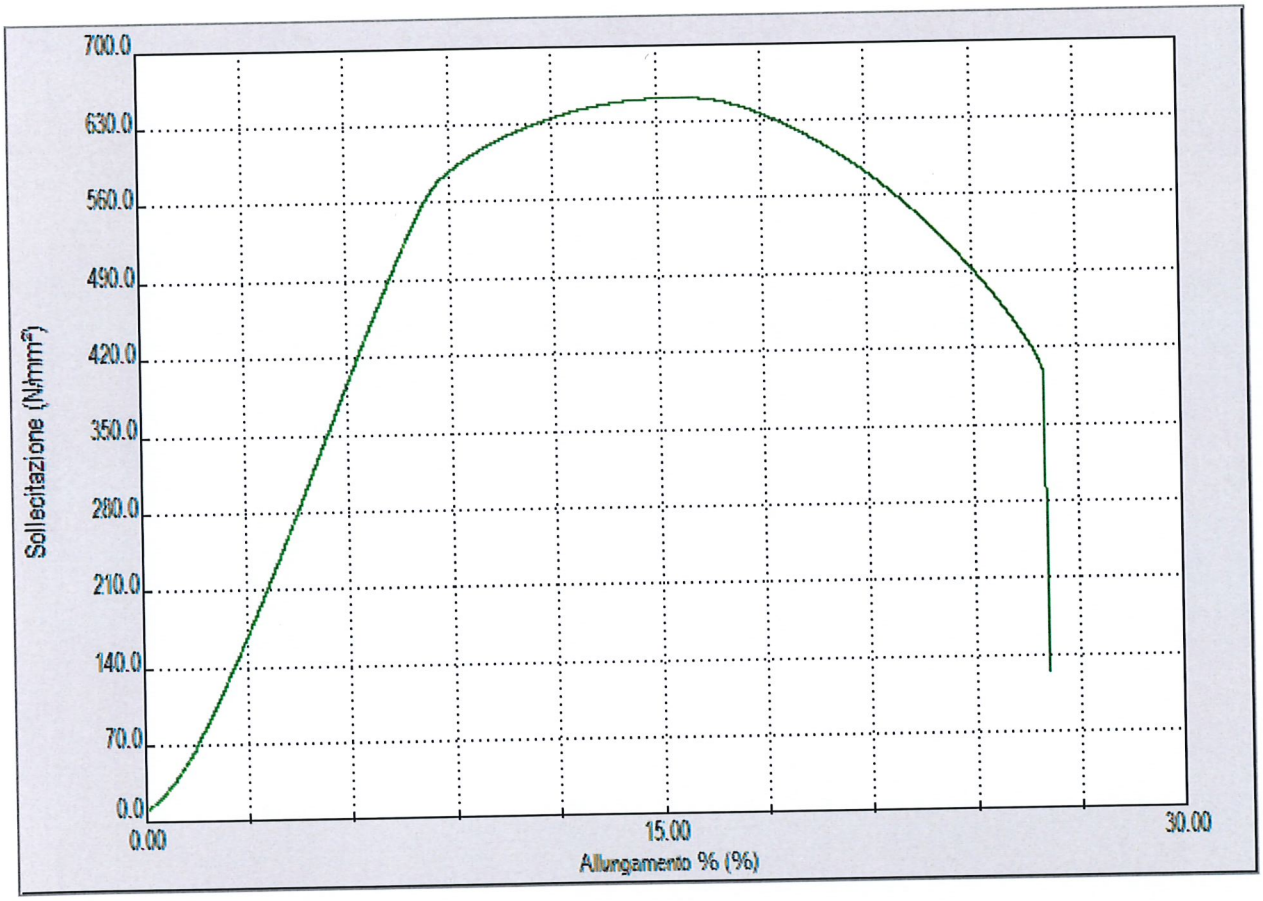
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Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
470/21 C TWT	20,15x25,04	504,56	23,4°C	//	//	/	//	/	328842	652	/	//	//	FOW



Remarks / *Note:*	*UPPER SIDE – POSTION PC*
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Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara		
- INSPECTA srl -	- INSPECTA srl -	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RS Surveyor
28/09/2021	28-09-2021		РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА RUSSIAN MARITIME REGISTER OF SHIPPING
Laboratory Technician	Service Responsible		

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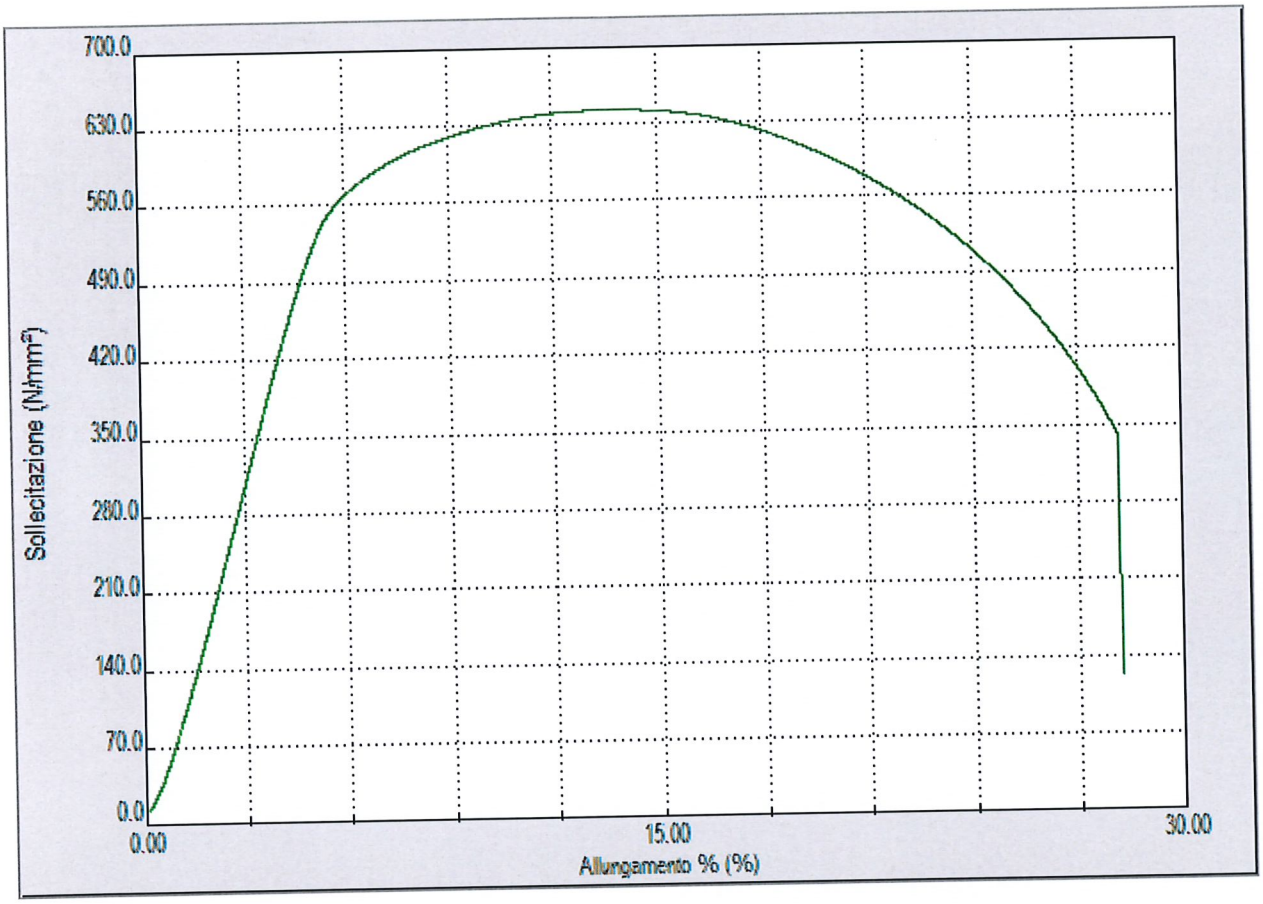
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Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
470/21 D TWT	20,16x25,06	505,21	23,4°C	//	//	/	//	/	324470	642	/	//	//	FOW



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Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara		
- INSPECTA srl -	- INSPECTA srl -	ROSETTI MARINO SPA Welding Dept. D. Cenacchi	
Laboratory Technician	28-09-2021 Service Responsible		

Headquarter: Via Giolitti 10 – 48123 Ravenna (RA) Italy – Phone /Fax + 39 0544 451424
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Capital Stock € 50.000 - Chamber of Commerce registration Forlì/Cesena No. 03944480403 - R.E.A. No. 323199

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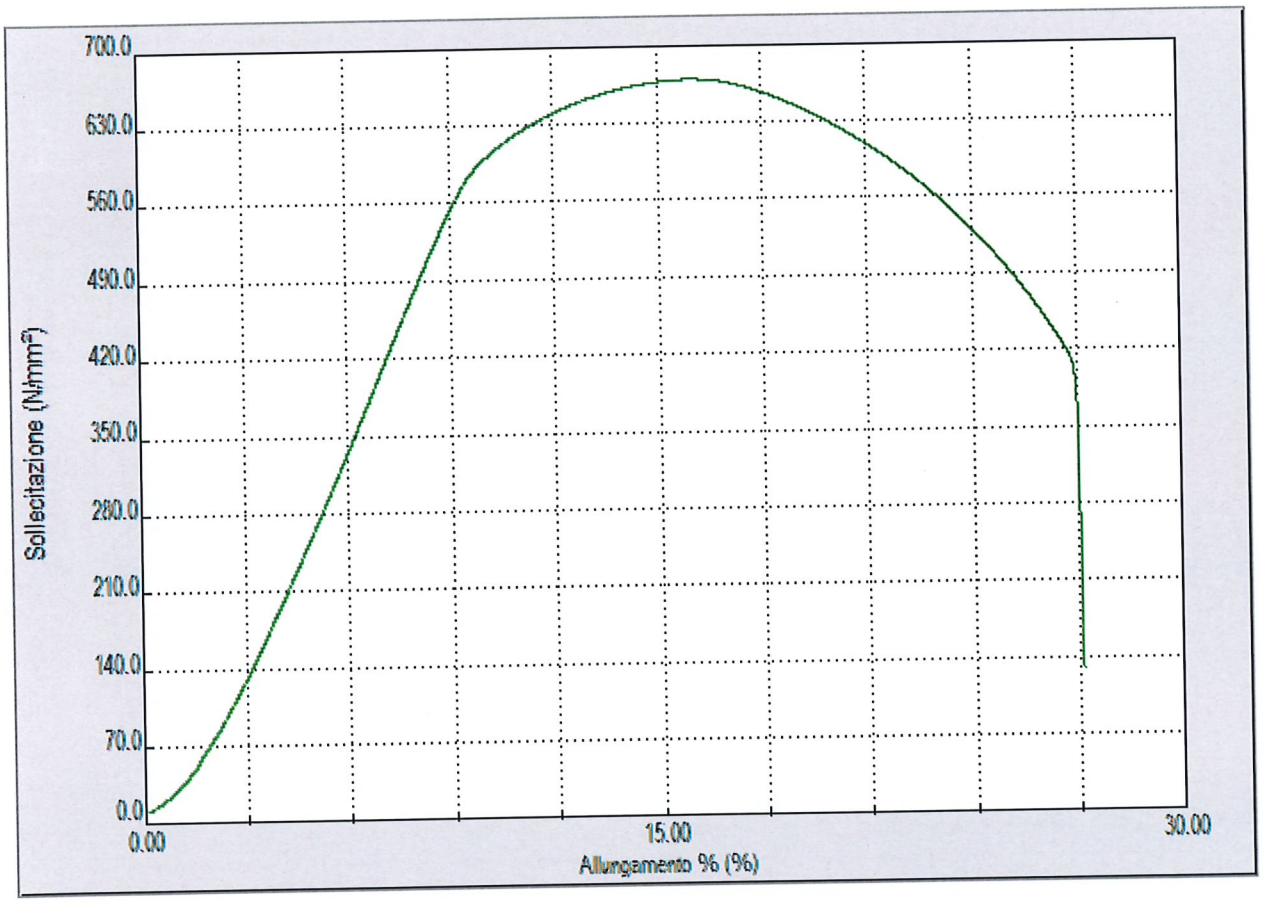
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Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
470/21 E TWT	19,80x25,06	496,19	23,4°C	//	//	/	//	/	332015	669	/	//	//	FOW



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Dott. Ing. Matteo Bacheschi	Sig. Giulio Bagnara	ROSETTI MARINO SPA Welding Dept. D. Cenacchi	RINA A. Landi
Laboratory Technician	- INSPECTA srl - 28-09-2021 Service Responsible		

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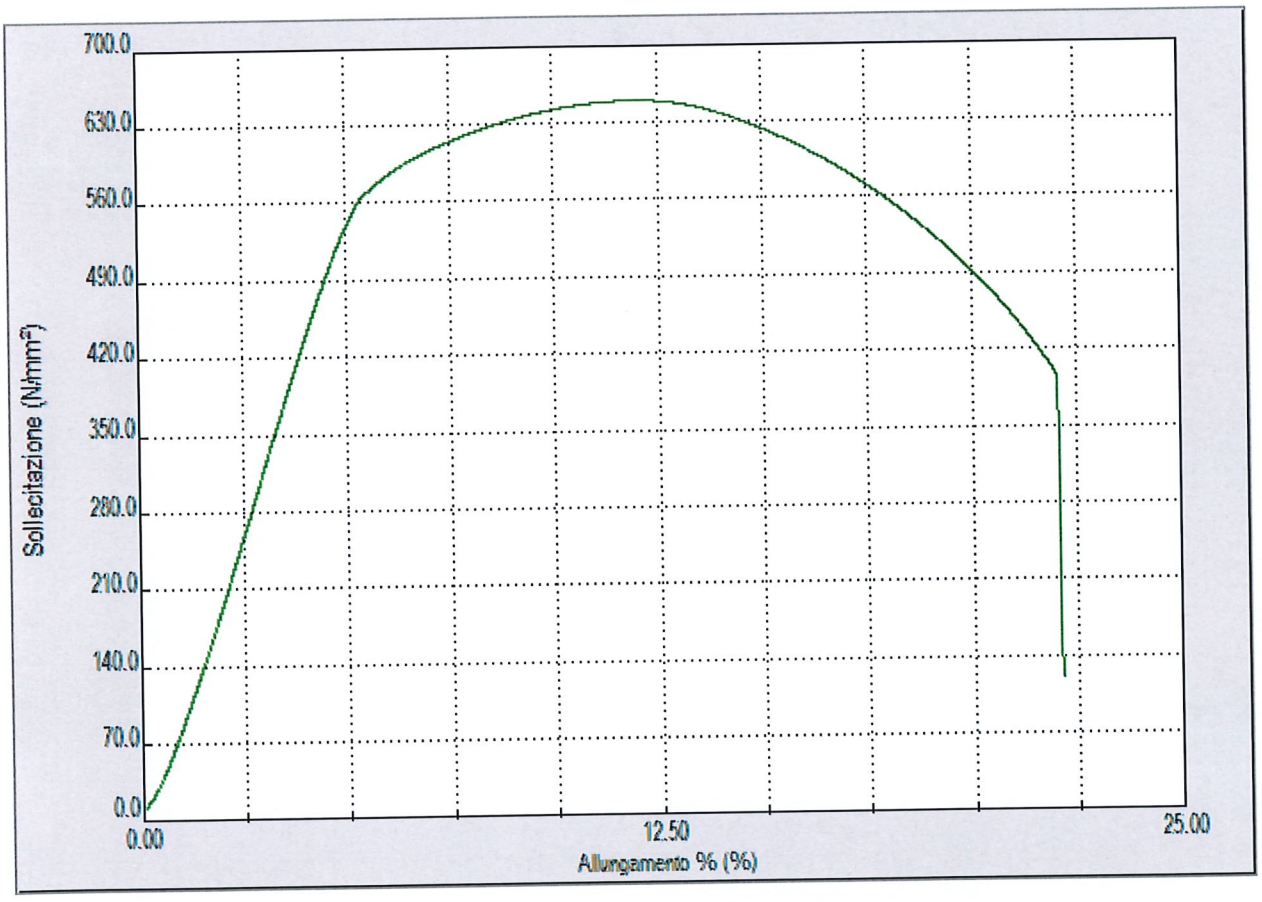
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Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
470/21 F TWT	20,15x25,04	504,56	23,4°C	//	//	/	//	/	327722	650	/	//	//	FOW



Remarks / *Note:*	*LOWER SIDE – POSTION PH*
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Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi - INSPECTA srl - Laboratory Technician 28/09/2021	Sig. Giulio Bagnara - INSPECTA srl - 28-09-2021 Service Responsible	ROSETTI MARINO SPA Welding Dept. D. Cenacchi	RS Surveyor РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА RUSSIAN MARITIME REGISTER OF SHIPPING 280 РС 001

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE
Prova di trazione trasversale a temperatura ambiente

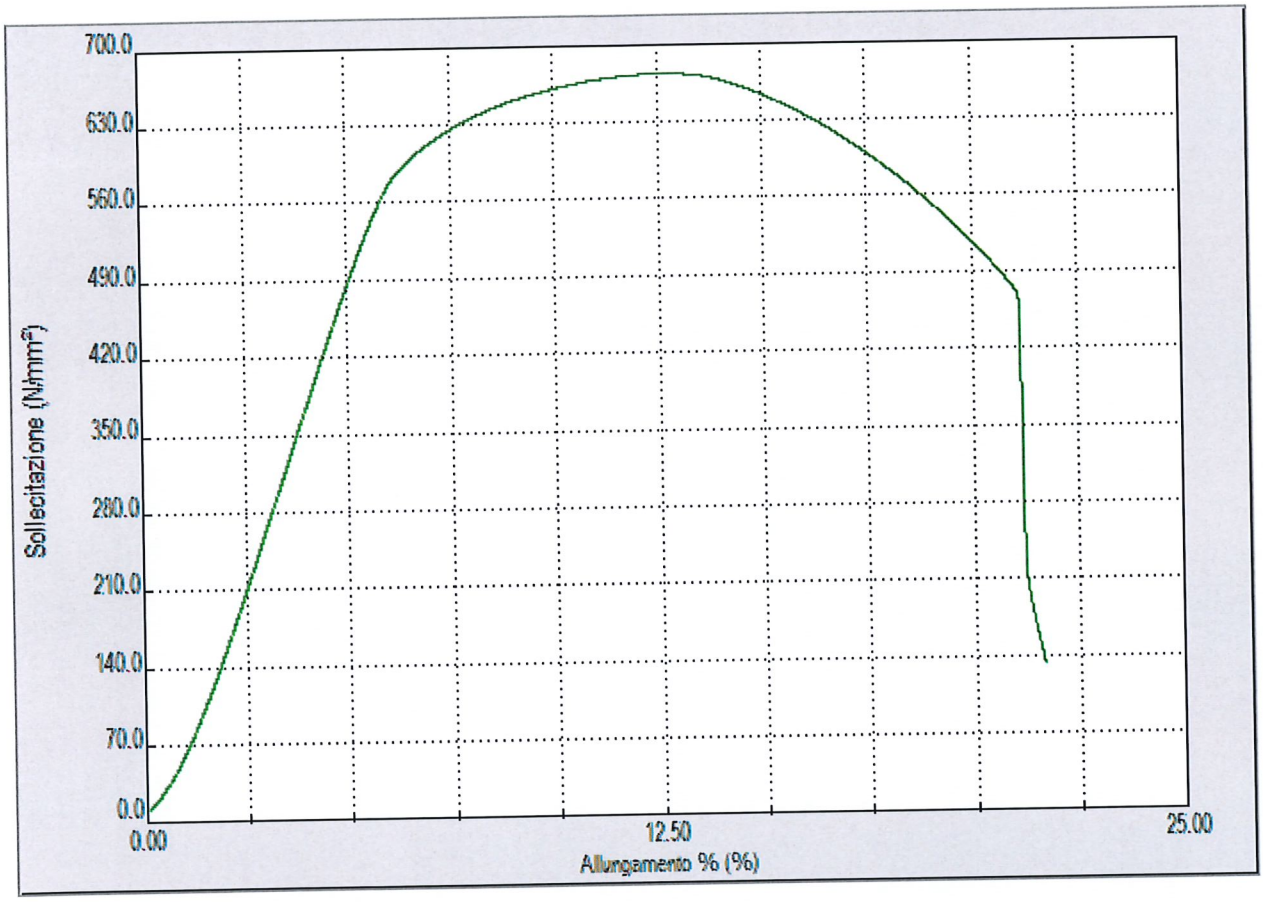
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Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
470/21 G TWT	20,23x25,01	505,95	23,4°C	//	//	/	//	/	340701	674	/	//	//	FOW



Remarks / *Note:*	*UPPER SIDE – POSTION PH*
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Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Marica Baccheschi - INSPECTA srl - 28/09/2021 Laboratory Technician	Sig. Giulio Bagnara - INSPECTA srl - 28-09-2021 Service Responsible	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА RUSSIAN MARITIME REGISTER OF SHIPPING 280 001

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Prova di trazione trasversale a temperatura ambiente

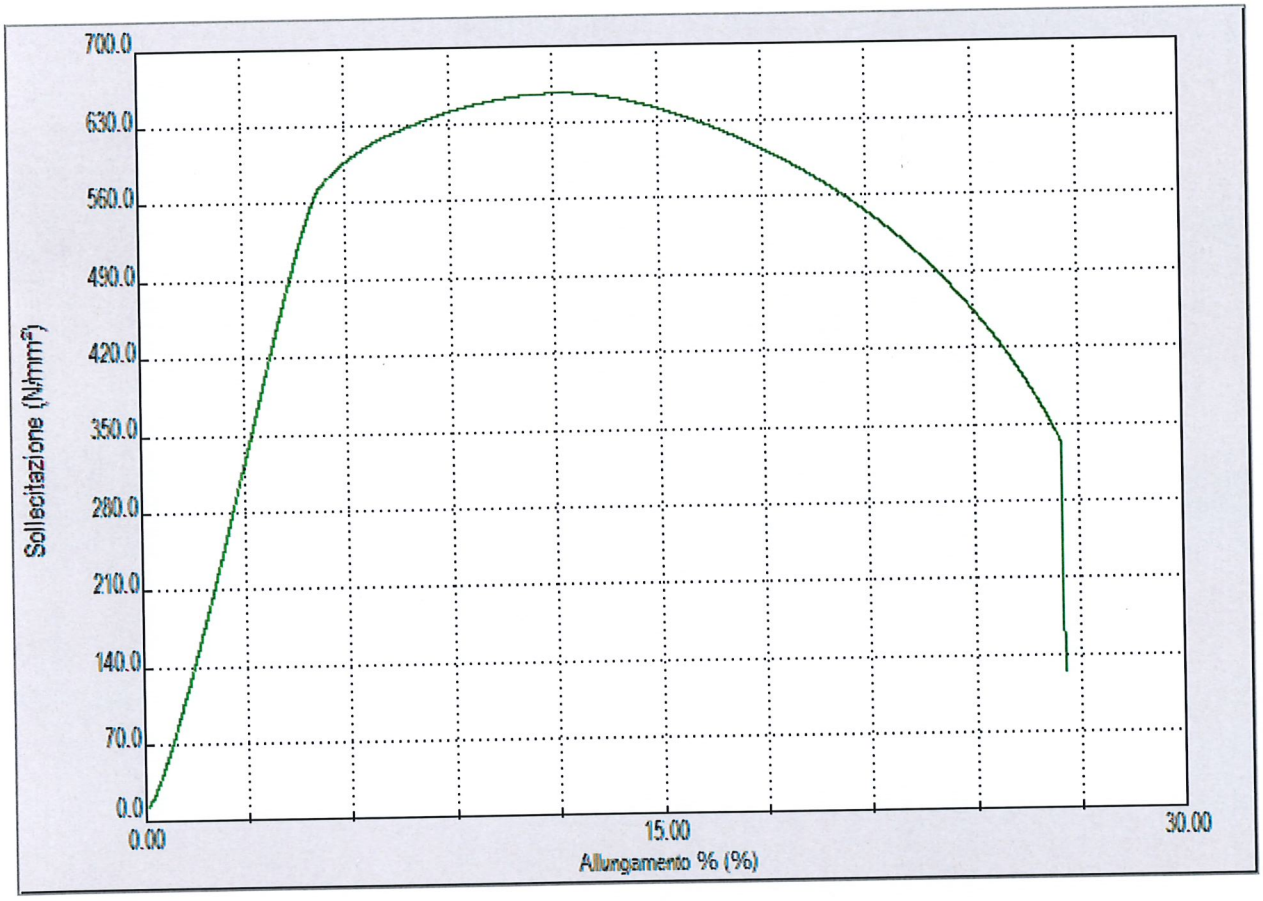
Date of Testing::28/09/2021
Data esecuzione prova:

performed in accordance with the standard / eseguita in conformità alla norma UNI EN ISO 4136:2012

The test was performed using the Galdabini testing materials machine, model Quasar 600, s.n. VAUP/01 (2014)
La prova è stata eseguita utilizzando la macchina per prove materiali Galdabini, modello Quasar 600, s.n. VAUP/01 (2014)

Internal procedure *Procedura interna :* ***PP08 rev.13***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
470/21 H TWT	20,15x25,03	504,35	23,4°C	//	//	/	//	/	331126	657	/	//	//	FOW



Remarks / *Note:*	*LOWER SIDE – POSTION PH*
Legend / *Legenda*	**TT = Transverse Tension**/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura* **TWT = Transverse Weld Tension**/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Bacchieschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА RUSSIAN MARITIME REGISTER OF SHIPPING 280 001
INSPECTA srl Laboratory Technician 28/09/2021	- INSPECTA srl - 28-09-2021 Service Responsible		

BEND TEST
Prova di piega

Date of Testing::28/09/2021
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* UNI EN ISO 5173:2012

The test was performed using the Galdabini testing materials machine, model Quasar 600, s.n. VAUP/01 (2014)
La prova è stata eseguita utilizzando la macchina per prove materiali Galdabini, modello Quasar 600, s.n. VAUP/01 (2014)

Internal procedure *Procedura interna* ***:PP11 rev.05***

Specimen id. *Identificazione provino*		Dimension *Dimensioni (mm)*	Test Temp. *Temp.test °C*	Bend Angle *Angolo di piega*	Ø Former *Ø Mandrino (mm)*	Distance between rollers *Distanza appoggi (mm)*	Remarks *Note*
470/2021 SBB	A	35,00x10,00	23,4°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone
470/2021 SBB	B	35,00x10,00	23,4°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone
470/2021 SBB	C	35,00x10,00	23,4°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone
470/2021 SBB	D	35,00x10,00	23,4°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone

Remarks *Note:* POSITION PC

Legend *Legenda*

SBB. = Transverse Side Bend/*Piega Trasversale laterale*
TRB. = Transverse Root Bend/*Piega Trasversale al rovescio*
TFB. = Transverse Face Bend/*Piega Trasversale al dritto*
LRB = Longitudinal Root Bend */ Piega Longitudinale al rovescio*
LFB. = Longitudinal Face Bend */ Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Maura Bacheschi INSPECTA SRL Laboratory Technician 28/09/2021	Sig. Giulio Bagnara - INSPECTA srl - 28-09-2021 Service Responsible	ROSETTI MARINO SPA Welding Dept. D. Cenacchi	РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА RUSSIAN MARITIME REGISTER OF SHIPPING 001 A. Landi

BEND TEST
Prova di piega

Date of Testing::28/09/2021
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *UNI EN ISO 5173:2012*

The test was performed using the Galdabini testing materials machine, model Quasar 600, s.n. VAUP/01 (2014)
La prova è stata eseguita utilizzando la macchina per prove materiali Galdabini, modello Quasar 600, s.n. VAUP/01 (2014)

Internal procedure *Procedura interna* ***:PP11 rev.05***

Specimen id. *Identificazione provino*		Dimension *Dimensioni (mm)*	Test Temp. *Temp.test °C*	Bend Angle *Angolo di piega*	Ø Former *ø Mandrino (mm)*	Distance between rollers *Distanza appoggi (mm)*	Remarks *Note*
470/2021 SBB	E	35,00x10,00	23,4°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone
470/2021 SBB	F	35,00x10,00	23,4°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone
470/2021 SBB	G	35,00x10,00	23,4°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone
470/2021 SBB	H	35,00x10,00	23,4°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone

Remarks *Note:* POSITION PH

Legend *Legenda*

SBB. = Transverse Side Bend/*Piega Trasversale laterale*
TRB. = Transverse Root Bend/*Piega Trasversale al rovescio*
TFB. = Transverse Face Bend/*Piega Trasversale al dritto*
LRB = Longitudinal Root Bend */ Piega Longitudinale al rovescio*
LFB. = Longitudinal Face Bend */ Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Buccheschi	Sig. Giulio Bagnara		
Laboratory Technician	INSPECTA srl	ROSETTI MARINO SpA	RS
28/09/2021	28-09-2021	Welding Dept. D. Cenacchi	280 001
	Service Responsible		

IMPACT TEST
Prova di resilienza

Date of Testing:28/09/2021
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* UNI EN ISO 9016:2012

The test was performed using the Galdabini Charpy pendulum machine, model Impact 450, s.n. VAUP/02
La prova è stata eseguita utilizzando macchina pendolo Charpy marca Galdabini, modello Impact 450, s.n. VAUP/02

Internal procedure *Procedura interna* :***PP09 rev.07***

Specimen id. *Identificazione provino*	Direction *Direzione*	Dimension *Dimensioni (mm)*	Test Temp. *Temp .test*	Notch Type *Intaglio*	Knife / *coltello*	Requirement / Requisiti: Energy absorbed / Energia assorbita – Individual *Individuale Joule* 1	2	3	Average *Media Joule*	U	Lateral Expansion *Espansione laterale (mm)* 1	2	3	Shear Area *Area fragile %* 1	2	3	Remarks *Note*
470/21 VWT 0/2	T	10x10x55	-60°C	V	2	51	56	78	62	/	//	//	//	//	//	//	CAP
470/21 VHT 0/2	T	10x10x55	-60°C	V	2	57	85	71	71	/	//	//	//	//	//	//	CAP
470/21 VHT2/2	T	10x10x55	-60°C	V	2	222	242	211	225	/	//	//	//	//	//	//	CAP
470/21 VHT 5/2	T	10x10x55	-60°C	V	2	291	286	306	294	/	//	//	//	//	//	//	CAP
470/21 VWT 0/23	T	10x10x55	-60°C	V	2	52	51	48	50	/	//	//	//	//	//	//	ROOT
470/21 VHT 2/23	T	10x10x55	-60°C	V	2	63	48	49	53	/	//	//	//	//	//	//	ROOT

Remarks *Note:* ***POSITION PC***

Legend *Legenda*

L= Longitudinal / Longitudinale
T= Trasversal / Trasversale
VWT 0/2 = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
VHT 0/2 = Impact Test on Fusion Line */ Resilienza Trasversale in linea di fusione*
VHT 1/2 = Impact Test at 1mm from Fusion Line */ Resilienza trasversale a 1 mm dalla linea di fusione*
VHT 2/2 = Impact Test at 2 mm from Fusion Line */ Resilienza trasversale a 2 mm dalla linea di fusione*
VHT 5/2 = Impact Test at 5 mm from Fusion Line */ Resilienza trasversale a 5 mm dalla linea di fusione*
WM = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
HAZ = Impact Test on Heat Affected Zone */ Resilienza Trasversale in zona termicamente alterata*
BM = Impact Test on Base Metal */ Resilienza Trasversale in materiale base*

FL = Fusion Line/ *Linea di fusione*
FL+1 = Fusion Line + 1mm/ *Linea di fusione+1mm*
FL+2 = Fusion Line + 2mm/ *Linea di fusione+2mm*
FL +5= Fusion Line + 5mm/ *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Bacchaschi	Sig. Giulio Bagnara		
- INSPECTA srl - Laboratory Technician 28/09/2021	- INSPECTA srl - 28-09-2021 Service Responsible	ROSETTI MARINO SPA Welding Dept. D. Cenacchi	РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА RUSSIAN MARITIME REGISTER OF SHIPPING 2800 PTC 001

IMPACT TEST
Prova di resilienza

Date of Testing:28/09/2021
Data esecuzione prova:

performed in accordance with the standard / eseguita in conformità alla norma UNI EN ISO 9016:2012

The test was performed using the Galdabini Charpy pendulum machine, model Impact 450, s.n. VAUP/02
La prova è stata eseguita utilizzando macchina pendolo Charpy marca Galdabini, modello Impact 450, s.n. VAUP/02

Internal procedure *Procedura interna* :**PP09 rev.07**

Specimen id. *Identificazione provino*	Direction *Direzione*	Dimension *Dimensioni (mm)*	Test Temp. *Temp .test*	Notch Type *Intaglio*	Knife / *coltello*	Requirement / Requisiti: Energy absorbed/ / Energia assorbita – Individual *Individuale Joule* 1	2	3	Average *Media Joule*	U	Lateral Expansion *Espansione laterale (mm)* 1	2	3	Shear Area *Area fragile %* 1	2	3	Remarks *Note*
470/21 VWT 0/2	T	10x10x55	-60°C	V	2	61	51	50	54	/	//	//	//	//	//	//	CAP
470/21 VHT 0/2	T	10x10x55	-60°C	V	2	160	146	189	165	/	//	//	//	//	//	//	CAP
470/21 VHT2/2	T	10x10x55	-60°C	V	2	232	282	293	269	/	//	//	//	//	//	//	CAP
470/21 VHT 5/2	T	10x10x55	-60°C	V	2	295	276	291	287	/	//	//	//	//	//	//	CAP
470/21 VWT 0/23	T	10x10x55	-60°C	V	2	64	61	59	61	/	//	//	//	//	//	//	ROOT
470/21 VHT 2/23	T	10x10x55	-60°C	V	2	102	64	95	87	/	//	//	//	//	//	//	ROOT

Remarks *Note:* **POSITION PH**

Legend *Legenda*

L= Longitudinal / Longitudinale
T= Trasversal / Trasversale
VWT 0/2 = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
VHT 0/2 = Impact Test on Fusion Line / *Resilienza Trasversale in linea di fusione*
VHT 1/2 = Impact Test at 1mm from Fusion Line / *Resilienza trasversale a 1 mm dalla linea di fusione*
VHT 2/2 = Impact Test at 2 mm from Fusion Line / *Resilienza trasversale a 2 mm dalla linea di fusione*
VHT 5/2 = Impact Test at 5 mm from Fusion Line / *Resilienza trasversale a 5 mm dalla linea di fusione*
WM = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
HAZ = Impact Test on Heat Affected Zone / *Resilienza Trasversale in zona termicamente alterata*
BM = Impact Test on Base Metal / *Resilienza Trasversale in materiale base*

FL = Fusion Line/ *Linea di fusione*
FL+1 = Fusion Line + 1mm/ *Linea di fusione+1mm*
FL+2 = Fusion Line + 2mm/ *Linea di fusione+2mm*
FL +5= Fusion Line + 5mm/ *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Bacalieschi	Sig. Giulio Bagnara		
INSPECTA SRL Laboratory Technician 28/09/2021	INSPECTA srl Service Responsible 28-09-2021	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА RUSSIAN MARITIME REGISTER OF SHIPPING 280 001

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::13/09/2021
Data esecuzione prova:

performed in accordance with the standard / eseguita in conformità alla norma UNI EN ISO 9015-1:2011

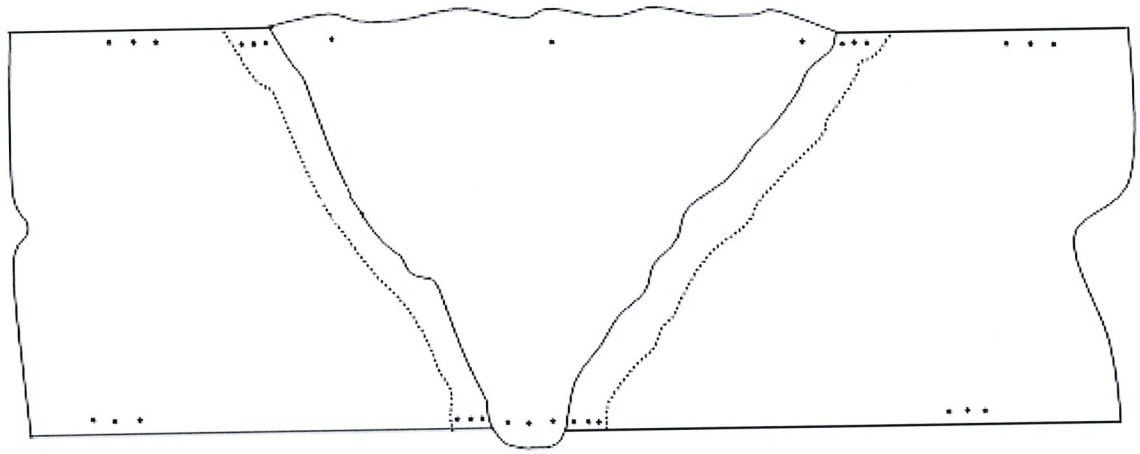
The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure / Procedura interna	PP10 rev.05	Sample Identification / Identificazione provino	470/21 A	Hardness test type / Tipo di durezza	HV10	Test Temp. / Temp.test	24,3°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: EN 10225 S460G1+M — **Base Material Side B: EN 10225 S460G1+M**

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6	7 – 8 – 9	10 – 11 – 12	13 – 14 – 15
16 – 17 – 18	19 – 20 – 21	22 – 23 – 24	25 – 26 – 27	28 – 29 – 30



Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U
1 – 2 – 3	276-264-277	/	16 – 17 – 18	254-249-209	/	//	//	/
4 – 5 – 6	285-277-283	/	19 - 20 – 21	227-239-209	/	//	//	/
7 – 8 – 9	240-225-225	/	22 – 23 – 24	204-208-236	/	//	//	/
10 – 11 – 12	239-241-245	/	25 - 26 – 27	222-216-212	/	//	//	/
13 – 14 – 15	260-264-266	/	28 – 29 – 30	253-259-269	/	//	//	/

Remarks/ *Note:* POSITION PC

Laboratory Technician / Tecnico di Laboratorio	Laboratory Responsible / Responsabile Laboratorio	Customer Inspector / Ispettore del cliente	Third part Inspector / Ispettore Terza parte
Dott. Ing. Mauro Baccheschi - INSPECTA srl - Laboratory Technician 28/09/2021	Sig. Giulio Bagnara - INSPECTA srl - Service Responsible 28-09-2021	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RS SURVEYOR РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА 28 09 001 RUSSIAN MARITIME REGISTER OF SHIPPING

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::13/09/2021
Data esecuzione prova:

performed in accordance with the standard / eseguita in conformità alla norma UNI EN ISO 9015-1:2011

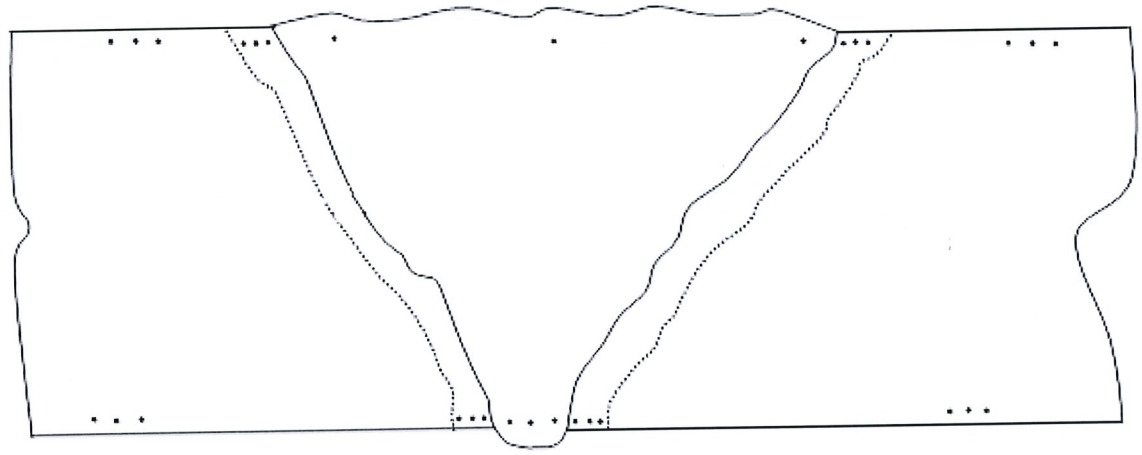
The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure / Procedura interna	PP10 rev.05	Sample Identification / Identificazione provino	470/21 C	Hardness test type / Tipo di durezza	HV10	Test Temp. / Temp.test	24,3°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: EN 10225 S460G1+M — **Base Material Side B: EN 10225 S460G1+M**

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6	7 – 8 – 9	10 – 11 – 12	13 – 14 – 15
16 – 17 – 18	19 – 20 – 21	22 – 23 – 24	25 – 26 – 27	28 – 29 – 30



Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U
1 – 2 – 3	248-245-233	/	16 – 17 – 18	229-220-229	/	//	//	/
4 – 5 – 6	212-235-248	/	19 - 20 – 21	205-210-210	/	//	//	/
7 – 8 – 9	264-241-269	/	22 – 23 – 24	221-223-220	/	//	//	/
10 – 11 – 12	257-235-213	/	25 - 26 – 27	217-213-210	/	//	//	/
13 – 14 – 15	237-235-235	/	28 – 29 – 30	229-237-237	/	//	//	/

Remarks/ *Note:* POSITION PH – H.3

Laboratory Technician / *Tecnico di Laboratorio*	Laboratory Responsible / *Responsabile Laboratorio*	Customer Inspector / *Ispettore del cliente*	Third part Inspector / *Ispettore Terza parte*
Dott. Ing. Mauro Bucchioschi INSPECTA srl Laboratory Technician 28/09/2021	Sig. Giulio Bagnara - INSPECTA srl - 28-09-2021 Service Responsible	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА 280 001 RUSSIAN MARITIME REGISTER OF SHIPPING

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::13/09/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* *UNI EN ISO 9015-1:2011*

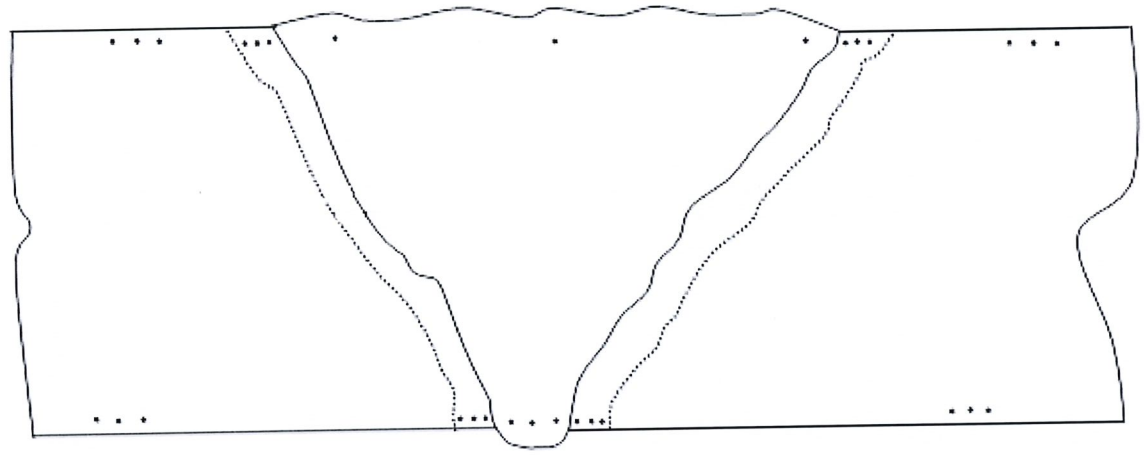
The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.05	**Sample Identification** *Identificazione provino*	470/21 D	**Hardness test type** *Tipo di durezza*	HV10	**Test Temp.** *Temp.test*	24,3°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: EN 10225 S460G1+M — **Base Material Side B: EN 10225 S460G1+M**

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6	7 – 8 – 9	10 – 11 – 12	13 – 14 – 15
16 – 17 – 18	19 – 20 – 21	22 – 23 – 24	25 – 26 – 27	28 – 29 – 30



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 – 3	272-272-261	/	16 – 17 – 18	251-256-240	/	//	//	/
4 – 5 – 6	215-250-249	/	19 - 20 – 21	207-221-226	/	//	//	/
7 – 8 – 9	265-286-279	/	22 – 23 – 24	222-239-220	/	//	//	/
10 – 11 – 12	258-236-250	/	25 - 26 – 27	226-225-219	/	//	//	/
13 – 14 – 15	250-251-258	/	28 – 29 – 30	237-234-240	/	//	//	/

Remarks/ *Note:* POSITION PH – H.6

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Bacchaschi	Sig. Giulio Bagnara	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RINA 280 001
INSPECTA srl Laboratory Technician 28/09/2021	- INSPECTA srl - Service Responsible 28-09-2021		

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::13/09/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* UNI EN ISO 17639:2013

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.03* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,3°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**470/2021 A**	**Magnification:** *Ingrandimento:*	**Photo at: 1.75x** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639 - A - E – 6 - 2.1 / 6 / 2.1 / A1**		



RINA

Remarks / *Note:*	**POSITION PC** **No defects have been found in Macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SPA Welding Dept. D. Cenacchi	RS surveyor
- INSPECTA srl - Laboratory Technician 28/09/2021	- INSPECTA srl - Service Responsible 28-09-2021		РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА 280 001 RUSSIAN MARITIME REGISTER OF SHIPPING

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::13/09/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* UNI EN ISO 17639:2013

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.03* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,3°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**470/2021 B**	**Magnification:** *Ingrandimento:*	**Photo at: 1.75x** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639 - A - E – 6 - 2.1 / 6 / 2.1 / A1**		



RINA 1861 RINA A. Landi

Remarks / *Note:*	**POSITION PC** **No defects have been found in Macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Marco Baccheschi	*Sig. Giulio Bagnara*		
INSPECTA srl Laboratory Technician 28/09/2021	- INSPECTA srl - Service Responsible 28-09-2021	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RS CLASS OR РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА 280 MOC 001 RUSSIAN MARITIME REGISTER OF SHIPPING CLASSREV

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::13/09/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* UNI EN ISO 17639:2013

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.03* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,3°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**470/2021 C**	**Magnification:** *Ingrandimento:*	**Photo at: 1.75x** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639 - A - E – 6 - 2.1 / 6 / 2.1 / A1**		



RINA A. Landi

Remarks / *Note:* **POSITION PH – H.3**
No defects have been found in Macro examination.

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*		
- INSPECTA srl -	- INSPECTA srl -	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА 280 001 RUSSIAN MARITIME REGISTER OF SHIPPING
Laboratory Technician	Service Responsible		
28/09/2021	28-09-2021		

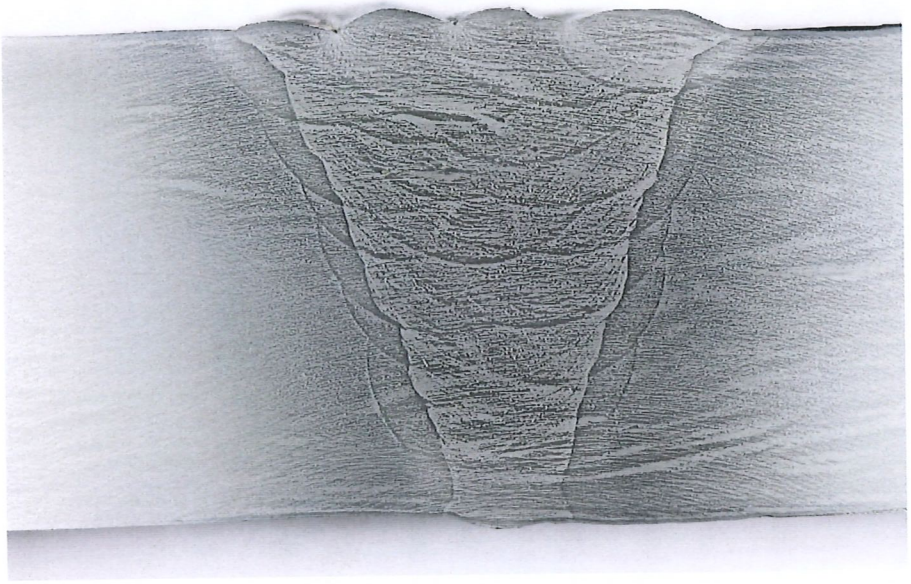
MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::13/09/2021
Data esecuzione prova:

performed in accordance with the standard / eseguita in conformità alla norma UNI EN ISO 17639:2013

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.03* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,3°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**470/2021 D**	**Magnification:** *Ingrandimento:*	**Photo at: 1.75x** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639 - A - E – 6 - 2.1 / 6 / 2.1 / A1**		



RINA
A. Landi

Remarks / *Note:*	**POSITION PH – H.6** **No defects have been found in Macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO S.p.A. Welding Dept. D.Cenacchi	RS Surveyor
- INSPECTA srl -	- INSPECTA srl -		РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА 280 001 RUSSIAN MARITIME REGISTER OF SHIPPING
Laboratory Technician 28/09/2021	Service Responsible 28-09-2021		

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::13/09/2021
Data esecuzione prova:

performed in accordance with the standard / eseguita in conformità alla norma UNI EN ISO 17639:2013

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.03* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,3°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**470/2021 E**	**Magnification:** *Ingrandimento:*	**Photo at: 1.75x** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639 - A - E – 6 - 2.1 / 6 / 2.1 / A1**		



RINA

Remarks / *Note:*	**POSITION PH – H.12** **No defects have been found in Macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO S.p.A. Welding Dept. D. Cenacchi	РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА 280 001 RUSSIAN MARITIME REGISTER OF SHIPPING D. LAZAREV
Laboratory Technician 28/09/2021	- INSPECTA srl - Service Responsible 28-09-2021		

END OF TEST REPORT
FINE DEL RAPPORTO DI PROVA

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2021-08-05 Numero certificato/Cert no: EC26516400 rev. 0

Nostro ordine/Our order:	0100324208	Vostro ordine/Your order:	CAMPIONATURA
Nostro riferimento/Our ref:	Davide Crotta	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB00060	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20210805	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address
AUTOFT.ART.17 ESAB SALDATURA SpA
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X
XXXXXXXXXX XXXXXXXXXX
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
ROSETTI MARINO SPA
VIA TRIESTE 230
48122 RAVENNA RA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PNV1710904 Quantità/Quantity: 80 KGM

PRODOTTO/PRODUCT

Marchio/Brand:	Filarc
Descrizione/Desc:	FILARC PZ6138 1.2mm 16kg
Codice/Item no:	**2580127730**

CLASSIFICAZIONE/CLASSIFICATIONS

EN ISO 17632-B: T 55 5 T1 M A N2 U H5
SFA/AWS A5.29: E81T1-Ni1M JH4
EN ISO 17632-A: T 50 6 1Ni P M21 1 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:	M21 (EN ISO 14175)
C	0.05%
Si	0.39%
Mn	1.24%
P	0.010%
S	0.013%
Cr	0.03%
Ni	0.89%
Mo	< 0.1%
Nb	0.02%
Cu	< 0.01%
V	0.02%

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:	EN ISO
Altro/Auxiliary:	M21 (EN ISO 14175)
Condizione/Condition:	As welded

TRAZIONE/TENSILE

Rp0.2	Rm	A5
577 MPa	616 MPa	29.0 %

RESILIENZA/IMPACT

Temp	-60 °C
KV	114 J

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura S.p.A. | Str. Provinciale 34, n.37 - 20010 Ossona MI, Italy

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis		Validazione - altro/Validation - Others	
Piotr Grela	Quality Assurance Manager	Neil Farrow	Product Manager

CIMOLAI

San Giorgio di Nogaro (UD)

WORKS TEST CERTIFICATE 3.2 (EN 10204:2005)

CERTIFICATO DI CONTROLLO 3.2 (EN 10204:2005)

CERT. No. / *ATTESTATO No.*: 2018237/VIS/07 rev. 01

DATE - *DATA*: 13/03/19

PAGE - *PAGINA*: 1 di 1

CLIENT / *CLIENTE*: **Rosetti Marino**

Cimolai JOB / *COMMESSA CIMOLAI*: **2018237**

P.O. No. / *Nr. ORDINE*: **1718001265 rev. 04**

PROJECT / *PROGETTO*: **Toulmount Platform**

We declare that the material hereunder listed has been produced and controlled in accordance with P.O. 1718001265 rev. 04 and documents referenced therein.

Order specifications: **EEMUA 158 III ed. 2015**

ITEM: See below

TYPE AND GRADE: See below

ENDS: Square ends

BASE MATERIAL: See plate cert.

PIPES DESCRIPTION AND TEST REPORTS TRACEABILITY

P.O. Item	Cimolai Mark	Nominal Dimensions (mm)	Grade	Heat Number	Plate Number	Plate certificate number	Supplier	Vis. and Dim. Number	VT Report Number	MT Report Number	UT Report Number	Mechanicat test Report Number	RT report Number	Hydrostatic test report number
40	18-5167	900 x 35 x 12000	EN 10225 : S460 G1 + M	710384	391371/1	A0362647	Voest Alpine	2018237-DIM-18-5167	2018237/VT/07	2018237/MT/07	2018237/UT/07	-	N.A.	N.A.
50	18-5177	900 x 25 x 12000	EN 10225:S355G9+M	904639	393418/1	A0362686	Voest Alpine	2018237-DIM-18-5177	2018237/VT/07	2018237/MT/07	2018237/UT/07	-	N.A.	N.A.
50	18-5178	900 x 25 x 12000	EN 10225:S355G9+M	904639	391769/1	A0362648	Voest Alpine	2018237-DIM-18-5178	2018237/VT/07	2018237/MT/07	2018237/UT/07	-	N.A.	N.A.
120	18-5231	800 x 20 x 12000	EN 10225:S355G9+M	710433	393545/2	A0362648	Voest Alpine	2018237-DIM-18-5231	2018237/VT/07	2018237/MT/07	2018237/UT/07	-	N.A.	N.A.
160	18-5254	700 x 30 x 12000	EN 10225:S355G9+M	815170	393438/1	A0362753	Voest Alpine	2018237-DIM-18-5254	2018237/VT/07	2018237/MT/07	2018237/UT/07	-	N.A.	N.A.
150	18-5255	700 x 30 x 12000	EN 10225:S460 G1 + M	814829	392546/2	A0362647	Voest Alpine	2018237-DIM-18-5255	2018237/VT/07	2018237/MT/07	2018237/UT/07	-	N.A.	N.A.
160	18-5256	700 x 30 x 12000	EN 10225:S355G9+M	815170	391748/1	A0362648	Voest Alpine	2018237-DIM-18-5256	2018237/VT/07	2018237/MT/07	2018237/UT/07	-	N.A.	N.A.
210	18-5270	600 x 30 x 11500	EN 10225:S355G9+M	904638	393353/21	A0362648	Voest Alpine	2018237-DIM-18-5270	2018237/VT/07	2018237/MT/07	2018237/UT/07	-	N.A.	N.A.

Cimolai Stamp:

SGS 05

SGS Italia S.p.A
WITNESSED ☐ REVIEWED ☐
DATE 13/03/2019
M. NOGARIN

CIMOLAI s.p.a.
Quality Control Department
Date 13/03/2019
Signature

Rev. 01: revised where underlined

Certificate Number: **VNA 1800122 / 12**
Page: 1 of 1

Inspection Certificate

Project: ----------
Client: **voestalpine Grobblech GmbH**
voestalpine-Straße 3, 4020 Linz, Austria

Office: **Vienna**

Clients Order Number: **8500978**

Date: **12-12-2018**

Order Status: **incomplete**

Inspection Dates
First: **22-11-2018**

final: **11-12-2018**

This certificate is issued to voestalpine Grobblech GmbH, Linz/Austria, to certify that the undersigned Surveyor attended their works Linz for the purpose of testing and inspecting the undernoted material with satisfactory results as stated below.

Purchaser: **CIMOLAI spa**
Corso Lino Zanussi 26
I-33080 PORCIA

Order No.: **2018102419 - Rev. 1**

Description:

14 piece(s) of steel plate(s) **99579 kg** , as per attached inspection Certificate no.: **A0362647**

Specification

S460G1+M EN 10225 : 2009

Heat treatment/Delivery Condition: thermomechanical rolled + accelerated cooled

Scope of inspection:

witness mechanical testing: yes ☑
review manufacturer's declared analysis: yes ☑
witness / verify ultrasonic examination: yes ☑ n/a ☐
witness / verify microstructure examination: yes ☐ n/a ☒
witness /verify corrosion testing: yes ☐ n/a ☒
random visual and dimensional control and check of hard stamping: yes ☑

Identification:

Makers Brand voestalpine
Material Quality
Heat No.
Plate No.
Brand of LR

06/02/2019 Review
ROSETTI MARINO SpA
Alberto Lucchi
Supply Management Dept.

SGS Italia S.p.A.
WITNESSED ☐ REVIEWED ☒
DATE .. 06/02/2019
M. NOGARIN

Lloyd's Register EMEA
Vienna Office
K. EDER
Lloyd's Register

Helmut Berger 14 DEC 2018
Surveyor to Lloyd's Register EMEA

a member of the Lloyd's Register group.

K. EDER

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Form 1123 (2017.07)

voestalpine Grobblech GmbH

A02
Inspection certificate
EN 10204 - 3.2

VNA1800122-12

Z02 Date 12-12-2018

voestalpine-Straße 3
4020 Linz, Austria
www.voestalpine.com/grobblech

A03 Document number	A0362647	A08 Order-No.:	8500978	A07 OrderDat.	24-10-2018

4F

A06 Customer	CIMOLAI spa Corso Lino Zanussi 26 I-33080 PORCIA	B01 Product	Plate		
		B02 Material	S460G1+M	B03 Standard	EN 10225 : 2009
A07 OrderNo.	2018102419 - Rev. 1	B04 Delivery condition	thermomechanical rolled + accelerated cooled		
A06 Consignee	CIMOLAI S.p.A. Via Ettore Maiorana 7 Zona Industr. I-33058 SAN GIORGIO DI NOGARO (UD)				

A10 - Supplementary information
TOLMOUNT

B03 - Supplementary requirements
MATERIAL IS FINE GRAINED, VACUUM DEGASSED AND FULLY KILLED, PRODUCED BY BOF // MATERIAL IS PRE-QUALIFIED AS PER EN10225 OPTION 18, ANNEX E // FINAL ROLLING DIRECTION IS PERPENDICULAR TO DIE STAMPING // MATERIAL IS ACCORDING TO AB-TO-ROS-TE-ST-SP-0006 REV.A01 AND AB-TO-PMO-TE-MT-SP-0001 REV.B01 // MATERIAL IS ACCORDING TO EN10225 OPTIONS 2, 6, 9, 12, 13, 15, 16 AND 18.

D01 - Visual Examination and dimensional checking: satisfactory. The results of tests performed are in compliance with the requirements.

Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Date of Tests	reference no.
709621	392543/1	120	30,00	2450,0	11050	1		6.400	76112	11-12-2018	2018237 01
709621	392543/2	120	30,00	2450,0	11050	1		6.397	76112	11-12-2018	2018237 01
709621	392547/2	120	30,00	2450,0	11050	1		6.377	76069	11-12-2018	2018237 01
710041	392221/2	120	30,00	2450,0	11050	1		6.397	76112	11-12-2018	2018237 01
710041	392221/1	120	30,00	2450,0	11050	1		6.398	76112	11-12-2018	2018237 01
710041	392222/2	120	30,00	2450,0	11050	1		6.397	76112	11-12-2018	2018237 01
710041	392222/1	120	30,00	2450,0	11050	1		6.397	76112	11-12-2018	2018237 01
710042	392544/21	180	30,00	2135,0	12050	1		6.063	75992	11-12-2018	2018237 01
710042	392544/11	180	30,00	2135,0	12050	1		6.066	75992	11-12-2018	2018237 01

SGS Italia S.p.A.
WITNESSED ☐ REVIEWED ☐
DATE 06/02/2019
M. NOGARIN

CIMOLAI S.p.A. QUALITY CONTROL
RECEIVED ☐
WITNESSED ☐ DATE 18.12.2018
REVIEWED ☐
SIGNATURE R. Sandini

A04
Symbol of the manufacturer's work

voestalpine

Z03
Stamp of the inspection representative

LR 14 DEC 2018
Lloyd's Register EMEA
Vienna Office
Initials: KE

Z02
Inspection representative voestalpine Grobblech
LINNER Norbert

06/02/2019
ROSETTI MARINO SpA
Alberto Lucchi
Supply Management Dept.
Review

voestalpine
ONE STEP AHEAD.

Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Date of Tests	reference no.
710384	391353/1	50	35,00	2745,0	12050	1		9.192	76134	22-11-2018	2018237 01
710384	391367/1	50	35,00	2745,0	12050	1		9.141	76134	22-11-2018	2018237 01
710384	391369/1	50	35,00	2745,0	12050	1		9.141	76134	22-11-2018	2018237 01
710384	391371/1	50	35,00	2745,0	12050	1		9.146	76134	22-11-2018	2018237 01
814829	392546/2	180	30,00	2135,0	12050	1		6.067	76023	22-11-2018	2018237 01
		Sum				14		99.579			

B14 - Supplementary information
Dimensional tolerances acc. EN 10029/10
Flatness acc. EN 10029/10 class N
EN10163-2: Class A3 - Repair-welding not permitted.
Thicknesstolerance acc. EN 10029/10 tab. 1 class A

Chemical composition (Heat analysis) - part 1 of 2

B07 Heat No.		C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %	Pb %	Cae %	Pcm %
	>=		.150				.015																
Set values	<=	.140	.550	1.650	.020	.0100	.055	.250	.700	.250	.300	.080	.040	.025	.0100	.0005	.0200	.0050	.0300	.0100	.010	.43	.22
709621		.036	.343	1.650	.006	.0004	.035	.166	.170	.023	.166	.004	.035	.012	.0052	.0002	.0020	.0019	.0020	.0020	.002	.37	.15
710041		.032	.327	1.620	.006	.0006	.030	.170	.170	.008	.158	.004	.035	.012	.0057	.0002	.0050	.0023	.0020	.0020	.002	.36	.15
710042		.030	.316	1.610	.005	.0004	.030	.162	.170	.007	.161	.004	.035	.012	.0048	.0002	.0070	.0021	.0020	.0020	.002	.36	.14
710384		.060	.364	1.500	.007	.0007	.037	.169	.260	.004	.162	.003	.027	.012	.0047	.0002	.0070	.0018	.0020	.0020	.002	.37	.17
814829		.030	.337	1.640	.007	.0010	.034	.187	.180	.010	.160	.004	.036	.012	.0053	.0002	.0050	.0022	.0030	.0020	.002	.37	.15

06/02/2019 reviewed
ROSETTI MARINO SpA
Alberto Lucchi
Supply Management Dept

SGS Italia S.p.A
WITNESSED ☐ REVIEWED ☐
DATE 06/02/2019
M. NOGARIN

CIMOLAI S.p.A. QUALITY CONTROL
RECEIVED ☐
WITNESSED ☐ DATE 18.12.2018
REVIEWED ☐
SIGNATURE R. Sandini

Z03
Stamp of the inspection representative

LR
14 DEC 2018
Lloyd's Register EMEA
Vienna Office
Initials: KE

Z02
Inspection representative voestalpine Grobblech
LINTNER Norbert

voestalpine
ONE STEP AHEAD.

Chemical composition (Heat analysis) - part 2 of 2

B07 Heat No.	LF01 %	LF02 %	LF03 %
Set values >=			
Set values <=	.090	.110	.900
709621	.039	.051	.525
710041	.039	.051	.506
710042	.039	.051	.500
710384	.030	.042	.595
814829	.040	.052	.537

C99 - Supplementary information
BI <= 0,01%
C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF03: Cr+Ni+Cu+Mo
LF02: Nb+V+Ti
LF01: Nb+V

06/02/2019 review
ROSETTI MARINO SpA
Alberto Lucchi
Supply Management Dept.

SGS Italia S.p.A.
WITNESSED ☐ REVIEWED ☒
DATE 06/02/2019
M. NOGARIN

QUALITY CONTROL
CIMOLAI S.p.A.
RECEIVED ☐
WITNESSED ☐ DATE 18.12.2018
REVIEWED ☑
SIGNATURE R. Sandini

Z03
Stamp of the inspection representative

LR 14 DEC 2018
Lloyd's Register EMEA
Vienna Office
Initials: KE

Z02
Inspection representative voestalpine Grobblech
LINTNER Norbert

voestalpine
ONE STEP AHEAD.

Test results: C10-C29 Tensile Test acc. EN ISO 6892-1

B07 Heat No.	B06 Plate No	C41 Width	SpThickn mm	C01 loc.	PosTh.	C02 Dir	C11 Reh MPa	C11 Rp0,2 MPa	C12 Rm MPa	L0	C13 E %	C11 Reh/Rm %	C11 Rp0,2/Rm %
Set values >=							420	420	520		17.0		
Set values <=									680			90.00	90.00
709621	392547	Ø	10.01	F	V	L		501	574	A5	25.8		87.28
	386817	30,0	30.11	F	O	T		528	600	A5	24.5		88.05
710041	392222	Ø	9.99	F	V	L		489	561	A5	29.7		87.22
	392222	30,0	30.08	F	O	T		518	578	A5	23.0		89.69
710042	392544	Ø	10.00	F	V	L		492	551	A5	29.4		89.20
	392544	30,0	29.97	F	O	T		528	588	A5	26.0		89.71
710384	391359	Ø	10.02	F	V	L		476	626	A5	26.4		76.14
	391363	Ø	10.00	F	V	L		458	621	A5	28.5		73.67
	391365	Ø	9.99	F	V	L		462	622	A5	28.7		74.24
	391359	30,0	35.31	F	O	T		503	652	A5	23.4		77.16
	391363	30,0	35.29	F	O	T		494	651	A5	23.2		75.87
	391365	30,0	35.42	F	O	T		491	657	A5	21.4		74.71
814829	392546	Ø	10.00	F	V	L	494	487	551	A5	29.8	89.55	88.30
	392546	30,0	30.09	F	O	T		512	580	A5	26.3		88.34

SpThickn: specimen thickness
C01;loc.:
F: Bottom
PosTh.: Pos Thickness
O: surface
V: ¼
C02;Dir:
L: longitudinal
T: transverse
C12; Rm: Tensile Strength
L0: gauge
A5: Length = 5.65 * sqr (area) mm
C13;E: elongation

06/02/2019 ROVIGO
ROSETTI MARINO SpA
Alberto Lucchi
Supply Management Dept.

SGS Italia S.p.A.
WITNESSED ☑ REVIEWED ☑
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M. NOGARIN

QUALITY CONTROL
CIMOLAI S.p.A.
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Inspection representative voestalpine Grobblech
LINTNER Norbert

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No.	B06 Plate No	C40 shape	C01 loc.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	samp.cond.
>=						-40	42	42	42	60	
Set values <=											
709621	392547	CV 10x10	F	O	T	-40	325	360	341	342	
710041	392222	CV 10x10	F	O	T	-40	350	341	354	349	
710042	392544	CV 10x10	F	O	T	-40	353	365	336	351	
710384	391359	CV 10x10	F	O	T	-40	337	344	353	345	
	391363	CV 10x10	F	O	T	-40	335	348	326	336	
	391365	CV 10x10	F	O	T	-40	335	331	331	332	
814829	392546	CV 10x10	F	O	T	-40	212	351	348	304	
>=						-40	29	29	29	46	
Set values <=											
709621	392547	CV 10x10	F	ZB2	T	-40	304	293	46	214	strain aged 5%, 60 min. at 250°C
710041	392222	CV 10x10	F	ZB2	T	-40	317	320	320	319	strain aged 5%, 60 min. at 250°C
710042	392544	CV 10x10	F	ZB2	T	-40	322	320	311	318	strain aged 5%, 60 min. at 250°C
710384	391361	CV 10x10	F	ZB2	T	-40	268	264	302	278	strain aged 5%, 60 min. at 250°C

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07	B06	C40	C01		C02	C03	C42	C42	C42	C43		
Heat No.	Plate No	shape	loc.	PosTh.	Dir	temp	SV	SV	SV	AV		samp.cond.
						°C	J	J	J	J		
>=						-40	29	29	29	46		
Set values <=												
814829	392546	CV 10x10	F	ZB2	T	-40	313	325	320	319	strain aged 5%, 60 min. at 250°C	

C40;shape:
CV 10x10: Test shape , Dimensions
C01;loc.:
F: Bottom
PosTh.: Pos Thickness
0: surface
ZB2: 2mm below surface
C02;Dir:
T: transverse
C42;SV: single value
C43;AV: average value
samp.cond.: sample condition

06/02/2019 REVIEW
ROSETTI MARINO SpA
Alberto Lucchi
Supply Management Dept.

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Chemical composition (Product analysis) - part 1 of 2

B07 Heat No.	B06 Plate No	C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %
>=			.150				.015													
Set values <=		.140	.550	1.650	.020	.0100	.055	.250	.700	.250	.300	.080	.040	.025	.0100	.0005	.0200	.0050	.0300	.0100
709621	386817	.037	.332	1.650	.008	.0013	.034	.179	.180	.027	.166	.004	.035	.012	.0065	.0002	.0020	.0018	.0030	.0020
710041	392222	.030	.328	1.610	.006	.0010	.027	.174	.170	.008	.156	.003	.035	.011	.0066	.0002	.0020	.0020	.0020	.0020
710042	392544	.029	.332	1.630	.007	.0008	.032	.180	.180	.008	.160	.004	.037	.013	.0051	.0003	.0040	.0018	.0030	.0020
710384	391359	.058	.357	1.510	.007	.0007	.041	.175	.270	.004	.160	.003	.026	.012	.0035	.0002	.0020	.0016	.0020	.0020
	391363	.057	.362	1.510	.007	.0007	.040	.175	.260	.003	.161	.003	.027	.012	.0037	.0002	.0020	.0015	.0030	.0020
814829	392535	.029	.335	1.600	.007	.0011	.033	.182	.180	.009	.157	.004	.035	.012	.0045	.0002	.0020	.0018	.0030	.0020

Chemical composition (Product analysis) - part 2 of 2

B07 Heat No.	B06 Plate No	Pb %	Cae %	Pcm %	LF01 %	LF02 %	LF03 %
>=							
Set values <=		.010	.43	.22	.090	.110	.900
709621	386817	.002	.38	.15	.039	.051	.552
710041	392222	.002	.36	.14	.038	.049	.508
710042	392544	.002	.36	.14	.041	.054	.528
710384	391359	.002	.37	.17	.029	.041	.609
	391363	.002	.37	.17	.030	.042	.599
814829	392535	.002	.36	.14	.039	.051	.528

C99 - Supplementary information
BI <= 0,01%

C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF03: Cr+Ni+Cu+Mo
LF02: Nb+V+Ti
LF01: Nb+V

06/02/2019 REVIEW

SGS Italia S.p.A.
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DATE 06/02/2019
M. NOGARIN

Remarks

ROSETTI MARINO SpA
Alberto Lucchi
Supply Management Dept.

CIMOLAI S.p.A. QUALITY CONTROL
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Remarks

We confirm that the above-mentioned delivery corresponds to the order (and standard).

C70 - Method of steelmaking: Basic oxygen furnace (BOF) steelmaking, continuous casting, steel is fully killed, vacuum degassed and melted by fine grain practice, austenitic grain size 5 or finer.

The signature of the inspection representative from voestalpine Grobblech GmbH is substituted by a electronic Signature, because the certificates of voestalpine Grobblech GmbH are prepared by a suitable data processing system (EN 10204, Pt.5).

QUALITY CONTROL
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06/02/2019

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Alberto Lucchi
Supply Management Dept.

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D02-D50 - ULTRASONIC EXAMINATION PLATE(S)

SPECIFICATION

Ultrasonic test acc. EN 10160, EN 10160 class S1/Body, Grid 200 mm, EN 10160 class E2/Edge Zone, Edge zone longitudinal 50 mm, Edge zone transverse 50 mm; satisfactory

VALID TEST EQUIPMENT
mechanized ultrasonic "In-Line testing system" (Manufacturer: NDT-Systems & Services) and
mechanized ultrasonic "off-line - testing system" (manufacturer: Windhoff Bahn- und Anlagentechnik GmbH) and
MUT (optional): Sonatest D20 no. 90006523 or Sonatest D20 no. 90007346 or Sonatest Masterscan 380 no. 90007347 or Sonatest Masterscan 380 no. 90006522 or Sonatest D50 no. 90010231 or GE - USM 36 no. 90010775

PROBE
(in-line AUT): 3STSE 18.3/8 P5, SEZ5R10RS, SE3 18.3/10 5A, (5MHz)
(off-line AUT): S140 (4MHz) 3T/1R
(MUT): SEB4E (4MHz), SEB4E0° (4MHz), MSEB4E (4MHz), B2SO (2MHz)
watergapcoupling

SURFACE CONDITION
Scaled surface - cleaned surface and free of loose scale.

RESULT
Plate(s) comply with the specification.

INSPECTION OPERATOR
Operators Level 1 or 2: qualified and certified according EN ISO 9712 (since 01.01.2013) respectively according the Written Practice „NDT-WP" (in accordance to Recommended Practice SNT-TC-1A). Operators Level 2 for ASME/ASTM.

INSPECTION SUPERVISOR
Responsible Level 3: Bindreiter Erich

06/02/2018 ROSETTI MARINO SpA Alberto Lucchi Supply Management Dept.

SGS Italia S.p.A. WITNESSED ☐ REVIEWED ☒ DATE 06/02/2018 M. NOGARIN

CIMOLAI S.p.A. QUALITY CONTROL RECEIVED ☐ WITNESSED ☐ DATE 18.12.2018 REVIEWED ☒ SIGNATURE R. Sandini

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Z02 Inspection representative voestalpine Grobblech LINTNER Norbert

voestalpine ONE STEP AHEAD.

CIMOLAI
Pordenone - Italy
Site: San Giorgio di Nogaro (UD) - ITALY

DIMENSIONAL CONTROL REPORT

RAPPORTO DI CONTROLLO DIMENSIONALE

REPORT No.	2018237-DIM-18-5167
REV.	0
DATE - *DATA*	22.02.2019
PAGE - *PAGINA*	1 of 1

INTERNAL JOB / COMMESSA INTERNA	OPERATING PROCEDURE / PROCEDURA OPERATIVA	PIPE N.	NOMINAL DIMENSION		
			NOMINAL DIAMETER	NOMINAL THICKNESS	NOMINAL LENGHT
2018237	IOP-DIM-2018237-01 (118A50-1265-QA-P03-0003)	18-5167	900	35	12000

REFERENCE STANDARD	CLIENT ITEM
EEMUA 158 ed.3	40

DIAMETER	NOMINAL DIAMETER	TOLERANCE				ACTUAL MEASUREMENT							
		ENDS		BODY		END A	1/3 L	2/3 L	END B	END A	1/3 L	2/3 L	END B
		LOWER LIMIT	UPPER LIMIT	LOWER LIMIT	UPPER LIMIT	DIAMETER CALCULATED BASED ON CIRCUMFERENCE MEASUREMENT				DIAMETER CALCULATED BASED ON AVERAGE DIAMETER			
	900	896,8	903,2	895,2	904,8	899,9	900,7	900,5	899,9	899,8	900,7	900,5	899,9

OUT OF ROUNDNESS (OVALITY)	TOLERANCE	ACTUAL MEASUREMENT											
		END A			1/3 L			2/3 L			END B		
	OVALITY	MIN. DIAMETER	MAX DIAMETER	OVALITY	MIN. DIAMETER	MAX DIAMETER	OVALITY	MIN. DIAMETER	MAX DIAMETER	OVALITY	MIN. DIAMETER	MAX DIAMETER	OVALITY
	6,8	895,8	901,8	6,0	899,5	901,9	2,4	898,5	903,0	4,5	898,4	900,9	2,5

THICKNESS	NOMINAL THICKNESS	TOLERANCE		ACTUAL MEASUREMENT	
		LOWER LIMIT	UPPER LIMIT	MIN. THICKNESS	MAX THIKNESS
	35	34,3	-	34,4	35,9

LENGHT	NOMINAL LENGHT	TOLERANCE		ACTUAL MEASUREMENT
		LOWER LIMIT	UPPER LIMIT	
	12000	12000	12020	12020

FULL-LENGHT STRAIGHTNESS	TOLERANCE	ACTUAL MEASUREMENT
	UPPER LIMIT	
	10,0	10,0

LOCAL OUT OF STRAIGHTNESS	TOLERANCE	ACTUAL MEASUREMENT
	UPPER LIMIT	
	-	2,0

OUT OF SQUARENESS	TOLERANCE	ACTUAL MEASUREMENT	
	UPPER LIMIT	END A	END B
	3,0	0	0

EXTERNAL WELD BEAD HEIGHT	TOLERANCE		ACTUAL MEASUREMENT			
	LOWER LIMIT	UPPER LIMIT	END A	1/3L	2/3L	END B

WELD EDGE MISALIGNMENT	TOLERANCE	ACTUAL MEASUREMENT			
	UPPER LIMIT	END A	1/3L	2/3L	END B

LOCAL OUT OF ROUNDNESS	TOLERANCE	ACTUAL MEASUREMENT			
	UPPER LIMIT	END A	1/3L	2/3L	END B

END BEVEL ANGLES	TOLERANCE		ACTUAL MEASUREMENT	
	LOWER LIMIT	UPPER LIMIT	END A	END B
	90°	90°	90°	90°

NOTES:
All dimensions are expressed in mm
The report was automatically generated and is valid without signature of the manufacturer

FIELD FOR THIRD PARTY OR CLIENTS SIGNATURE

SGS ITALIA S.p.A.
WITNESSED ☐ REVIEWED ☒
MONITORING SW ☐
DATE 27 FEB. 2019
5

Manufacturer's Welding Procedure. Ref. no. Спецификация изготовителя сварного соединения испытаний рег. №	**07/21-A REV. 0**		
Manufacturer Производитель	ROSETTI MARINO S.p.A.		
Address Адрес	VIA TRIESTE 230 - 48121 RAVENNA		
Code, Testing Standard Нормы и правила, стандарты испытаний	GOST R ISO 15614-1 2009; ND No. 2-020201-015, ND No. 2-020101-138, ND No. 2-020101-139		
	Location of test specimen according to GOST R ISO 15614-1 2009 Section 7.2, Fig. 5 Essential variables according to GOST R ISO 15614-1 2009, Section 8		
Date of welding Дата сварки	Start: Sept 16th , 2021 Complete: Sept 17nd , 2021		
Examiner of examining body Инспектор или инспекционный орган	RINA		
RANGE OF QUALIFICATION / ПРОТОКОЛ РЕЗУЛЬТАТОВ ИСПЫТАНИЙ			
Welding process Способ сварки	136 – FCAW		
Type(s) Тип (ы)	Semiautomatic		
Welding Equipment Type Тип сварочного оборудования	Machine – see as run		
Actual parent Material side A Основной материал сторона А	Pipe: API 5L L450M PSL2 (Heat: G11162)		
Actual parent Material side B Основной материал сторона Б	Pipe: API 5L L450M PSL2 (Heat: G11162)		
Parent Material grade Категория основного материала	Carbon steel Gr. 2 ISO 15608		
Supply condition Состояние поставки	SEAM WELDED PIPE		
Cev Углеродный эквивалент топлива	Heat Value: 0,41		
Groove design/configuration Калибровка / конфигурация валиков	Single Vee Butt Joint for groove dimension and details see As-Run Sheet		
Parent material thickness (mm) Толщина основного материала (мм)	Machined from 18,3 to 12 mm		
Weld metal thickness (mm) Толщина металла шва (мм)	136 - FCAW 12 mm		
Single or Multi-pass Один проход или много проходов	136 - FCAW (Multi pass)		
Outside diameter Внешний диаметр	660,4 mm		
Filler material Designation Присадочный материал обозначение	136 FCAW RS: 5Y46MS H5 (E81T1-Ni1M JH4) - EN ISO 17632-A: T 50 6 1Ni P M21 1 H5		
Filler material Maker Присадочный материал марка	136 – ESAB FILARC PZ6138		
Filler material Size Присадочный материал размер	136 – FCAW ∅ 1,2 mm		
Shielding gas/Flux Защитный газ / флюс	ISO 14175 :2008 M21 (80% Ar + 20% CO_2) for FCAW		
Shielding gas flow rate Расход защитного газа / флюса	16-22 l/min.		
Backing gas (purging) Газ для защиты обратной стороны (продувки)	None		
Type of welding current & polarity Тип сварочного тока и полярность	DC – RP		

IIW
A.KHALIFA
IWT 070134A
INTERNATIONAL WELDING TECHNOLOGIST

Welding parameters **Параметры сварки**	Pass Проход	Diameter / Диаметр Mm / мм	[A]	[V]	[mm/min] [мм/мин]	H.I. [kJ/mm]
	Root Корневой	∅ 1,2 (FCAW)	165-185	23	50-70	2.60-4.08
	Hot Горячий	∅ 1,2 (FCAW)	200-235	25-26	150-400	0.70-1.58
	Filll & Cap Присад. и Верхний	∅ 1,2 (FCAW)	185-215	25-27	200-250	0.88-1.07

Welding position **Положение сварки**	PC-PH (136- FCAW)		
Preheat (°C) **Предварительный подогрев (°C)**	50	**Interpass temperature (°C)** **Температура между проходами (°C)**	250
Post-Weld Heat Treatment and/or ageing **Термообработка после сварки и/или старение**	None		
Weld bead width **Толщина наплавленного валика**	Max. 16 mm (136-FCAW)		
Welder's detail **Данные сварщика**	Bolognesi Giugliano, Stamp: GX11		
Time lapse between root and hot pass **Промежуток времени между корневым и горячим проходом**	N.A.		
Other information **Другая информация**	- Preheat performed by propane torch -Accelerated weld cooling not used; -Base material origin: pipe API 5L L450M PSL2		



Manufacturer's Welding Procedure. Ref. no. Спецификация испытаний сварного соединения изготовителя рег. №	07/21-A REV. 0		
Test result (WPQR) N° Протокол результатов испытаний №	07/21-A	Date/Дата	23/11/2021
Manufacturer's WPS No. Спецификация испытаний сварного соединения изготовителя №	pWPS 07/21 REV. 0	Date/Дата	17-09-2021

TESTS CARRIED OUT ON SAMPLE 07/21-A WELDED IN 2G+5G POSITION (PC+PH)
ИСПЫТАНИЯ, ПРОВЕДЕННЫЕ НА ОБРАЗЦЕ 07/21-A СВАРКА В ПОЛОЖЕНИИ 2G+5G (PC+PH)

NON DESTRUCTIVE EXAMINATIONS
НЕРАЗРУШАЮЩИЕ ИСПЫТАНИЯ

	Judgement Результат	Report No. Отчет №
Visual examinations Визуальный контроль	Satisfactory	07-21-A
Penetrant test Испытания проникающей жидкостью	N.A.	/
Magnetic particle test Дефектоскопия магнитными частицами	Satisfactory	21174MT09SZ
Radiographic test Радиографическая дефектоскопия	Satisfactory	21174RT11SZ-21174RT12SZ
Ultrasonic test Ультразвуковая дефектоскопия	Satisfactory	21174UT10RZ-21174UT11RZ

TENSILE TEST
ИСПЫТАНИЕ НА РАСТЯЖЕНИЕ

Specimen type and No. Стандартный образец тип и №	$R_{P0,2\%}$ [N/mm2]	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 535	A [%]	Z [%]	Fracture Location Место разрушения	Remarks Примечания
TRANSVERSE 531/21 A ПОПЕРЕЧНОЕ	/	/	624	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PC
TRANSVERSE 531/21 B ПОПЕРЕЧНОЕ	/	/	613	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PC
TRANSVERSE 531/21 C ПОПЕРЕЧНОЕ	/	/	615	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PH
TRANSVERSE 531/21 D ПОПЕРЕЧНОЕ	/	/	629	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PH

BEND TEST
ИСПЫТАНИЯ НА ИЗГИБ

Type & N. Тип и №	Bend angle Угол загиба	Remarks Примечания	Results Результат
4 Side bend Pos. PC 4х сторонний загиб PC	180°	Former Ø 40 mm Исходный Ø 40 мм	Satisfactory
4 Side bend Pos. PH 4х сторонний загиб PH	180°	Former Ø 40 mm Исходный Ø 40 мм	Satisfactory

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IMPACT TEST
ИСПЫТАНИЯ НА УДАРНЫЙ ИЗГИБ

Specimen Dimensions (mm) Размеры стандартного образца (мм)	Notch Locations / Direction Расположение / направление надреза	Notch Type Тип надреза	Test Temp. (°C) Температура испытания (°C)	Absorbed energy [J] Поглощенная энергия [J]			Average value [J] Среднее значение [J]	Lateral expansion [mm] Поперечное расширение [мм]	Remarks Примечания
10x10x55	Weld metal PC	KV2	-60°C	58	69	58	62	/	/
10x10x55	Fusion Line PC	KV2	-60°C	114	110	120	115	/	/
10x10x55	FL +2 PC	KV2	-60°C	235	238	253	242	/	/
10x10x55	FL+5 PC	KV2	-60°C	234	237	231	234	/	/
10x10x55	Weld metal PH	KV2	-60°C	70	55	49	58	/	/
10x10x55	Fusion Line PH	KV2	-60°C	114	183	125	141	/	/
10x10x55	FL +2 PH	KV2	-60°C	142	165	286	198	/	/
10x10x55	FL+5 PH	KV2	-60°C	248	318	253	273	/	/

OTHER TESTS
ДРУГИЕ ИСПЫТАНИЯ

Type of test Тип испытания	Results / Результат
Macro examination & Hardness test Осмотр макрошлифов и измерение твердости	Satisfactory-See Inspecta report No. 415-00103-21 Dated 23/11/2021
Welding test conducted by Сварочные испытания проведены	Rosetti Marino S.p.A. – Ravenna
Mechanical test conducted by Механические испытания проведены	Inspecta s.r.l.
Laboratory report reference N. Ссылка на лабораторный отчет №	Inspecta report No. 415-00103-21
Test carried out in the presence of: Испытания проводятся в присутствии:	RINA

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of GOST R ISO 15614-1 2009, RS RULES: ND No. 2-020201-015, ND No. 2-020101-138, ND No. 2-020101-139

Date/Дата
25/11/2021

IIW A.KHALIFA IWT 070154A INTERNATIONAL WELDING TECHNOLOGIST

ROSETTI MARINO S.p.A.

Examiner or Examination Body/ Инспектор или инспекционный орган
RINA Services S.p.A.

RINA F. Lago RINA Services S.p.A.

Name and signature / Имя и подпись

ROSETTI MARINO

pWPS 07/21
PRELIMINARY WELDING PROCEDURE SPECIFICATION
(EN ISO 15609-1)

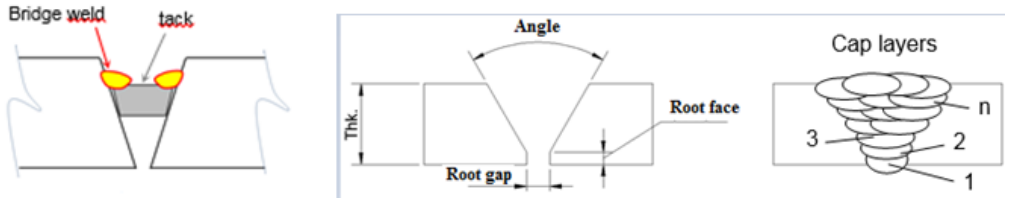
TEST CODE	GOST R ISO 15614-1-2009	TEST SPEC	ND 2-020201-015, ND No. 2-020101-139

Сварочный процесс: Welding process:	136 FCAW	Тип : Type:	SEMIAUTOMATIC	scopo : scope:	CJP, BW

GIUNTO - JOINT

Вид соединения: Joint Design:	V	☐ DOULBE SIDED WELD	☒ Single sided weld

Детали / Details:



BEVEL GOST ISO 9692-1

Root face 1.0±0.5 mm
Root gap 4.5 ± 2.5mm
Angle 40°-45°

Note:

1) The bullets for tacking shall be take from Carbon steel pipe. Minimum tack welds 2 times of wall thickness or 50 mm whichever is less / *Usare per i tacchetti materiale in acciaio al carbonio. Minima lunghezza delle puntature 2 volte lo spessore o 50 mm, quale dei due è più piccolo.*
2) The alignment of pipe ends shall be such as to minimize the internal offset between surfaces/ *L'allineamento dei tubi deve essere tale da minimizzare il disallineamento.*
3) Surfaces cleaned from moisture, oil, grease, paint. The cleaning shall be extend 75 mm from bevel end on internal and external surface. /*Pulire le superfici da sporcizia, oli e grassi. La pulizia deve essere estesa per 75 mm dal bordo del tubo sia sulla superfice esterna che interna.*

ОСНОВНОЙ МЕТАЛЛ - BASE MATERIAL

EN 10225-S460 G2+M, CRS ISO 15608 GR.2	Material grade / Типа и сорта:	Up to PCF 460 / DC1/DC2/DC3/DC4	Max Cev 0.43

Диапазон толщин / Thickness range:	► Основной металл / Base material:	полным проплавлением / groove	12 mm MACHINED FROM 18mm
	► Диапазон диам. труб / Pipe dia. Range:	полным проплавлением / groove	660mm

METALLO D'APPORTO - FILLER METAL

	136 - GS FCAW	
Spec. N° (SFA) / Спецификация №	5Y46MS H5	
(CLASS)(класс)	T 50 6 1Ni P M21 1 H5	5.29/5.36 - E81T1-M21A8-Ni1-H4
F-N°	6	
A-N°	10	
Размер присадочного материала / Size of filler metal	1,2	
Metallo depositato / Deposit weld metal	Up to 12 mm	
Диапазон толщин /Thick. range		
Флюс, Торговая марка / FLUX trade name	NA	
Применяемая вставка / Consumable insert	NA	
прочее Торговая Марка / other TRADE NAME:	Wire: ESAB FILARC PZ 6138 BÖHLER DIAMONDSPARK Ni1 RC	

ТИП СОЕДИНЕНИЯ / JOINT	Cianfrino / groove	ПОЗИЦИЯ / position	PC+PF / 2G+5G	Сварочный прогрес / Progression	UPHILL ↑

PRERISCALDO - PRE-HEAT (QW406)

Мин. Предварительная температура : Min. pre-heat temp:	50°C	Максимальная Межваликовая Max interpass temp.:	250°C

ПОСЛЕСВАРОЧНАЯ ТЕРМООБРАБОТКА - POST WELD HEAT TREATMENT: NO/НЕТ

GAS DI PROTEZIONE - GAS

	GAS/ ГАЗ	МИКСТУРА Mixture	норма. / Flow rate
Защита / Shielding:	Ar+CO2	80-20	12-20lt/1'
Перемещение / Trailing:	N.A.	N.A.	N.A.
Поддержка / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Ток / Current :	DC -CV	ПОЛЯРНОСТЬ / Polarity	RP
Вольфрам Электрод Тип и размер / Tungsten elctr. Size & type:			N.A.
Металл метод GMAW / GMAW metal tranfer mode:			Spray arc
Проводной диапазон скорости подачи / Electr. Wire feed speed range:			self regulatd

TECNICA - TECHNIQUE

ВАЛИК : Bead:	Tirata/String	Диаметр сопла Orifice of gas cup size:	½"	Начальная и межпроходная Initial and interpass cleaning:	Spazzolatura e Molatura/Brushing Grinding
Метод обратной зачистки Method of back gouging:	N.A.	Колебание: Oscillation:	N.A.	Контакт и рабочее расстояние: Contact tube to work distance:	12-18 mm
Номер прохода : Passes nr.:	Multipla/Multiple	Многократные или отдельные электроды: Multiple or single electrodes:	Singolo/Single	НАКЛЕП: Peening:	N.A.

Altro / Other:

Номер прохода Weld layers nr.	Процесс Process	Присадочный металл Filler metal		Показатели Current		Вольт Volt range	Скорость сварки Travel speed range (mm/min)	Тепловложение Heat input (KJ/mm)
		Класс / Class	Dia. (mm.)	ПОЛЯРНОСТЬ / Polarity	Amp. range			
Root - Hot	GS FCAW	5Y46MS H5	1,2	RP	160-220	25-27	140-220	0.87-1.85
FILL- CAP	GS FCAW	5Y46MS H5	1,2	RP	180-230	24-27	160-300	0.60-1.86
FILL- CAP	GS FCAW	5Y46MS H5	1,2	RP	220-270	24-28	180-440	0.60-2.00

ROSETTI - prepared by:

A.KHALIFA

ROSETTI MARINO

PQR - AS- RUN PARAMETER SHEET

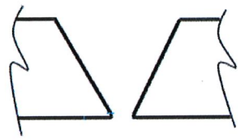
pWPS 07/21	
PQR 07/21	
Coupon Nr. 07/21 PC A	
Date: 16/09/2021	Page: 1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: **GOST R ISO 15614-1 2009, ND 2-020201-015-E, ND No. 2-020101-138-E Spec.**

Welder Name(s):	BOLOGNESI GIULIANO	Welder Id No(s):	GX11
Welding Process(es):	136-FCAW	Type(s):	PARTLY MECHANIZED
Welding Position:	PC (2G)	Progression:	N.A.
Base Materials:	API 5L L450M PSL2	Wall Thickness:	12 mm
Heat No(s):	G11162	Joint Type:	SINGLE V BUTT JOINT SINGLE SIDE WELDING WITHOUT BACKING

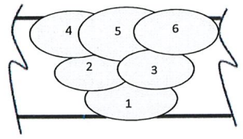
Diameter: 660,4 mm

WELD PREPARATION:



Angle: 50° ; Root gap: 4,5 mm ; Root face: 1,5 mm

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNV1710904	ESAB FILARC PZ 6138
Hot passes	1,2	PNV1710904	ESAB FILARC PZ 6138
Fill/ Cap	1,2	PNV1710904	ESAB FILARC PZ 6138

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar - 20%CO2
Flow:	16 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	1/2"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Preheat Method:	Max Interpass Temperature:	Check / Control Method:
50°C PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
14 mm	String		Multiple	Single

Heat Treatment Required	Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
NA	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
NA	1	FCAW	1	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	160	170	165,0	22	24	23,0	-	-	7	2,60	0,80	50	INE KME 5000
NA	2	FCAW	2	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	230	240	235,0	25	27	26,0	-	-	40	0,73	0,80	110	Grinding between passes performed by manual tools
NA	2	FCAW	3	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	230	240	235,0	25	27	26,0	-	-	25	1,17	0,80	170	Pipe Thickness machined from 18,3 mm to 12 mm
NA	3	FCAW	4÷6	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	210	220	215,0	25	27	26,0	-	-	25	1,07	0,80	250	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA Welding Dept. D. Cenacchi	Signature:	Signature: RINA	Signature:
Date:	Date:		Date:

ROSETTI MARINO

PQR - AS- RUN PARAMETER SHEET

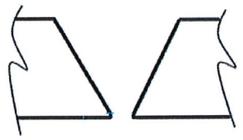
pWPS 07/21	
PQR 07/21	
Coupon Nr. 07/21 PH A	
Date: 17/09/2021	Page: 1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: **GOST R ISO 15614-1 2009, ND 2-020201-015-E, ND No. 2-020101-138-E Spec.**

Welder Name(s):	BOLOGNESI GIULIANO	Welder Id No(s):	GX11
Welding Process(es):	136-FCAW	Type(s):	PARTLY MECHANIZED
Welding Position:	PH (5G)	Progression:	VERTICAL UPHILL
Base Materials:	API 5L L450M PSL2	Wall Thickness:	12 mm
Heat No(s):	G11162	Joint Type:	SINGLE V BUTT JOINT SINGLE SIDE WELDING WITHOUT BACKING

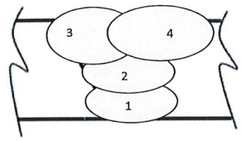
Diameter: 660,4 mm

WELD PREPARATION:



Angle: 50° ; Root gap: 4,5 mm ; Root face: 1,5 mm

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNV1710904	ESAB FILARC PZ 6138
Hot passes	1,2	PNV1710904	ESAB FILARC PZ 6138
Fill/ Cap	1,2	PNV1710904	ESAB FILARC PZ 6138

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar - 20%CO2
Flow:	16 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	1/2"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Preheat Method:	Max Interpass Temperature:	Check / Control Method:
50°C	PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
16 mm	String		Multiple	Single

Heat Treatment Required	Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
NA	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
NA	1	FCAW	1	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	180	190	185,0	22	24	23,0	-	-	5	4,08	0,80	50	INE KME 5000
NA	2	FCAW	2	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	195	205	200,0	23	25	24,0	-	-	15	1,54	0,80	110	Grinding between passes performed by manual tools
NA	3	FCAW	3	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	180	190	185,0	23	25	24,0	-	-	20	1,07	0,80	190	Pipe Thickness machined from 18,3 mm to 12 mm
NA	3	FCAW	4	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	180	190	185,0	23	25	24,0	-	-	20	1,07	0,80	250	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA Welding Dept. D.Cerlacchi	Signature:	Signature: RINA A. Landi	Signature:
Date:	Date:	Date:	Date:

Vedi 1380

ROSETTI MARINO	**ОТЧЕТ О ПРОВЕДЕНИИ ВИЗУАЛЬНОЙ ПРОВЕРКИ И КОНТРОЛЯ РАЗМЕРОВ visual/dimensional inspection report**	VDR N° **07-21** дата: 21/09/2021
проект project **D33**	Заказчик client **LUKOIL**	№ проекта job **121A00**

наименование – item

Procedure Qualification Record (WPQR) 07/21

СЕРТИФИКАТ ПРОТОКОЛА АТТЕСТАЦИИ СВАРОЧНОЙ ТЕХНОЛОГИИ (WPQR) 07/21

WE CERTIFY THAT:

ITEMS INDICATED ABOVE HAVE UNDERGONE A VISUAL INSPECTION AND HAVE BEEN ACCEPTED ACCORDING TO THE SPECIFICATION / PROCEDURE MENTIONED AND TO ACCEPTANCE CRITERIA DEFINED IN IT

Настоящим

ПОДТВЕРЖДАЕТСЯ, ЧТО ВЫШЕУКАЗАННЫЕ СВАРНЫЕ ШВЫ ПРОШЛИ 100% ВИЗУАЛЬНЫЙ ОСМОТР И БЫЛИ УТВЕРЖДЕНЫ В СООТВЕТСТВИИ С УКАЗАННЫМИ ТЕХНИЧЕСКИМИ ХАРАКТЕРИСТИКАМИ И СТАНДАРТАМИ.

примечания – remarks

Inspection on welds Diameter 660 mm and 12 mm WT in as welded condition.

- Half sample 180° (part A) has been welded with FILARC PZ6138 If sample 180° with Bohler diamond Ni1 for PC-2G position
- Half sample 180° (part A) has been welded with FILARC PZ6138 and half sample 180° with Bohler diamond Ni1 for PH-5G for position.

No visible defects have been detected.

результат - result ☒ соответствует - conforming ☐ не соответствует - not conforming

Процедура/ применяемые спецификации - applicable procedures / specifications

Appendix 1,Table 5 of 0D33-П-10-КМ-1-002-0010-09981 /EN ISO 5817:2014 Lev. B /GOST R ISO 15614-1-2009/121A00-PML-QC-PRO-00012

Оператор – Operator	Контроль качества - Quality Control	Заказчик - Client
CSWIP D.CENACCHI 305250 WI 3.1	РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА * RUSSIAN MARITIME REGISTER OF SHIPPING * 280 РС 001	

RINA

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n° 21174 MT 09 SZ Rev. 01	
RAPPORTO D'ESAME MAGNETOSCOPICO Magnetic Particle Test Report		DATA / Date 27/09/2021	FOGLIO / Sheet 1

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	FASE Step
LUKOIL-KMN LLC	pWPS	/	/	/

ESECUZIONE / Execution		ACCETTABILITA' / Acceptance	
121A00-PML-QC-PRO-00010		121A00-PML-QC-PRO-00010	
MATERIALE/Material	TEMP. SUPERFICI Surface temperature	INTENSITA' LUMINOSA/ Light intensity	
S460 G1+M	22°C	☑ LUCE BIANCA 1250 Lux	☐ LUCE NERA 1000 µW/cm²

STATO DELLA SUPERFICIE – Surface condition			
☑ COME SALDATO As welded	☐ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined	
☐ GREZZO – Forged	☐ LAMINATO – Rolled	☐ MOLATO – Ground	☐ SABBIATO – Blasted

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☑ GIOGO/Yoke	☐ PUNTALI/Prods	☐ BOBINA/Coil	☐ CONDUTTORE CENTRALE/Central conduttor

METODO / Method		SMAGNETIZZAZIONE/Demagnetization	
☐ CONTINUO/Continuous	☐ RESIDUO /Residual	☐ RICHIESTA/Required	☑ NON RICHIESTA/Not Required
TIPO DI MAGNETIZZAZIONE/magnetization type		DIREZIONE CAMPO MAGNETICO/magnetic field direction	
☑ MAGNETICO/magnetic	☐ ELETTRICO/electric	☐ CIRCOLARE/Circular	☑ LONGITUDINALE/longitudinal
TIPO APPARECCHIO/Type of equipment	Magneticontrol HR235	DISTANZA PUNTALI/Pole spacing	180 mm
NUMERO DI SERIE/Serial number	18-235-19		
TIPO DI CORRENTE/Current Type		POTERE DI SOLLEVAMENTO GIOGO / Lifting power	
☑ A.C.	☐ D.C.	☑ 4,5 kg	☐ 18 kg
MEZZO DI ISPEZIONE / Examination medium		INTENSITÀ DI CORRENTE / Intesity	
☑ UMIDO/Wet	☐ SECCO/Dry	☐ A/ mm	☐ / spira

PARTICELLE UTILIZZATE/Particle Type			
CONTRASTO DI COLOR/Color contrast	☐	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	☑ NDT BW2 ☐ NDT DRY	MARCA TIPO/Mark Type	NDT FW1
LOTTO/BACH	7243S	LOTTO/BACH	/
VERNICE DI CONTRASTO / Contrast Paint		☑ NDT WBL5	LOTTO/BACH U190107S

SALDATURE CONTROLLATE / Welds Verified

Item	Welder	Joit Type	Bevel	Thk	Scan plan
pWPS 07-21 PC	GX11-GX12	BUT WELD	V	12 mm	IDL-QCI-MT-02
pWPS 07-21 PH	GX11-GX12	BUT WELD	V	12 mm	IDL-QCI-MT-02
pWPS 15-21 PH	GX11-GX12	BUT WELD	V	12 mm	IDL-QCI-MT-02
pWPS 15-21 PC	GX11-GX12	BUT WELD	V	12 mm	IDL-QCI-MT-02

RINA A. Landi

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITÀ Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zanzi II Livello	ROSETTI MARINO SpA A. Khalifa Welding Dept.	

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta.
I risultati delle prove si riferiscono unicamente ai particolari esaminati.
Partial reproduction of this certificate must be written authorized.
Test results relate only to examined items.

Z:\Qualita\5 modulistica\01 moduli cnd\validi\01 moduli 2020\convenzionali superficiali

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n°
		21174 RT 11 SZ Rev. 00
RAPPORTO D'ESAME RADIOGRAFICO RADIOGRAPHIC TEST		DATA / Date 23/09/2021 — FOGLIO / Sheet 1

CLIENTE / Client	ORDINE / Order	PROGETTO / Project	COMMESSA / Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE /Customer	OGGETTO / Object	DISEGNO / Dwg	P.F.C. / Q.C.P.	Fase / Step
LUKOIL-KMN LLC	pWPS	/	/	/

Schizzo Sketch	Saldatura Weld	Diametro Diameter	Spessore Thikeness	Punzone Welder	Posizione Position	Difetto Defect	Giudizio Judgement
pWPS 07-21 POS. 2G	/	660 mm	12 mm	GX11	0-1	/	A
				GX12	1-2	/	A
					2-3	/	A
					3-4	/	A
					4-5	/	A
					5-0	/	A

DIFETTI / Defects

101	Longitudinal crack	2014	Linear porosity	3041	Tungsten inclusion	501	Undercut
104	Crater crack	2016	Wormholes	3042	Copper inclusion	504	Excess penetration
2011	Porosity	301	Slag inclusion	401	Lack of fusion	507	misaligment
2013	Clustered	DF	Difetto film Film defect	402	Lack of penetration	515	Root concavity

ESITO / Results

A	Accettabile Acceptable	NR	Riparare Repair	NX	Ripetere Film Repeat Film	RX	Conferma difetto Defect confirm

PROCEDURA /Procedure 121A00-PML-QC-PRO-00013	Schermi / Lead screen PB 0,10 Front and Back	Pellicole / Film type KODAK T200 (C4)
Tipo macchina Rx / Type machine Rx Gilardoni MHF 300-PO matr.045259001	Densità / Density Range ≤ 4 base material	Densità / Density Range 2÷3 welded area

TECNICA DI ESPOSIZIONE / Exposure Technique: SINGOLA PARETE SINGOLA IMMAGINE SWSI

Tipo di sorgente / source type			Tipo di IQI / IQI type	
☑ RX	☐ IR 192	☐ SE 75	☐ ASTM	☑ EN
Macchia focale focal spot		3	Posizione / position	
Attività activity			☐ Lato film film side	☑ Lato sorgente Source side
Ci	kV	mA	Esposizione / esposition	
/	240	2	☑ Film singolo Single film	☐ Film doppio Double ilm
Tempo di esposizione exposure time			Tecnica di sviluppo / Film processing	
30 sec			☐ Manuale / manual	☑ Automatico / Automatic

Spessore attraversato Crossed thickness w	Dist. Sorgente film *Source film distance* (SFD)	Dist. oggetto film *Film object distance* (b)	Distanza minima Minimum distance (f min)	Filo visibile n° Visible Wire n°	Lastre n° *Films n°*
Range 12 ÷ 20 mm	330 mm	12 mm	177 mm	13	6

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zanli 2° Livello	ROSETTI MARINO SpA A. Khalifa Welding Dept.	

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RINA A. Landi

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n°
		21174 RT 12 SZ Rev. 00
RAPPORTO D'ESAME RADIOGRAFICO RADIOGRAPHIC TEST		DATA / Date 23/09/2021 — FOGLIO / Sheet 1

CLIENTE / Client	ORDINE / Order	PROGETTO / Project	COMMESSA / Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE /Customer	OGGETTO / Object	DISEGNO / Dwg	P.F.C. / Q.C.P.	Fase / Step
LUKOIL-KMN LLC	pWPS	/	/	/

Schizzo Sketch	Saldatura Weld	Diametro Diameter	Spessore Thikeness	Punzone Welder	Posizione Position	Difetto Defect	Giudizio Judgement
pWPS 07-21 POS. 5G	/	660 mm	12 mm	GX11	0-1	2011	A
				GX12	1-2	/	A
					2-3	/	A
					3-4	/	A
					4-5	/	A
					5-0	/	A

DIFETTI / Defects

101	Longitudinal crack	2014	Linear porosity	3041	Tungsten inclusion	501	Undercut
104	Crater crack	2016	Wormholes	3042	Copper inclusion	504	Excess penetration
2011	Porosity	301	Slag inclusion	401	Lack of fusion	507	misaligment
2013	Clustered	DF	Difetto film Film defect	402	Lack of penetration	515	Root concavity

ESITO / Results

A	Accettabile Acceptable	NR	Riparare Repair	NX	Ripetere Film Repeat Film	RX	Conferma difetto Defect confirm

PROCEDURA /Procedure 121A00-PML-QC-PRO-00013	Schermi / Lead screen PB 0,10 Front and Back	Pellicole / Film type KODAK T200 (C4)
Tipo macchina Rx / Type machine Rx Gilardoni MHF 300-PO matr.045259001	Densità / Density Range ≤ 4 base material	Densità / Density Range 2÷3 welded area

TECNICA DI ESPOSIZIONE / Exposure Technique: SINGOLA PARETE SINGOLA IMMAGINE SWSI

Tipo di sorgente / source type			Tipo di IQI / IQI type	
☑ RX	☐ IR 192	☐ SE 75	☐ ASTM	☑ EN
Macchia focale focal spot		3	Posizione / position	
Attività activity			☐ Lato film film side	☑ Lato sorgente Source side
Ci	kV	mA	Esposizione / esposition	
/	240	2	☑ Film singolo Single film	☐ Film doppio Double ilm
Tempo di esposizione exposure time			Tecnica di sviluppo / Film processing	
30 sec			☐ Manuale / manual	☑ Automatico / Automatic

Spessore attraversato Crossed thickness w	Dist. Sorgente film *Source film distance* (SFD)	Dist. oggetto film *Film object distance* (b)	Distanza minima Minimum distance (f min)	Filo visibile n° Visible Wire n°	Lastre n° *Films n°*
Range 12 ÷ 20 mm	330 mm	12 mm	177 mm	13	6

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zanti 2° Livello	ROSETTI MARINO SpA A. Khalifa Welding Dept.	

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QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n°
		21174 UT 10 SZ Rev. 00

RAPPORTO D'ESAME CON ULTRASUONI Ultrasonic Examination report			DATA / Date 27/09/2021	FOGLIO / Sheet 1
CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
LUKOIL-KMN LLC	pWPS	/	/	/

ESECUZIONE / Execution	ACCETTABILITA' / Acceptance level
121A00-PML-QC-PRO-00009	121A00-PML-QC-PRO-00009

MATERIALE Material	DIMENSIONI mm Dimension	SPESSORE NOMINALE / Thk mm
S460 G1+M	D= 660 mm	12 mm

STATO DELLA SUPERFICIE – Surface condition

☑ COME SALDATO As welded ☐ SPAZZOLATO - Brushed ☐ LAVORATO DI MACCHINA - Machined

☐ GREZZO – Forged ☐ LAMINATO – Rolled ☐ MOLATO – Ground ☐ SABBIATO – Blasted

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG 700	No. SERIE Serial Number	I003937

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	AMPLIFICAZIONE dB value	ONDE Waves
KRAUTKRAMER	KNF	4	10	0°	36	LONG.
DOPPLER	A4P	3	8X9	70°	44	SHEAR
DOPPLER	A4P	3	8X9	60°	44	SHEAR

BLOCCO DI CALIBRAZIONE Calibration block	IIW V2	BLOCCO DI RIFERIMENTO Reference block	QT-BLOCK-RM
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity	DAC ON SDH 3 mm

SALDATURE CONTROLLATE / Welds Verified

Item	Welder	Joit Type	Bevel	Thk	Scan plan
pWPS 07-21 PC	GX11-GX12	BUT WELD	V	12 mm	IDL-QCI-UT-0214

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Not According to specification ☐

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zauli 2° Livello	ROSETTI MARINO SpA A. Khalifa Welding Dept.	

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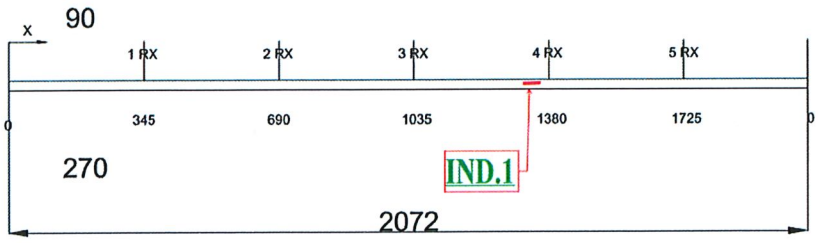
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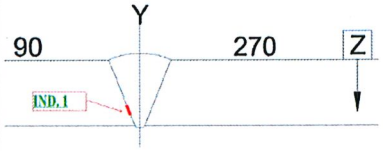
QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n° 21174 UT 10 SZ Rev. 00	
RAPPORTO D'ESAME CON ULTRASUONI Ultrasonic Examination report		DATA / Date 27/09/2021	FOGLIO / Sheet 2

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
LUKOIL-KMN LLC	pWPS	/	/	/

LOCALIZZAZIONE DIFETTI - DEFECTS LOCATION										
INDICAZIONE Indication	1									
X = PUNTO DI RIFERIMENTO / Referens point										
Δ /X = DISTANZA DI INDICAZIONE DA X Flaw distance from X	1330									
Y = PUNTO DI RIFERIMENTO Referens point	C.W									
Δ /Y = DISTANZA DI INDICAZIONE DA Y Flaw distance from Y	0									
Δ L = LUNGHEZZA INDICAZIONE Flaw lenght	15									
Z = PROFONDITA' INDICAZIONE Flaw depth	19									
H = ALTEZZA DEL PICCO Pitch level	20									
√\Ω= TIPO DI DIFETTO Flaw type	VOL									
A / R = ACCETTABILE-RIPARARE Acceptable-repair	A									

DISEGNO / SKETCH





RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Not According to specification ☐

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zauli 2° Livello	ROSETTI MARINO SpA A. Khalifa Welding Dept.	

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RINA
A. Landi

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n° 21174 UT 11 SZ Rev. 00	
RAPPORTO D'ESAME CON ULTRASUONI Ultrasonic Examination report		DATA / Date 27/09/2021	FOGLIO / Sheet 1

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
LUKOIL-KMN LLC	pWPS	/	/	/

ESECUZIONE / Execution	ACCETTABILITA' / Acceptance level
121A00-PML-QC-PRO-00009	121A00-PML-QC-PRO-00009

MATERIALE Material	DIMENSIONI mm Dimension	SPESSORE NOMINALE / Thk mm
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SALDATURE CONTROLLATE / Welds Verified

Item	Welder	Joit Type	Bevel	Thk	Scan plan
pWPS 07-21 PH	GX11-GX12	BUT WELD	V	12 mm	IDL-QCI-UT-0214

RINA A. Landi

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Not According to specification ☐

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zauli 2° Livello	ROSETTI MARINO Sp A. Khalifa Welding Dept.	

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INSPECTA S.R.L.	**TEST REPORT** ***RAPPORTO DI PROVA***	ilac-MRA ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO
	N° 415-00103-21 **Rev.00** **Data: 23/11/2021**	**LAB N°1607 L**

Object: *Oggetto:*	**MECHANICAL TEST ON WPQR 07-2021 A**				Pag. 1 di 17
Specimen: *Saggio:* **531/21**	**#Base Material:** *Materiale Base:*	**EN 10225 S460G1+M**	**PIPE Ø 660 mm THK 12 mm**		
	# Informazione fornita dal cliente/ Information provided by the customer				
Customer: *Committente:*	**ROSETTI MARINO S.p.A.**				
Address: *Indirizzo:*	**Via Trieste, 230 - 48122 Ravenna (RA)**				
Final customer:. *Cliente finale:*	//				
Your delivery note n°: *Vs. DDT di consegna*	**n°** // *n°*	**Date:** *Data:* //	**MD52** *MD 52* **123/2021**	**Date:** *Data:*	**08/10/2021**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **29/10/2021**	**End of activities:** *Fine prove:*		**Date:** *Data:*	**23/11/2021**

PROVE RICHIESTE

☒ **TENSILE TEST**/*Trazione*	☒ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*
☒ **BEND TEST**/*Piega*	☒ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☒ Face/Root */Dritto/Rovescio* ☐ Side/ *Laterale*
☒ **IMPACT TEST**/*Resilienza*	☒ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*
☒ **MACROEXAMINATION TEST /** *Macrografia*		
☒ **HARDNESS TEST**/ *Durezza*	☐ HV 5	☒ HV 10
☐ **FRACTURE TEST**/ *Frattura*	☐ Plate with/on Plate/ *Piastra con/su Piastra* ☐ Pipe with/on Pipe/*Tubo con/ su Tubo*	☐ Pipe on Plate/*Tubo su Piastra*
☐ **CHEMICAL ANALYSIS**/*Analisi Chimica*		
☐ **MICROEXAMINATION TEST /** *Micrografia*		
☐ **OTHER (Specify)**/*Altro/(Specificare)*		

Allegati /Attachments: NONE

NOTE/ Remarks: **REFERENCE CODE FROM CUSTOMER REQUEST: RINA RULES + RMRS ND No.2-020101-015 + RMRS ND No.2-020101-138 + RMRS ND No.2-020101-139 + GOST R ISO 15614-1-2009**
TEST WITNESSED BY CENACCHI DAVIDE (ROSETTI MARINO SPA) – ALEKSEY LAZAREV (RS-CLASS) – LANDI ANDREA (RINA)
Informazioni aggiuntive fornite dal cliente:
Additional information provided by the customer

Laboratory Responsible *Responsabile Laboratorio* *Sig. Giulio Bagnara* - INSPECTA srl - 23-11-2021	**Customer Inspector** *Ispettore del cliente* ROSETTI MARINO SpA Welding Dept. D.Cenacchi	**Third part Inspector** *Ispettore Terza parte*

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I risultati di prova si riferiscono al campione così come ricevuto, essendo il campionamento eseguito dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%. Quando emesso il Report in revisione, l'oggetto revisionato è identificabile mediante barra verticale posta sul lato sinistro e dal testo in formato corsivo sottolineato.
The results in this test report refers only to the specimen that has been tested. The customer undertakes to print out/reproduce the test report. Any partial reproduction is prohibited. Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory. The test results refer to the sample as received, since the sampling is performed by the customer. Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku=2 equivalent to a level of confidence of 95 %. When the Report under review is issued, the revised object can be identified by the vertical bar on the left side and by the text in italics underlined.

RINA A. Landi

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

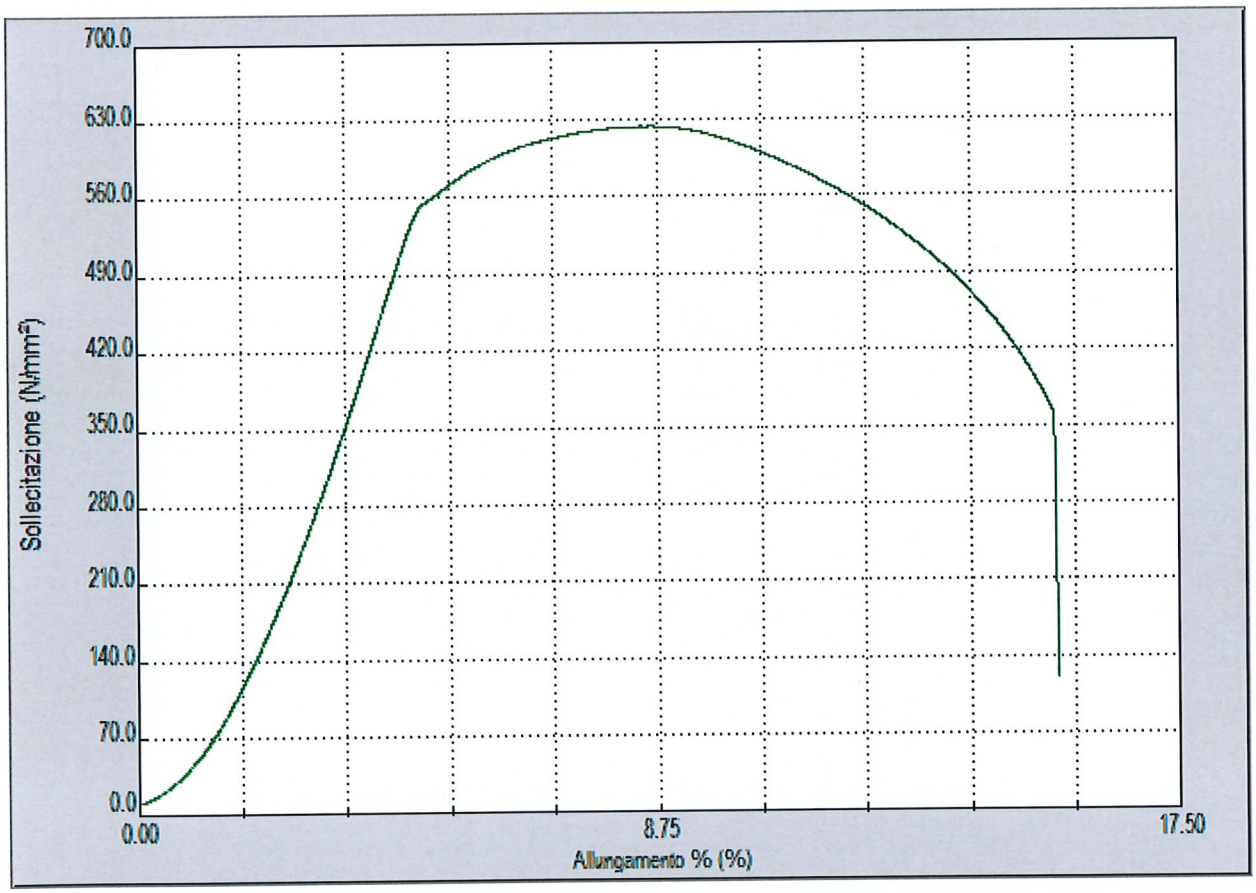
Date of Testing::23/11/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* UNI EN ISO 4136:2012

The test was performed using the Galdabini testing materials machine, model Quasar 600, s.n. VAUP/01 (2014)
La prova è stata eseguita utilizzando la macchina per prove materiali Galdabini, modello Quasar 600, s.n. VAUP/01 (2014)

Internal procedure *Procedura interna* : ***PP08 rev.14***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
531/21 A TWT	**10,60x24,96**	**264,58**	**22,4°C**	**//**	**//**	**/**	**//**	**/**	**164974**	**624**	**/**	**//**	**//**	**FOW**



Remarks / *Note:*	*POSTION PC*
Legend / *Legenda*	**TT = Transverse Tension**/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura* **TWT = Transverse Weld Tension**/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Bacheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	
INSPECTA srl Laboratory Technician 23/11/2021	- INSPECTA srl - 23-11-2021 Service Responsible		

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE
Prova di trazione trasversale a temperatura ambiente

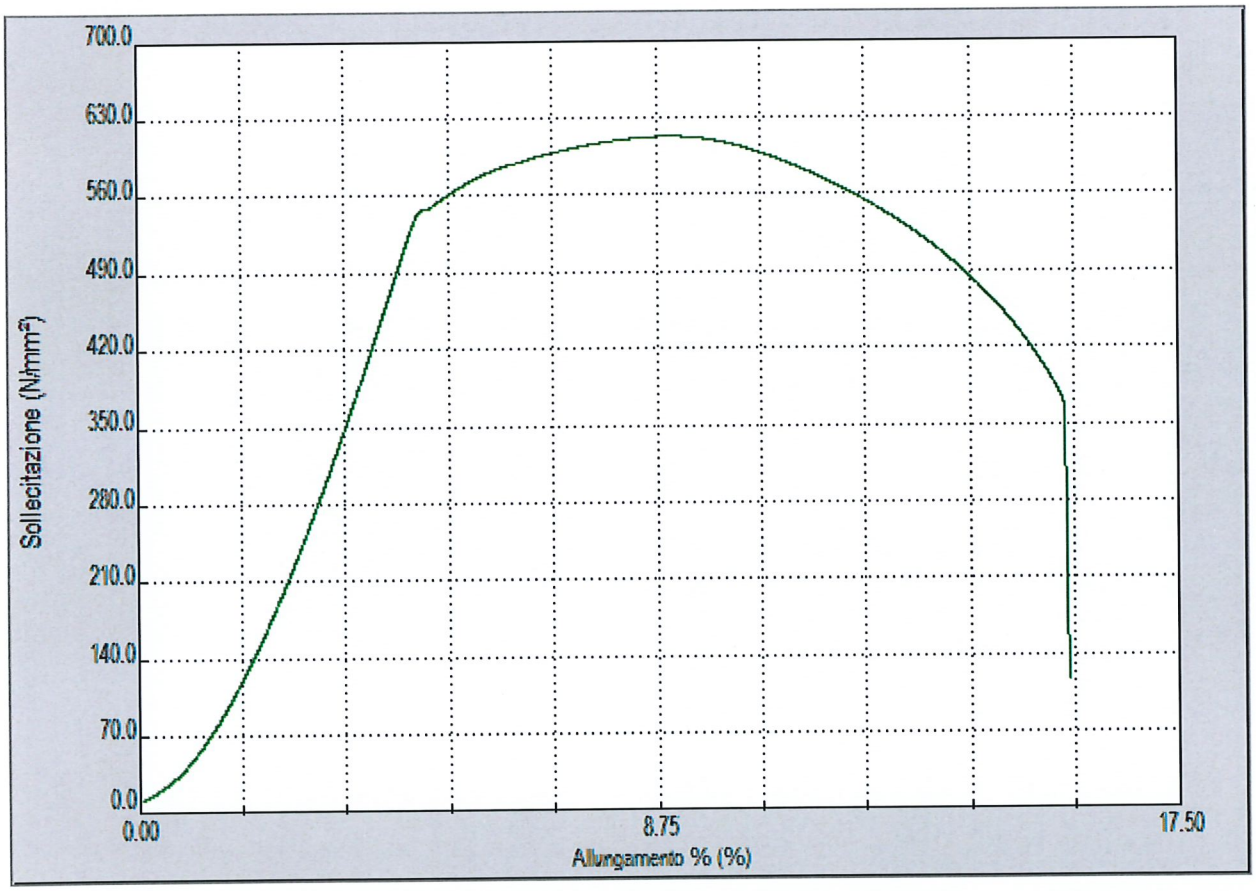
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Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
531/21 B TWT	10,80x24,92	269,14	22,4°C	//	//	/	//	/	164914	613	/	//	//	FOW



Remarks / *Note:*	*POSTION PC*
Legend / *Legenda*	**TT = Transverse Tension**/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura* **TWT = Transverse Weld Tension**/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Bacchieschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	
INSPECTA srl Laboratory Technician 23/11/2021	- INSPECTA srl - 23-11-2021 Service Responsible		

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE
Prova di trazione trasversale a temperatura ambiente

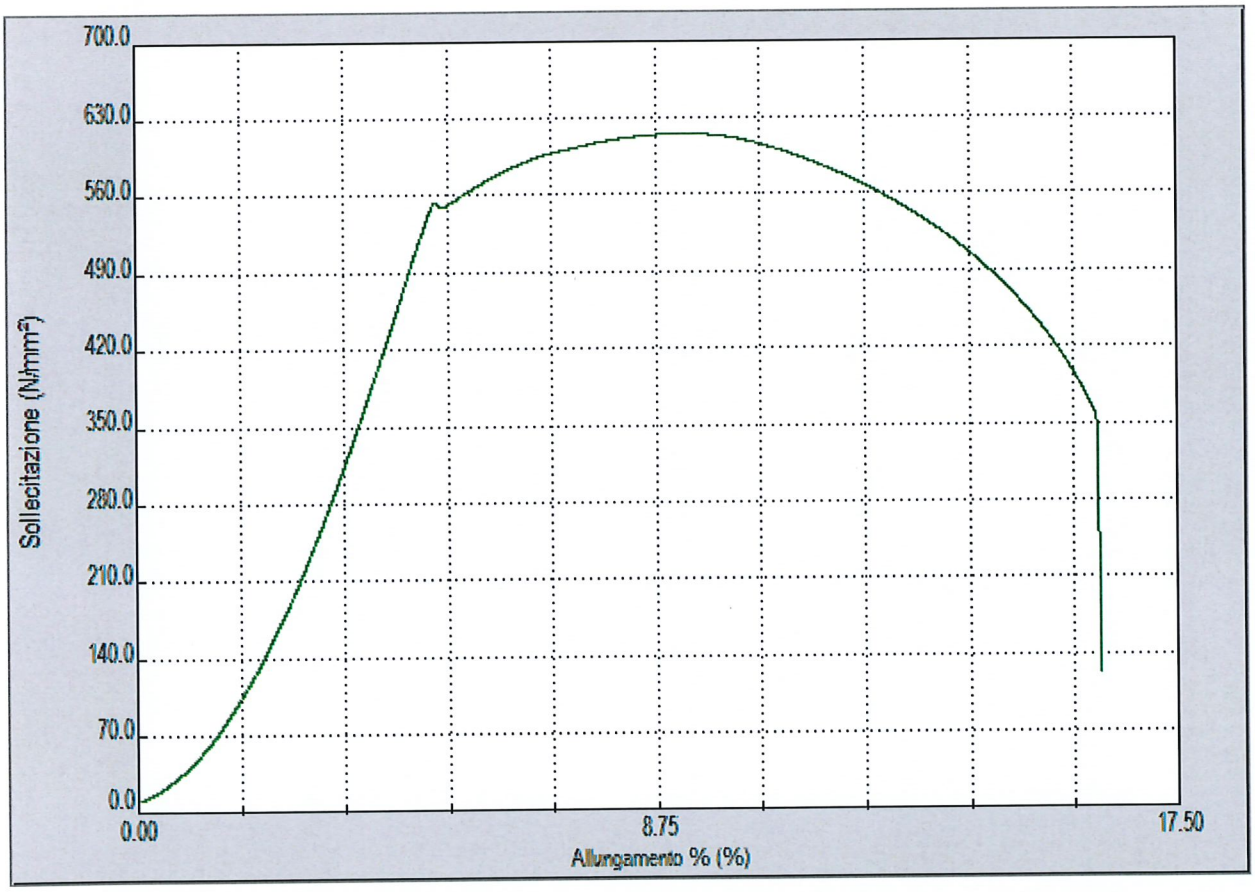
Date of Testing::23/11/2021
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Internal procedure *Procedura interna* : ***PP08 rev.14***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
531/21 C TWT	10,86x25,03	271,83	22,4°C	//	//	/	//	/	167233	615	/	//	//	FOW



Remarks / *Note:*	*POSTION PH*
Legend / *Legenda*	**TT = Transverse Tension**/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura* **TWT = Transverse Weld Tension**/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Bacchetti Laboratory Technician 23/11/2021	Sig. Giulio Bagnara - INSPECTA srl - Service Responsible 23-11-2021	ROSETTI MARINO SPA Welding Dept. D. Cenacchi	

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE
Prova di trazione trasversale a temperatura ambiente

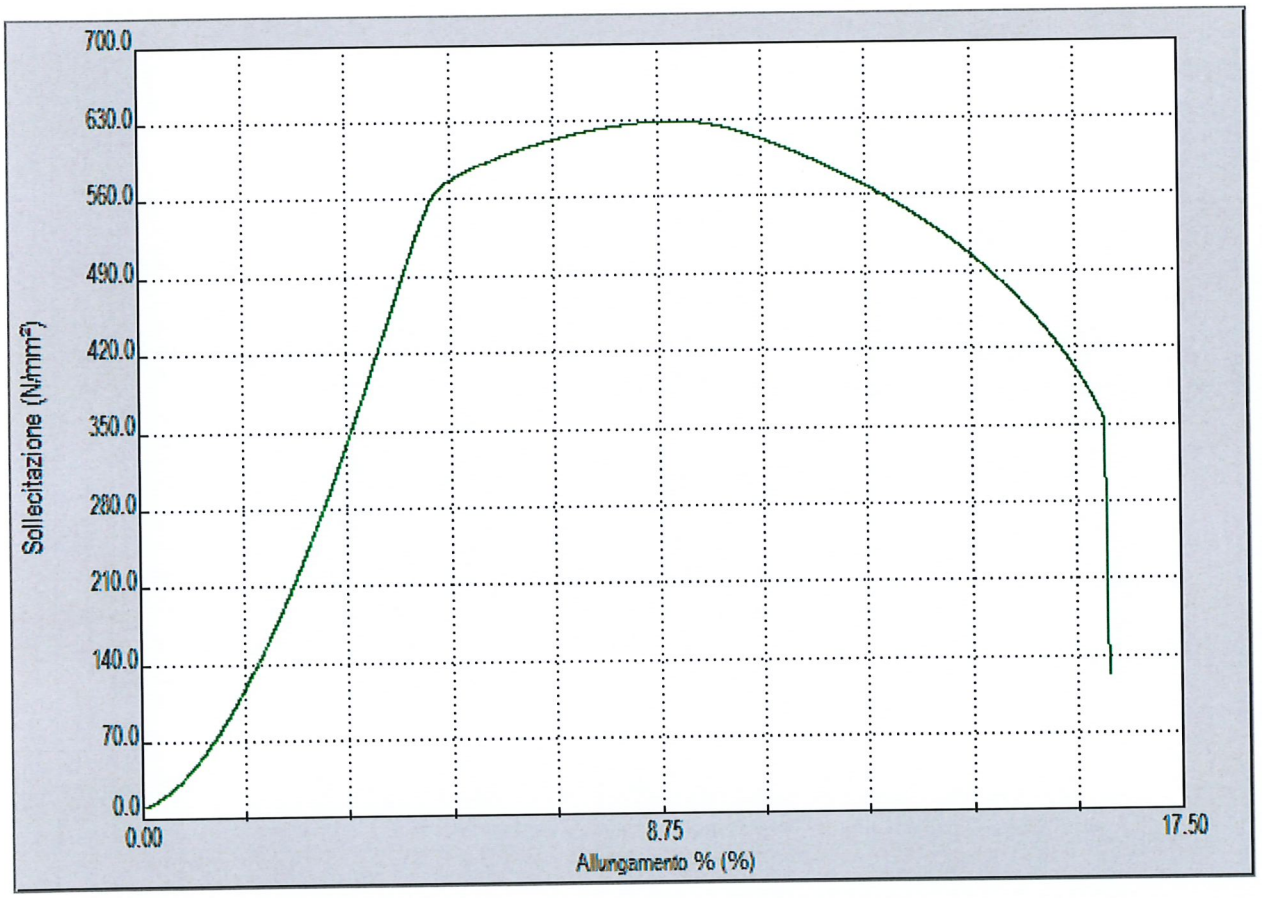
Date of Testing::23/11/2021
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* UNI EN ISO 4136:2012

The test was performed using the Galdabini testing materials machine, model Quasar 600, s.n. VAUP/01 (2014)
La prova è stata eseguita utilizzando la macchina per prove materiali Galdabini, modello Quasar 600, s.n. VAUP/01 (2014)

Internal procedure *Procedura interna :* ***PP08 rev.14***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
531/21 D TWT	11,14x25,08	279,39	22,4°C	//	//	/	//	/	175643	629	/	//	//	FOW



Remarks */ Note:*	*POSTION PH*
Legend */ Legenda*	**TT = Transverse Tension***/Trazione.trasversale;* **FOW = Failure Out of Weld***/Rottura fuori dalla saldatura*
	TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;* **FIW = Failure in Weld***/Rottura in saldatura*

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO S.p.A. Welding Dept. D.Cenacchi	
VISTO PER ACCETTAZIONE Laboratory Technician 23/11/2021	- INSPECTA srl - 23-11-2021 Service Responsible		

BEND TEST
Prova di piega

Date of Testing::03/11/2021
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *UNI EN ISO 5173:2012*

The test was performed using the Galdabini testing materials machine, model Quasar 600, s.n. VAUP/01 (2014)
La prova è stata eseguita utilizzando la macchina per prove materiali Galdabini, modello Quasar 600, s.n. VAUP/01 (2014)

Internal procedure *Procedura interna* ***:PP11 rev.06***

Specimen id. *Identificazione provino*		Dimension *Dimensioni (mm)*	Test Temp. *Temp.test °C*	Bend Angle *Angolo di piega*	Ø Former *Ø Mandrino (mm)*	Distance between rollers *Distanza appoggi (mm)*	Remarks *Note*
531/2021 TFB	A	12,00x40,00	23,4°C	180°	40	67	No open discontinuities have been found in weld metal and heat affected zone
531/2021 TFB	B	12,00x40,00	23,4°C	180°	40	67	No open discontinuities have been found in weld metal and heat affected zone
531/2021 TRB	C	12,00x40,00	23,4°C	180°	40	67	No open discontinuities have been found in weld metal and heat affected zone
531/2021 TRB	D	12,00x40,00	23,4°C	180°	40	67	No open discontinuities have been found in weld metal and heat affected zone

Remarks *Note:* POSITION PC

Legend *Legenda*
SBB. = Transverse Side Bend/*Piega Trasversale laterale*
TRB. = Transverse Root Bend/*Piega Trasversale al rovescio*
TFB. = Transverse Face Bend/*Piega Trasversale al dritto*
LRB = Longitudinal Root Bend / *Piega Longitudinale al rovescio*
LFB. = Longitudinal Face Bend / *Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi INSPECTA srl 23/11/2021 Laboratory Technician	Sig. Giulio Bagnara - INSPECTA srl - 23-11-2021 Service Responsible	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	

BEND TEST
Prova di piega

Date of Testing::03/11/2021
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *UNI EN ISO 5173:2012*

The test was performed using the Galdabini testing materials machine, model Quasar 600, s.n. VAUP/01 (2014)
La prova è stata eseguita utilizzando la macchina per prove materiali Galdabini, modello Quasar 600, s.n. VAUP/01 (2014)

Internal procedure *Procedura interna* **:*PP11 rev.06***

Specimen id. *Identificazione provino*		Dimension *Dimensioni (mm)*	Test Temp. *Temp.test °C*	Bend Angle *Angolo di piega*	Ø Former *Ø Mandrino (mm)*	Distance between rollers *Distanza appoggi (mm)*	Remarks *Note*
531/2021 TFB	E	12,00x40,00	23,4°C	180°	40	67	No open discontinuities have been found in weld metal and heat affected zone
531/2021 TFB	F	12,00x40,00	23,4°C	180°	40	67	No open discontinuities have been found in weld metal and heat affected zone
531/2021 TRB	G	12,00x40,00	23,4°C	180°	40	67	No open discontinuities have been found in weld metal and heat affected zone
531/2021 TRB	H	12,00x40,00	23,4°C	180°	40	67	No open discontinuities have been found in weld metal and heat affected zone

Remarks *Note:* **POSITION PH**

Legend *Legenda*

SBB. = Transverse Side Bend/*Piega Trasversale laterale*
TRB. = Transverse Root Bend/*Piega Trasversale al rovescio*
TFB. = Transverse Face Bend/*Piega Trasversale al dritto*
LRB = Longitudinal Root Bend */ Piega Longitudinale al rovescio*
LFB. = Longitudinal Face Bend */ Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Bacchieschi INSPECTA srl Laboratory Technician 23/11/2021	Sig. Giulio Bagnara - INSPECTA srl - 23-11-2021 Service Responsible	ROSETTI MARINO SPA Welding Dept. D. Genacchi	

IMPACT TEST
Prova di resilienza

Date of Testing:23/11/2021
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *UNI EN ISO 9016:2012*

The test was performed using the Galdabini Charpy pendulum machine, model Impact 450, s.n. VAUP/02
La prova è stata eseguita utilizzando macchina pendolo Charpy marca Galdabini, modello Impact 450, s.n. VAUP/02

Internal procedure *Procedura interna* **:*PP09 rev.08***

Specimen id. *Identificazione provino*	**Direction** *Direzione*	**Dimension** *Dimensioni (mm)*	**Test Temp.** *Temp .test*	**Notch Type** *Inta glio*	**Knife /** *coltello*	**Requirement** / Requisiti: **Energy absorbed/ / Energia assorbita** — **Individual** *Individuale Joule* 1	2	3	**Average** *Media Joule*	**U**	**Lateral Expansion** *Espansione laterale (mm)* 1	2	3	**Shear Area** *Area fragile %* 1	2	3	**Remarks** *Note*
531/21 VWT 0/2	**T**	**10x10x55**	**-60°C**	**V**	**2**	**58**	**69**	**58**	**62**	/	//	//	//	//	//	//	//
531/21 VHT 0/2	**T**	**10x10x55**	**-60°C**	**V**	**2**	**114**	**110**	**120**	**115**	/	//	//	//	//	//	//	//
531/21 VHT2/2	**T**	**10x10x55**	**-60°C**	**V**	**2**	**235**	**238**	**253**	**242**	/	//	//	//	//	//	//	//
531/21 VHT 5/2	**T**	**10x10x55**	**-60°C**	**V**	**2**	**234**	**237**	**231**	**234**	/	//	//	//	//	//	//	//

Remarks *Note:*	***POSITION PC***
Legend *Legenda*	**L= Longitudinal / Longitudinale** **T= Trasversal / Trasversale** **VWT 0/2 = Impact Test on Weld Metal/** *Resilienza trasversale in saldatura* **VHT 0/2 = Impact Test on Fusion Line** */ Resilienza Trasversale in linea di fusione* **VHT 1/2 = Impact Test at 1mm from Fusion Line** */ Resilienza trasversale a 1 mm dalla linea di fusione* **VHT 2/2 = Impact Test at 2 mm from Fusion Line** */ Resilienza trasversale a 2 mm dalla linea di fusione* **VHT 5/2 = Impact Test at 5 mm from Fusion Line** */ Resilienza trasversale a 5 mm dalla linea di fusione* **WM = Impact Test on Weld Metal/** *Resilienza trasversale in saldatura* **HAZ = Impact Test on Heat Affected Zone** */ Resilienza Trasversale in zona termicamente alterata* **BM = Impact Test on Base Metal** */ Resilienza Trasversale in materiale base* **FL = Fusion Line/** *Linea di fusione* **FL+1 = Fusion Line + 1mm/** *Linea di fusione+1mm* **FL+2 = Fusion Line + 2mm/** *Linea di fusione+2mm* **FL +5= Fusion Line + 5mm/** *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO S.p.A. Welding Dept. D. Genacchi	
INSPECTA srl Laboratory Technician 23/11/2021	- INSPECTA srl - 23-11-2021 Service Responsible		

IMPACT TEST
Prova di resilienza

Date of Testing:23/11/2021
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *UNI EN ISO 9016:2012*

The test was performed using the Galdabini Charpy pendulum machine, model Impact 450, s.n. VAUP/02
La prova è stata eseguita utilizzando macchina pendolo Charpy marca Galdabini, modello Impact 450, s.n. VAUP/02

Internal procedure *Procedura interna* **:*PP09 rev.08***

Specimen id. *Identificazione provino*	**Direction** *Direzione*	**Dimension** *Dimensioni (mm)*	**Test Temp.** *Temp .test*	**Notch Type** *Inta glio*	**Knife /** *coltello*	**Requirement** / Requisiti: **Energy absorbed/ / Energia assorbita** — **Individual** *Individuale Joule* 1	2	3	**Average** *Media Joule*	**U**	**Lateral Expansion** *Espansione laterale (mm)* 1	2	3	**Shear Area** *Area fragile %* 1	2	3	**Remarks** *Note*
531/21 VWT 0/2	**T**	**10x10x55**	**-60°C**	**V**	**2**	**70**	**55**	**49**	**58**	/	//	//	//	//	//	//	//
531/21 VHT 0/2	**T**	**10x10x55**	**-60°C**	**V**	**2**	**114**	**183**	**125**	**141**	/	//	//	//	//	//	//	//
531/21 VHT2/2	**T**	**10x10x55**	**-60°C**	**V**	**2**	**142**	**165**	**286**	**198**	/	//	//	//	//	//	//	//
531/21 VHT 5/2	**T**	**10x10x55**	**-60°C**	**V**	**2**	**248**	**318**	**253**	**273**	/	//	//	//	//	//	//	//

Remarks *Note:* ***POSITION PH***

Legend *Legenda*

L= Longitudinal / Longitudinale
T= Trasversal / Trasversale
VWT 0/2 = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
VHT 0/2 = Impact Test on Fusion Line */ Resilienza Trasversale in linea di fusione*
VHT 1/2 = Impact Test at 1mm from Fusion Line */ Resilienza trasversale a 1 mm dalla linea di fusione*
VHT 2/2 = Impact Test at 2 mm from Fusion Line */ Resilienza trasversale a 2 mm dalla linea di fusione*
VHT 5/2 = Impact Test at 5 mm from Fusion Line */ Resilienza trasversale a 5 mm dalla linea di fusione*
WM = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
HAZ = Impact Test on Heat Affected Zone */ Resilienza Trasversale in zona termicamente alterata*
BM = Impact Test on Base Metal */ Resilienza Trasversale in materiale base*

FL = Fusion Line/ *Linea di fusione*
FL+1 = Fusion Line + 1mm/ *Linea di fusione+1mm*
FL+2 = Fusion Line + 2mm/ *Linea di fusione+2mm*
FL +5= Fusion Line + 5mm/ *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Bucchieschi - INSPECTA srl - Laboratory Technician 23/11/2021	*Sig. Giulio Bagnara* - INSPECTA srl - 23-11-2021 Service Responsible	ROSETTI MARINO SPA Welding Dept. D. Cenacchi	

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::16/11/2021
Data esecuzione prova:

performed in accordance with the standard / eseguita in conformità alla norma UNI EN ISO 9015-1:2011

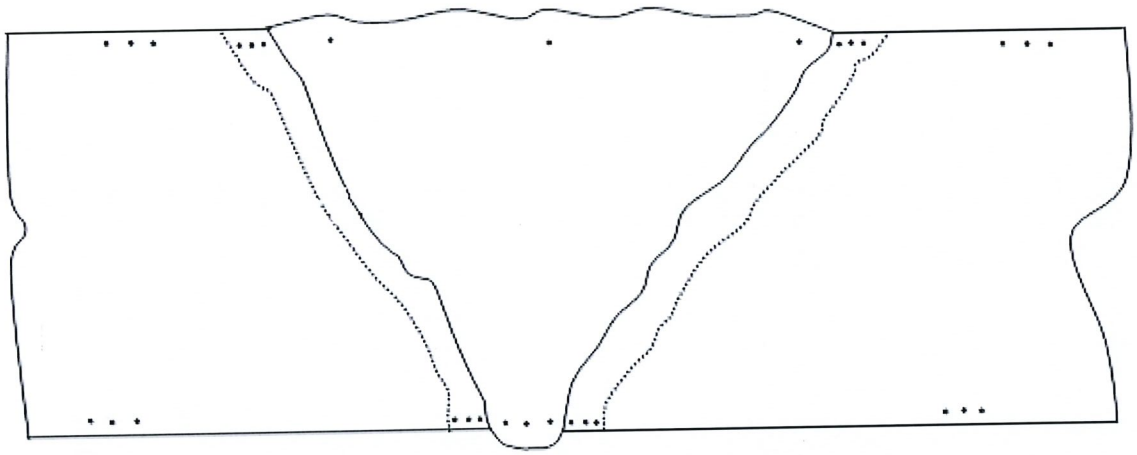
The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure / Procedura interna	PP10 rev.06	Sample Identification / Identificazione provino	531/21 A	Hardness test type / Tipo di durezza	HV10	Test Temp. / Temp.test	22,4°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: EN 10225 S460G1+M — **Base Material Side B: EN 10225 S460G1+M**

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6	7 – 8 – 9	10 – 11 – 12	13 – 14 – 15
16 – 17 – 18	19 – 20 – 21	22 – 23 – 24	25 – 26 – 27	28 – 29 – 30



Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U
1 – 2 – 3	222-227-227	/	16 – 17 – 18	207-211-212	/	//	//	/
4 – 5 – 6	213-225-235	/	19 - 20 – 21	200-198-212	/	//	//	/
7 – 8 – 9	246-249-243	/	22 – 23 – 24	213-228-243	/	//	//	/
10 – 11 – 12	235-226-207	/	25 - 26 – 27	238-229-210	/	//	//	/
13 – 14 – 15	220-222-228	/	28 – 29 – 30	208-204-199	/	//	//	/

Remarks/ *Note:* POSITION PC

Laboratory Technician / Tecnico di Laboratorio	Laboratory Responsible / Responsabile Laboratorio	Customer Inspector / Ispettore del cliente	Third part Inspector / Ispettore Terza parte
Dott. Ing. Mauro Baccheschi INSPECTA srl Laboratory Technician 23/11/2021	Sig. Giulio Bagnara - INSPECTA srl - 23-11-2021 Service Responsible	ROSETTI MARINO SPA Welding Dept. D. Cenacchi	

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::16/11/2021
Data esecuzione prova:

performed in accordance with the standard / eseguita in conformità alla norma UNI EN ISO 9015-1:2011

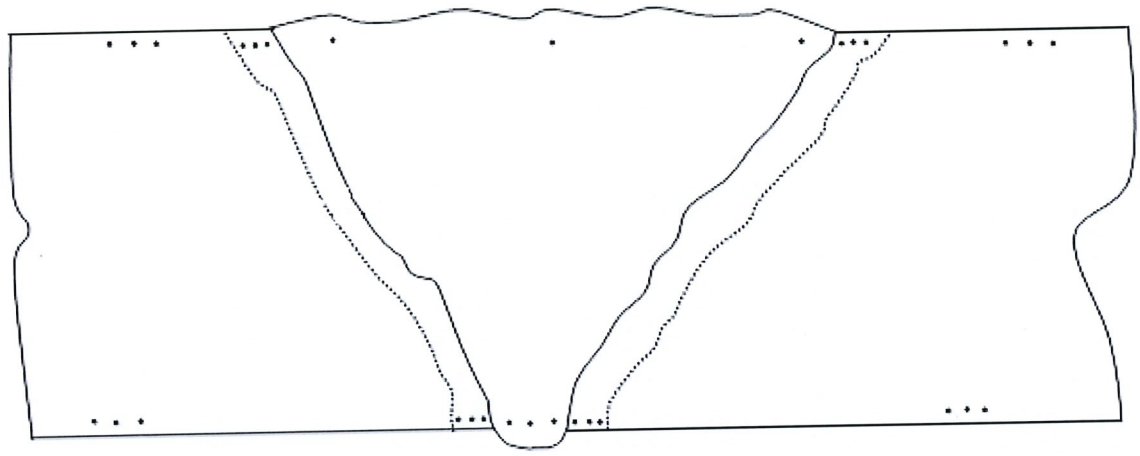
The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure / Procedura interna	PP10 rev.06	Sample Identification / Identificazione provino	531/21 C	Hardness test type / Tipo di durezza	HV10	Test Temp. / Temp.test	22,4°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: EN 10225 S460G1+M — **Base Material Side B: EN 10225 S460G1+M**

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6	7 – 8 – 9	10 – 11 – 12	13 – 14 – 15
16 – 17 – 18	19 – 20 – 21	22 – 23 – 24	25 – 26 – 27	28 – 29 – 30



Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U
1 – 2 – 3	217-208-205	/	16 – 17 – 18	208-200-213	/	//	//	/
4 – 5 – 6	202-219-228	/	19 - 20 – 21	210-208-231	/	//	//	/
7 – 8 – 9	248-244-244	/	22 – 23 – 24	248-239-245	/	//	//	/
10 – 11 – 12	241-236-224	/	25 - 26 – 27	237-217-208	/	//	//	/
13 – 14 – 15	209-214-217	/	28 – 29 – 30	205-213-210	/	//	//	/

Remarks/ *Note:* POSITION PH – H.3

Laboratory Technician *Tecnico di Laboratorio* *Dott. Ing. Mauro Bacchieschi*	Laboratory Responsible *Responsabile Laboratorio* *Sig. Giulio Bagnara*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
- INSPECTA srl - Laboratory Technician 23/11/2021	- INSPECTA srl - Service Responsible 23-11-2021	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::16/11/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* UNI EN ISO 9015-1:2011

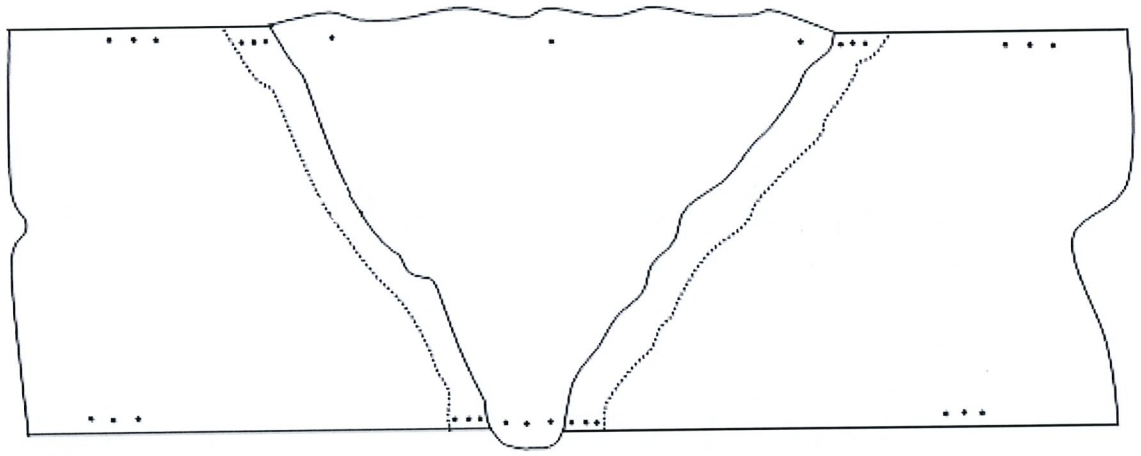
The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure / *Procedura interna*	PP10 rev.06	Sample Identification / *Identificazione provino*	531/21 D	Hardness test type / *Tipo di durezza*	HV10	Test Temp. / *Temp.test*	22,4°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: EN 10225 S460G1+M — **Base Material Side B: EN 10225 S460G1+M**

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6	7 – 8 – 9	10 – 11 – 12	13 – 14 – 15
16 – 17 – 18	19 – 20 – 21	22 – 23 – 24	25 – 26 – 27	28 – 29 – 30



Reference points / *Punto di riferimento*	Values measured / *Valori misurati*	U	Reference points / *Punto di riferimento*	Values measured / *Valori misurati*	U	Reference points / *Punto di riferimento*	Values measured / *Valori misurati*	U
1 – 2 – 3	**224-217-215**	/	16 – 17 – 18	**210-212-217**	/	//	//	/
4 – 5 – 6	**213-216-214**	/	19 - 20 – 21	**215-220-218**	/	//	//	/
7 – 8 – 9	**231-227-252**	/	22 – 23 – 24	**228-225-234**	/	//	//	/
10 – 11 – 12	**239-236-230**	/	25 - 26 – 27	**230-216-202**	/	//	//	/
13 – 14 – 15	**217-216-226**	/	28 – 29 – 30	**218-219-214**	/	//	//	/

Remarks/ *Note:* **POSITION PH – H.6**

Laboratory Technician / *Tecnico di Laboratorio*	Laboratory Responsible / *Responsabile Laboratorio*	Customer Inspector / *Ispettore del cliente*	Third part Inspector / *Ispettore Terza parte*
Dott. Ing. Mauro Bacchetchi - INSPECTA srl - Laboratory Technician 23/11/2021	Sig. Giulio Bagnara - INSPECTA srl - Service Responsible 23-11-2021	ROSETTI MARINO SPA Welding Dept. D. Cenacchi	

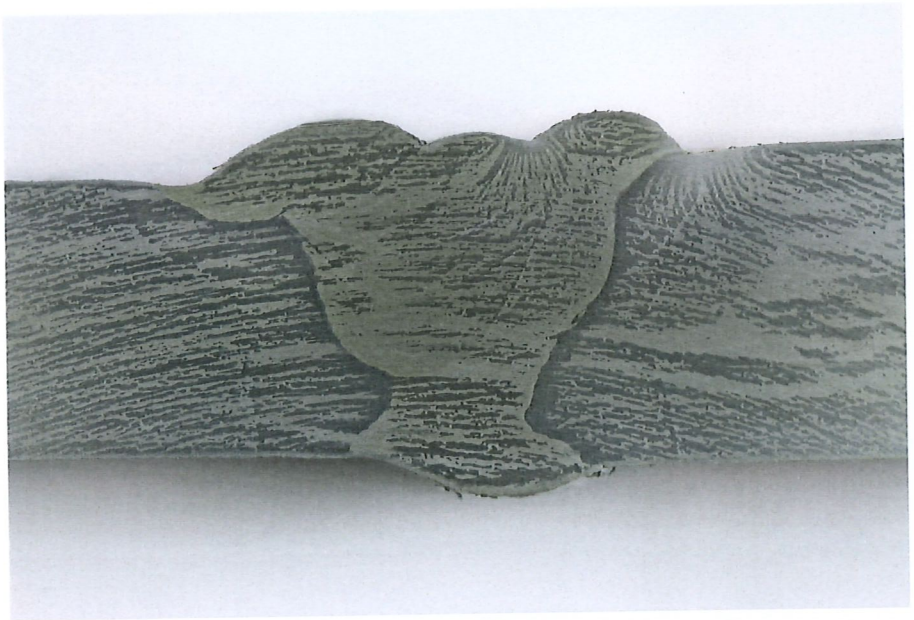
MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::29/10/2021
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* UNI EN ISO 17639:2013

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,3°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**531/2021 A**	**Magnification:** *Ingrandimento:*	**Photo at: 3.30** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639 - A - E – 6 - 2.1 / 6 / 2.1 / A1**		



Remarks / *Note:*	**POSITION PC** **No defects have been found in Macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baecheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	
INSPECTA srl Laboratory Technician 23/11/2021	- INSPECTA srl - Service Responsible 23-11-2021		

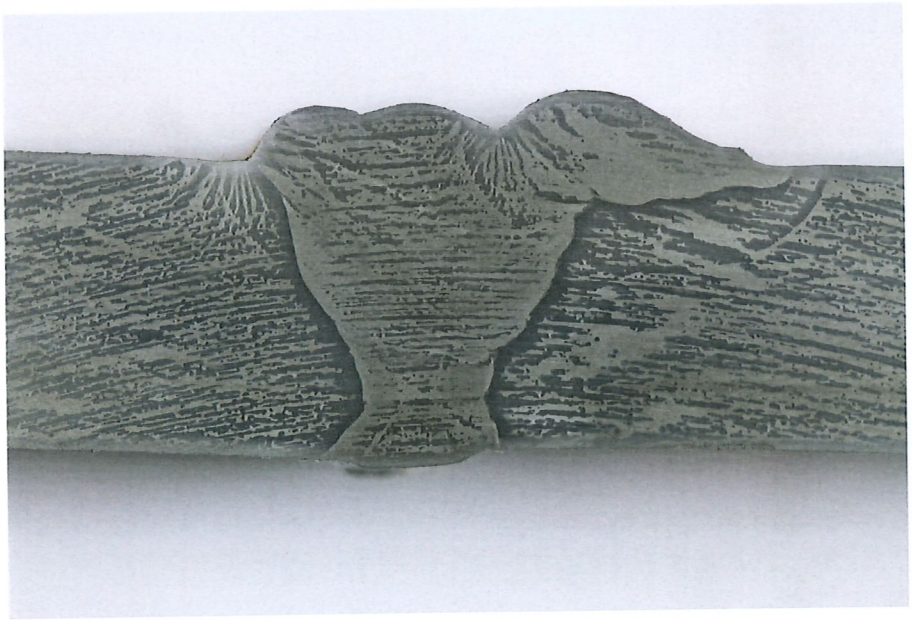
MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::29/10/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* UNI EN ISO 17639:2013

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,3°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**531/2021 B**	**Magnification:** *Ingrandimento:*	**Photo at: 3.20** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639 - A - E – 6 - 2.1 / 6 / 2.1 / A1**		



Remarks / *Note:*	**POSITION PC** **No defects have been found in Macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SpA Welding Dept. D. Geraccht	
- INSPECTA srl - Laboratory Technician 23/11/2021	- INSPECTA srl - Service Responsible 23-11-2021		

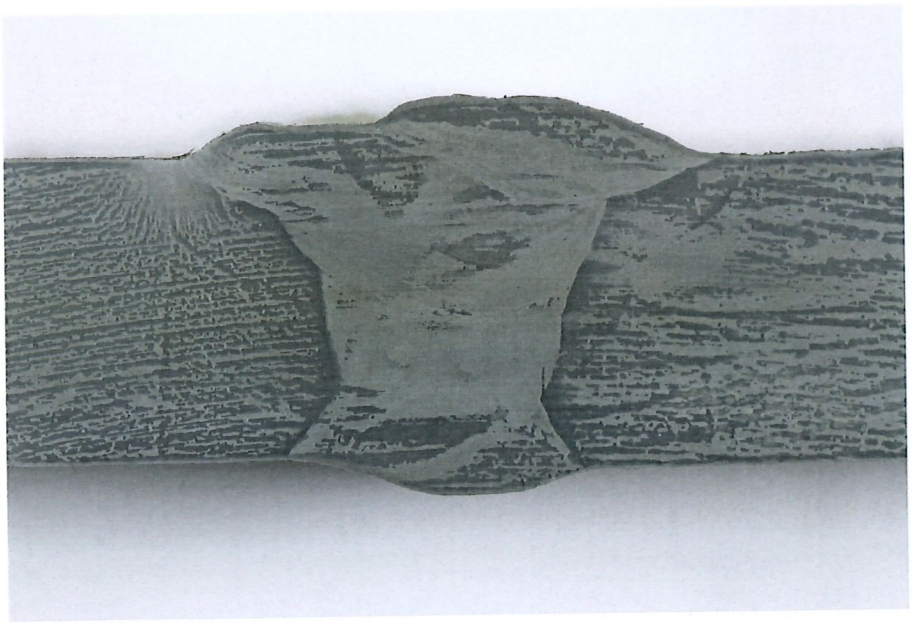
MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::29/10/2021
Data esecuzione prova:

performed in accordance with the standard / eseguita in conformità alla norma UNI EN ISO 17639:2013

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,3°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**531/2021 C**	**Magnification:** *Ingrandimento:*	**Photo at: 3.30** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639 - A - E – 6 - 2.1 / 6 / 2.1 / A1**		



Remarks / *Note:*	**POSITION PH – H.3** **No defects have been found in Macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*		
- INSPECTA srl -	- INSPECTA srl -	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	
Laboratory Technician 23/11/2021	23-11-2021 Service Responsible		

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::29/10/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* UNI EN ISO 17639:2013

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,3°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**531/2021 D**	**Magnification:** *Ingrandimento:*	**Photo at: 3.30** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639 - A - E – 6 - 2.1 / 6 / 2.1 / A1**		



Remarks / *Note:*	**POSITION PH – H.6** **No defects have been found in Macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SpA Welding Dept. D.Genacchi	
- INSPECTA srl - Laboratory Technician 23/11/2021	- INSPECTA srl - Service Responsible 23-11-2021		

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::29/10/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* UNI EN ISO 17639:2013

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,3°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**531/2021 E**	**Magnification:** *Ingrandimento:*	**Photo at: 3.30** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639 - A - E – 6 - 2.1 / 6 / 2.1 / A1**		



Remarks / *Note:*	**POSITION PH – H.12** **No defects have been found in Macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*		
INSPECTA srl Laboratory Technician 23/11/2021	- INSPECTA srl - 23-11-2021 Service Responsible	ROSETTI MARINO S.p.A. Welding Dept. D. Cenacchi	

END OF TEST REPORT
FINE DEL RAPPORTO DI PROVA

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2021-08-05 Numero certificato/Cert no: EC26516400 rev. 0

Nostro ordine/Our order:	0100324208	Vostro ordine/Your order:	CAMPIONATURA
Nostro riferimento/Our ref:	Davide Crotta	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB00060	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20210805	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address
AUTOFT.ART.17 ESAB SALDATURA SpA
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X
XXXXXXXXXX XXXXXXXXXX
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
ROSETTI MARINO SPA
VIA TRIESTE 230
48122 RAVENNA RA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PNV1710904 Quantità/Quantity: 80 KGM

PRODOTTO/PRODUCT

Marchio/Brand:	Filarc
Descrizione/Desc:	FILARC PZ6138 1.2mm 16kg
Codice/Item no:	**2580127730**

CLASSIFICAZIONE/CLASSIFICATIONS

EN ISO 17632-B: T 55 5 T1 M A N2 U H5
SFA/AWS A5.29: E81T1-Ni1M JH4
EN ISO 17632-A: T 50 6 1Ni P M21 1 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:	M21 (EN ISO 14175)
C	0.05%
Si	0.39%
Mn	1.24%
P	0.010%
S	0.013%
Cr	0.03%
Ni	0.89%
Mo	< 0.1%
Nb	0.02%
Cu	< 0.01%
V	0.02%

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:	EN ISO
Altro/Auxiliary:	M21 (EN ISO 14175)
Condizione/Condition:	As welded

TRAZIONE/TENSILE

Rp0.2	Rm	A5
577 MPa	616 MPa	29.0 %

RESILIENZA/IMPACT

Temp	-60 °C
KV	114 J

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura S.p.A. | Str. Provinciale 34, n.37 - 20010 Ossona MI, Italy

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis		Validazione - altro/Validation - Others	
Piotr Grela	Quality Assurance Manager	Neil Farrow	Product Manager

鋼管検査証明書
INSPECTION CERTIFICATE

新日鐵住金株式会社
NIPPON STEEL & SUMITOMO METAL CORPORATION

本社 HEAD OFFICE：〒100-8071 東京都千代田区丸の内二丁目6番1号 2-6-1, MARUNOUCHI CHIYODA-KU, TOKYO 100-8071, JAPAN

君津製鐵所 KIMITSU WORKS：〒299-1141 千葉県君津市君津1番地 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF., 299-1141, JAPAN

注文者 SHIPPER：SUMIKIN BUSSAN CORPORATION

注文者照合番号 REFERENCE No.：1216-HCY3413

契約番号 CONTRACT No.：3-841-N3-5-0-X001-02

商品名 COMMODITY：SUBMERGED ARC LONGITUDINALLY WELDED STEEL LINE PIPE

規格 SPECIFICATION：API SPEC 5L GR.L450M PSL2 (45TH EDITION,DEC.2012)

寸法 SIZE：660.4X18.3X12000

員数 QUANTITY：30 PCS

質量 MASS：NET 104.310KG

特記 NOTE：ORDER NO.HCY3413/SBE2013081 ACCORDING TO EN10204 3.1

需要家 CUSTOMER：SIDERPIGHI S.P.A. CON SOCIO UNICO

需要家管理番号 CUSTOMER'S CONTROL No.：

証明書番号 CERTIFICATE No.：U-13100107 頁 PAGE：1

発行年月日 DATE OF ISSUE：2013-10-29 Q05

管理番号 CONTROL No.：417401 (製造番号 PRODUCTION No.)

製鋼番号 HEAT NO. / 試験番号 TEST NO.	化学成分 CHEMICAL COMPOSITION % C	Si	Mn	P	S	Ni	Cu	Cr	Mo	Nb	V	Ti	TA	TAL	B	TE	Ceq	LOCATION	ORIENTATION	GL	引張試験 TENSILE TEST 耐力 YS	引張強さ TS	伸び EL	降伏比 YR	BEND TEST	試験温度 TEST TEMP.	IMPACT TEST SIZE	NOTCH	衝撃値 IMPACT VALUE 平均値 AVG	個々の値 EACH	延性破面率 SHEAR FRACTURE 平均値 AVG	個々の値 EACH	落重試験 DWTT 延性破面率 SHEAR FRACTURE 平均値 AVG	個々の値 EACH	LOCATION	硬さ試験 HARDNESS TEST	粒度試験 GRAIN SIZE TEST	備考 REMARKS
	X100	X100	X100	X1000	X1000 PPM	X100	X100	X100	X100	X100 X1000	X100 X1000	X100 X1000	X1000	X1000 PPM	X1000 PPM	X100 T2	X100				0.5%	MPA	%			°C			J		%		%					
*** SPEC. ***																																						
MIN																		BT	A		450	535	23			0	FV	27			21							
MAX H	10	45	170	25	15	50	50	50	50						10	25	43	BT	A		600	760		93														
MIN																		WT				535				0	FV	27			21							
MAX H																15																						
MIN																		HT								0	FV	27			21							
MAX P	10	45	170	25	15	50	50	50	50						10	25	43																					
MAX P																15																						
G10987 H	4	22	139	9	0	1	1	19	11	3	0	1		24	2	14	33																					
H 19637 (PIECE NO:417401-0020,PIPE NO:4174-01-0030)																4		BT	A		537	618	44	87														
19638 (PIECE NO:417401-0020,PIPE NO:4174-01-0030)																		WT				636			A												
19634 (PIECE NO:417401-0020,PIPE NO:4174-01-0030)																		BT								0	FV	470	472	469	469	100	100	100	100			
																		WT								0	FV	153	192	140	128	88	95	85	85			
																		HT								0	FV	439	435	439	444	100	100	100	100			
19635 P P	4	22	140	9	0	1	1	19	12	3	0	1		23	2	14	34																					
(PIECE NO:417401-0020,PIPE NO:4174-01-0030)																4																						
19636 P P	4	22	139	8	0	1	1	19	12	3	0	1		22	1	14	33																					
(PIECE NO:417401-0020,PIPE NO:4174-01-0030)																4																						
G11102 H H	5	21	141	5	0	1	1	19	11	3	0	1		17	2	15	35																					
19607 (PIECE NO:417401-0018,PIPE NO:4174-01-0002)																4		BT	A		553	635	42	87														
																		WT				630																

その他試験 DESCRIPTION OF TEST	寸法・外観検査 VISUAL & DIMENSIONS INSPECTION	水圧試験 HYDROSTATIC TEST	非破壊検査 NON-DESTRUCTIVE INSPECTION
	ACCEPTABLE	20.5 MPA 10 SEC. ACCEPTABLE	UT,RT ACCEPTABLE

注記1 NOTES1 ※1 H: 溶鋼分析 Heat Analysis, P: 母材製品分析 Product Analysis(Base), W: 溶接部製品分析 Product Analysis(Weld) ※2 B: 母材 Base Metal, W: 溶接部 Weld, H: 熱影響部 HAZ ※3 L: 縦方向 Longitudinal, T: 横方向 Transverse ※4 GL: 標点距離 Gauge Length, A:50mm, B:200mm, C:2", D:8", E:5.65√So, F:4√So ※5 G 合格, A:Acceptable ※6 試験片寸法 Specimen Size, F:10×10mm, 7:10×7.5mm, 6:10×6.7mm, 5:10×5mm, 3:10×3.3mm, 2:10×2.5mm ※7 ノッチ形状 Notch Type, V:2mmV, U:2mmU, D:5mmU ※8 AGS: オーステナイト粒度 Austenitic Grain Size, FGS:フェライト粒度 Ferritic Grain Size

注記2 NOTES2 CEQ=C+MN/6+(NI+CU)/15+(CR+MO+V)/5, TE=C+MN/20+SI/30+CU/20+NI/60+CR/20+MO/15+V/10+5B, T2=NB+V+TI

Rosetti Marino S.p.A.
Vs. Ordine n°. 1714002380 112A70D del 18/07/2014
Ns. DDT n°. 2093 del 24/07/2014
N°. 1 barra, colata G10987, kg 3523

上記注文品は御指定の規格または仕様に従って製造され、その要求事項を満足していることを証明します。
WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE TO THE APPLICABLE SPECIFICATION BY THE BASIC OXYGEN PROCESS AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE API WITH SATISFACTORY RESULTS.

T. Adachi
君津製鐵所 品質保証室
HEAD OF DEPARTMENT
QUALITY ASSURANCE DEPT.
KIMITSU WORKS

Page 185 di 1380

鋼管検査証明書
INSPECTION CERTIFICATE

新日鐵住金株式会社
NIPPON STEEL & SUMITOMO METAL CORPORATION

本社 HEAD OFFICE：〒100-8071 東京都千代田区丸の内二丁目6番1号 2-6-1, MARUNOUCHI CHIYODA-KU, TOKYO 100-8071, JAPAN

君津製鐵所 KIMITSU WORKS：〒299-1141 千葉県君津市君津1番地 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF., 299-1141, JAPAN

注文者 SHIPPER：SUMIKIN BUSSAN CORPORATION

注文者照合番号 REFERENCE No.：1216-HCY3413

契約番号 CONTRACT No.：3-841-N3-5-0-X001-02

需要家 CUSTOMER：SIDERPIGHI S.P.A. CON SOCIO UNICO

需要家管理番号 CUSTOMER'S CONTROL No.：

証明書番号 CERTIFICATE No.：U-13100107　頁 PAGE：2

発行年月日 DATE OF ISSUE：2013-10-29 Q05

商品名 COMMODITY：SUBMERGED ARC LONGITUDINALLY WELDED STEEL LINE PIPE

規格 SPECIFICATION：API SPEC 5L GR.L450M PSL2 (45TH EDITION, DEC. 2012)

寸法 SIZE：660.4X18.3X12000

員数 QUANTITY：30 PCS

質量 MASS：NET 104,310KG

特記 NOTE：ORDER NO.HCY3413/SBE2013081　ACCORDING TO EN10204 3.1

管理番号 CONTROL No.：417401
(製造番号 PRODUCTION No.)

製鋼番号 HEAT NO. / 試験番号 TEST NO.	化学成分 CHEMICAL COMPOSITION % C	Si	Mn	P	S	Ni	Cu	Cr	Mo	Nb	V	Ti	T-Al	TAL	B	TE	Ceq	LOCATION	ORIENTATION	GL	引張試験 TENSILE TEST 耐力 YS	引張強さ TS	伸び EL	降伏比 YR	BEND TEST	試験温度 TEST TEMP.	衝撃試験 IMPACT TEST SIZE	NOTCH	衝撃値 IMPACT VALUE 平均値 AVG	個々の値 EACH	延性破面率 SHEAR FRACTURE 平均値 AVG	個々の値 EACH	落重試験 DWTT 延性破面率 SHEAR FRACTURE 平均値 AVG	個々の値 EACH	LOCATION	硬さ試験 HARDNESS TEST	粒度試験 GRAIN SIZE TEST	備考 REMARKS
	X100 X4039	X100	X100	X1000	X1000 PPM	X100	X100	X100	X100	X100 X4039	X100 X4039	X100 X4039	X4039	X1000 -PPM-	X4039 PPM	X1000 PPM	X100 T2	X100			0.5%	MPA	%			・C			J		%		%					
19608	(PIECE NO:417401-0022, PIPE NO:4174-01-0004)																	BT							A	0	FV	469	470	469	469	100	100	100	100				
19604	(PIECE NO:417401-0028, PIPE NO:4174-01-0008)																	WT								0	FV	136	141	135	131	90	90	90	90				
																		HT								0	FV	442	442	443	442	100	100	100	100				
19605	PP 5	22	143	5	0	1	1	19	12	3	0	1		17	2	15 4	35																						
19606	(PIECE NO:417401-0018, PIPE NO:4174-01-0002) PP 5	22	143	5	0	1	1	19	12	3	0	1		18	2	15 4	35																						
	(PIECE NO:417401-0022, PIPE NO:4174-01-0004)																																						
G11103	HH 4	21	141	7	0	1	1	19	11	3	0	1		25	1	14 4	34																						
19612	(PIECE NO:417401-0019, PIPE NO:4174-01-0028)																	BT	A		562	640	42	88															
19613	(PIECE NO:417401-0024, PIPE NO:4174-01-0018)																	WT				638			A														
19609	(PIECE NO:417401-0012, PIPE NO:4174-01-0005)																	BT								0	FV	476	476	477	476	100	100	100	100				
																		WT								0	FV	146	158	133	146	90	90	90	90				
																		HT								0	FV	443	438	444	446	100	100	100	100				
19610	PP 4	22	143	7	0	1	1	19	12	3	0	1		26	2	14 4	34																						
	(PIECE NO:417401-0024, PIPE NO:4174-01-0018)																																						
19611	PP 4	22	142	7	0	1	1	19	12	3	0	1		25	1	14 4	34																						
	(PIECE NO:417401-0019, PIPE NO:4174-01-0028)																																						
G11158	HH 4	22	141	7	0	1	1	19	10	3	0	1		21	3	14 4	33																						
19632	(PIECE NO:417401-0030, PIPE NO:4174-01-0023)																	BT	A		540	618	43	87															
19633	(PIECE NO:417401-0017, PIPE NO:4174-01-0022)																	WT				636			A														

その他試験 DESCRIPTION OF TEST	寸法・外観検査 VISUAL & DIMENSIONS INSPECTION	水圧試験 HYDROSTATIC TEST	非破壊検査 NON-DESTRUCTIVE INSPECTION
	ACCEPTABLE	20.5 MPA 10 SEC. ACCEPTABLE	UT, RT ACCEPTABLE

注記1 NOTES1 ※1 H: 溶鋼分析 Heat Analysis, P: 母材製品分析 Product Analysis(Base), W: 溶接部製品分析 Product Analysis(Weld) ※2 B: 母材 Base Metal, W: 溶接部 Weld, H: 熱影響部 HAZ ※3 L: 縦方向 Longitudinal, T: 横方向 Transverse ※4 GL: 標点距離 Gauge Length, A:50mm, B:200mm, C:2", D:8", E:5.65√So, F:4.√So ※5 G 合格, A:Acceptable ※6 試験片寸法 Specimen Size, F:10×10mm, 7:10×7.5mm, 6:10×6.7mm, 5:10×5mm, 3:10×3.3mm, 2:10×2.5mm ※7 ノッチ形状 Notch Type, V:2mmV, U:2mmU, D:5mmU ※8 AGS: オーステナイト粒度 Austenitic Grain Size, FGS:フェライト粒度 Ferritic Grain Size

注記2 NOTES2

上記注文品は御指定の規格または仕様に従って製造され、その要求事項を満足していることを証明します。

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE TO THE APPLICABLE SPECIFICATION BY THE BASIC OXYGEN PROCESS AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE API WITH SATISFACTORY RESULTS.

T. Adachi
君津製鐵所 品質保証室
HEAD OF DEPARTMENT
QUALITY ASSURANCE DEPT.
KIMITSU WORKS

鋼管検査証明書
INSPECTION CERTIFICATE

新日鐵住金株式会社
NIPPON STEEL & SUMITOMO METAL CORPORATION

本社 HEAD OFFICE：〒100-8071 東京都千代田区丸の内二丁目6番1号 2-6-1, MARUNOUCHI CHIYODA-KU, TOKYO 100-8071, JAPAN

君津製鐵所 KIMITSU WORKS：〒299-1141 千葉県君津市君津1番地 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF., 299-1141, JAPAN

注文者 SHIPPER：SUMIKIN BUSSAN CORPORATION

注文者照合番号 REFERENCE No.：1216-HCY3413

契約番号 CONTRACT No.：3-841-N3-5-0-X001-02

商品名 COMMODITY：SUBMERGED ARC LONGITUDINALLY WELDED STEEL LINE PIPE

規格 SPECIFICATION：API SPEC 5L GR.L450M PSL2 (45TH EDITION, DEC. 2012)

寸法 SIZE：660.4X18.3X12000

員数 QUANTITY：30 PCS

質量 MASS：NET 104,310KG

特記 NOTE：ORDER NO.HCY3413/SBE2013081 ACCORDING TO EN10204 3.1

需要家 CUSTOMER：SIDERPIGHI S.P.A. CON SOCIO UNICO

需要家管理番号 CUSTOMER'S CONTROL No.：

証明書番号 CERTIFICATE No.：U-13100107 頁 PAGE：3

発行年月日 DATE OF ISSUE：2013-10-29 Q05

管理番号 CONTROL No.：417401 (製造番号 PRODUCTION No.)

製鋼番号 HEAT NO. / 試験番号 TEST NO.	化学成分 CHEMICAL COMPOSITION % C	Si	Mn	P	S	Ni	Cu	Cr	Mo	Nb	V	Ti	TAl	TAL	B	TE	Ceq	LOCATION	ORIENTATION	GL	引張試験 TENSILE TEST 耐力 降伏点 YS 0.5%	引張強さ TS	伸び El.	降伏比 YR	BEND TEST 番号	LOCATION	ORIENTATION	試験温度 TEST TEMP. °C	SIZE	NOTCH	衝撃試験 IMPACT TEST 衝撃値 IMPACT VALUE 平均値 AVG	個々の値 EACH	延性破面率 SHEAR FRACTURE 平均値 AVG	個々の値 EACH	落重試験 DWTT 延性破面率 SHEAR FRACTURE 平均値 AVG	個々の値 EACH	LOCATION	硬さ試験 HARDNESS TEST	粒度試験 GRAIN SIZE TEST	備考 REMARKS
	※1	X100	X100	X100	X100	X1000 PPM	X100	X100	X1000	X100	X1000	X100	X1000	X1000	PPM	PPM	X100	X100	T 2 X100	X100	※2	※3	※4	MPA	%	※5	※2	※3	°C	※6	※7	J	%	%	%	%	※2		※8	
19629		(PIECE NO:417401-0030, PIPE NO:4174-01-0023)																								BT		0	FV	478	479	478	477	100	100	100	100				
																										WT		0	FV	145	142	150	142	88	85	90	90				
																										HT		0	FV	440	441	439	439	100	100	100	100				
19630	P P	5	22	142	7	0	1	1	18	11	3	0	1		20	3	15 4	35																							
		(PIECE NO:417401-0017, PIPE NO:4174-01-0022)																																							
19631	P P	5	22	143	7	0	1	1	18	11	3	0	1		20	3	15 4	35																							
		(PIECE NO:417401-0030, PIPE NO:4174-01-0023)																																							
G11159	H H	4	21	140	7	0	1	1	18	11	3	0	1		33	2	13 4	33																							
19622		(PIECE NO:417401-0027, PIPE NO:4174-01-0025)																		BT	A		540	615	43	88															
																				WT				639																	
19623		(PIECE NO:417401-0029, PIPE NO:4174-01-0015)																									A														
19619		(PIECE NO:417401-0027, PIPE NO:4174-01-0025)																		BT									0	FV	476	475	475	478	100	100	100	100				
																				WT									0	FV	174	186	182	154	90	90	90	90				
																				HT									0	FV	443	450	440	440	100	100	100	100				
19620	P P	4	22	141	7	0	1	1	18	11	3	0	1		34	3	14 4	33																							
19621	P P	(PIECE NO:417401-0029, PIPE NO:4174-01-0015) 4	22	142	7	0	1	1	18	11	3	0	1		35	2	14 4	34																							
		(PIECE NO:417401-0027, PIPE NO:4174-01-0025)																																							
G11161	H H	4	22	141	8	0	1	1	19	11	3	0	1		22	2	14 4	34																							
19598		(PIECE NO:417401-0021, PIPE NO:4174-01-0014)																		BT	A		538	610	42	88															
																				WT				626																	
19599		(PIECE NO:417401-0013, PIPE NO:4174-01-0007)																									A														

その他試験 DESCRIPTION OF TEST	寸法・外観検査 VISUAL & DIMENSIONS INSPECTION	水圧試験 HYDROSTATIC TEST	非破壊検査 NON-DESTRUCTIVE INSPECTION
	ACCEPTABLE	20.5 MPA 10 SEC. ACCEPTABLE	UT, RT ACCEPTABLE

注釈1 NOTES1 ※1 H: 溶鋼分析 Heat Analysis, P: 母材製品分析 Product Analysis(Base), W: 溶接部製品分析 Product Analysis(Weld) ※2 B: 母材 Base Metal, W: 溶接部 Weld, H: 熱影響部 HAZ ※3 L: 縦方向 Longitudinal, T: 横方向 Transverse ※4 GL: 標点距離 Gauge Length, A:50mm, B:200mm, C:2", D:8", E:5.65√So, F:4√So ※6 G 合格, A:Acceptable ※6 試験片寸法 Specimen Size, F:10×10mm, 7:10×7.5mm, 6:10×6.7mm, 5:10×5mm, 3:10×3.3mm, 2:10×2.5mm ※7 ノッチ形状 Notch Type, V:2mmV, U:2mmU, D:5mmU ※8 AGS: オーステナイト粒度 Austenitic Grain Size, FGS:フェライト粒度 Ferritic Grain Size

注釈2 NOTES2

上記注文品は御指定の規格または仕様に従って製造され、その要求事項を満足していることを証明します。

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE TO THE APPLICABLE SPECIFICATION BY THE BASIC OXYGEN PROCESS AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE API WITH SATISFACTORY RESULTS.

T. Adachi

君津製鐵所 品質保証室
HEAD OF DEPARTMENT
QUALITY ASSURANCE DEPT.
KIMITSU WORKS

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鋼管検査証明書
INSPECTION CERTIFICATE

新日鐵住金株式会社
NIPPON STEEL & SUMITOMO METAL CORPORATION

本社 HEAD OFFICE：〒100-8071 東京都千代田区丸の内二丁目6番1号 / 2-6-1, MARUNOUCHI CHIYODA-KU, TOKYO 100-8071, JAPAN

君津製鐵所 KIMITSU WORKS：〒299-1141 千葉県君津市君津1番地 / 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF., 299-1141, JAPAN

注文者 SHIPPER：SUMIKIN BUSSAN CORPORATION

注文者照合番号 REFERENCE No.：1216-HCY3413

契約番号 CONTRACT No.：3-841-N3-5-0-X001-02

需要家 CUSTOMER：SIDERPIGHI S.P.A. CON SOCIO UNICO

需要家管理番号 CUSTOMER'S CONTROL No.：

証明書番号 CERTIFICATE No.：U-13100107　頁 PAGE：4

発行年月日 DATE OF ISSUE：2013-10-29　Q05

商品名 COMMODITY：SUBMERGED ARC LONGITUDINALLY WELDED STEEL LINE PIPE

規格 SPECIFICATION：API SPEC 5L GR.L450M PSL2 (45TH EDITION,DEC.2012)

寸法 SIZE：660.4X18.3X12000

員数 QUANTITY：30 PCS

質量 MASS：NET 104,310KG

特記 NOTE：ORDER NO.HCY3413/SBE2013081　ACCORDING TO EN10204 3.1

管理番号 CONTROL No.：417401
(製造番号 PRODUCTION No.)

製鋼番号 HEAT NO. / 試験番号 TEST NO.	化学成分 CHEMICAL COMPOSITION % C	Si	Mn	P	S	Ni	Cu	Cr	Mo	Nb	V	Ti	TAl	TAL	B	TE	Ceq	LOCATION ※2	ORIENTATION ※3	GL ※4	引張試験 TENSILE TEST 耐力 YS	引張強さ TS	伸び EL	降伏比 YR	BEND TEST ※5	LOCATION ※2	ORIENTATION ※3	試験温度 TEST TEMP.	衝撃試験 IMPACT TEST SIZE ※6	NOTCH ※7	衝撃値 IMPACT VALUE 平均値 AVG	個々の値 EACH	延性破面率 SHEAR FRACTURE 平均値 AVG	個々の値 EACH	落重試験 DWTT 延性破面率 SHEAR FRACTURE 平均値 AVG	個々の値 EACH	LOCATION ※2	硬さ試験 HARDNESS TEST	粒度試験 GRAIN SIZE TEST ※8	備考 REMARKS
	※1 X100 X4000	X100	X100	X100	X1000	X100	X100	X1000	X100	X1000	X100 X1000	X100 X1000	X100	X1000	X4000 PPM	X100 PPM	X100	X100 T2	X100				0.5%	MPA	%				・C			J		%		%					
19595	(PIECE NO:417401-0021,PIPE NO:4174-01-0014)																									BT		0	FV	470	467	471	472	100	100	100	100					
																										WT		0	FV	158	157	147	170	85	85	85	85					
																										HT		0	FV	441	437	445	442	100	100	100	100					
19596	P 4 22140 7 0 1 1 1811 3 0 1 22 2 1433																																								
	P (PIECE NO:417401-0013,PIPE NO:4174-01-0007)																																								
19597	P 4 23142 7 0 1 1 1811 3 0 1 22 3 1434																																								
	(PIECE NO:417401-0021,PIPE NO:4174-01-0014)																																								
G11162	H 4 21140 8 0 1 1 1911 3 0 1 19 2 1433																																								
	H																																								
19627	(PIECE NO:417401-0026,PIPE NO:4174-01-0021)																									BT	A		530	607	45	87										
																										WT				627												
19628	(PIECE NO:417401-0023,PIPE NO:4174-01-0016)																									WT																
19624	(PIECE NO:417401-0026,PIPE NO:4174-01-0021)																										A															
																										BT		0	FV	473	472	472	475	100	100	100	100					
																										WT		0	FV	155	161	145	158	90	90	90	90					
																										HT		0	FV	439	443	439	436	100	100	100	100					
19625	P 4 22141 8 0 1 1 1811 3 0 1 19 2 1433																																								
	P (PIECE NO:417401-0023,PIPE NO:4174-01-0016)																																								
19626	P 4 22141 8 0 1 1 1811 3 0 1 19 2 1433																																								
	P (PIECE NO:417401-0026,PIPE NO:4174-01-0021)																																								
G11164	H 5 20139 7 0 1 1 2011 3 0 1 21 2 1534																																								
	H																																								
19617	(PIECE NO:417401-0000,PIPE NO:4174-01-0012)																									BT	A		505	592	46	85										
																										WT				603												
19618	(PIECE NO:417401-0000,PIPE NO:4174-01-0012)																									WT																
																											A															

その他試験 DESCRIPTION OF TEST	寸法・外観検査 VISUAL & DIMENSIONS INSPECTION	水圧試験 HYDROSTATIC TEST	非破壊検査 NON-DESTRUCTIVE INSPECTION
	ACCEPTABLE	20.5 MPA 10 SEC. ACCEPTABLE	UT,RT ACCEPTABLE

注記1 NOTES1 ※1 H: 溶鋼分析 Heat Analysis, P: 母材製品分析 Product Analysis(Base), W: 溶接部製品分析 Product Analysis(Weld) ※2 B: 母材 Base Metal, W: 溶接部 Weld, H: 熱影響部 HAZ ※3 L: 縦方向 Longitudinal, T: 横方向 Transverse ※4 GL: 標点距離 Gauge Length, A:50mm, B:200mm, C:2", D:8", E:5.65√So, F:4√So ※5 G 合格, A:Acceptable ※6 試験片寸法 Specimen Size, F:10×10mm, 7:10×7.5mm, 6:10×6.7mm, 5:10×5mm, 3:10×3.3mm, 2:10×2.5mm ※7 ノッチ形状 Notch Type, V:2mmV, U:2mmU, D:5mmU ※8 AGS: オーステナイト粒度 Austenitic Grain Size, FGS:フェライト粒度 Ferritic Grain Size

注記2 NOTES2

上記注文品は御指定の規格または仕様に従って製造され、その要求事項を満足していることを証明します。

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE TO THE APPLICABLE SPECIFICATION BY THE BASIC OXYGEN PROCESS AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE API WITH SATISFACTORY RESULTS.

J. Adachi

君津製鐵所 品質保証室長
HEAD OF DEPARTMENT QUALITY ASSURANCE DEPT. KIMITSU WORKS

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鋼管検査証明書
INSPECTION CERTIFICATE

新日鐵住金株式会社
NIPPON STEEL & SUMITOMO METAL CORPORATION

本社 HEAD OFFICE：〒100-8071 東京都千代田区丸の内二丁目6番1号 2-6-1, MARUNOUCHI CHIYODA-KU, TOKYO 100-8071, JAPAN

君津製鐵所 KIMITSU WORKS：〒299-1141 千葉県君津市君津1番地 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF., 299-1141, JAPAN

注文者 SHIPPER：SUMIKIN BUSSAN CORPORATION

注文者照合番号 REFERENCE No.：1216-HCY3413

契約番号 CONTRACT No.：3-841-N3-5-0-X001-02

商品名 COMMODITY：SUBMERGED ARC LONGITUDINALLY WELDED STEEL LINE PIPE

規格 SPECIFICATION：API SPEC 5L GR.L450M PSL2 (45TH EDITION,DEC.2012)

寸法 SIZE：660.4X18.3X12000

員数 QUANTITY：30 PCS

質量 MASS：NET 104,310KG

特記 NOTE：ORDER NO.HCY3413/SBE2013081 ACCORDING TO EN10204 3.1

需要家 CUSTOMER：SIDERPIGHI S.P.A. CON SOCIO UNICO

需要家管理番号 CUSTOMER'S CONTROL No.：

証明書番号 CERTIFICATE No.：U-13100107

頁 PAGE：5

発行年月日 DATE OF ISSUE：2013-10-29

Q05

管理番号 CONTROL No.：417401

(製造番号 PRODUCTION No.)

製鋼番号 HEAT NO. / 試験番号 TEST NO.	化学成分 CHEMICAL COMPOSITION % C	Si	Mn	P	S	Ni	Cu	Cr	Mo	Nb	V	Ti	TAI	TAL	B	TE	Ceq	LOCATION	ORIENTATION	GL	引張試験 TENSILE TEST 耐力 YS	引張強さ TS	伸び EL	降伏比 YR	BEND TEST 曲げ	LOCATION	ORIENTATION	試験温度 TEST TEMP. °C	NOTCH	SIZE	衝撃試験 IMPACT TEST 衝撃値 IMPACT VALUE 平均値 AVG	個々の値 EACH J	延性破面率 SHEAR FRACTURE 平均値 AVG	個々の値 EACH %	落重試験 DWTT 延性破面率 SHEAR FRACTURE 平均値 AVG	個々の値 EACH %	LOCATION	硬さ試験 HARDNESS TEST	粒度試験 GRAIN SIZE TEST ※8	備考 REMARKS
	※1	X100	X100	X100	X100	X1000 PPM	X100	X100	X1000	X1000	X1000	X1000	X1000	PPM	X1000 -PPM-	X1000 PPM	X100 T2	X100	※2	※4	※4	0.5% MPA	MPA	%	%	※6	※2	※3	°C	※7	※5									
19614	(PIECE NO:417401-0000,PIPE NO:4174-01-0012)																									BT		0	F	V	476	473	477	478	100	100	100	100		
																										WT		0	F	V	157	166	157	148	90	90	90	90		
																										HT		0	F	V	444	443	445	443	100	100	100	100		
19615 PP	5 21140	8	0	1	1	1911	3	0	1		21	2				1534																								
	(PIECE NO:417401-0000,PIPE NO:4174-01-0012)																																							
19616 PP	5 21141	8	0	1	1	1912	3	0	1		21	2				1535																								
	(PIECE NO:417401-0000,PIPE NO:4174-01-0012)																																							
G11771 HH	5 22141	8	0	1	1	1911	3	0	1		22	1				1535																								
19642	(PIECE NO:417401-0014,PIPE NO:4174-01-0031)																	BT	TA		527	608 635	45	87																
19643	(PIECE NO:417401-0014,PIPE NO:4174-01-0031)																	WT							A															
19639	(PIECE NO:417401-0014,PIPE NO:4174-01-0031)																									BT		0	F	V	481	483	478	481	100	100	100	100		
																										WT		0	F	V	146	167	138	133	87	90	85	85		
																										HT		0	F	V	442	439	442	446	100	100	100	100		
19640 PP	5 23143	8	0	1	1	1912	3	0	1		20	2				1535																								
19641 PP	(PIECE NO:417401-0014,PIPE NO:4174-01-0031) 4 22142	7	0	1	1	1911	3	0	1		20	1				1434																								
	(PIECE NO:417401-0014,PIPE NO:4174-01-0031)																																							

*** TYPE AND SIZE OF REFERENCE INDICATOR OR IMAGE QUALITY INDICATOR USED FOR NON-DESTRUCTIVE INSPECTION FOR WELD ***

UT: 3.2 MM DIAMETER THROUGH THICKNESS DRILLED HOLE

RT: WIRE-TYPE (ISO) IMAGE QUALITY INDICATOR

*** THE DATA PRESENTED WAS CONVERTED FROM THE MEASUREMENT SYSTEM USED FOR THE ORIGINAL INSPECTION ***

その他試験 DESCRIPTION OF TEST	寸法・外観検査 VISUAL & DIMENSIONS INSPECTION	水圧試験 HYDROSTATIC TEST	非破壊検査 NON-DESTRUCTIVE INSPECTION
	ACCEPTABLE	20.5 MPA 10 SEC. ACCEPTABLE	UT,RT ACCEPTABLE

注釈1 NOTES1 ※1 H: 溶鋼分析 Heat Analysis, P: 母材製品分析 Product Analysis(Base), W: 溶接部製品分析 Product Analysis(Weld) ※2 B: 母材 Base Metal, W: 溶接部 Weld, H: 熱影響部 HAZ ※3 L: 縦方向 Longitudinal, T: 横方向 Transverse ※4 GL: 標点距離 Gauge Length, A:50mm, B:200mm, C:2", D:8", E:5.65√So, F:4√So ※5 G 合格, A:Acceptable ※6 試験片寸法 Specimen Size, F:10×10mm, 7:10×7.5mm, 6:10×6.7mm, 5:10×5mm, 3:10×3.3mm, 2:10×2.5mm ※7 ノッチ形状 Notch Type, V:2mmV, U:2mmU, D:5mmU ※8 AGS: オーステナイト粒度 Austenitic Grain Size, FGS:フェライト粒度 Ferritic Grain Size

注釈2 NOTES2

上記注文品は御指定の規格または仕様に従って製造され、その要求事項を満足していることを証明します。

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE TO THE APPLICABLE SPECIFICATION BY THE BASIC OXYGEN PROCESS AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE API WITH SATISFACTORY RESULTS.

J. Adachi

君津製鐵所 品質保証室長

HEAD OF DEPARTMENT QUALITY ASSURANCE DEPT. KIMITSU WORKS

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0220701107

鋼管検査証明書
INSPECTION CERTIFICATE

新日鐵住金株式会社
NIPPON STEEL & SUMITOMO METAL CORPORATION

本社 HEAD OFFICE：〒100-8071 東京都千代田区丸の内二丁目6番1号 2-6-1, MARUNOUCHI CHIYODA-KU, TOKYO 100-8071, JAPAN
君津製鐵所 KIMITSU WORKS：〒299-1141 千葉県君津市君津1番地 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF., 299-1141, JAPAN

注文者 SHIPPER：SUMIKIN BUSSAN CORPORATION
注文者照合番号 REFERENCE No.：1216-HCY3413
契約番号 CONTRACT No.：3-841-N3-5-0-X001-02
品名 COMMODITY：SUBMERGED ARC LONGITUDINALLY WELDED STEEL LINE PIPE
規格 SPECIFICATION：API SPEC 5L GR.L450M PSL2 (45TH EDITION, DEC. 2012)
寸法 SIZE：660.4X18.3X12000
員数 QUANTITY：30 PCS
質量 MASS：NET 104.310KG
特記 NOTE：ORDER NO. HCY3413/SBE2013081 ACCORDING TO EN10204 3.1

需要家 CUSTOMER：SIDERPIGHI S.P.A. CON SOCIO UNICO
需要家管理番号 CUSTOMER'S CONTROL No.：

証明書番号 CERTIFICATE No.：U-13100107
頁 PAGE：6E
発行年月日 DATE OF ISSUE：2013-10-29
Q05

管理番号 CONTROL No.：417401
(製造番号 PRODUCTION No.)

製鋼番号 HEAT NO. / 試験番号 TEST NO.	化学成分 CHEMICAL COMPOSITION %																		引張試験 TENSILE TEST						試験温度 TEST TEMP.	衝撃試験 IMPACT TEST						落重試験 DWTT				硬さ試験 HARDNESS TEST		粒度試験 GRAIN SIZE TEST ※8	備考 REMARKS
	C X1000	Si X100	Mn X100	P X1000	S X1000 PPM	Ni X100	Cu X100	Cr X100	Mo X100	Nb X100 X1000	V X100 X1000	Ti X100 X1000	TA X1000	X1000 PPM	X1000 PPM	X1000 PPM	X1000 PPM	TE X100	Ceq X100	※2 LOCATION	※3 ORIENTATION	※4 GL	耐力 YS	降伏点 YP	引張強さ TS	伸び EL	降伏比 YR	※5 BEND TEST 曲げ		※2 LOCATION	※3 ORIENTATION		※6 SIZE	※7 NOTCH	衝撃値 IMPACT VALUE 平均値 AVG	衝撃値 IMPACT VALUE 個々の値 EACH	延性破面率 SHEAR FRACTURE 平均値 AVG	延性破面率 SHEAR FRACTURE 個々の値 EACH	※2 LOCATION			
	X100	X100	X100	X100	X100	X100	X1000	X1000	X1000	X1000	X1000	X1000	PPM	PPM	X100	X100	X100	X100							%									%		%				
*** NAME AND LOCATION OF FACILITIES USED FOR PIPE MANUFACTURING, PLATE ROLLING AND STEEL MAKING *** NIPPON STEEL & SUMITOMO METAL CORPORATION KIMITSU WORKS																																								

その他試験 DESCRIPTION OF TEST	寸法・外観検査 VISUAL & DIMENSIONS INSPECTION	水圧試験 HYDROSTATIC TEST	非破壊検査 NON-DESTRUCTIVE INSPECTION
	ACCEPTABLE	20.5 MPA 10 SEC. ACCEPTABLE	UT, RT ACCEPTABLE

注釈1 NOTES1
※1 H: 溶鋼分析 Heat Analysis, P: 母材製品分析 Product Analysis(Base), W: 溶接部製品分析 Product Analysis(Weld) ※2 B: 母材 Base Metal, W: 溶接部 Weld, H: 熱影響部 HAZ ※3 L: 縦方向 Longitudinal, T: 横方向 Transverse ※4 GL: 標点距離 Gauge Length, A:50mm, B:200mm, C:2", D:8", E:5.65√So, F:4√So ※5 G 合格, A:Acceptable ※6 試験片寸法 Specimen Size, F:10×10mm, 7:10×7.5mm, 6:10×6.7mm, 5:10×5mm, 3:10×3.3mm, 2:10×2.5mm ※7 ノッチ形状 Notch Type, V:2mmV, U:2mmU, D:5mmU ※8 AGS: オーステナイト粒度 Austenitic Grain Size, FGS: フェライト粒度 Ferritic Grain Size

注釈2 NOTES2

上記注文品は御指定の規格または仕様に従って製造され、その要求事項を満足していることを証明します。

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE TO THE APPLICABLE SPECIFICATION BY THE BASIC OXYGEN PROCESS AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE API WITH SATISFACTORY RESULTS.

J. Adachi
君津製鐵所 品質保証室
HEAD OF DEPARTMENT QUALITY ASSURANCE DEPT. KIMITSU WORKS

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ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) СВИДЕТЕЛЬСТВО ОБ ОДОБРЕНИИ ТЕХНОЛОГИЧЕСКОГО ПРОЦЕССА СВАРКИ	№ 07/21-B	Sheet/Лист 1/4

Manufacturer's Welding Procedure. Ref. no. **Спецификация изготовителя сварного соединения испытаний рег. №**	**07/21-B REV. 0**		
Manufacturer **Производитель**	ROSETTI MARINO S.p.A.		
Address **Адрес**	VIA TRIESTE 230 - 48121 RAVENNA		
Code, Testing Standard **Нормы и правила, стандарты испытаний**	GOST R ISO 15614-1 2009; ND No. 2-020201-015, ND No. 2-020101-138, ND No. 2-020101-139		
	Location of test specimen according to GOST R ISO 15614-1 2009 Section 7.2, Fig. 5 Essential variables according to GOST R ISO 15614-1 2009, Section 8		
Date of welding **Дата сварки**	Start: Sept 16th , 2021 Complete: Sept 17nd , 2021		
Examiner of examining body **Инспектор или инспекционный орган**	RINA		
RANGE OF QUALIFICATION / ПРОТОКОЛ РЕЗУЛЬТАТОВ ИСПЫТАНИЙ			
Welding process **Способ сварки**	136 – FCAW		
Type(s) **Тип (ы)**	Semiautomatic		
Welding Equipment Type **Тип сварочного оборудования**	Machine – see as run		
Actual parent Material side A **Основной материал сторона А**	Pipe: API 5L L450M PSL2 (Heat: G11162)		
Actual parent Material side B **Основной материал сторона Б**	Pipe: API 5L L450M PSL2 (Heat: G11162)		
Parent Material grade **Категория основного материала**	Carbon steel Gr. 2 ISO 15608		
Supply condition **Состояние поставки**	SEAM WELDED PIPE		
Cev **Углеродный эквивалент топлива**	Heat Value: 0,41		
Groove design/configuration **Калибровка / конфигурация валиков**	Single Vee Butt Joint for groove dimension and details see As-Run Sheet		
Parent material thickness (mm) **Толщина основного материала (мм)**	Machined from 18,3 to 12 mm		
Weld metal thickness (mm) **Толщина металла шва (мм)**	136 - FCAW 12 mm		
Single or Multi-pass **Один проход или много проходов**	136 - FCAW (Multi pass)		
Outside diameter **Внешний диаметр**	660,4 mm		
Filler material Designation **Присадочный материал обозначение**	136 FCAW RS: 5Y46MS H5 (E81T1-Ni1M JH4) - EN ISO 17632-A: T 50 6 1Ni P M21 1 H5		
Filler material Maker **Присадочный материал марка**	136 – BOHLER Diamond spark Ni1 RC		
Filler material Size **Присадочный материал размер**	136 – FCAW ∅ 1,2 mm		
Shielding gas/Flux **Защитный газ / флюс**	ISO 14175 :2008 M21 (80% Ar + 20% CO_2) for FCAW		
Shielding gas flow rate **Расход защитного газа / флюса**	16-22 l/min.		
Backing gas (purging) **Газ для защиты обратной стороны (продувки)**	None		
Type of welding current & polarity **Тип сварочного тока и полярность**	DC – RP		



Welding parameters **Параметры сварки**	Pass Проход	Diameter / Диаметр Mm / мм	[A]	[V]	[mm/min] [мм/мин]	H.I. [kJ/mm]
	Root Корневой	∅ 1,2 (FCAW)	165-185	23	50-70	2.60-4.08
	Hot Горячий	∅ 1,2 (FCAW)	200-235	25-26	150-400	0.70-1.58
	Filll & Cap Присад. и Верхний	∅ 1,2 (FCAW)	185-215	25-27	200-250	0.88-1.07

Welding position **Положение сварки**	PC-PH (136- FCAW)		
Preheat (°C) **Предварительный подогрев (°C)**	50	**Interpass temperature (°C)** **Температура между проходами (°C)**	250
Post-Weld Heat Treatment and/or ageing **Термообработка после сварки и/или старение**	None		
Weld bead width **Толщина наплавленного валика**	Max. 16 mm (136-FCAW)		
Welder's detail **Данные сварщика**	Bolognesi Giugliano, Stamp: GX11		
Time lapse between root and hot pass **Промежуток времени между корневым и горячим проходом**	N.A.		
Other information **Другая информация**	- Preheat performed by propane torch -Accelerated weld cooling not used; -Base material origin: pipe API 5L L450M PSL2		



Manufacturer's Welding Procedure. Ref. no. Спецификация испытаний сварного соединения изготовителя рег. №	07/21-B REV. 0		
Test result (WPQR) N° Протокол результатов испытаний №	07/21-B	Date/Дата	23/11/2021
Manufacturer's WPS No. Спецификация испытаний сварного соединения изготовителя №	pWPS 07/21 REV. 0	Date/Дата	17-09-2021

TESTS CARRIED OUT ON SAMPLE 07/21-B WELDED IN 2G+5G POSITION (PC+PH)
ИСПЫТАНИЯ, ПРОВЕДЕННЫЕ НА ОБРАЗЦЕ 07/21-B СВАРКА В ПОЛОЖЕНИИ 2G+5G (PC+PH)

NON DESTRUCTIVE EXAMINATIONS
НЕРАЗРУШАЮЩИЕ ИСПЫТАНИЯ

	Judgement Результат	Report No. Отчет №
Visual examinations Визуальный контроль	Satisfactory	07-21-B
Penetrant test Испытания проникающей жидкостью	N.A.	/
Magnetic particle test Дефектоскопия магнитными частицами	Satisfactory	21174MT09SZ
Radiographic test Радиографическая дефектоскопия	Satisfactory	21174RT11SZ-21174RT12SZ
Ultrasonic test Ультразвуковая дефектоскопия	Satisfactory	21174UT10RZ-21174UT11RZ

TENSILE TEST
ИСПЫТАНИЕ НА РАСТЯЖЕНИЕ

Specimen type and No. Стандартный образец тип и №	$R_{P0,2\%}$ [N/mm2]	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 535	A [%]	Z [%]	Fracture Location Место разрушения	Remarks Примечания
TRANSVERSE 532/21 A ПОПЕРЕЧНОЕ	/	/	620	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PC
TRANSVERSE 532/21 B ПОПЕРЕЧНОЕ	/	/	608	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PC
TRANSVERSE 532/21 C ПОПЕРЕЧНОЕ	/	/	607	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PH
TRANSVERSE 532/21 D ПОПЕРЕЧНОЕ	/	/	616	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PH

BEND TEST
ИСПЫТАНИЯ НА ИЗГИБ

Type & N. Тип и №	Bend angle Угол загиба	Remarks Примечания	Results Результат
4 Side bend Pos. PC 4х сторонний загиб PC	180°	Former Ø 40 mm Исходный Ø 40 мм	Satisfactory
4 Side bend Pos. PH 4х сторонний загиб PH	180°	Former Ø 40 mm Исходный Ø 40 мм	Satisfactory

IIW A.KHALIFA IWT 070154A INTERNATIONAL WELDING TECHNOLOGIST

IMPACT TEST
ИСПЫТАНИЯ НА УДАРНЫЙ ИЗГИБ

Specimen Dimensions (mm) Размеры стандартного образца (мм)	Notch Locations / Direction Расположение / направление надреза	Notch Type Тип надреза	Test Temp. (°C) Температура испытания (°C)	Absorbed energy [J] Поглощенная энергия [J]			Average value [J] Среднее значение [J]	Lateral expansion [mm] Поперечное расширение [мм]	Remarks Примечания
10x10x55	Weld metal PC	KV2	-60°C	48	53	46	42	/	/
10x10x55	Fusion Line PC	KV2	-60°C	70	93	86	89	/	/
10x10x55	FL +2 PC	KV2	-60°C	301	307	268	292	/	/
10x10x55	FL+5 PC	KV2	-60°C	333	319	320	324	/	/
10x10x55	Weld metal PH	KV2	-60°C	86	79	60	75	/	/
10x10x55	Fusion Line PH	KV2	-60°C	98	77	101	92	/	/
10x10x55	FL +2 PH	KV2	-60°C	92	257	225	191	/	/
10x10x55	FL+5 PH	KV2	-60°C	340	320	307	322	/	/

OTHER TESTS
ДРУГИЕ ИСПЫТАНИЯ

Type of test Тип испытания	Results / Результат
Macro examination & Hardness test Осмотр макрошлифов и измерение твердости	Satisfactory-See Inspecta report No. 416-00103-21 Dated 23/11/2021
Welding test conducted by Сварочные испытания проведены	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by Механические испытания проведены	Inspecta s.r.l.
Laboratory report reference N. Ссылка на лабораторный отчет №	Inspecta report No. 416-00103-21
Test carried out in the presence of: Испытания проводятся в присутствии:	RINA

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of GOST R ISO 15614-1 2009, RS RULES: ND No. 2-020201-015, ND No. 2-020101-138, ND No. 2-020101-139

Date/Дата
25/11/2021

IIW A.KHALIFA IWT 070154A INTERNATIONAL WELDING TECHNOLOGIST

ROSETTI MARINO S.p.A.

Examiner or Examination Body/ Инспектор или инспекционный орган
RINA Services S.p.A.

RINA F. Lago RINA Services S.p.A.

Name and signature / Имя и подпись

ROSETTI MARINO

pWPS 07/21
PRELIMINARY WELDING PROCEDURE SPECIFICATION
(EN ISO 15609-1)

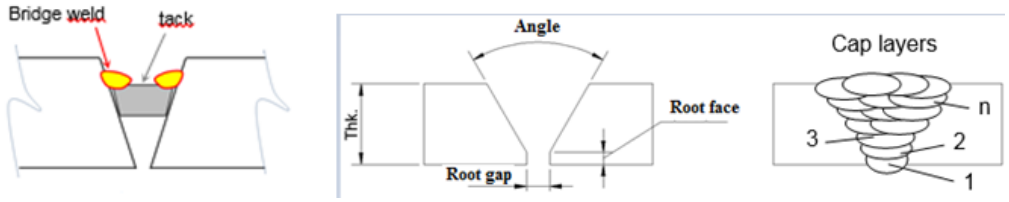
TEST CODE	**GOST R ISO 15614-1-2009**	**TEST SPEC**	**ND 2-020201-015, ND No. 2-020101-139**

Сварочный процесс: Welding process:	**136 FCAW**	Тип : Type:	**SEMIAUTOMATIC**	scopo : scope:	**CJP, BW**

GIUNTO - JOINT

Вид соединения: Joint Design:	**V**	☐ **DOULBE SIDED WELD**	☒ **Single sided weld**

Детали / Details:



BEVEL GOST ISO 9692-1

Root face 1.0±0.5 mm
Root gap 4.5 ± 2.5mm
Angle 40°-45°

Note:

1) The bullets for tacking shall be take from Carbon steel pipe. Minimum tack welds 2 times of wall thickness or 50 mm whichever is less / *Usare per i tacchetti materiale in acciaio al carbonio. Minima lunghezza delle puntature 2 volte lo spessore o 50 mm, quale dei due è più piccolo.*
2) The alignment of pipe ends shall be such as to minimize the internal offset between surfaces/ *L'allineamento dei tubi deve essere tale da minimizzare il disallineamento.*
3) Surfaces cleaned from moisture, oil, grease, paint. The cleaning shall be extend 75 mm from bevel end on internal and external surface. /*Pulire le superfici da sporcizia, oli e grassi. La pulizia deve essere estesa per 75 mm dal bordo del tubo sia sulla superfice esterna che interna.*

ОСНОВНОЙ МЕТАЛЛ - BASE MATERIAL

EN 10225-S460 G2+M, CRS ISO 15608 GR.2	**Material grade / Типа и сорта:**	**Up to PCF 460 / DC1/DC2/DC3/DC4**	**Max Cev 0.43**

Диапазон толщин / Thickness range:	► Основной металл / Base material:	полным проплавлением / groove	**12 mm MACHINED FROM 18mm**
	► Диапазон диам. труб / Pipe dia. Range:	полным проплавлением / groove	**660mm**

METALLO D'APPORTO - FILLER METAL

	136 - GS FCAW	
Spec. N° (SFA) / Спецификация №	**5Y46MS H5**	
(CLASS)(класс)	**T 50 6 1Ni P M21 1 H5**	**5.29/5.36 - E81T1-M21A8-Ni1-H4**
F-N°	**6**	
A-N°	**10**	
Размер присадочного материала / Size of filler metal	**1,2**	
Metallo depositato / Deposit weld metal	**Up to 12 mm**	
Диапазон толщин /Thick. range		
Флюс, Торговая марка / FLUX trade name	**NA**	
Применяемая вставка / Consumable insert	**NA**	
прочее Торговая Марка / other TRADE NAME:	**Wire: ESAB FILARC PZ 6138** **BÖHLER DIAMONDSPARK Ni1 RC**	

ТИП СОЕДИНЕНИЯ / JOINT	**Cianfrino / groove**	ПОЗИЦИЯ / position	**PC+PF / 2G+5G**	Сварочный прогрес / Progression	**UPHILL ↑**

PRERISCALDO - PRE-HEAT (QW406)

Мин. Предварительная температура : Min. pre-heat temp:	**50°C**	Максимальная Межваликовая Max interpass temp.:	**250°C**

ПОСЛЕСВАРОЧНАЯ ТЕРМООБРАБОТКА - POST WELD HEAT TREATMENT: NO/НЕТ

GAS DI PROTEZIONE - GAS

	GAS/ ГАЗ	МИКСТУРА Mixture	норма. / Flow rate
Защита / Shielding:	**Ar+CO2**	**80-20**	**12-20lt/1'**
Перемещение / Trailing:	**N.A.**	**N.A.**	**N.A.**
Поддержка / Backing:	**N.A.**	**N.A.**	**N.A.**

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Ток / Current :	**DC -CV**	ПОЛЯРНОСТЬ / Polarity	**RP**
Вольфрам Электрод Тип и размер / Tungsten elctr. Size & type:			**N.A.**
Металл метод GMAW / GMAW metal tranfer mode:			**Spray arc**
Проводной диапазон скорости подачи / Electr. Wire feed speed range:			**self regulatd**

TECNICA - TECHNIQUE

ВАЛИК : Bead:	**Tirata/String**	Диаметр сопла Orifice of gas cup size:	**½"**	Начальная и межпроходная Initial and interpass cleaning:	**Spazzolatura e Molatura/Brushing Grinding**
Метод обратной зачистки Method of back gouging:	**N.A.**	Колебание: Oscillation:	**N.A.**	Контакт и рабочее расстояние: Contact tube to work distance:	**12-18 mm**
Номер прохода : Passes nr.:	**Multipla/Multiple**	Многократные или отдельные электроды: Multiple or single electrodes:	**Singolo/Single**	НАКЛЕП: Peening:	**N.A.**

Altro / Other:

Номер прохода Weld layers nr.	Процесс Process	Присадочный металл Filler metal		Показатели Current		Вольт Volt range	Скорость сварки Travel speed range (mm/min)	Тепловложение Heat input (KJ/mm)
		Класс / Class	Dia. (mm.)	ПОЛЯРНОСТЬ / Polarity	Amp. range			
Root - Hot	**GS FCAW**	**5Y46MS H5**	**1,2**	**RP**	**160-220**	**25-27**	**140-220**	**0.87-1.85**
FILL- CAP	**GS FCAW**	**5Y46MS H5**	**1,2**	**RP**	**180-230**	**24-27**	**160-300**	**0.60-1.86**
FILL- CAP	**GS FCAW**	**5Y46MS H5**	**1,2**	**RP**	**220-270**	**24-28**	**180-440**	**0.60-2.00**

ROSETTI - prepared by:

A.KHALIFA

ROSETTI MARINO

PQR - AS- RUN PARAMETER SHEET

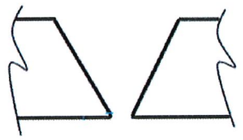
pWPS 07/21	
PQR 07/21	
Coupon Nr. 07/21 PC B	
Date: 16/09/2021	Page: 1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: **GOST R ISO 15614-1 2009, ND 2-020201-015-E, ND No. 2-020101-138-E Spec.**

Welder Name(s):	GIULIANINI DARIO	Welder Id No(s):	GX12
Welding Process(es):	136-FCAW	Type(s):	PARTLY MECHANIZED
Welding Position:	PC (2G)	Progression:	NA
Base Materials:	API 5L L450M PSL2	Wall Thickness:	12 mm
Heat No(s):	G11162	Joint Type:	SINGLE V BUTT JOINT SINGLE SIDE WELDING WITHOUT BACKING

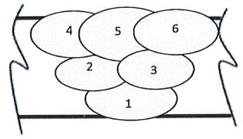
Diameter: 660,4 mm

WELD PREPARATION:



Angle: 50° ; Root gap: 4,5 mm ; Root face: 1,5 mm

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	939012	DIAMONDSPARK NI1-RC
Hot passes	1,2	939012	DIAMONDSPARK NI1-RC
Fill/ Cap	1,2	939012	DIAMONDSPARK NI1-RC

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar - 20%CO2
Flow:	16 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	1/2"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Preheat Method:	Max Interpass Temperature:	Check / Control Method:
50°C	PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
14 mm	String		Multiple	Single

Heat Treatment Required	Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
NA	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
NA	1	FCAW	1	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	160	170	165,0	22	24	23,0	-	-	7	2,60	0,80	50	INE THT 501
NA	2	FCAW	2	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	230	240	235,0	25	27	26,0	-	-	40	0,73	0,80	120	Grinding between passes performed by manual tools
NA	2	FCAW	3	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	230	240	235,0	25	27	26,0	-	-	25	1,17	0,80	180	Pipe Thickness machined from 18,3 mm to 12 mm
NA	3	FCAW	4÷6	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	210	220	215,0	25	27	26,0	-	-	25	1,07	0,80	250	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA Welding Dept. D'Cenacchi	Signature:	Signature: RINA A. Landi	Signature:
Date:	Date:	Date:	Date:

ROSETTI MARINO

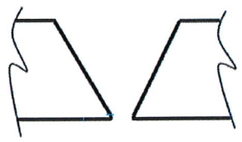
PQR - AS- RUN PARAMETER SHEET

pWPS 07/21			
PQR 07/21			
Coupon Nr. 07/21 PH B			
Date:	17/09/2021	Page:	1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: **GOST R ISO 15614-1 2009, ND 2-020201-015-E, ND No. 2-020101-138-E Spec.**

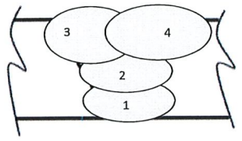
Welder Name(s):	GIULIANINI DARIO	Welder Id No(s):	GX12		
Welding Process(es):	136-FCAW	Type(s):	PARTLY MECHANIZED		
Welding Position:	PH (5G)	Progression:	VERTICAL UPHILL		
Base Materials:	API 5L L450M PSL2	Wall Thickness:	12 mm	Diameter:	660,4 mm
Heat No(s):	G11162	Joint Type:	SINGLE V BUTT JOINT SINGLE SIDE WELDING WITHOUT BACKING		

WELD PREPARATION:



Angle: 50° ; Root gap: 4,5 mm ; Root face: 1,5 mm

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	939012	DIAMONDSPARK NI1-RC
Hot passes	1,2	939012	DIAMONDSPARK NI1-RC
Fill/ Cap	1,2	939012	DIAMONDSPARK NI1-RC

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar - 20%CO2
Flow:	16 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	1/2"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
16 mm	String		Multiple	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
50°C PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER	NA	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
NA	1	FCAW	1	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	180	190	185,0	22	24	23,0	-	-	5	4,08	0,80	50	INE THT 501
NA	2	FCAW	2	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	195	205	200,0	23	25	24,0	-	-	15	1,54	0,80	110	Grinding between passes performed by manual tools
NA	3	FCAW	3	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	180	190	185,0	23	25	24,0	-	-	20	1,07	0,80	190	Pipe Thickness machined from 18,3 mm to 12 mm
NA	3	FCAW	4	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	180	190	185,0	23	25	24,0	-	-	20	1,07	0,80	250	

ROSETTI MARINO	**ОТЧЕТ О ПРОВЕДЕНИИ ВИЗУАЛЬНОЙ ПРОВЕРКИ И КОНТРОЛЯ РАЗМЕРОВ visual/dimensional inspection report**	VDR N° 07-21 дата: 21/09/2021
проект / project: D33	Заказчик / client: LUKOIL	№ проекта / job: 121A00

наименование – item

Procedure Qualification Record (WPQR) 07/21

СЕРТИФИКАТ ПРОТОКОЛА АТТЕСТАЦИИ СВАРОЧНОЙ ТЕХНОЛОГИИ (WPQR) 07/21

WE CERTIFY THAT:

ITEMS INDICATED ABOVE HAVE UNDERGONE A VISUAL INSPECTION AND HAVE BEEN ACCEPTED ACCORDING TO THE SPECIFICATION / PROCEDURE MENTIONED AND TO ACCEPTANCE CRITERIA DEFINED IN IT

Настоящим

ПОДТВЕРЖДАЕТСЯ, ЧТО ВЫШЕУКАЗАННЫЕ СВАРНЫЕ ШВЫ ПРОШЛИ 100% ВИЗУАЛЬНЫЙ ОСМОТР И БЫЛИ УТВЕРЖДЕНЫ В СООТВЕТСТВИИ С УКАЗАННЫМИ ТЕХНИЧЕСКИМИ ХАРАКТЕРИСТИКАМИ И СТАНДАРТАМИ.

примечания – remarks

Inspection on welds Diameter 660 mm and 12 mm WT in as welded condition.

- Half sample 180° (part A) has been welded with FILARC PZ6138 If sample 180° with Bohler diamond Ni1 for PC-2G position
- Half sample 180° (part A) has been welded with FILARC PZ6138 and half sample 180° with Bohler diamond Ni1 for PH-5G for position.

No visible defects have been detected.

результат - result ☒ соответствует - conforming ☐ не соответствует - not conforming

Процедура/ применяемые спецификации - applicable procedures / specifications

Appendix 1,Table 5 of 0D33-П-10-КМ-1-002-0010-09981 /EN ISO 5817:2014 Lev. B /GOST R ISO 15614-1-2009/121A00-PML-QC-PRO-00012

Оператор – Operator	~~Контроль качества - Quality Control~~	Заказчик - Client
CSWIP D.CENACCHI 305250 WI 3.1	РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА * RUSSIAN MARITIME REGISTER OF SHIPPING * 280 001	RINA A. Landi

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		21174 UT 10 SZ Rev. 00	
RAPPORTO D'ESAME CON ULTRASUONI Ultrasonic Examination report		DATA / Date 27/09/2021	FOGLIO / Sheet 1

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
LUKOIL-KMN LLC	pWPS	/	/	/

ESECUZIONE / Execution	ACCETTABILITA' / Acceptance level
121A00-PML-QC-PRO-00009	121A00-PML-QC-PRO-00009

MATERIALE Material	DIMENSIONI mm Dimension	SPESSORE NOMINALE / Thk mm
S460 G1+M	D= 660 mm	12 mm

STATO DELLA SUPERFICIE – Surface condition

☑ COME SALDATO As welded ☐ SPAZZOLATO - Brushed ☐ LAVORATO DI MACCHINA - Machined

☐ GREZZO – Forged ☐ LAMINATO – Rolled ☐ MOLATO – Ground ☐ SABBIATO – Blasted

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG 700	No. SERIE Serial Number	I003937

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	AMPLIFICAZIONE dB value	ONDE Waves
KRAUTKRAMER	KNF	4	10	0°	36	LONG.
DOPPLER	A4P	3	8X9	70°	44	SHEAR
DOPPLER	A4P	3	8X9	60°	44	SHEAR

BLOCCO DI CALIBRAZIONE Calibration block	IIW V2	BLOCCO DI RIFERIMENTO Reference block	QT-BLOCK-RM
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity	DAC ON SDH 3 mm

SALDATURE CONTROLLATE / Welds Verified

Item	Welder	Joit Type	Bevel	Thk	Scan plan
pWPS 07-21 PC	GX11-GX12	BUT WELD	V	12 mm	IDL-QCI-UT-0214

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Not According to specification ☐

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zauli II° Livello	ROSETTI MARINO SpA Welding Dept. D. Conacchi	

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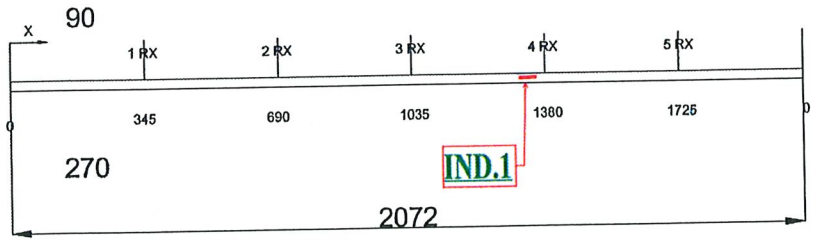
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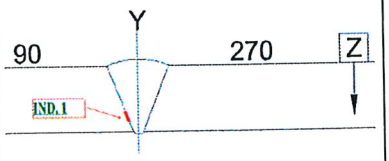
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RAPPORTO D'ESAME CON ULTRASUONI Ultrasonic Examination report		DATA / Date 27/09/2021	FOGLIO / Sheet 2

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
LUKOIL-KMN LLC	pWPS	/	/	/

LOCALIZZAZIONE DIFETTI - DEFECTS LOCATION										
INDICAZIONE Indication	1									
X = PUNTO DI RIFERIMENTO / Referens point										
Δ /X = DISTANZA DI INDICAZIONE DA X Flaw distance from X	1330									
Y = PUNTO DI RIFERIMENTO Referens point	C.W									
Δ /Y = DISTANZA DI INDICAZIONE DA Y Flaw distance from Y	0									
Δ L = LUNGHEZZA INDICAZIONE Flaw lenght	15									
Z = PROFONDITA' INDICAZIONE Flaw depth	19									
H = ALTEZZA DEL PICCO Pitch level	20									
√Ω= TIPO DI DIFETTO Flaw type	VOL									
A / R = ACCETTABILE-RIPARARE Acceptable-repair	A									

DISEGNO / SKETCH





RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Not According to specification ☐
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zanli II Livello	ROSETTI MARINO S.p.A. Welding Dept. D. Cenacchi	

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RAPPORTO D'ESAME CON ULTRASUONI Ultrasonic Examination report		DATA / Date 27/09/2021	FOGLIO / Sheet 1

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
LUKOIL-KMN LLC	pWPS	/	/	/

ESECUZIONE / Execution	ACCETTABILITA' / Acceptance level
121A00-PML-QC-PRO-00009	121A00-PML-QC-PRO-00009

MATERIALE Material	DIMENSIONI mm Dimension	SPESSORE NOMINALE / Thk mm
S460 G1+M	D= 660 mm	12 mm

STATO DELLA SUPERFICIE – Surface condition

☑ COME SALDATO As welded ☐ SPAZZOLATO - Brushed ☐ LAVORATO DI MACCHINA - Machined

☐ GREZZO – Forged ☐ LAMINATO – Rolled ☐ MOLATO – Ground ☐ SABBIATO – Blasted

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG 700	No. SERIE Serial Number	I003937

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	AMPLIFICAZIONE dB value	ONDE Waves
KRAUTKRAMER	KNF	4	10	0°	36	LONG.
DOPPLER	A4P	3	8X9	70°	44	SHEAR
DOPPLER	A4P	3	8X9	60°	44	SHEAR

BLOCCO DI CALIBRAZIONE Calibration block	IIW V2	BLOCCO DI RIFERIMENTO Reference block	QT-BLOCK-RM
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity	DAC ON SDH 3 mm

SALDATURE CONTROLLATE / Welds Verified

Item	Welder	Joit Type	Bevel	Thk	Scan plan
pWPS 07-21 PH	GX11-GX12	BUT WELD	V	12 mm	IDL-QCI-UT-0214

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Not According to specification ☐

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zauli II Livello	ROSETTI MARINO SpA Welding Dept. D.Genacchi	

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		21174 MT 09 SZ Rev. 00	
RAPPORTO D'ESAME MAGNETOSCOPICO Magnetic Particle Test Report		DATA / Date 27/09/2021	FOGLIO / Sheet 1

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	FASE Step
LUKOIL-KMN LLC	pWPS	/	/	/

ESECUZIONE / Execution		ACCETTABILITA' / Acceptance	
121A00-PML-QC-PRO-00010		121A00-PML-QC-PRO-00010	
MATERIALE/Material	TEMP. SUPERFICI Surface temperature	INTENSITA' LUMINOSA/ Light intensity	
S460 G1+M	22°C	☑ LUCE BIANCA 1250 Lux	☐ LUCE NERA 1000 µW/cm²

STATO DELLA SUPERFICIE – Surface condition			
☑ COME SALDATO As welded	☐ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined	
☐ GREZZO – Forged	☐ LAMINATO – Rolled	☐ MOLATO – Ground	☐ SABBIATO – Blasted

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☑ GIOGO/Yoke	☐ PUNTALI/Prods	☐ BOBINA/Coil	☐ CONDUTTORE CENTRALE/Central conduttor

METODO / Method		SMAGNETIZZAZIONE/Demagnetization	
☐ CONTINUO/Continuous	☐ RESIDUO /Residual	☐ RICHIESTA/Required	☑ NON RICHIESTA/Not Required
TIPO DI MAGNETIZZAZIONE/magnetization type		DIREZIONE CAMPO MAGNETICO/magnetic field direction	
☑ MAGNETICO/magnetic	☐ ELETTRICO/electric	☐ CIRCOLARE/Circular	☑ LONGITUDINALE/longitudinal
TIPO APPARECCHIO/Type of equipment	Magneticontrol HR235	DISTANZA PUNTALI/Pole spacing	180 mm
NUMERO DI SERIE/Serial number	18-235-19		
TIPO DI CORRENTE/Current Type		POTERE DI SOLLEVAMENTO GIOGO / Lifting power	
☑ A.C.	☐ D.C.	☑ 4,5 kg	☐ 18 kg
MEZZO DI ISPEZIONE / Examination medium		INTENSITÀ DI CORRENTE / Intesity	
☑ UMIDO/Wet	☐ SECCO/Dry	☐ A/ mm	☐ / spira

PARTICELLE UTILIZZATE/Particle Type			
CONTRASTO DI COLOR/Color contrast	☐	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	☑ NDT BW2 ☐ NDT DRY	MARCA TIPO/Mark Type	NDT FW1
LOTTO/BACH	7243S	LOTTO/BACH	/
VERNICE DI CONTRASTO / Contrast Paint		☑ NDT WBL5	LOTTO/BACH U190107S

SALDATURE CONTROLLATE / Welds Verified

Item	Welder	Joit Type	Bevel	Thk	Scan plan
pWPS 07-21 PC	GX11-GX12	BUT WELD	V	12 mm	IDL-QCI-MT-02
pWPS 07-21 PH	GX11-GX12	BUT WELD	V	12 mm	IDL-QCI-MT-02
pWPS 15-21 PH	GX11-GX12	BUT WELD	V	12 mm	IDL-QCI-MT-02

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITÀ Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zanzi II Livello	ROSETTI MARINO SpA Welding Dept. D. Conacchi	

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		21174 RT 11 SZ Rev. 00	
RAPPORTO D'ESAME RADIOGRAFICO RADIOGRAPHIC TEST		DATA / Date 23/09/2021	FOGLIO / Sheet 1

CLIENTE / Client	ORDINE / Order	PROGETTO / Project	COMMESSA / Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE /Customer	OGGETTO / Object	DISEGNO / Dwg	P.F.C. / Q.C.P.	Fase / Step
LUKOIL-KMN LLC	pWPS	/	/	/

Schizzo Sketch	Saldatura Weld	Diametro Diameter	Spessore Thikeness	Punzone Welder	Posizione Position	Difetto Defect	Giudizio Judgement
pWPS 07-21 POS. 2G	/	660 mm	12 mm	GX11	0-1	/	A
				GX12	1-2	/	A
					2-3	/	A
					3-4	/	A
					4-5	/	A
					5-0	/	A

DIFETTI / Defects

101	Longitudinal crack	2014	Linear porosity	3041	Tungsten inclusion	501	Undercut
104	Crater crack	2016	Wormholes	3042	Copper inclusion	504	Excess penetration
2011	Porosity	301	Slag inclusion	401	Lack of fusion	507	misaligment
2013	Clustered	DF	Difetto film Film defect	402	Lack of penetration	515	Root concavity

ESITO / Results

A	Accettabile Acceptable	NR	Riparare Repair	NX	Ripetere Film Repeat Film	RX	Conferma difetto Defect confirm

PROCEDURA /Procedure 121A00-PML-QC-PRO-00013	Schermi / Lead screen PB 0,10 Front and Back	Pellicole / Film type KODAK T200 (C4)
Tipo macchina Rx / Type machine Rx Gilardoni MHF 300-PO matr.045259001	Densità / Density Range ≤ 4 base material	Densità / Density Range 2÷3 welded area

TECNICA DI ESPOSIZIONE / Exposure Technique: SINGOLA PARETE SINGOLA IMMAGINE SWSI

Tipo di sorgente / source type			Tipo di IQI / IQI type	
☑ RX	☐ IR 192	☐ SE 75	☐ ASTM	☑ EN
Macchia focale focal spot		3	Posizione / position	
Attività activity			☐ Lato film film side	☑ Lato sorgente Source side
Ci	kV	mA	Esposizione / esposition	
/	240	2	☑ Film singolo Single film	☐ Film doppio Double ilm
Tempo di esposizione exposure time			Tecnica di sviluppo / Film processing	
30 sec			☐ Manuale / manual	☑ Automatico / Automatic

Spessore attraversato Crossed thickness w	Dist. Sorgente film *Source film distance* (SFD)	Dist. oggetto film *Film object distance* (b)	Distanza minima Minimum distance (f min)	Filo visibile n° Visible Wire n°	Lastre n° *Films n°*
Range 12 ÷ 20 mm	330 mm	12 mm	177 mm	13	6

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zanzi 2° Livello	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	

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		21174 RT 12 SZ Rev. 00	
RAPPORTO D'ESAME RADIOGRAFICO RADIOGRAPHIC TEST		DATA / Date 23/09/2021	FOGLIO / Sheet 1

CLIENTE / Client	ORDINE / Order	PROGETTO / Project	COMMESSA / Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE /Customer	OGGETTO / Object	DISEGNO / Dwg	P.F.C. / Q.C.P.	Fase / Step
LUKOIL-KMN LLC	pWPS	/	/	/

Schizzo Sketch	Saldatura Weld	Diametro Diameter	Spessore Thikeness	Punzone Welder	Posizione Position	Difetto Defect	Giudizio Judgement
pWPS 07-21 POS. 5G	/	660 mm	12 mm	GX11	0-1	2011	A
				GX12	1-2	/	A
					2-3	/	A
					3-4	/	A
					4-5	/	A
					5-0	/	A

DIFETTI / Defects

101	Longitudinal crack	2014	Linear porosity	3041	Tungsten inclusion	501	Undercut
104	Crater crack	2016	Wormholes	3042	Copper inclusion	504	Excess penetration
2011	Porosity	301	Slag inclusion	401	Lack of fusion	507	misaligment
2013	Clustered	DF	Difetto film Film defect	402	Lack of penetration	515	Root concavity

ESITO / Results

A	Accettabile Acceptable	NR	Riparare Repair	NX	Ripetere Film Repeat Film	RX	Conferma difetto Defect confirm

PROCEDURA /Procedure 121A00-PML-QC-PRO-00013	Schermi / Lead screen PB 0,10 Front and Back	Pellicole / Film type KODAK T200 (C4)
Tipo macchina Rx / Type machine Rx Gilardoni MHF 300-PO matr.045259001	Densità / Density Range ≤ 4 base material	Densità / Density Range 2÷3 welded area

TECNICA DI ESPOSIZIONE / Exposure Technique: SINGOLA PARETE SINGOLA IMMAGINE SWSI

Tipo di sorgente / source type			Tipo di IQI / IQI type	
☑ RX	☐ IR 192	☐ SE 75	☐ ASTM	☑ EN
Macchia focale focal spot		3	Posizione / position	
Attività activity			☐ Lato film film side	☑ Lato sorgente Source side
Ci	kV	mA	Esposizione / esposition	
/	240	2	☑ Film singolo Single film	☐ Film doppio Double ilm
Tempo di esposizione exposure time			Tecnica di sviluppo / Film processing	
30 sec			☐ Manuale / manual	☑ Automatico / Automatic

Spessore attraversato Crossed thickness w	Dist. Sorgente film *Source film distance* (SFD)	Dist. oggetto film *Film object distance* (b)	Distanza minima Minimum distance (f min)	Filo visibile n° Visible Wire n°	Lastre n° *Films n°*
Range 12 ÷ 20 mm	330 mm	12 mm	177 mm	13	6

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zanzi II° Livello	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	

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I risultati delle prove si riferiscono unicamente ai particolari esaminati. - Test results relate only to examined items.
Z:\Qualita\5 modulistica\Validi\01 moduli cnd\validi\01 2020 rev.1\convenzionali volumetrici

RINA A. Landi

INSPECTA S.R.L.	**TEST REPORT** ***RAPPORTO DI PROVA***	ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO LAB N°1607 L
	N° 416-00103-21 **Rev.00** **Data: 23/11/2021**	

Object: *Oggetto:*	**MECHANICAL TEST ON WPQR 07-2021 B**					Pag. 1 di 17
Specimen: *Saggio:* **532/21**	**#Base Material:** *Materiale Base:*	**EN 10225 S460G1+M**	**PIPE Ø 660 mm THK 12 mm**			
	# Informazione fornita dal cliente/ Information provided by the customer					
Customer: *Committente:* **Address:** *Indirizzo:*	**ROSETTI MARINO S.p.A.** **Via Trieste, 230 - 48122 Ravenna (RA)**					
Final customer:. *Cliente finale:*	//					
Your delivery note n°: *Vs. DDT di consegna*	**n°** //	**Date:** *Data:* //	**MD52** *MD 52*	**123/2021**	**Date:** *Data:*	**08/10/2021**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **29/10/2021**	**End of activities:** *Fine prove:*			**Date:** *Data:*	**23/11/2021**

PROVE RICHIESTE

☒ **TENSILE TEST**/*Trazione*	☒ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*
☒ **BEND TEST**/*Piega*	☒ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☒ Face/Root */Dritto/Rovescio* ☐ Side/ *Laterale*
☒ **IMPACT TEST**/*Resilienza*	☒ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*
☒ **MACROEXAMINATION TEST /** *Macrografia*		
☒ **HARDNESS TEST**/ *Durezza*	☐ HV 5	☒ HV 10
☐ **FRACTURE TEST**/ *Frattura*	☐ Plate with/on Plate/ *Piastra con/su Piastra* ☐ Pipe with/on Pipe/*Tubo con/ su Tubo*	☐ Pipe on Plate/*Tubo su Piastra*
☐ **CHEMICAL ANALYSIS**/*Analisi Chimica*		
☐ **MICROEXAMINATION TEST /** *Micrografia*		
☐ **OTHER (Specify)**/*Altro/(Specificare)*		

Allegati /Attachments: NONE

NOTE/ Remarks: **REFERENCE CODE FROM CUSTOMER REQUEST: RINA RULES + RMRS ND No.2-020101-015 + RMRS ND No.2-020101-138 + RMRS ND No.2-020101-139 + GOST R ISO 15614-1-2009**
TEST WITNESSED BY CENACCHI DAVIDE (ROSETTI MARINO SPA) – ALEKSEY LAZAREV (RS-CLASS) – LANDI ANDREA (RINA)
Informazioni aggiuntive fornite dal cliente:
Additional information provided by the customer

Laboratory Responsible *Responsabile Laboratorio* *Sig. Giulio Bagnara*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - 23-11-2021 Service Responsible	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I risultati di prova si riferiscono al campione così come ricevuto, essendo il campionamento eseguito dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%. Quando emesso il Report in revisione, l'oggetto revisionato è identificabile mediante barra verticale posta sul lato sinistro e dal testo in formato corsivo sottolineato.
The results in this test report refers only to the specimen that has been tested. The customer undertakes to print out/reproduce the test report. Any partial reproduction is prohibited. Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory. The test results refer to the sample as received, since the sampling is performed by the customer. Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku=2 equivalent to a level of confidence of 95 %. When the Report under review is issued, the revised object can be identified by the vertical bar on the left side and by the text in italics underlined.

RINA A. Landi

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE
Prova di trazione trasversale a temperatura ambiente

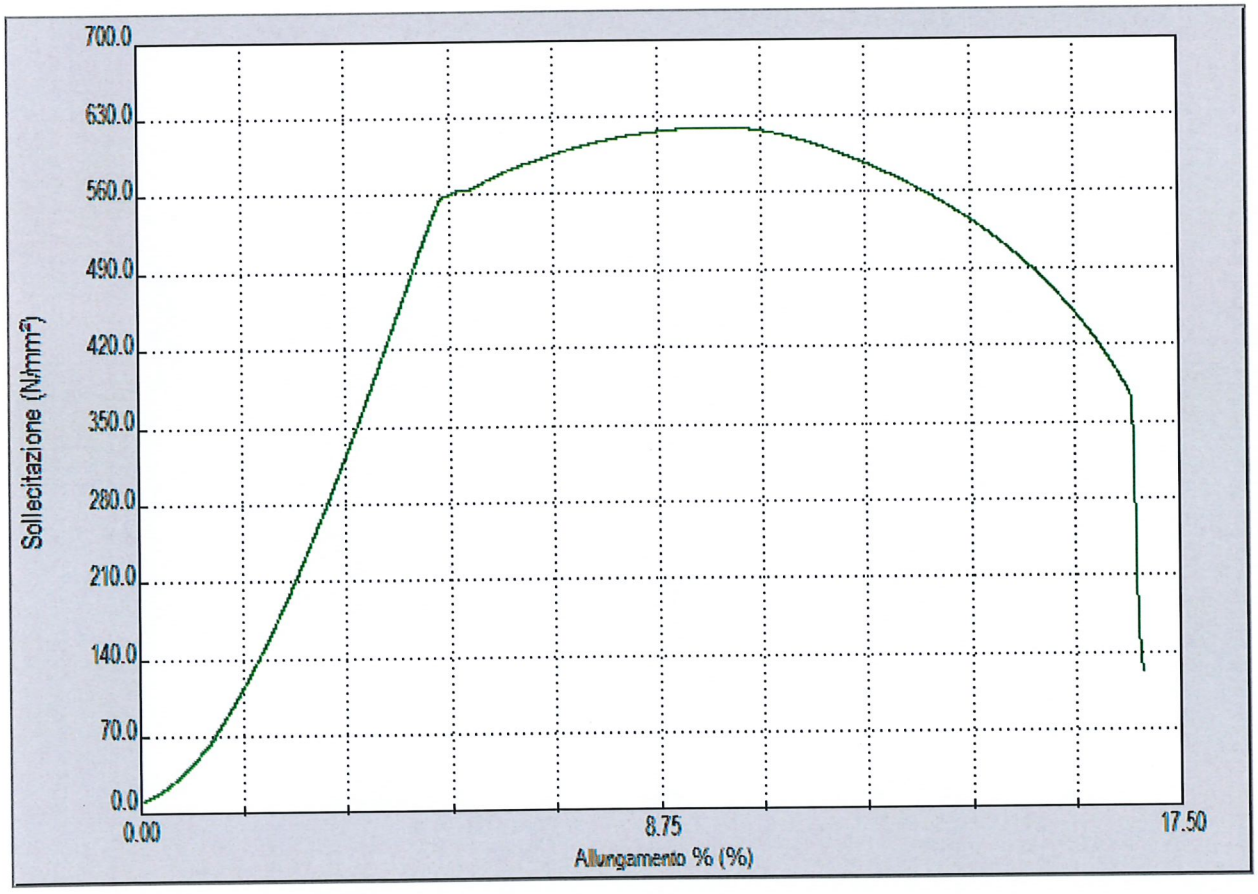
Date of Testing::23/11/2021
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *UNI EN ISO 4136:2012*

The test was performed using the Galdabini testing materials machine, model Quasar 600, s.n. VAUP/01 (2014)
La prova è stata eseguita utilizzando la macchina per prove materiali Galdabini, modello Quasar 600, s.n. VAUP/01 (2014)

Internal procedure *Procedura interna :* ***PP08 rev.14***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
532/21 A TWT	11,40x25,04	285,46	22,4°C	//	//	/	//	/	176849	620	/	//	//	FOW



Remarks */ Note:*	*POSTION PC*
Legend */ Legenda*	**TT = Transverse Tension***/Trazione.trasversale;* **FOW = Failure Out of Weld***/Rottura fuori dalla saldatura*
	TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;* **FIW = Failure in Weld***/Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi Laboratory Technician 23/11/2021	Sig. Giulio Bagnara - INSPECTA srl - 23-11-2021 Service Responsible	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

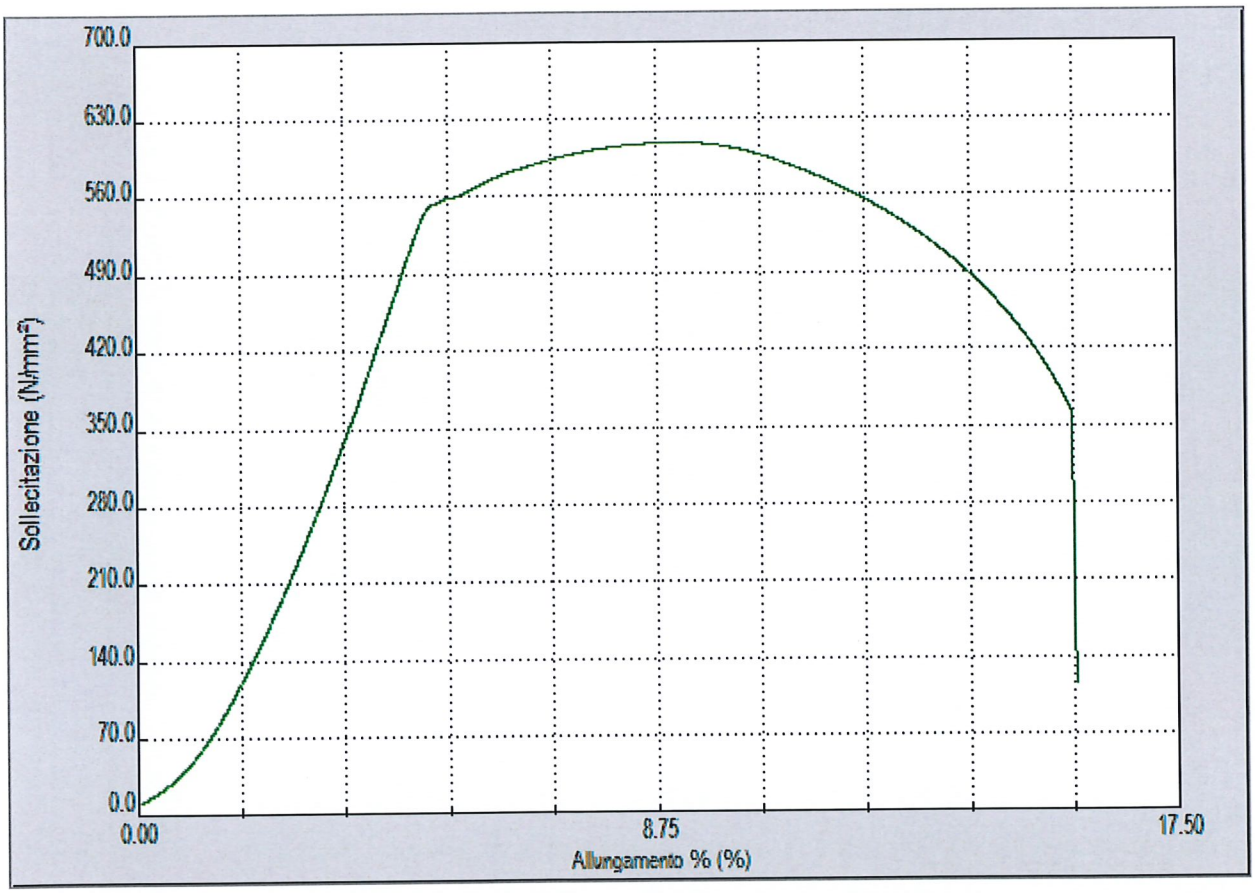
Date of Testing::23/11/2021
Data esecuzione prova:

performed in accordance with the standard / eseguita in conformità alla norma UNI EN ISO 4136:2012

The test was performed using the Galdabini testing materials machine, model Quasar 600, s.n. VAUP/01 (2014)
La prova è stata eseguita utilizzando la macchina per prove materiali Galdabini, modello Quasar 600, s.n. VAUP/01 (2014)

Internal procedure *Procedura interna :* ***PP08 rev.14***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
532/21 B TWT	11,28x25,04	282,45	22,4°C	//	//	/	//	/	171738	608	/	//	//	FOW



Remarks */ Note:*	*POSTION PC*
Legend / *Legenda*	**TT = Transverse Tension***/Trazione.trasversale;* **FOW = Failure Out of Weld***/Rottura fuori dalla saldatura*
	TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;* **FIW = Failure in Weld***/Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi Laboratory Technician 23/11/2021	Sig. Giulio Bagnara - INSPECTA srl - 23-11-2021 Service Responsible	ROSETTI MARINO SPA Welding Dept. D. Conacchi	

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

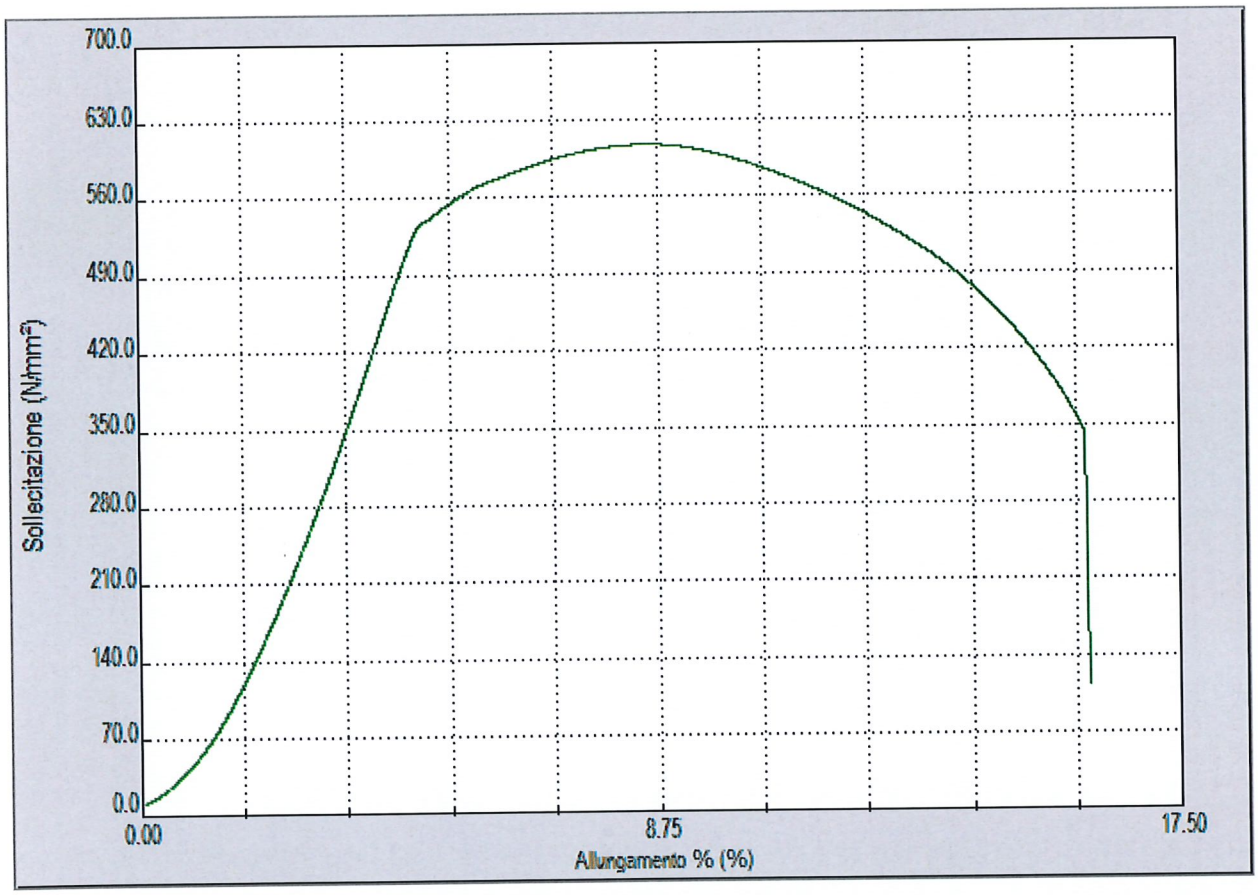
Date of Testing::23/11/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* UNI EN ISO 4136:2012

The test was performed using the Galdabini testing materials machine, model Quasar 600, s.n. VAUP/01 (2014)
La prova è stata eseguita utilizzando la macchina per prove materiali Galdabini, modello Quasar 600, s.n. VAUP/01 (2014)

Internal procedure *Procedura interna* : ***PP08 rev.14***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
532/21 C TWT	11,46x25,07	287,30	22,4°C	//	//	/	//	/	174510	607	/	//	//	FOW



Remarks / *Note:*	*POSTION PH*
Legend / *Legenda*	**TT = Transverse Tension**/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura* **TWT = Transverse Weld Tension**/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara	ROSETTI MARINO SPA Welding Dept D. Canacchi	
Laboratory Technician 23/11/2021	INSPECTA srl 23-11-2021 Service Responsible		

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE
Prova di trazione trasversale a temperatura ambiente

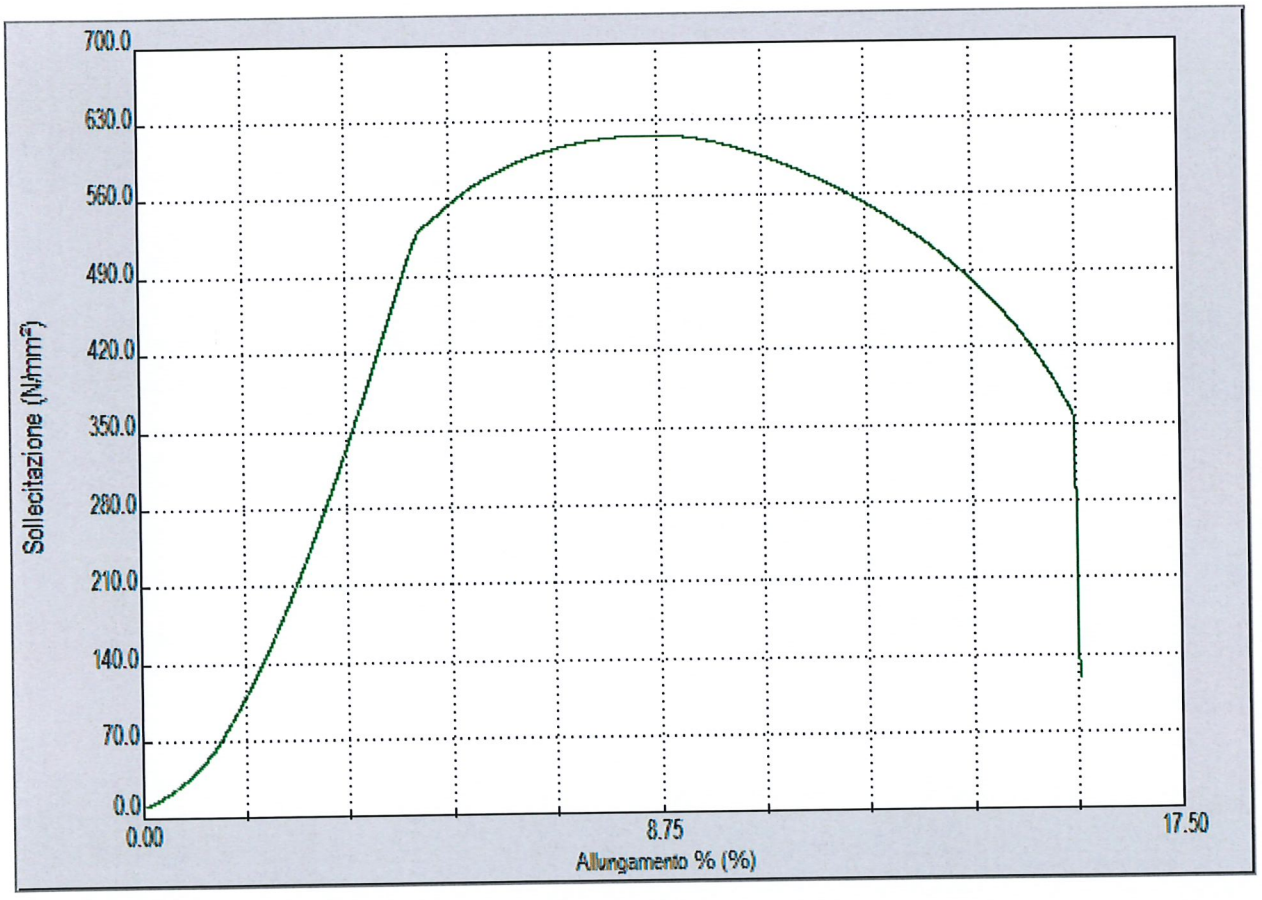
Date of Testing::23/11/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* UNI EN ISO 4136:2012

The test was performed using the Galdabini testing materials machine, model Quasar 600, s.n. VAUP/01 (2014)
La prova è stata eseguita utilizzando la macchina per prove materiali Galdabini, modello Quasar 600, s.n. VAUP/01 (2014)

Internal procedure *Procedura interna :* ***PP08 rev.14***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
532/21 D TWT	11,06x25,01	276,61	22,4°C	//	//	/	//	/	170416	616	/	//	//	FOW



Remarks */ Note:*	POSTION PH
Legend */ Legenda*	**TT = Transverse Tension***/Trazione.trasversale;* **FOW = Failure Out of Weld***/Rottura fuori dalla saldatura*
	TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;* **FIW = Failure in Weld***/Rottura in saldatura*

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott.Ing. Matteo Racchetti	*Sig. Giulio Bagnara*	ROSETTI MARINO S.p.A. Welding Dept. D. Cenacchi	
Laboratory Technician 23/11/2021	- INSPECTA srl - 23-11-2021 Service Responsible		

BEND TEST
Prova di piega

Date of Testing::03/11/2021
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* UNI EN ISO 5173:2012

The test was performed using the Galdabini testing materials machine, model Quasar 600, s.n. VAUP/01 (2014)
La prova è stata eseguita utilizzando la macchina per prove materiali Galdabini, modello Quasar 600, s.n. VAUP/01 (2014)

Internal procedure *Procedura interna* : ***PP11 rev.06***

Specimen id. *Identificazione provino*		Dimension *Dimensioni (mm)*	Test Temp. *Temp.test °C*	Bend Angle *Angolo di piega*	Ø Former *Ø Mandrino (mm)*	Distance between rollers *Distanza appoggi (mm)*	Remarks *Note*
532/2021 TFB	A	12,00x40,00	23,4°C	180°	40	67	No open discontinuities have been found in weld metal and heat affected zone
532/2021 TFB	B	12,00x40,00	23,4°C	180°	40	67	No open discontinuities have been found in weld metal and heat affected zone
532/2021 TRB	C	12,00x40,00	23,4°C	180°	40	67	No open discontinuities have been found in weld metal and heat affected zone
532/2021 TRB	D	12,00x40,00	23,4°C	180°	40	67	No open discontinuities have been found in weld metal and heat affected zone

Remarks *Note:* POSITION PC

Legend *Legenda*
SBB. = Transverse Side Bend/*Piega Trasversale laterale*
TRB. = Transverse Root Bend/*Piega Trasversale al rovescio*
TFB. = Transverse Face Bend/*Piega Trasversale al dritto*
LRB = Longitudinal Root Bend / *Piega Longitudinale al rovescio*
LFB. = Longitudinal Face Bend / *Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara		
INSPECTA srl Laboratory Technician 23/11/2021	- INSPECTA srl - 23-11-2021 Service Responsible	ROSETTI MARINO SpA Welding Dept. G. Cenacchi	

BEND TEST
Prova di piega

Date of Testing::03/11/2021
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *UNI EN ISO 5173:2012*

The test was performed using the Galdabini testing materials machine, model Quasar 600, s.n. VAUP/01 (2014)
La prova è stata eseguita utilizzando la macchina per prove materiali Galdabini, modello Quasar 600, s.n. VAUP/01 (2014)

Internal procedure *Procedura interna* **:*PP11 rev.06***

Specimen id. *Identificazione provino*		Dimension *Dimensioni (mm)*	Test Temp. *Temp.test °C*	Bend Angle *Angolo di piega*	Ø Former *Ø Mandrino (mm)*	Distance between rollers *Distanza appoggi (mm)*	Remarks *Note*
532/2021 TFB	E	12,00x40,00	23,4°C	180°	40	67	No open discontinuities have been found in weld metal and heat affected zone
532/2021 TFB	F	12,00x40,00	23,4°C	180°	40	67	No open discontinuities have been found in weld metal and heat affected zone
532/2021 TRB	G	12,00x40,00	23,4°C	180°	40	67	No open discontinuities have been found in weld metal and heat affected zone
532/2021 TRB	H	12,00x40,00	23,4°C	180°	40	67	No open discontinuities have been found in weld metal and heat affected zone

Remarks *Note:* POSITION PH

Legend *Legenda*

SBB. = Transverse Side Bend/*Piega Trasversale laterale*
TRB. = Transverse Root Bend/*Piega Trasversale al rovescio*
TFB. = Transverse Face Bend/*Piega Trasversale al dritto*
LRB = Longitudinal Root Bend */ Piega Longitudinale al rovescio*
LFB. = Longitudinal Face Bend */ Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi - INSPECTA srl - Laboratory Technician 23/11/2021	Sig. Giulio Bagnara - INSPECTA srl - 23-11-2021 Service Responsible	ROSETTI MARINO SPA Welding Dept D.Cenacchi	

IMPACT TEST
Prova di resilienza

Date of Testing:23/11/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* UNI EN ISO 9016:2012

The test was performed using the Galdabini Charpy pendulum machine, model Impact 450, s.n. VAUP/02
La prova è stata eseguita utilizzando macchina pendolo Charpy marca Galdabini, modello Impact 450, s.n. VAUP/02

Internal procedure *Procedura interna* :***PP09 rev.08***

Specimen id. *Identificazione provino*	Direction *Direzione*	Dimension *Dimensioni (mm)*	Test Temp. *Temp .test*	Notch Type *Intaglio*	Knife / *coltello*	Requirement / Requisiti: Energy absorbed/ / Energia assorbita – Individual *Individuale Joule* 1	2	3	Average *Media Joule*	U	Lateral Expansion *Espansione laterale (mm)* 1	2	3	Shear Area *Area fragile %* 1	2	3	Remarks *Note*
532/21 VWT 0/2	T	10x10x55	-60°C	V	2	48	53	46	42	/	//	//	//	//	//	//	//
532/21 VHT 0/2	T	10x10x55	-60°C	V	2	70	93	86	89	/	//	//	//	//	//	//	//
532/21 VHT2/2	T	10x10x55	-60°C	V	2	301	307	268	292	/	//	//	//	//	//	//	//
532/21 VHT 5/2	T	10x10x55	-60°C	V	2	333	319	320	324	/	//	//	//	//	//	//	//

Remarks *Note:* ***POSITION PC***

Legend *Legenda*

L= Longitudinal / Longitudinale
T= Trasversal / Trasversale
VWT 0/2 = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
VHT 0/2 = Impact Test on Fusion Line / *Resilienza Trasversale in linea di fusione*
VHT 1/2 = Impact Test at 1mm from Fusion Line / *Resilienza trasversale a 1 mm dalla linea di fusione*
VHT 2/2 = Impact Test at 2 mm from Fusion Line / *Resilienza trasversale a 2 mm dalla linea di fusione*
VHT 5/2 = Impact Test at 5 mm from Fusion Line / *Resilienza trasversale a 5 mm dalla linea di fusione*
WM = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
HAZ = Impact Test on Heat Affected Zone / *Resilienza Trasversale in zona termicamente alterata*
BM = Impact Test on Base Metal / *Resilienza Trasversale in materiale base*

FL = Fusion Line/ *Linea di fusione*
FL+1 = Fusion Line + 1mm/ *Linea di fusione+1mm*
FL+2 = Fusion Line + 2mm/ *Linea di fusione+2mm*
FL +5= Fusion Line + 5mm/ *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Bacchereschi - INSPECTA srl - Laboratory Technician 23/11/2021	Sig. Giulio Bagnara - INSPECTA srl - Service Responsible 23-11-2021	ROSETTI MARINO SPA Welding Dept D. Ceracchi	

IMPACT TEST
Prova di resilienza

Date of Testing:23/11/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* *UNI EN ISO 9016:2012*

The test was performed using the Galdabini Charpy pendulum machine, model Impact 450, s.n. VAUP/02
La prova è stata eseguita utilizzando macchina pendolo Charpy marca Galdabini, modello Impact 450, s.n. VAUP/02

Internal procedure *Procedura interna* :***PP09 rev.08***

Specimen id. *Identificazione provino*	Direction *Direzione*	Dimension *Dimensioni (mm)*	Test Temp. *Temp .test*	Notch Type *Intaglio*	Knife / *coltello*	Requirement / Requisiti: Energy absorbed/ / Energia assorbita – Individual *Individuale Joule* 1	2	3	Average *Media Joule*	U	Lateral Expansion *Espansione laterale (mm)* 1	2	3	Shear Area *Area fragile %* 1	2	3	Remarks *Note*
532/21 VWT 0/2	**T**	**10x10x55**	**-60°C**	**V**	**2**	**86**	**79**	**60**	**75**	/	//	//	//	//	//	//	//
532/21 VHT 0/2	**T**	**10x10x55**	**-60°C**	**V**	**2**	**98**	**77**	**101**	**92**	/	//	//	//	//	//	//	//
532/21 VHT2/2	**T**	**10x10x55**	**-60°C**	**V**	**2**	**92**	**257**	**225**	**191**	/	//	//	//	//	//	//	//
532/21 VHT 5/2	**T**	**10x10x55**	**-60°C**	**V**	**2**	**340**	**320**	**307**	**322**	/	//	//	//	//	//	//	//

Remarks *Note:* ***POSITION PH***

Legend *Legenda*

L= Longitudinal / Longitudinale
T= Trasversal / Trasversale
VWT 0/2 = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
VHT 0/2 = Impact Test on Fusion Line / *Resilienza Trasversale in linea di fusione*
VHT 1/2 = Impact Test at 1mm from Fusion Line / *Resilienza trasversale a 1 mm dalla linea di fusione*
VHT 2/2 = Impact Test at 2 mm from Fusion Line / *Resilienza trasversale a 2 mm dalla linea di fusione*
VHT 5/2 = Impact Test at 5 mm from Fusion Line / *Resilienza trasversale a 5 mm dalla linea di fusione*
WM = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
HAZ = Impact Test on Heat Affected Zone / *Resilienza Trasversale in zona termicamente alterata*
BM = Impact Test on Base Metal / *Resilienza Trasversale in materiale base*

FL = Fusion Line/ *Linea di fusione*
FL+1 = Fusion Line + 1mm/ *Linea di fusione+ 1mm*
FL+2 = Fusion Line + 2mm/ *Linea di fusione+2mm*
FL +5= Fusion Line + 5mm/ *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Bacchereschi INSPECTA S.r.l. Laboratory Technician 23/11/2021	Sig. Giulio Bagnara - INSPECTA srl - 23-11-2021 Service Responsible	ROSETTI MARINO SPA Welding Dept. B. Ceracchi	

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::16/11/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* UNI EN ISO 9015-1:2011

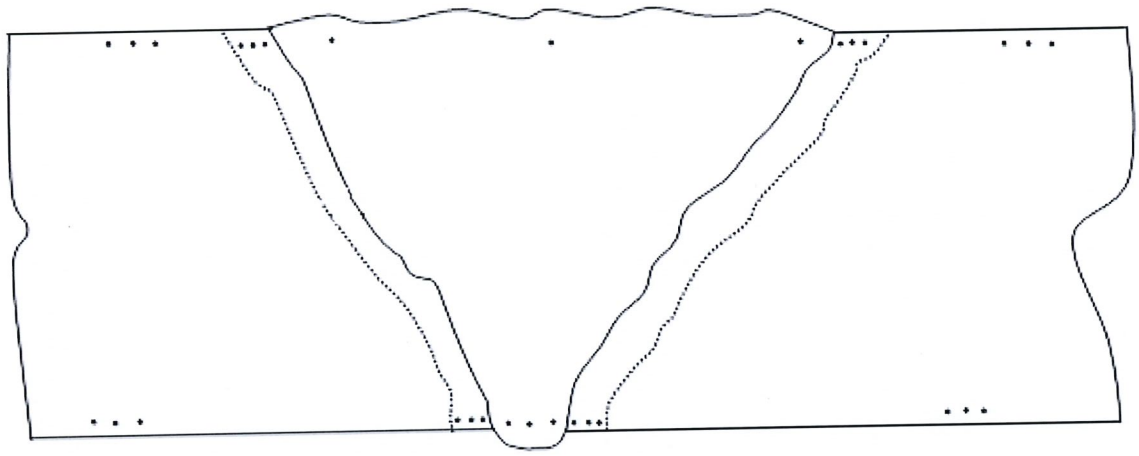
The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure / Procedura interna	PP10 rev.06	Sample Identification / Identificazione provino	532/21 A	Hardness test type / Tipo di durezza	HV10	Test Temp. / Temp.test	22,4°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: EN 10225 S460G1+M — **Base Material Side B: EN 10225 S460G1+M**

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6	7 – 8 – 9	10 – 11 – 12	13 – 14 – 15
16 – 17 – 18	19 – 20 – 21	22 – 23 – 24	25 – 26 – 27	28 – 29 – 30



Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U
1 – 2 – 3	218-221-217	/	16 – 17 – 18	217-217-202	/	//	//	/
4 – 5 – 6	209-213-222	/	19 - 20 – 21	200-200-209	/	//	//	/
7 – 8 – 9	236-248-271	/	22 – 23 – 24	216-209-225	/	//	//	/
10 – 11 – 12	249-238-235	/	25 - 26 – 27	234-224-210	/	//	//	/
13 – 14 – 15	227-223-225	/	28 – 29 – 30	218-221-218	/	//	//	/

Remarks/ *Note:* POSITION PC

Laboratory Technician *Tecnico di Laboratorio* *Dott. Ing. Mauro Bacchieschi*	Laboratory Responsible *Responsabile Laboratorio* *Sig. Giulio Bagnara*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
INSPECTA srl Laboratory Technician 23/11/2021	- INSPECTA srl - 23-11-2021 Service Responsible	ROSETTI MARINO SpA Welding Dept. D. Ceracchi	

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::16/11/2021
Data esecuzione prova:

performed in accordance with the standard / eseguita in conformità alla norma UNI EN ISO 9015-1:2011

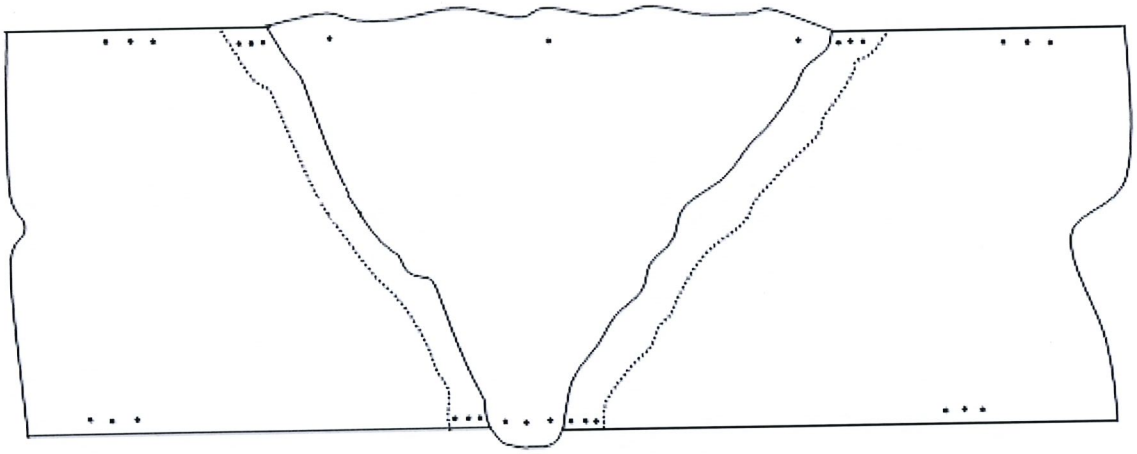
The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure / Procedura interna	PP10 rev.06	Sample Identification / Identificazione provino	532/21 C	Hardness test type / Tipo di durezza	HV10	Test Temp. / Temp.test	22,4°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: EN 10225 S460G1+M — **Base Material Side B: EN 10225 S460G1+M**

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6	7 – 8 – 9	10 – 11 – 12	13 – 14 – 15
16 – 17 – 18	19 – 20 – 21	22 – 23 – 24	25 – 26 – 27	28 – 29 – 30



Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U
1 – 2 – 3	217-214-217	/	16 – 17 – 18	200-202-203	/	//	//	/
4 – 5 – 6	218-229-237	/	19 - 20 – 21	209-215-225	/	//	//	/
7 – 8 – 9	255-235-244	/	22 – 23 – 24	212-198-207	/	//	//	/
10 – 11 – 12	239-231-222	/	25 - 26 – 27	219-218-209	/	//	//	/
13 – 14 – 15	223-228-228	/	28 – 29 – 30	211-206-202	/	//	//	/

Remarks/ *Note:* POSITION PH – H.3

Laboratory Technician / Tecnico di Laboratorio	Laboratory Responsible / Responsabile Laboratorio	Customer Inspector / Ispettore del cliente	Third part Inspector / Ispettore Terza parte
Dott. Ing. Mauro Baccheschi - INSPECTA srl - Laboratory Technician 23/11/2021	Sig. Giulio Bagnara - INSPECTA srl - 23-11-2021 Service Responsible	ROSETTI MARINO SpA Welding Dept P. Cenacchi	

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::16/11/2021
Data esecuzione prova:

performed in accordance with the standard / eseguita in conformità alla norma UNI EN ISO 9015-1:2011

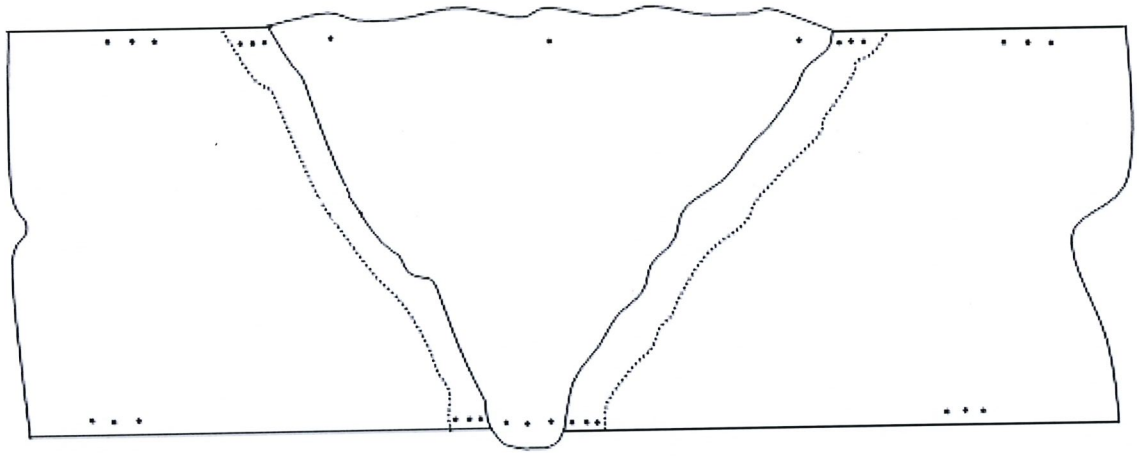
The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure / Procedura interna	PP10 rev.06	Sample Identification / Identificazione provino	532/21 D	Hardness test type / Tipo di durezza	HV10	Test Temp. / Temp.test	22,4°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: EN 10225 S460G1+M — **Base Material Side B: EN 10225 S460G1+M**

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6	7 – 8 – 9	10 – 11 – 12	13 – 14 – 15
16 – 17 – 18	19 – 20 – 21	22 – 23 – 24	25 – 26 – 27	28 – 29 – 30



Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U
1 – 2 – 3	222-224-224	/	16 – 17 – 18	204-207-215	/	//	//	/
4 – 5 – 6	209-208-219	/	19 - 20 – 21	202-205-212	/	//	//	/
7 – 8 – 9	222-212-239	/	22 – 23 – 24	225-224-227	/	//	//	/
10 – 11 – 12	224-209-215	/	25 - 26 – 27	215-207-207	/	//	//	/
13 – 14 – 15	220-224-226	/	28 – 29 – 30	207-206-207	/	//	//	/

Remarks/ *Note:* **POSITION PH – H.6**

Laboratory Technician / Tecnico di Laboratorio	Laboratory Responsible / Responsabile Laboratorio	Customer Inspector / Ispettore del cliente	Third part Inspector / Ispettore Terza parte
Dott. Ing. Mauro Bacchieschi Laboratory Technician 23/11/2021	Sig. Giulio Bagnara - INSPECTA srl - Service Responsible 23-11-2021	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::29/10/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* UNI EN ISO 17639:2013

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,3°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**532/2021 A**	**Magnification:** *Ingrandimento:*	**Photo at: 3.20x** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639 - A - E – 6 - 2.1 / 6 / 2.1 / A1**		



Remarks / *Note:*	**POSITION PC** **No defects have been found in Macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	
Laboratory Technician 23/11/2021	- INSPECTA srl - Service Responsible 23-11-2021		

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::29/10/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* UNI EN ISO 17639:2013

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,3°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**532/2021 B**	**Magnification:** *Ingrandimento:*	**Photo at: 3.20x** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639 - A - E – 6 - 2.1 / 6 / 2.1 / A1**		



Remarks / *Note:*	**POSITION PC** **No defects have been found in Macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara	ROSETTI MARINO S.p.A. Welding Dept. G. Cenacchi	
Laboratory Technician 23/11/2021	- INSPECTA srl - Service Responsible 23-11-2021		

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::29/10/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* UNI EN ISO 17639:2013

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,3°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**532/2021 C**	**Magnification:** *Ingrandimento:*	**Photo at: 3.40x** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639 - A - E – 6 - 2.1 / 6 / 2.1 / A1**		



Remarks / *Note:*	**POSITION PH – H.3** **No defects have been found in Macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*		
- INSPECTA srl -	- INSPECTA srl -	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	
Laboratory Technician 23/11/2021	Service Responsible 23-11-2021		

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::29/10/2021
Data esecuzione prova:

performed in accordance with the standard / eseguita in conformità alla norma UNI EN ISO 17639:2013

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,3°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**532/2021 D**	**Magnification:** *Ingrandimento:*	**Photo at: 3.30x** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639 - A - E – 6 - 2.1 / 6 / 2.1 / A1**		



Remarks / *Note:*	**POSITION PH – H.6** **No defects have been found in Macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO S.p.A. Welding Dept. D. Cenacchi	
Laboratory Technician 23/11/2021	- INSPECTA srl - Service Responsible 23-11-2021		

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::29/10/2021
Data esecuzione prova:

performed in accordance with the standard / eseguita in conformità alla norma UNI EN ISO 17639:2013

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,3°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**532/2021 E**	**Magnification:** *Ingrandimento:*	**Photo at: 3.30x** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639 - A - E – 6 - 2.1 / 6 / 2.1 / A1**		



Remarks / *Note:*	**POSITION PH – H.12** **No defects have been found in Macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SPA Welding Dept. D. Cenacchi	
Laboratory Technician 23/11/2021	INSPECTA srl Service Responsible 23-11-2021		

END OF TEST REPORT
FINE DEL RAPPORTO DI PROVA

voestalpine Böhler Welding Italia S.r.l.

Via Palizzi, 90
I – 20157 MILANO MI
Tel. +39 02 39017.1
Fax +39 02 39017244

www.voestalpine.com/welding

Certificato di prova 3.1
Inspection certificate 3.1

secondo / as per : EN 10204
No. : No. : 2021-2014568877-10-939012-014
Rev. 0 Page / Page : 1 / 1

ROSETTI MARINO S.p.A.

Via Trieste 230
48100 RAVENNA
Italia

Ordine N°	PO no.	Campionatura gratuita	del / of	28.06.2021
Ordine N°	Order no.	1014243616		
Bolla di consegna/Pos./Splitt.	Delivery note/pos./split	2014568877/000000/000010	del / of	07.07.2021
Oggetto test	Product	filo animato / Tubular cored electrode		
Denominazione commerciale	Trade name	**diamondspark Ni1 RC**		208593 27098 CU05110F 0140
Classificazione norma	Standard designation	EN ISO 17632-A: T50 6 1Ni P M 1 H5 AWS A5.36: E81T1-M21A8-Ni1-H4		
Dimensione	Dimension	1,2 mm		
Colata	Serial no.	939012		
Quantità fornita	Quantity	48,0 KG		

Composizione chimica in % del deposito **Chemical composition in % of the weld metal**

C	Si	Mn	P	S	Cr	Mo	Ni	Cu	Al					
0,05	0,30	1,04	0,009	0,013	0,03	< 0,01	0,93	0,10	< 0,01					

proprietà meccaniche **Mechanical properties** **EN 10204 - 2.2**

Prova di trazione Tensile test

T	ReL / Rp 0,2 MPa	Rp 1,0 MPa	Rm MPa	A (Lo = 5d) %	Z %	WBH PWHT	Note Remarks
20°C	≥ 500		560 - 690	≥ 18			

Prova di resilienza Impact test

T	Energia di impatto Impact energy KV / J	Medio Average KV / J	Espansione lat. Lateral expansion mm	Frattura cristalliina Shear fracture %	WBH PWHT	Note Remarks
-60°C	≥ 47					

Questo certificate è stato emesso con sistema automatizzato e non richiede firma
This certificate was issued by DP-equipment and does not require signature.

Centro / Town: Milano
Data / Date: 02.08.2021
Q.A. representative / Authorized representative: Zuin

voestalpine
ONE STEP AHEAD.

鋼管検査証明書
INSPECTION CERTIFICATE

新日鐵住金株式会社
NIPPON STEEL & SUMITOMO METAL CORPORATION

本社 HEAD OFFICE：〒100-8071 東京都千代田区丸の内二丁目6番1号 2-6-1, MARUNOUCHI CHIYODA-KU, TOKYO 100-8071, JAPAN

君津製鐵所 KIMITSU WORKS：〒299-1141 千葉県君津市君津1番地 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF., 299-1141, JAPAN

注文者 SHIPPER：SUMIKIN BUSSAN CORPORATION

注文者照合番号 REFERENCE No.：1216-HCY3413

契約番号 CONTRACT No.：3-841-N3-5-0-X001-02

商品名 COMMODITY：SUBMERGED ARC LONGITUDINALLY WELDED STEEL LINE PIPE

規格 SPECIFICATION：API SPEC 5L GR.L450M PSL2 (45TH EDITION,DEC.2012)

寸法 SIZE：660.4X18.3X12000

需要家 CUSTOMER：SIDERPIGHI S.P.A. CON SOCIO UNICO

需要家管理番号 CUSTOMER'S CONTROL No.：

証明書番号 CERTIFICATE No.：U-13100107 頁 PAGE：1

発行年月日 DATE OF ISSUE：2013-10-29 Q05

数量 QUANTITY：30 PCS

質量 MASS：NET 104,310KG

特記 NOTE：ORDER NO.HCY3413/SBE2013081 ACCORDING TO EN10204 3.1

管理番号 CONTROL No.：417401 (製造番号 PRODUCTION No.)

製鋼番号 HEAT NO. / 試験番号 TEST NO.	化学成分 CHEMICAL COMPOSITION % C	Si	Mn	P	S	Ni	Cu	Cr	Mo	Nb	V	Ti	TA	TAL	B	TE	Ceq	LOCATION	ORIENTATION	GL	引張試験 TENSILE TEST 耐力 YS	引張強さ TS	伸び EL	降伏比 YR	BEND TEST	試験温度 TEST TEMP.	衝撃試験 IMPACT TEST SIZE	NOTCH	LOCATION	ORIENTATION	衝撃値 IMPACT VALUE 平均値 AVG	個々の値 EACH	延性破面率 SHEAR FRACTURE 平均値 AVG	個々の値 EACH	落重試験 DWTT 延性破面率 SHEAR FRACTURE 平均値 AVG	個々の値 EACH	LOCATION	硬さ試験 HARDNESS TEST	粒度試験 GRAIN SIZE TEST	備考 REMARKS
	X100	X100	X100	X1000	X1000 PPM	X100	X100	X100	X100	X100	X100	X100	X1000	X1000 PPM	X1000 PPM	X100	X100				0.5%	MPA	%			°C					J		%		%					
*** SPEC. ***																																								
MIN																		BT	A		450	535	23			0	FV	27				21								
MAX H	10	45	170	25	15	50	50	50	50						10	25	43	BT	A		600	760		93																
MIN																		WT				535				0	FV	27				21								
MAX H																15																									
MIN																		HT								0	FV	27				21								
MAX P	10	45	170	25	15	50	50	50	50						10	25	43																							
MAX P																15																									
G10987 H	4	22	139	9	0	1	1	19	11	3	0	1		24	2	14	33																							
H																4																									
19637	(PIECE NO:417401-0020,PIPE NO:4174-01-0030)																	BT	A		537	618	44	87																	
19638	(PIECE NO:417401-0020,PIPE NO:4174-01-0030)																	WT				636			A															
19634	(PIECE NO:417401-0020,PIPE NO:4174-01-0030)																	BT								0	FV	470	472	469	469	100	100	100	100					
																		WT								0	FV	153	192	140	128	88	95	85	85					
19635 P	4	22	140	9	0	1	1	19	12	3	0	1		23	2	14	34	HT								0	FV	439	435	439	444	100	100	100	100					
P																4																									
	(PIECE NO:417401-0020,PIPE NO:4174-01-0030)																																								
19636 P	4	22	139	8	0	1	1	19	12	3	0	1		22	1	14	33																							
P																4																									
	(PIECE NO:417401-0020,PIPE NO:4174-01-0030)																																								
G11102 H	5	21	141	5	0	1	1	19	11	3	0	1		17	2	15	35																							
H																4																									
19607	(PIECE NO:417401-0018,PIPE NO:4174-01-0002)																	BT	A		553	635	42	87																	
																		WT				630																		

その他試験 DESCRIPTION OF TEST	寸法・外観検査 VISUAL & DIMENSIONS INSPECTION	水圧試験 HYDROSTATIC TEST	非破壊検査 NON-DESTRUCTIVE INSPECTION
	ACCEPTABLE	20.5 MPA 10 SEC. ACCEPTABLE	UT,RT ACCEPTABLE

注釈1 NOTES1 ※1 H: 溶鋼分析 Heat Analysis, P: 母材製品分析 Product Analysis(Base), W: 溶接部製品分析 Product Analysis(Weld) ※2 B: 母材 Base Metal, W: 溶接部 Weld, H: 熱影響部 HAZ ※3 L: 縦方向 Longitudinal, T: 横方向 Transverse ※4 GL: 標点距離 Gauge Length, A:50mm, B:200mm, C:2", D:8", E:5.65√So, F:4√So ※5 G 合格, A:Acceptable ※6 試験片寸法 Specimen Size, F:10×10mm, 7:10×7.5mm, 6:10×6.7mm, 5:10×5mm, 3:10×3.3mm, 2:10×2.5mm ※7 ノッチ形状 Notch Type, V:2mmV, U:2mmU, D:5mmU ※8 AGS: オーステナイト粒度 Austenitic Grain Size, FGS:フェライト粒度 Ferritic Grain Size

注釈2 NOTES2

CEQ=C+MN/6+(NI+CU)/15+(CR+MO+V)/5, TE=C+MN/20+SI/30+CU/20+NI/60+CR/20+MO/15+V/10+5B, T2=NB+V+TI

Rosetti Marino S.p.A.
Vs. Ordine n°. 1714002380 112A70D del 18/07/2014
Ns. DDT n°. 2093 del 24/07/2014
N°. 1 barra, colata G10987, kg 3523

上記注文品は御指定の規格または仕様に従って製造され、その要求事項を満足していることを証明します。
WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE TO THE APPLICABLE SPECIFICATION BY THE BASIC OXYGEN PROCESS AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE API WITH SATISFACTORY RESULTS.

T. Adachi
君津製鐵所 品質保証室
HEAD OF DEPARTMENT QUALITY ASSURANCE DEPT. KIMITSU WORKS

鋼管検査証明書
INSPECTION CERTIFICATE

新日鐵住金株式会社
NIPPON STEEL & SUMITOMO METAL CORPORATION

本社 HEAD OFFICE：〒100-8071 東京都千代田区丸の内二丁目6番1号 2-6-1, MARUNOUCHI CHIYODA-KU, TOKYO 100-8071, JAPAN

君津製鐵所 KIMITSU WORKS：〒299-1141 千葉県君津市君津1番地 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF., 299-1141, JAPAN

注文者 SHIPPER：SUMIKIN BUSSAN CORPORATION

注文者照合番号 REFERENCE No.：1216-HCY3413

契約番号 CONTRACT No.：3-841-N3-5-0-X001-02

需要家 CUSTOMER：SIDERPIGHI S.P.A. CON SOCIO UNICO

需要家管理番号 CUSTOMER'S CONTROL No.：

証明書番号 CERTIFICATE No.：U-13100107　頁 PAGE：2

発行年月日 DATE OF ISSUE：2013-10-29　Q05

商品名 COMMODITY：SUBMERGED ARC LONGITUDINALLY WELDED STEEL LINE PIPE

規格 SPECIFICATION：API SPEC 5L GR.L450M PSL2 (45TH EDITION, DEC. 2012)

寸法 SIZE：660.4X18.3X12000

員数 QUANTITY：30 PCS

質量 MASS：NET 104,310KG

特記 NOTE：ORDER NO.HCY3413/SBE2013081　ACCORDING TO EN10204 3.1

管理番号 CONTROL No.：417401
(製造番号 PRODUCTION No.)

製鋼番号 HEAT NO. / 試験番号 TEST NO.	化学成分 CHEMICAL COMPOSITION % C	Si	Mn	P	S	Ni	Cu	Cr	Mo	Nb	V	Ti	T-Al	TAL	B	TE	Ceq	LOCATION	ORIENTATION	GL	引張試験 TENSILE TEST 耐力 YS	引張強さ TS	伸び EL	降伏比 YR	BEND TEST	試験温度 TEST TEMP.	衝撃試験 IMPACT TEST SIZE	NOTCH	衝撃値 IMPACT VALUE 平均値 AVG	個々の値 EACH	延性破面率 SHEAR FRACTURE 平均値 AVG	個々の値 EACH	落重試験 DWTT 延性破面率 SHEAR FRACTURE 平均値 AVG	個々の値 EACH	LOCATION	硬さ試験 HARDNESS TEST	粒度試験 GRAIN SIZE TEST	備考 REMARKS
	X100 X4039	X100	X100	X1000	X1000 PPM	X100	X100	X100	X100	X100 X4039	X100 X4039	X100 X4039	X4039	X1000 -PPM-	X4039 PPM	X1000 PPM	X100				0.5%	MPA		%		・C		J		%		%					
19608	(PIECE NO:417401-0022, PIPE NO:4174-01-0004)																	BT							A	0	FV	469	470	469	469	100	100	100	100				
19604	(PIECE NO:417401-0028, PIPE NO:4174-01-0008)																																						
																		BT								0	FV	136	141	135	131	90	90	90	90				
																		HT								0	FV	442	442	443	442	100	100	100	100				
19605	P 5	22	143	5	0	1	1	19	12	3	0	1		17	2	15 4	35																						
19606	P (PIECE NO:417401-0018, PIPE NO:4174-01-0002) 5	22	143	5	0	1	1	19	12	3	0	1		18	2	15 4	35																						
	P (PIECE NO:417401-0022, PIPE NO:4174-01-0004)																																						
G11103	H 4	21	141	7	0	1	1	19	11	3	0	1		25	1	14 4	34																						
19612	H (PIECE NO:417401-0019, PIPE NO:4174-01-0028)																	BT		A	562	640	42	88															
19613	(PIECE NO:417401-0024, PIPE NO:4174-01-0018)																	WT				638			A														
19609	(PIECE NO:417401-0012, PIPE NO:4174-01-0005)																	BT								0	FV	476	476	477	476	100	100	100	100				
																		WT								0	FV	146	158	133	146	90	90	90	90				
																		HT								0	FV	443	438	444	446	100	100	100	100				
19610	P 4	22	143	7	0	1	1	19	12	3	0	1		26	2	14 4	34																						
	P (PIECE NO:417401-0024, PIPE NO:4174-01-0018)																																						
19611	P 4	22	142	7	0	1	1	19	12	3	0	1		25	1	14 4	34																						
	P (PIECE NO:417401-0019, PIPE NO:4174-01-0028)																																						
G11158	H 4	22	141	7	0	1	1	19	10	3	0	1		21	3	14 4	33																						
19632	H (PIECE NO:417401-0030, PIPE NO:4174-01-0023)																	BT		A	540	618	43	87															
19633	(PIECE NO:417401-0017, PIPE NO:4174-01-0022)																	WT				636			A														

その他試験 DESCRIPTION OF TEST	寸法・外観検査 VISUAL & DIMENSIONS INSPECTION	水圧試験 HYDROSTATIC TEST	非破壊検査 NON-DESTRUCTIVE INSPECTION
	ACCEPTABLE	20.5 MPA 10 SEC. ACCEPTABLE	UT, RT ACCEPTABLE

注記1 NOTES1 ※1 H: 溶鋼分析 Heat Analysis, P: 母材製品分析 Product Analysis(Base), W: 溶接部製品分析 Product Analysis(Weld) ※2 B: 母材 Base Metal, W: 溶接部 Weld, H: 熱影響部 HAZ ※3 L: 縦方向 Longitudinal, T: 横方向 Transverse ※4 GL: 標点距離 Gauge Length, A:50mm, B:200mm, C:2", D:8", E:5.65√So, F:4.√So ※5 G 合格, A:Acceptable ※6 試験片寸法 Specimen Size, F:10×10mm, 7:10×7.5mm, 6:10×6.7mm, 5:10×5mm, 3:10×3.3mm, 2:10×2.5mm ※7 ノッチ形状 Notch Type, V:2mmV, U:2mmU, D:5mmU ※8 AGS: オーステナイト粒度 Austenitic Grain Size, FGS:フェライト粒度 Ferritic Grain Size

注記2 NOTES2

上記注文品は御指定の規格または仕様に従って製造され、その要求事項を満足していることを証明します。

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE TO THE APPLICABLE SPECIFICATION BY THE BASIC OXYGEN PROCESS AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE API WITH SATISFACTORY RESULTS.

T. Adachi
君津製鐵所 品質保証室
HEAD OF DEPARTMENT
QUALITY ASSURANCE DEPT.
KIMITSU WORKS

鋼管検査証明書
INSPECTION CERTIFICATE

新日鐵住金株式会社
NIPPON STEEL & SUMITOMO METAL CORPORATION

本社 HEAD OFFICE：〒100-8071 東京都千代田区丸の内二丁目6番1号 2-6-1, MARUNOUCHI CHIYODA-KU, TOKYO 100-8071, JAPAN

君津製鐵所 KIMITSU WORKS：〒299-1141 千葉県君津市君津1番地 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF., 299-1141, JAPAN

注文者 SHIPPER：SUMIKIN BUSSAN CORPORATION

注文者照合番号 REFERENCE No.：1216-HCY3413

契約番号 CONTRACT No.：3-841-N3-5-0-X001-02

商品名 COMMODITY：SUBMERGED ARC LONGITUDINALLY WELDED STEEL LINE PIPE

規格 SPECIFICATION：API SPEC 5L GR.L450M PSL2 (45TH EDITION, DEC. 2012)

寸法 SIZE：660.4X18.3X12000

員数 QUANTITY：30 PCS

質量 MASS：NET 104,310KG

特記 NOTE：ORDER NO.HCY3413/SBE2013081 ACCORDING TO EN10204 3.1

需要家 CUSTOMER：SIDERPIGHI S.P.A. CON SOCIO UNICO

需要家管理番号 CUSTOMER'S CONTROL No.：

証明書番号 CERTIFICATE No.：U-13100107 頁 PAGE：3

発行年月日 DATE OF ISSUE：2013-10-29 Q05

管理番号 CONTROL No.：417401 (製造番号 PRODUCTION No.)

製鋼番号 HEAT NO. / 試験番号 TEST NO.	化学成分 CHEMICAL COMPOSITION % C	Si	Mn	P	S	Ni	Cu	Cr	Mo	Nb	V	Ti	TAl	TAL	B	TE	Ceq	LOCATION	ORIENTATION	GL	引張試験 TENSILE TEST 耐力 -降伏点- YS 0.5%	引張強さ TS	伸び El.	降伏比 YR	BEND TEST番号	試験温度 TEST TEMP. °C	衝撃試験 IMPACT TEST SIZE	NOTCH	衝撃値 IMPACT VALUE 平均値 AVG	個々の値 EACH	延性破面率 SHEAR FRACTURE 平均値 AVG	個々の値 EACH	落重試験 DWTT 延性破面率 SHEAR FRACTURE 平均値 AVG	個々の値 EACH	LOCATION	硬さ試験 HARDNESS TEST	粒度試験 GRAIN SIZE TEST	備考 REMARKS
	※1 X100	X100	X100	X100	X1000 PPM	X100	X1000	X1000	X1000	X1000	X1000	X1000	PPM	PPM	X100	X100	X100	X100	※2	※3	※4	MPA	MPA	%	%	※5	°C	※6	※7	J	J	%	%	%	%	※2		※8	
19629	(PIECE NO:417401-0030, PIPE NO:4174-01-0023)																		BT			540	615	43	88		0	FV		478	479	478	477	100	100	100	100				
																			WT								0	FV		145	142	150	142	88	85	90	90				
																			HT								0	FV		440	441	439	439	100	100	100	100				
19630 PP	5	22	142	7	0	1	1	18	11	3	0	1		20	3	15 4	35																						
	(PIECE NO:417401-0017, PIPE NO:4174-01-0022)																																						
19631 PP	5	22	143	7	0	1	1	18	11	3	0	1		20	3	15 4	35																						
	(PIECE NO:417401-0030, PIPE NO:4174-01-0023)																																						
G11159 HH	4	21	140	7	0	1	1	18	11	3	0	1		33	2	13 4	33																						
19622	(PIECE NO:417401-0027, PIPE NO:4174-01-0025)																		BT	A		540	615	43	88														
																			WT				639																
19623	(PIECE NO:417401-0029, PIPE NO:4174-01-0015)																									A													
19619	(PIECE NO:417401-0027, PIPE NO:4174-01-0025)																		BT								0	FV		476	475	475	478	100	100	100	100				
																			WT								0	FV		174	186	182	154	90	90	90	90				
																			HT								0	FV		443	450	440	440	100	100	100	100				
19620 PP	4	22	141	7	0	1	1	18	11	3	0	1		34	3	14 4	33																						
19621 PP	(PIECE NO:417401-0029, PIPE NO:4174-01-0015) 4	22	142	7	0	1	1	18	11	3	0	1		35	2	14 4	34																						
	(PIECE NO:417401-0027, PIPE NO:4174-01-0025)																																						
G11161 HH	4	22	141	8	0	1	1	19	11	3	0	1		22	2	14 4	34																						
19598	(PIECE NO:417401-0021, PIPE NO:4174-01-0014)																		BT	A		538	610	42	88														
																			WT				626																
19599	(PIECE NO:417401-0013, PIPE NO:4174-01-0007)																		WT							A													

その他試験 DESCRIPTION OF TEST	寸法・外観検査 VISUAL & DIMENSIONS INSPECTION	水圧試験 HYDROSTATIC TEST	非破壊検査 NON-DESTRUCTIVE INSPECTION
	ACCEPTABLE	20.5 MPA 10 SEC. ACCEPTABLE	UT, RT ACCEPTABLE

注釈1 NOTES1
※1 H: 溶鋼分析 Heat Analysis, P: 母材製品分析 Product Analysis(Base), W: 溶接部製品分析 Product Analysis(Weld) ※2 B: 母材 Base Metal, W: 溶接部 Weld, H: 熱影響部 HAZ ※3 L: 縦方向 Longitudinal, T: 横方向 Transverse ※4 GL: 標点距離 Gauge Length, A:50mm, B:200mm, C:2", D:8", E:5.65√So, F:4√So ※6 G 合格, A:Acceptable ※6 試験片寸法 Specimen Size, F:10×10mm, 7:10×7.5mm, 6:10×6.7mm, 5:10×5mm, 3:10×3.3mm, 2:10×2.5mm ※7 ノッチ形状 Notch Type, V:2mmV, U:2mmU, D:5mmU ※8 AGS: オーステナイト粒度 Austenitic Grain Size, FGS:フェライト粒度 Ferritic Grain Size

注釈2 NOTES2

上記注文品は御指定の規格または仕様に従って製造され、その要求事項を満足していることを証明します。

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE TO THE APPLICABLE SPECIFICATION BY THE BASIC OXYGEN PROCESS AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE API WITH SATISFACTORY RESULTS.

T. Adachi

君津製鐵所 品質保証室
HEAD OF DEPARTMENT
QUALITY ASSURANCE DEPT.
KIMITSU WORKS

Page 225 di 1380

鋼管検査証明書
INSPECTION CERTIFICATE

新日鐵住金株式会社
NIPPON STEEL & SUMITOMO METAL CORPORATION

本社 HEAD OFFICE：〒100-8071 東京都千代田区丸の内二丁目6番1号 / 2-6-1, MARUNOUCHI CHIYODA-KU, TOKYO 100-8071, JAPAN

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注文者照合番号 REFERENCE No.：1216-HCY3413

契約番号 CONTRACT No.：3-841-N3-5-0-X001-02

需要家 CUSTOMER：SIDERPIGHI S.P.A. CON SOCIO UNICO

需要家管理番号 CUSTOMER'S CONTROL No.：

証明書番号 CERTIFICATE No.：U-13100107　頁 PAGE：4

発行年月日 DATE OF ISSUE：2013-10-29　Q05

商品名 COMMODITY：SUBMERGED ARC LONGITUDINALLY WELDED STEEL LINE PIPE

規格 SPECIFICATION：API SPEC 5L GR.L450M PSL2 (45TH EDITION,DEC.2012)

寸法 SIZE：660.4X18.3X12000

員数 QUANTITY：30 PCS

質量 MASS：NET 104,310KG

特記 NOTE：ORDER NO.HCY3413/SBE2013081　ACCORDING TO EN10204 3.1

管理番号 CONTROL No.：417401
(製造番号 PRODUCTION No.)

製鋼番号 HEAT NO. / 試験番号 TEST NO.	化学成分 CHEMICAL COMPOSITION % C	Si	Mn	P	S	Ni	Cu	Cr	Mo	Nb	V	Ti	TAl	TAL	B	TE	Ceq	LOCATION ※2 3	ORIENTATION ※3 4	GL	引張試験 TENSILE TEST 耐力 YS	引張強さ TS	伸び EL	降伏比 YR	BEND TEST ※5 6	LOCATION ※2 3	ORIENTATION ※3 4	試験温度 TEST TEMP.	衝撃試験 IMPACT TEST SIZE ※6 7	NOTCH ※7	衝撃値 IMPACT VALUE 平均値 AVG	個々の値 EACH	延性破面率 SHEAR FRACTURE 平均値 AVG	個々の値 EACH	落重試験 DWTT 延性破面率 SHEAR FRACTURE 平均値 AVG	個々の値 EACH	LOCATION ※2	硬さ試験 HARDNESS TEST	粒度試験 GRAIN SIZE TEST ※8	備考 REMARKS
	※1 X100 X1000	X100	X100	X100	X1000	X100	X100	X100	X1000	X1000	X1000	X1000	X1000	X4000	X1000	X1000	X100				0.5%	MPA	%					°C			J	%		%						
19595	(PIECE NO:417401-0021,PIPE NO:4174-01-0014)																									BT		0	FV	470	467	471	472	100	100	100	100				
																										WT		0	FV	158	157	147	170	85	85	85	85				
19596	P 4 22140 7 0 1 1 1811 3 0 1 22 2 1433																									HT		0	FV	441	437	445	442	100	100	100	100				
	P (PIECE NO:417401-0013,PIPE NO:4174-01-0007)															4																								
19597	P 4 23142 7 0 1 1 1811 3 0 1 22 3 1434																																						
	P (PIECE NO:417401-0021,PIPE NO:4174-01-0014)															4																								
G11162	H 4 21140 8 0 1 1 1911 3 0 1 19 2 1433																																						
	H															4																								
19627	(PIECE NO:417401-0026,PIPE NO:4174-01-0021)																									BT		A	530	607	45	87										
																										WT				627												
19628	(PIECE NO:417401-0023,PIPE NO:4174-01-0016)																									WT		A														
19624	(PIECE NO:417401-0026,PIPE NO:4174-01-0021)																									BT		0	FV	473	472	472	475	100	100	100	100				
																										WT		0	FV	155	161	145	158	90	90	90	90				
																										HT		0	FV	439	443	439	436	100	100	100	100				
19625	P 4 22141 8 0 1 1 1811 3 0 1 19 2 1433																																						
	P															4																								
19626	(PIECE NO:417401-0023,PIPE NO:4174-01-0016)																																						
	P 4 22141 8 0 1 1 1811 3 0 1 19 2 1433																																						
	P															4																								
	(PIECE NO:417401-0026,PIPE NO:4174-01-0021)																																						
G11164	H 5 20139 7 0 1 1 2011 3 0 1 21 2 1534																																						
	H															4																								
19617	(PIECE NO:417401-0000,PIPE NO:4174-01-0012)																									BT		A	505	592	46	85										
																										WT				603												
19618	(PIECE NO:417401-0000,PIPE NO:4174-01-0012)																									WT		A														

その他試験 DESCRIPTION OF TEST	寸法・外観検査 VISUAL & DIMENSIONS INSPECTION	水圧試験 HYDROSTATIC TEST	非破壊検査 NON-DESTRUCTIVE INSPECTION
	ACCEPTABLE	20.5 MPA 10 SEC. ACCEPTABLE	UT,RT ACCEPTABLE

注記1 NOTES1 ※1 H: 溶鋼分析 Heat Analysis, P: 母材製品分析 Product Analysis(Base), W: 溶接部製品分析 Product Analysis(Weld) ※2 B: 母材 Base Metal, W: 溶接部 Weld, H: 熱影響部 HAZ ※3 L: 縦方向 Longitudinal, T: 横方向 Transverse ※4 GL: 標点距離 Gauge Length, A:50mm, B:200mm, C:2", D:8", E:5.65√So, F:4√So ※5 G 合格, A:Acceptable ※6 試験片寸法 Specimen Size, F:10×10mm, 7:10×7.5mm, 6:10×6.7mm, 5:10×5mm, 3:10×3.3mm, 2:10×2.5mm ※7 ノッチ形状 Notch Type, V:2mmV, U:2mmU, D:5mmU ※8 AGS: オーステナイト粒度 Austenitic Grain Size, FGS:フェライト粒度 Ferritic Grain Size

注記2 NOTES2

上記注文品は御指定の規格または仕様に従って製造され、その要求事項を満足していることを証明します。

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J. Adachi

君津製鐵所 品質保証室長
HEAD OF DEPARTMENT
QUALITY ASSURANCE DEPT.
KIMITSU WORKS

鋼管検査証明書
INSPECTION CERTIFICATE

新日鐵住金株式会社
NIPPON STEEL & SUMITOMO METAL CORPORATION

本社 HEAD OFFICE：〒100-8071 東京都千代田区丸の内二丁目6番1号 2-6-1, MARUNOUCHI CHIYODA-KU, TOKYO 100-8071, JAPAN

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注文者 SHIPPER：SUMIKIN BUSSAN CORPORATION

注文者照合番号 REFERENCE No.：1216-HCY3413

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寸法 SIZE：660.4X18.3X12000

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需要家 CUSTOMER：SIDERPIGHI S.P.A. CON SOCIO UNICO

需要家管理番号 CUSTOMER'S CONTROL No.：

証明書番号 CERTIFICATE No.：U-13100107

頁 PAGE：5

発行年月日 DATE OF ISSUE：2013-10-29

Q05

特記 NOTE：ORDER NO.HCY3413/SBE2013081 ACCORDING TO EN10204 3.1

管理番号 CONTROL No.：417401
(製造番号 PRODUCTION No.)

製鋼番号 HEAT NO. / 試験番号 TEST NO.	化学成分 CHEMICAL COMPOSITION % C	Si	Mn	P	S	Ni	Cu	Cr	Mo	Nb	V	Ti	TA	TAL	B	TE	Ceq	LOCATION	ORIENTATION	GL	引張試験 TENSILE TEST 耐力 YS	引張強さ TS	伸び EL	降伏比 YR	BEND TEST 曲げ	LOCATION	試験温度 TEST TEMP. °C	衝撃試験 IMPACT TEST NOTCH	SIZE	衝撃値 IMPACT VALUE 平均値 AVG	個々の値 EACH J	延性破面率 SHEAR FRACTURE 平均値 AVG	個々の値 EACH %	落重試験 DWTT 延性破面率 SHEAR FRACTURE 平均値 AVG	個々の値 EACH %	LOCATION	硬さ試験 HARDNESS TEST	粒度試験 GRAIN SIZE TEST ※8	備考 REMARKS
	X100	X100	X100	X100	X100	X100	X100	X1000	X1000	X1000	X1000	X1000	PPM	PPM	X100	X100	X100				0.5% MPA		%				°C												
19614	(PIECE NO:417401-0000,PIPE NO:4174-01-0012)																								BT		0	F	V	476	473	477	478	100	100	100	100				
																									WT		0	F	V	157	166	157	148	90	90	90	90				
																									HT		0	F	V	444	443	445	443	100	100	100	100				
19615 PP	5 21140	8	0	1	1	1911	3	0	1		21	2		1534																										
	(PIECE NO:417401-0000,PIPE NO:4174-01-0012)																																							
19616 PP	5 21141	8	0	1	1	1912	3	0	1		21	2		1535																										
	(PIECE NO:417401-0000,PIPE NO:4174-01-0012)																																							
G11771 HH	5 22141	8	0	1	1	1911	3	0	1		22	1		1535																										
19642	(PIECE NO:417401-0014,PIPE NO:4174-01-0031)																	BT	TA		527	608 635	45	87																
19643	(PIECE NO:417401-0014,PIPE NO:4174-01-0031)																	WT							A															
19639	(PIECE NO:417401-0014,PIPE NO:4174-01-0031)																									BT		0	F	V	481	483	478	481	100	100	100	100				
																									WT		0	F	V	146	167	138	133	87	90	85	85				
																									HT		0	F	V	442	439	442	446	100	100	100	100				
19640 PP	5 23143	8	0	1	1	1912	3	0	1		20	2		1535																										
	(PIECE NO:417401-0014,PIPE NO:4174-01-0031)																																							
19641 PP	4 22142	7	0	1	1	1911	3	0	1		20	1		1434																										
	(PIECE NO:417401-0014,PIPE NO:4174-01-0031)																																							

*** TYPE AND SIZE OF REFERENCE INDICATOR OR IMAGE QUALITY INDICATOR USED FOR NON-DESTRUCTIVE INSPECTION FOR WELD ***
UT: 3.2 MM DIAMETER THROUGH THICKNESS DRILLED HOLE
RT: WIRE-TYPE (ISO) IMAGE QUALITY INDICATOR

*** THE DATA PRESENTED WAS CONVERTED FROM THE MEASUREMENT SYSTEM USED FOR THE ORIGINAL INSPECTION ***

その他試験 DESCRIPTION OF TEST	寸法・外観検査 VISUAL & DIMENSIONS INSPECTION	水圧試験 HYDROSTATIC TEST	非破壊検査 NON-DESTRUCTIVE INSPECTION
	ACCEPTABLE	20.5 MPA 10 SEC. ACCEPTABLE	UT,RT ACCEPTABLE

注釈1 NOTES1 ※1 H: 溶鋼分析 Heat Analysis, P: 母材製品分析 Product Analysis(Base), W: 溶接部製品分析 Product Analysis(Weld) ※2 B: 母材 Base Metal, W: 溶接部 Weld, H: 熱影響部 HAZ ※3 L: 縦方向 Longitudinal, T: 横方向 Transverse ※4 GL: 標点距離 Gauge Length, A:50mm, B:200mm, C:2", D:8", E:5.65√So, F:4√So ※5 G 合格, A:Acceptable ※6 試験片寸法 Specimen Size, F:10×10mm, 7:10×7.5mm, 6:10×6.7mm, 5:10×5mm, 3:10×3.3mm, 2:10×2.5mm ※7 ノッチ形状 Notch Type, V:2mmV, U:2mmU, D:5mmU ※8 AGS: オーステナイト粒度 Austenitic Grain Size, FGS:フェライト粒度 Ferritic Grain Size

注釈2 NOTES2

上記注文品は御指定の規格または仕様に従って製造され、その要求事項を満足していることを証明します。

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE TO THE APPLICABLE SPECIFICATION BY THE BASIC OXYGEN PROCESS AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE API WITH SATISFACTORY RESULTS.

J. Adachi

君津製鐵所 品質保証室長
HEAD OF DEPARTMENT QUALITY ASSURANCE DEPT. KIMITSU WORKS

鋼管検査証明書
INSPECTION CERTIFICATE

新日鐵住金株式会社
NIPPON STEEL & SUMITOMO METAL CORPORATION

本社 HEAD OFFICE：〒100-8071 東京都千代田区丸の内二丁目6番1号 2-6-1, MARUNOUCHI CHIYODA-KU, TOKYO 100-8071, JAPAN

君津製鐵所 KIMITSU WORKS：〒299-1141 千葉県君津市君津1番地 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF., 299-1141, JAPAN

注文者 SHIPPER：SUMIKIN BUSSAN CORPORATION

注文者照合番号 REFERENCE No.：1216-HCY3413

契約番号 CONTRACT No.：3-841-N3-5-0-X001-02

品名 COMMODITY：SUBMERGED ARC LONGITUDINALLY WELDED STEEL LINE PIPE

規格 SPECIFICATION：API SPEC 5L GR.L450M PSL2 (45TH EDITION, DEC. 2012)

寸法 SIZE：660.4X18.3X12000

員数 QUANTITY：30 PCS

質量 MASS：NET 104.310KG

需要家 CUSTOMER：SIDERPIGHI S.P.A. CON SOCIO UNICO

需要家管理番号 CUSTOMER'S CONTROL No.：

証明書番号 CERTIFICATE No.：U-13100107

頁 PAGE：6E

発行年月日 DATE OF ISSUE：2013-10-29

Q05

特記 NOTE：ORDER NO. HCY3413/SBE2013081 ACCORDING TO EN10204 3.1

管理番号 CONTROL No.：417401
(製造番号 PRODUCTION No.)

製鋼番号 HEAT NO. / 試験番号 TEST NO.	化学成分 CHEMICAL COMPOSITION %																		引張試験 TENSILE TEST							試験温度 TEST TEMP.	衝撃試験 IMPACT TEST							落重試験 DWTT				硬さ試験 HARDNESS TEST	粒度試験 GRAIN SIZE TEST ※8	備考 REMARKS
	C X1000	Si X100	Mn X100	P X1000	S X1000 PPM	Ni X100	Cu X100	Cr X100	Mo X100	Nb X100 X1000	V X100 X1000	Ti X100 X1000	TAI X1000		X1000 PPM	X1000 PPM	X1000 PPM	TE X100	Ceq X100	※1 LOCATION ※2	※3 ORIENTATION ※4 GL	耐力 降伏点 YS	引張強さ TS	伸び EL.	降伏比 YR	※5 BEND TEST direction		※6 SIZE ※7 NOTCH	衝撃値 IMPACT VALUE 平均値 AVG	衝撃値 IMPACT VALUE 個々の値 EACH	延性破面率 SHEAR FRACTURE 平均値 AVG	延性破面率 SHEAR FRACTURE 個々の値 EACH	※1 LOCATION ※2	延性破面率 SHEAR FRACTURE 平均値 AVG	延性破面率 SHEAR FRACTURE 個々の値 EACH			
※1	X109	X100	X100	X100	X100	X100	X1000	X1000	X1000	X1000	X1000	X1000	PPM		PPM	X100	X100	X100	X100					%														
*** NAME AND LOCATION OF FACILITIES USED FOR PIPE MANUFACTURING, PLATE ROLLING AND STEEL MAKING ***																																						
NIPPON STEEL & SUMITOMO METAL CORPORATION KIMITSU WORKS																																						

その他試験 DESCRIPTION OF TEST	寸法・外観検査 VISUAL & DIMENSIONS INSPECTION	水圧試験 HYDROSTATIC TEST	非破壊検査 NON-DESTRUCTIVE INSPECTION
	ACCEPTABLE	20.5 MPA 10 SEC. ACCEPTABLE	UT, RT ACCEPTABLE

注釈1 NOTES1 ※1 H: 溶鋼分析 Heat Analysis, P: 母材製品分析 Product Analysis(Base), W: 溶接部製品分析 Product Analysis(Weld) ※2 B: 母材 Base Metal, W: 溶接部 Weld, H: 熱影響部 HAZ ※3 L: 縦方向 Longitudinal, T: 横方向 Transverse ※4 GL: 標点距離 Gauge Length, A:50mm, B:200mm, C:2", D:8", E:5.65√So, F:4√So ※5 G 合格, A:Acceptable ※6 試験片寸法 Specimen Size, F:10×10mm, 7:10×7.5mm, 6:10×6.7mm, 5:10×5mm, 3:10×3.3mm, 2:10×2.5mm ※7 ノッチ形状 Notch Type, V:2mmV, U:2mmU, D:5mmU ※8 AGS: オーステナイト粒度 Austenitic Grain Size, FGS: フェライト粒度 Ferritic Grain Size

注釈2 NOTES2

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J. Adachi

君津製鐵所 品質保証室
HEAD OF DEPARTMENT
QUALITY ASSURANCE DEPT.
KIMITSU WORKS

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D2200180146Z

Manufacturer's Welding Procedure. Ref. no. Спецификация изготовителя сварного соединения испытаний рег. №	**13/21 REV. 0**		
Manufacturer Производитель	ROSETTI MARINO S.p.A.		
Address Адрес	VIA TRIESTE 230 - 48121 RAVENNA		
Code, Testing Standard Нормы и правила, стандарты испытаний	GOST R ISO 15614-1 2009; ND No. 2-020201-015, ND No. 2-020101-138, ND No. 2-020101-139		
	Location of test specimen according to GOST R ISO 15614-1 2009 Section 7.2, Fig. 5 Essential variables according to GOST R ISO 15614-1 2009, Section 8		
Date of welding Дата сварки	Start: Aug 26th , 2021 Complete: September 01st , 2021		
Examiner of examining body Инспектор или инспекционный орган	RINA		
RANGE OF QUALIFICATION / ПРОТОКОЛ РЕЗУЛЬТАТОВ ИСПЫТАНИЙ			
Welding process Способ сварки	136 – FCAW		
Type(s) Тип (ы)	Semiautomatic		
Welding Equipment Type Тип сварочного оборудования	Machine – see as run		
Actual parent Material side A Основной материал сторона А	Plate: EN 10225: S460G1+M (Heat: 710384)		
Actual parent Material side B Основной материал сторона Б	Plate: EN 10225: S460G1+M (Heat: 710384)		
Parent Material grade Категория основного материала	Carbon steel Gr. 2 ISO 15608		
Supply condition Состояние поставки	Thermomechanical rolled		
Cev Углеродный эквивалент топлива	Heat Value: 0,41		
Groove design/configuration Калибровка / конфигурация валиков	Single Vee Butt Joint for groove dimension and details see As-Run Sheet		
Parent material thickness (mm) Толщина основного материала (мм)	35 mm		
Weld metal thickness (mm) Толщина металла шва (мм)	136 - FCAW 35 mm		
Single or Multi-pass Один проход или много проходов	136 - FCAW (Multi pass)		
Outside diameter Внешний диаметр	900 mm		
Filler material Designation Присадочный материал обозначение	136 FCAW RS: 4Y46MS H5 (E 81T1-M21A8-Ni1-H4) - EN ISO 17632-A: T 50 6 1Ni P M21 1 H4		
Filler material Maker Присадочный материал марка	136 – ESAB DIAMONDSPARK NI1-RC		
Filler material Size Присадочный материал размер	136 – FCAW ∅ 1,2 mm		
Shielding gas/Flux Защитный газ / флюс	ISO 14175 :2008 M21 (80% Ar + 20% CO_2) for FCAW		
Shielding gas flow rate Расход защитного газа / флюса	16-22 l/min.		
Backing gas (purging) Газ для защиты обратной стороны (продувки)	None		
Type of welding current & polarity Тип сварочного тока и полярность	DC – RP		

IIW
A.KHALIFA
IWT 070154A
INTERNATIONAL WELDING TECHNOLOGIST

Welding parameters **Параметры сварки**	Pass Проход	Diameter / Диаметр Mm / мм	[A]	[V]	[mm/min] [мм/мин]	H.I. [kJ/mm]
	Root Корневой	∅ 1,2 (FCAW)	215-220	23-27	60-80	3.04-4.64
	Hot Горячий	∅ 1,2 (FCAW)	235-270	26-27	130-420	0.80-2.34
	Filll Присад.	∅ 1,2 (FCAW)	230-265	25-26	150-380	1.20-1.91
	Cap Верхний	∅ 1,2 (FCAW)	215-250	25-26	230-330	0.91-1.12

Welding position **Положение сварки**	PC-PH (136- FCAW)		
Preheat (°C) **Предварительный подогрев (°C)**	50	**Interpass temperature (°C)** **Температура между проходами (°C)**	250
Post-Weld Heat Treatment and/or ageing **Термообработка после сварки и/или старение**	None		
Weld bead width **Толщина наплавленного валика**	Max. 16 mm (136-FCAW)		
Welder's detail **Данные сварщика**	Bolognesi Giugliano, Stamp: GX11 Giulianini Dario, Stamp: GX12		
Time lapse between root and hot pass **Промежуток времени между корневым и горячим проходом**	N.A.		
Other information **Другая информация**	- Preheat performed by propane torch -Accelerated weld cooling not used; -Base material origin: plate rolled ∅ 900 mm		



Manufacturer's Welding Procedure. Ref. no. Спецификация испытаний сварного соединения изготовителя рег. №	13/21 REV. 0		
Test result (WPQR) N° Протокол результатов испытаний №	13/21	Date/Дата	28/09/2021
Manufacturer's WPS No. Спецификация испытаний сварного соединения изготовителя №	pWPS 13/21 REV. 0	Date/Дата	01/09/2021

TESTS CARRIED OUT ON SAMPLE 13/21 WELDED IN 2G+5G POSITION (PC+PH)
ИСПЫТАНИЯ, ПРОВЕДЕННЫЕ НА ОБРАЗЦЕ 13/21 СВАРКА В ПОЛОЖЕНИИ 2G+5G (PC+PH)

NON DESTRUCTIVE EXAMINATIONS НЕРАЗРУШАЮЩИЕ ИСПЫТАНИЯ		
	Judgement Результат	Report No. Отчет №
Visual examinations Визуальный контроль	Satisfactory	13-21
Penetrant test Испытания проникающей жидкостью	N.A.	/
Magnetic particle test Дефектоскопия магнитными частицами	Satisfactory	21174MT06SZ
Radiographic test Радиографическая дефектоскопия	Satisfactory	21174RT06SZ
Ultrasonic test Ультразвуковая дефектоскопия	Satisfactory	21174UT06RZ

TENSILE TEST
ИСПЫТАНИЕ НА РАСТЯЖЕНИЕ

Specimen type and No. Стандартный образец тип и №	$R_{P0,2\%}$ [N/mm2]	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 535	A [%]	Z [%]	Fracture Location Место разрушения	Remarks Примечания
TRANSVERSE 472/21 A ПОПЕРЕЧНОЕ	/	/	662	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PC
TRANSVERSE 472/21 B ПОПЕРЕЧНОЕ	/	/	651	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PC
TRANSVERSE 472/21 C ПОПЕРЕЧНОЕ	/	/	674	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PC
TRANSVERSE 472/21 D ПОПЕРЕЧНОЕ	/	/	645	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PC
TRANSVERSE 472/21 E ПОПЕРЕЧНОЕ	/	/	675	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PH
TRANSVERSE 472/21 F ПОПЕРЕЧНОЕ	/	/	651	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PH
TRANSVERSE 472/21 G ПОПЕРЕЧНОЕ	/	/	676	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PH
TRANSVERSE 472/21 H ПОПЕРЕЧНОЕ	/	/	650	/	/	Broken out of weld Разрушение за пределами сварного шва	Pos. PH



BEND TEST
ИСПЫТАНИЯ НА ИЗГИБ

Type & N. Тип и №	Bend angle Угол загиба	Remarks Примечания	Results Результат
4 Side bend Pos. PC 4х сторонний загиб PC	180°	Former Ø 40 mm Исходный Ø 40 мм	Satisfactory
4 Side bend Pos. PH 4х сторонний загиб PH	180°	Former Ø 40 mm Исходный Ø 40 мм	Satisfactory

IMPACT TEST
ИСПЫТАНИЯ НА УДАРНЫЙ ИЗГИБ

Specimen Dimensions (mm) Размеры стандартного образца (мм)	Notch Locations / Direction Расположение / направление надреза	Notch Type Тип надреза	Test Temp. (°C) Температура испытания (°C)	Absorbed energy [J] Поглощенная энергия [J]			Average value [J] Среднее значение [J]	Lateral expansion [mm] Поперечное расширение [мм]	Remarks Примечания
10x10x55	Weld metal Cap PC	KV2	-60°C	85	80	77	81	/	/
10x10x55	Fusion Line Cap PC	KV2	-60°C	39	43	38	40	/	/
10x10x55	FL +2 Cap PC	KV2	-60°C	220	225	239	228	/	/
10x10x55	FL+5 Cap PC	KV2	-60°C	262	313	259	278	/	/
10x10x55	FL Root PC	KV2	-60°C	58	68	67	64	/	/
10x10x55	FL+2 Root PC	KV2	-60°C	70	95	92	86	/	/
10x10x55	Weld metal Cap PH	KV2	-60°C	62	67	74	68	/	/
10x10x55	Fusion Line Cap PH	KV2	-60°C	98	87	77	87	/	/
10x10x55	FL +2 Cap PH	KV2	-60°C	247	249	240	245	/	/
10x10x55	FL+5 Cap PH	KV2	-60°C	281	301	308	297	/	/
10x10x55	FL Root PH	KV2	-60°C	54	52	51	52	/	/
10x10x55	FL+2 Root PH	KV2	-60°C	70	88	70	76	/	/

OTHER TESTS
ДРУГИЕ ИСПЫТАНИЯ

Type of test Тип испытания	Results / Результат
Macro examination & Hardness test Осмотр макрошлифов и измерение твердости	Satisfactory-See Inspecta report No. 383-00103-21 Dated 28/09/2021
Welding test conducted by Сварочные испытания проведены	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by Механические испытания проведены	Inspecta s.r.l. - Ravenna and Element Materials Technology Milan s.r.l.
Laboratory report reference N. Ссылка на лабораторный отчет №	Inspecta report No. 383-00103-21
Test carried out in the presence of: Испытания проводятся в присутствии:	RINA

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of GOST R ISO 15614-1 2009, RS RULES: ND No. 2-020201-015, ND No. 2-020101-138, ND No. 2-020101-139

Date/Дата
28/09/2021

IIW A.KHALIFA IWT 070154 INTERNATIONAL WELDING TECHNOLOGIST

Examiner or Examination Body/ Инспектор или инспекционный орган
RINA Services S.p.A.

RINA F. Lago RINA Services S.p.A.

Name and signature / Имя и подпись

ROSETTI MARINO S.p.A.

ROSETTI MARINO

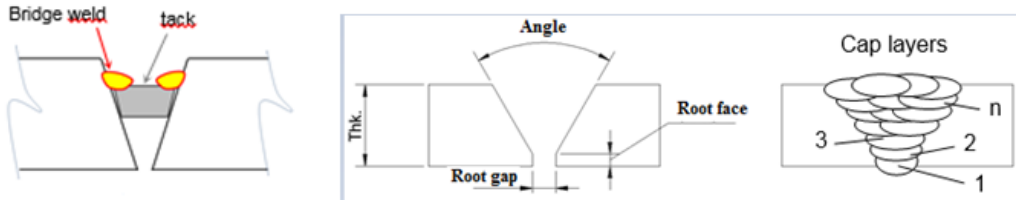
pWPS 13/21
PRELIMINARY WELDING PROCEDURE SPECIFICATION
(EN ISO 15609-1)

TEST CODE	GOST R ISO 15614-1-2009		TEST SPEC	ND 2-020201-015, ND No. 2-020101-139	
Сварочный процесс: Welding process:	136 FCAW	Тип : Type:	SEMIAUTOMATIC	scopo : scope:	CJP, BW

GIUNTO - JOINT

Вид соединения: Joint Design:	V	☐ DOULBE SIDED WELD	☒ Single sided weld

Детали / Details:



BEVEL GOST ISO 9692-1

Root face 1.0±0.5 mm
Root gap 4.5 ± 2.5mm
Angle 40°-45°

Note:

1) The bullets for tacking shall be take from Carbon steel pipe. Minimum tack welds 2 times of wall thickness or 50 mm whichever is less / *Usare per i tacchetti materiale in acciaio al carbonio. Minima lunghezza delle puntature 2 volte lo spessore o 50 mm, quale dei due è più piccolo.*
2) The alignment of pipe ends shall be such as to minimize the internal offset between surfaces/ *L'allineamento dei tubi deve essere tale da minimizzare il disallineamento.*
3) Surfaces cleaned from moisture, oil, grease, paint. The cleaning shall be extend 75 mm from bevel end on internal and external surface. /*Pulire le superfici da sporcizia, oli e grassi. La pulizia deve essere estesa per 75 mm dal bordo del tubo sia sulla superfice esterna che interna.*

ОСНОВНОЙ МЕТАЛЛ - BASE MATERIAL

EN 10225-S460 G2+M, CRS ISO 15608 GR.2	Material grade / Типа и сорта:	Up to PCF 460 / DC1/DC2/DC3/DC4	Max Cev 0.43		
Диапазон толщин / Thickness range:	► Основной металл / Base material:	полным проплавлением / groove	35 mm		
	► Диапазон диам. труб / Pipe dia. Range:	полным проплавлением / groove	900mm		

METALLO D'APPORTO - FILLER METAL

	136 - GS FCAW	
Spec. N° (SFA) / Спецификация №	Y46MS H5	
(CLASS)(класс)	T 50 6 1Ni P M21 1 H5	5.29/5.36 - E81T1-M21A8-Ni1-H4
F-N°	6	
A-N°	10	
Размер присадочного материала / Size of filler metal	1,2	
Metallo depositato / Deposit weld metal	Up to 35 mm	
Диапазон толщин /Thick. range		
Флюс, Торговая марка / FLUX trade name	NA	
Применяемая вставка / Consumable insert	NA	
прочее Торговая Марка / other TRADE NAME:	BÖHLER DIAMONDSPARK Ni1 RC	

ТИП СОЕДИНЕНИЯ / JOINT	Cianfrino / groove	ПОЗИЦИЯ / position	PC+PF / 2G+5G	Сварочный прогрес / Progression	UPHILL ↑

PRERISCALDO - PRE-HEAT (QW406)

Мин. Предварительная температура : Min. pre-heat temp:	50°C	Максимальная Межваликовая Max interpass temp.:	250°C

ПОСЛЕСВАРОЧНАЯ ТЕРМООБРАБОТКА - POST WELD HEAT TREATMENT: NO/НЕТ

GAS DI PROTEZIONE - GAS

	GAS/ ГАЗ	МИКСТУРА Mixture	норма. / Flow rate
Защита / Shielding:	Ar+CO2	80-20	12-20lt/1'
Перемещение / Trailing:	N.A.	N.A.	N.A.
Поддержка / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Ток / Current :	DC -CV	ПОЛЯРНОСТЬ / Polarity	RP
Вольфрам Электрод Тип и размер / Tungsten elctr. Size & type:	N.A.		
Металл метод GMAW / GMAW metal tranfer mode:	Spray arc		
Проводной диапазон скорости подачи / Electr. Wire feed speed range:	self regulatd		

TECNICA - TECHNIQUE

ВАЛИК : Bead:	Tirata/String	Диаметр сопла Orifice of gas cup size:	½"	Начальная и межпроходная Initial and interpass cleaning:	Spazzolatura e Molatura/Brushing Grinding
Метод обратной зачистки Method of back gouging:	N.A.	Колебание: Oscillation:	N.A.	Контакт и рабочее расстояние: Contact tube to work distance:	12-18 mm
Номер прохода : Passes nr.:	Multipla/Multiple	Многократные или отдельные электроды: Multiple or single electrodes:	Singolo/Single	НАКЛЕП: Peening:	N.A.

Altro / Other:

Номер прохода Weld layers nr.	Процесс Process	Присадочный металл Filler metal		Показатели Current		Вольт Volt range	Скорость сварки Travel speed range (mm/min)	Тепловложение Heat input (KJ/mm)
		Класс / Class	Dia. (mm.)	ПОЛЯРНОСТЬ / Polarity	Amp. range			
Root - Hot	GS FCAW	5Y46MS H5	1,2	RP	160-220	25-27	140-220	0.87-1.85
FILL- CAP	GS FCAW	5Y46MS H5	1,2	RP	180-230	24-27	160-300	0.60-1.86
FILL- CAP	GS FCAW	5Y46MS H5	1,2	RP	220-270	24-28	180-440	0.60-2.00

ROSETTI - prepared by:

A.KHALIFA

ROSETTI MARINO

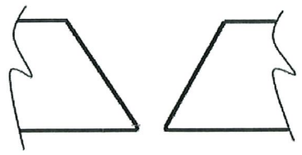
PQR - AS- RUN PARAMETER SHEET

pWPS 13/21	
PQR 13/21	
Coupon Nr. 13/21 PH	
Date: 26/27/30/08/2021	Page: 1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: **GOST R ISO 15614-1 2009, ND 2-020201-015-E, ND No. 2-020101-138-E Spec.**

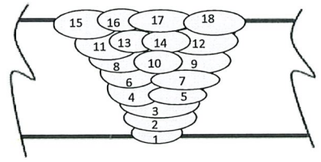
Welder Name(s):	BOLOGNESI GIULIANO / GIULIANINI DARIO	Welder Id No(s):	GX11 / GX12		
Welding Process(es):	136-FCAW	Type(s):	PARTLY MECHANIZED		
Welding Position:	PH (5G)	Progression:	VERTICAL UPHILL		
Base Materials:	EN 10225: S460G1+M	Wall Thickness:	35 mm	Diameter:	900 mm
Heat No(s):	710384	Joint Type:	SINGLE V BUTT JOINTSINGLE SIDE WELDING WITHOUT BACKING		

WELD PREPARATION:



Angle: 40° ; Root gap: 4-5 mm ; Root face: 1,5-2 mm

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	939012	DIAMONDSPARK NI1-RC
Hot passes	1,2	939012	DIAMONDSPARK NI1-RC
Fill/ Cap	1,2	939012	DIAMONDSPARK NI1-RC

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar - 20%CO2
Flow:	16 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	1/2"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
16 mm	String		Multiple	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
50°C PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER	NA	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
N.A.	1	FCAW	1	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	210	220	215,0	26	28	27,0	-	-	6	4,64	0,80	50	INE THT 501 + INE THT 501
N.A.	2	FCAW	2	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	230	240	235,0	26	28	27,0	-	-	13	2,34	0,80	60	Grinding between passes performed by manual tools
N.A.	3	FCAW	3	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	225	235	230,0	25	27	26,0	-	-	15	1,91	0,80	70	
N.A.	4	FCAW	4	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	220	230	225,0	25	27	26,0	-	-	19	1,48	0,80	90	
N.A.	4	FCAW	5	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	220	230	225,0	25	27	26,0	-	-	19	1,48	0,80	110	
N.A.	5	FCAW	6	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	235	245	240,0	25	27	26,0	-	-	18	1,66	0,80	120	
N.A.	5	FCAW	7	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	235	245	240,0	25	27	26,0	-	-	18	1,66	0,80	150	
N.A.	6	FCAW	8	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	235	245	240,0	25	27	26,0	-	-	18	1,66	0,80	180	
N.A.	6	FCAW	9	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	235	245	240,0	25	27	26,0	-	-	18	1,66	0,80	200	
N.A.	6	FCAW	10	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	235	245	240,0	25	27	26,0	-	-	18	1,66	0,80	220	
N.A.	7	FCAW	11	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	235	245	240,0	25	27	26,0	-	-	21	1,43	0,80	230	
N.A.	7	FCAW	12	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	235	245	240,0	25	27	26,0	-	-	21	1,43	0,80	240	
N.A.	7	FCAW	13	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	235	245	240,0	25	27	26,0	-	-	21	1,43	0,80	250	
N.A.	7	FCAW	14	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	235	245	240,0	25	27	26,0	-	-	21	1,43	0,80	190	
N.A.	8	FCAW	15	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	210	220	215,0	24	26	25,0	-	-	23	1,12	0,80	200	
N.A.	8	FCAW	16	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	210	220	215,0	24	26	25,0	-	-	23	1,12	0,80	210	
N.A.	8	FCAW	17	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	210	220	215,0	24	26	25,0	-	-	23	1,12	0,80	220	
N.A.	8	FCAW	18	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	210	220	215,0	24	26	25,0	-	-	23	1,12	0,80	230	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA Welding Dept. D. Colacelli	Signature:	Signature: RINA	Signature:
Date:	Date:		Date: 01.09.2021

ROSETTI MARINO

PQR - AS- RUN PARAMETER SHEET

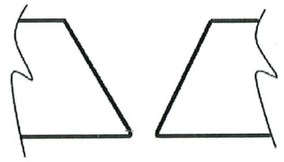
pWPS 13/21	
PQR 13/21	
Coupon Nr. 13/21 PC	
Date: 31/08/21 01/09/21	Page: 1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: **GOST R ISO 15614-1 2009, ND 2-020201-015-E, ND No. 2-020101-138-E Spec.**

Welder Name(s):	BOLOGNESI GIULIANO / GIULIANINI DARIO	Welder Id No(s):	GX11/GX12
Welding Process(es):	136-FCAW	Type(s):	PARTLY MECHANIZED
Welding Position:	PC (2G)	Progression:	N.A.
Base Materials:	EN 10225: S460G1+M	Wall Thickness:	35 mm
Heat No(s):	710384	Joint Type:	SINGLE V BUTT JOINTSINGLE SIDE WELDING WITHOUT BACKING

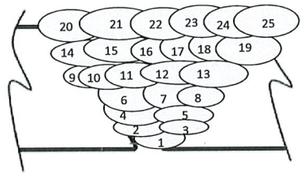
Diameter: 900 mm

WELD PREPARATION:



Angle: 40° ; Root gap: 4-5 mm ; Root face: 1,5-2 mm

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	939012	DIAMONDSPARK NI1-RC
Hot passes	1,2	939012	DIAMONDSPARK NI1-RC
Fill/ Cap	1,2	939012	DIAMONDSPARK NI1-RC

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar - 20%CO2
Flow:	16 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	1/2"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
14 mm	String		Multiple	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
50°C PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER	NA	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
NA	1	FCAW	1	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	215	225	220,0	22	24	23,0	-	-	8	3,04	0,80	50	INE THT 501 + INE THT 501
NA	2	FCAW	2	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	265	275	270,0	25	27	26,0	-	-	42	0,80	0,80	60	Grinding between passes performed by manual tools
NA	2	FCAW	3	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	265	275	270,0	25	27	26,0	-	-	28	1,20	0,80	80	
NA	3	FCAW	4÷5	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	265	275	270,0	25	27	26,0	-	-	28	1,20	0,80	100	
NA	4	FCAW	6÷8	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	265	275	270,0	25	27	26,0	-	-	32	1,05	0,80	160	
NA	5	FCAW	9÷13	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	250	260	255,0	25	27	26,0	-	-	38	0,84	0,80	210	
NA	6	FCAW	14÷19	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	250	260	255,0	25	27	26,0	-	-	35	0,91	0,80	250	
NA	7	FCAW	20÷25	-	E 81T1-M21A8-Ni1-H4	1,2	DC EP	245	255	250,0	25	27	26,0	-	-	33	0,95	0,80	150	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name: O.UKHAREV
Signature: ROSETTI MARINO SpA Welding Dept. D. Genaccini	Signature:	Signature: RINA A. Landi	Signature:
Date:	Date:	Date:	Date: 1.09.2021

ROSETTI MARINO	**ОТЧЕТ О ПРОВЕДЕНИИ ВИЗУАЛЬНОЙ ПРОВЕРКИ И КОНТРОЛЯ РАЗМЕРОВ visual/dimensional inspection report**	VDR N° 13-21 дата: 3/09/2021
проект project D33	Заказчик client LUKOIL	№ проекта job 121A00

наименование – item

Procedure Qualification Record (WPQR) 13/21

СЕРТИФИКАТ ПРОТОКОЛА АТТЕСТАЦИИ СВАРОЧНОЙ ТЕХНОЛОГИИ (WPQR) 13/21

WE CERTIFY THAT:

ITEMS INDICATED ABOVE HAVE UNDERGONE A VISUAL INSPECTION AND HAVE BEEN ACCEPTED ACCORDING TO THE SPECIFICATION / PROCEDURE MENTIONED AND TO ACCEPTANCE CRITERIA DEFINED IN IT

Настоящим

ПОДТВЕРЖДАЕТСЯ, ЧТО ВЫШЕУКАЗАННЫЕ СВАРНЫЕ ШВЫ ПРОШЛИ 100% ВИЗУАЛЬНЫЙ ОСМОТР И БЫЛИ УТВЕРЖДЕНЫ В СООТВЕТСТВИИ С УКАЗАННЫМИ ТЕХНИЧЕСКИМИ ХАРАКТЕРИСТИКАМИ И СТАНДАРТАМИ.

примечания – remarks

Inspection on welds Diameter 900 mm and 35 mm WT in as welded condition.

1 Sample in PC-2G and 1 sample in PH-5G

No visible defects have been detected.

результат - result ☒ соответствует - conforming ☐ не соответствует - not conforming

Процедура/ применяемые спецификации - applicable procedures / specifications

Appendix 1,Table 5 of 0D33-П-10-КМ-1-002-0010-09981 /EN ISO 5817:2014 Lev. B /GOST R ISO 15614-1-2009/121A00-PML-QC-PRO-00012

Оператор – Operator	Контроль качества - Quality Control	Заказчик - Client
CSWIP D.CENACCHI 305250 WI 3.1	РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА RUSSIAN MARITIME REGISTER OF SHIPPING 280 001	

RINA A. Landi

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n° 21174 RT 06 SZ Rev. 01
RAPPORTO D'ESAME RADIOGRAFICO RADIOGRAPHIC TEST		DATA / Date 02/09/2021 — FOGLIO / Sheet 1

CLIENTE / Client	ORDINE / Order	PROGETTO / Project	COMMESSA / Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE /Customer	OGGETTO / Object	DISEGNO / Dwg	P.F.C. / Q.C.P.	Fase / Step
LUKOIL-KMN LLC	pWPS	/	/	/

Schizzo Sketch	Saldatura Weld	Diametro Diameter	Spessore Thikeness	Punzone Welder	Posizione Position	Difetto Defect	Giudizio Judgement
pWPS 13-21	/	900 mm	35 mm	GX11	0-1	/	A
POS. 5G + 2G				GX12	1-2	*	A
					2-3	/	A
					3-4	2011	A
					4-5	2011	A
					5-6	2016	A
					6-7	/	A
					7-0	/	A
*= IRREGOLARITÀ DI MAGLIA – CONTROLLO CON ESAME VT CONFORME							

DIFETTI / Defects

101	Longitudinal crack	2014	Linear porosity	3041	Tungsten inclusion	501	Undercut
104	Crater crack	2016	Wormholes	3042	Copper inclusion	504	Excess penetration
2011	Porosity	301	Slag inclusion	401	Lack of fusion	507	misaligment
2013	Clustered	DF	Difetto film Film defect	402	Lack of penetration	515	Root concavity

ESITO / Results

A	Accettabile Acceptable	NR	Riparare Repair	NX	Ripetere Film Repeat Film	RX	Conferma difetto Defect confirm

PROCEDURA /Procedure 121A00-PML-QC-PRO-00013	Schermi / Lead screen PB 0,10 Front and Back	Pellicole / Film type KODAK T200 (C4)
Tipo macchina Rx / Type machine Rx Gilardoni MHF 300-PO matr.045259001	Densità / Density Range ≤ 4 base material	Densità / Density Range 2÷3 welded area

TECNICA DI ESPOSIZIONE / Exposure Technique: SINGOLA PARETE SINGOLA IMMAGINE SWSI

Tipo di sorgente / source type			Tipo di IQI / IQI type	
☑ RX	☐ IR 192	☐ SE 75	☐ ASTM	☑ EN
Macchia focale focal spot		3	Posizione / position	
Attività activity			☐ Lato film film side	☑ Lato sorgente Source side
Ci	kV	mA	Esposizione / esposition	
/	290	2	☑ Film singolo Single film	☐ Film doppio Double ilm
Tempo di esposizione exposure time			Tecnica di sviluppo / Film processing	
3 min 15 sec			☐ Manuale / manual	☑ Automatico / Automatic

Spessore attraversato Crossed thickness w	Dist. Sorgente film *Source film distance* (SFD)	Dist. oggetto film *Film object distance* (b)	Distanza minima Minimum distance (f min)	Filo visibile n° Visible Wire n°	Lastre n° *Films n°*
Range 35 ÷ 45 mm	450 mm	35 mm	263 mm	10	8

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zanli 2° Livello	ROSETTI MARINO SpA A. Khalifa Welding Dept.	

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta. - Partial reproduction of this certificate must be written authorized.
I risultati delle prove si riferiscono unicamente ai particolari esaminati. - Test results relate only to examined items.
Z:\Qualita\5 modulistica\Validi\01 moduli cnd\validi\01 2020 rev.1\convenzionali volumetrici

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		21174 MT 06 SZ Rev. 01

RAPPORTO D'ESAME MAGNETOSCOPICO Magnetic Particle Test Report			DATA / Date 02/09/2021	FOGLIO / Sheet 1
CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	FASE Step
LUKOIL-KMN LLC	pWPS	/	/	/

ESECUZIONE / Execution		ACCETTABILITA' / Acceptance	
121A00-PML-QC-PRO-00010		121A00-PML-QC-PRO-00010	
MATERIALE/Material	TEMP. SUPERFICI Surface temperature	INTENSITA' LUMINOSA/ Light intensity	
S460 G1+M	28°C	☑ LUCE BIANCA 1250 Lux	☐ LUCE NERA 1000 µW/cm²

STATO DELLA SUPERFICIE – Surface condition			
☑ COME SALDATO As welded	☐ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined	
☐ GREZZO – Forged	☐ LAMINATO – Rolled	☐ MOLATO – Ground	☐ SABBIATO – Blasted

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☑ GIOGO/Yoke	☐ PUNTALI/Prods	☐ BOBINA/Coil	☐ CONDUTTORE CENTRALE/Central conduttor

METODO / Method		SMAGNETIZZAZIONE/Demagnetization	
☐ CONTINUO/Continuous	☐ RESIDUO /Residual	☐ RICHIESTA/Required	☑ NON RICHIESTA/Not Required
TIPO DI MAGNETIZZAZIONE/magnetization type		DIREZIONE CAMPO MAGNETICO/magnetic field direction	
☑ MAGNETICO/magnetic	☐ ELETTRICO/electric	☐ CIRCOLARE/Circular	☑ LONGITUDINALE/longitudinal
TIPO APPARECCHIO/Type of equipment	Magneticontrol HR235	DISTANZA PUNTALI/Pole spacing	180 mm
NUMERO DI SERIE/Serial number	18-235-19		
TIPO DI CORRENTE/Current Type		POTERE DI SOLLEVAMENTO GIOGO / Lifting power	
☑ A.C.	☐ D.C.	☑ 4,5 kg	☐ 18 kg
MEZZO DI ISPEZIONE / Examination medium		INTENSITÀ DI CORRENTE / Intesity	
☑ UMIDO/Wet	☐ SECCO/Dry	☐ A/ mm	☐ / spira

PARTICELLE UTILIZZATE/Particle Type			
CONTRASTO DI COLOR/Color contrast	☐	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	☑ NDT BW2 ☐ NDT DRY	MARCA TIPO/Mark Type	NDT FW1
LOTTO/BACH	7243S	LOTTO/BACH	/
VERNICE DI CONTRASTO / Contrast Paint		☑ NDT WBL5	LOTTO/BACH U190107S

SALDATURE CONTROLLATE / Welds Verified

Item	Welder	Joit Type	Bevel	Thk	Scan plan
pWPS 13-21 5G + 2G	GX11-GX12	BUT WELD	V	35 mm	IDL-QCI-MT-02

RINA A. Landi

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITÀ Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zanti II Livello	ROSETTI MARINO SpA A. Khalifa Welding Dept.	

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Test results relate only to examined items.

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RAPPORTO D'ESAME CON ULTRASUONI Ultrasonic Examination report		DATA / Date 02/09/2021 / FOGLIO / Sheet 1

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	Development of D33 Field with Infrastructure Facilities Phase 1	121A00	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
LUKOIL-KMN LLC	pWPS	/	/	/

ESECUZIONE / Execution	ACCETTABILITA' / Acceptance level
121A00-PML-QC-PRO-00009	121A00-PML-QC-PRO-00009

MATERIALE Material	DIMENSIONI mm Dimension	SPESSORE NOMINALE / Thk mm
S460 G1+M	D= 900 mm	35 mm

STATO DELLA SUPERFICIE – Surface condition

☑ COME SALDATO As welded ☐ SPAZZOLATO - Brushed ☐ LAVORATO DI MACCHINA - Machined

☐ GREZZO – Forged ☐ LAMINATO – Rolled ☐ MOLATO – Ground ☐ SABBIATO – Blasted

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG 700	No. SERIE Serial Number	I003937

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	AMPLIFICAZIONE dB value	ONDE Waves
KRAUTKRAMER	KNF	4	10	0°	36	LONG.
UNION TEST	NDT	2	14X14	70°	42	SHEAR
UNION TEST	NDT	2	14X14	60°	42	SHEAR
UNION TEST	NDT	2	14X14	45°	42	SHEAR

BLOCCO DI CALIBRAZIONE Calibration block	IIW V1	BLOCCO DI RIFERIMENTO Reference block	QT-BLOCK-RM
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity	DAC ON SDH 3 mm

SALDATURE CONTROLLATE / Welds Verified

Item	Welder	Joit Type	Bevel	Thk	Scan plan
Pwps 13-21 5G + 2G	GX11-GX12	BUT WELD	V	35 mm	IDL-QCI-UT-0216

RINA

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Not According to specification ☐

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zanli 2° Livello	ROSETTI MARINO SpA A. Khalifa Welding Dept.	

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta.
I risultati delle prove si riferiscono unicamente ai particolari esaminati.
Partial reproduction of this certificate must be written authorized.
Test results relate only to examined items.

Z:\Qualita\5 modulistica\01 moduli cnd\validi\01 moduli 2020\convenzionali volumetrici

Object: *Oggetto:*	**MECHANICAL TEST ON WPQR 13-2021**		Pag. 1 di 21
Specimen: *Saggio:* **472/21**	**#Base Material:** *Materiale Base:* **EN 10225 S460G1+M**	**PIPE Ø 900 mm THK 35 mm**	
	# Informazione fornita dal cliente/ Information provided by the customer		
Customer: *Committente:*	**ROSETTI MARINO S.p.A.**		
Address: *Indirizzo:*	**Via Trieste, 230 - 48122 Ravenna (RA)**		
Final customer:. *Cliente finale:*	//		
Your delivery note n°: *Vs. DDT di consegna* **n°** // *n°*	**Date:** *Data:* //	**MD52** *MD 52* **104/2021**	**Date:** *Data:* **24/08/2021**
Start of activities:: *Inizio prove :* **Date:** *Data:* **23/09/2021**	**End of activities:** *Fine prove:*		**Date:** *Data:* **28/09/2021**

PROVE RICHIESTE

☒ **TENSILE TEST**/*Trazione*	☒ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*
☒ **BEND TEST**/*Piega*	☒ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root /*Dritto/Rovescio* ☒ Side/ *Laterale*
☒ **IMPACT TEST**/*Resilienza*	☒ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*
☒ **MACROEXAMINATION TEST /** *Macrografia*		
☒ **HARDNESS TEST**/ *Durezza*	☐ HV 5	☒ HV 10
☐ **FRACTURE TEST**/ *Frattura*	☐ Plate with/on Plate/ *Piastra con/su Piastra* ☐ Pipe with/on Pipe/*Tubo con/ su Tubo*	☐ Pipe on Plate/*Tubo su Piastra*
☐ **CHEMICAL ANALYSIS**/*Analisi Chimica*		
☐ **MICROEXAMINATION TEST /** *Micrografia*		
☐ **OTHER (Specify)**/*Altro/(Specificare)*		

Allegati /Attachments: NONE

NOTE/ Remarks: **REFERENCE CODE FROM CUSTOMER REQUEST: RINA RULES + RMRS ND No.2-020101-015 + RMRS ND No.2-020101-138 + RMRS ND No.2-020101-139 + GOST R ISO 15614-1-2009**
TEST WITNESSED BY CENACCHI DAVIDE (ROSETTI MARINO SPA) AND LANDI ANDREA (RINA) AND ALEKSEY LAZAREV (RS-CLASS)
Informazioni aggiuntive fornite dal cliente:
Additional information provided by the customer

Laboratory Responsible *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig. Giulio Bagnara - INSPECTA srl - 28-09-2021 Service Responsible	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RS Surveyor 280 PTC 001 A. Lazarev

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I risultati di prova si riferiscono al campione così come ricevuto, essendo il campionamento eseguito dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%. Quando emesso il Report in revisione, l'oggetto revisionato è identificabile mediante barra verticale posta sul lato sinistro e dal testo in formato corsivo sottolineato.
The results in this test report refers only to the specimen that has been tested. The customer undertakes to print out/reproduce the test report. Any partial reproduction is prohibited. Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory. The test results refer to the sample as received, since the sampling is performed by the customer. Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku=2 equivalent to a level of confidence of 95 %. When the Report under review is issued, the revised object can be identified by the vertical bar on the left side and by the text in italics underlined.

RINA

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE
Prova di trazione trasversale a temperatura ambiente

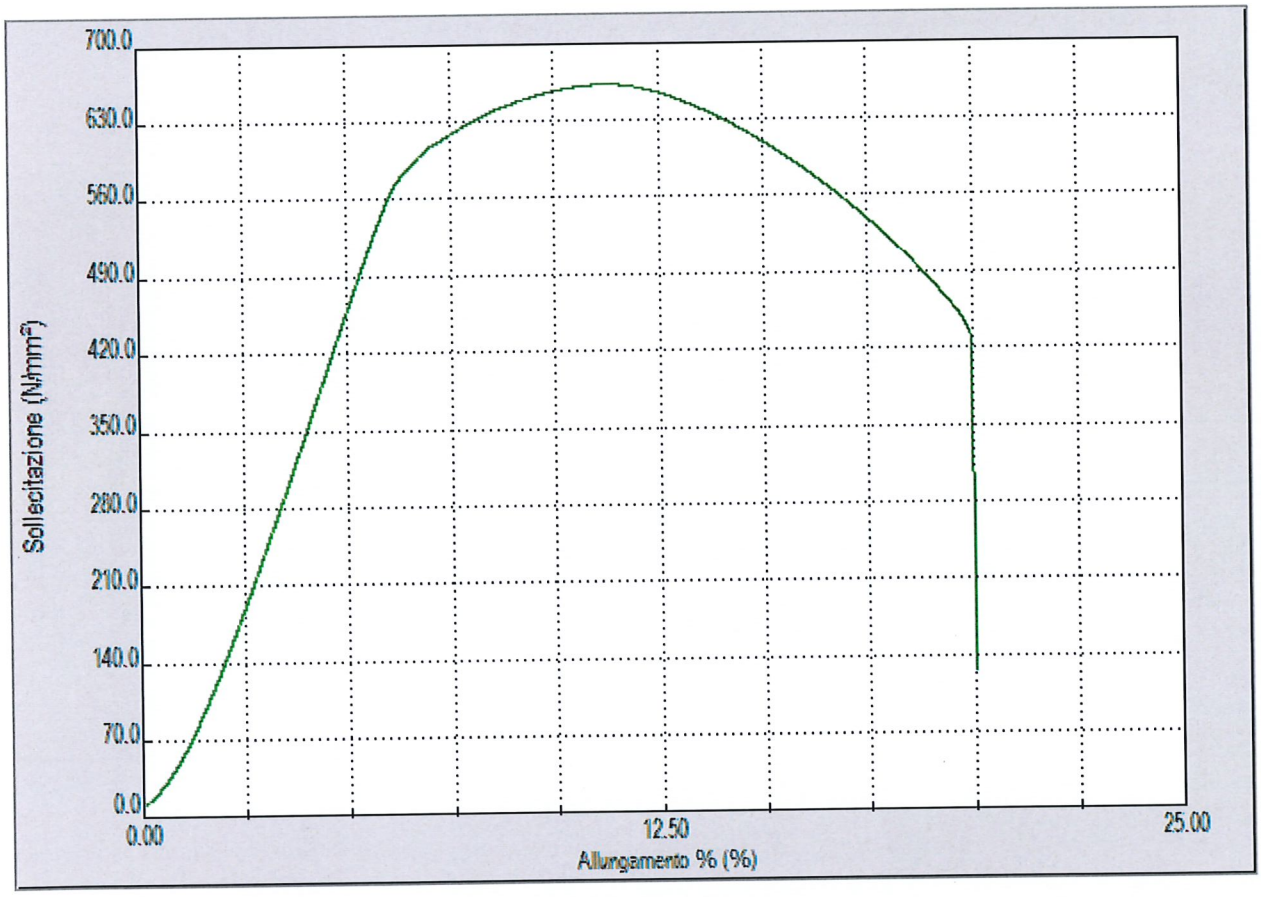
Date of Testing::28/09/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* UNI EN ISO 4136:2012

The test was performed using the Galdabini testing materials machine, model Quasar 600, s.n. VAUP/01 (2014)
La prova è stata eseguita utilizzando la macchina per prove materiali Galdabini, modello Quasar 600, s.n. VAUP/01 (2014)

Internal procedure *Procedura interna* : ***PP08 rev.13***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
472/21 A TWT	20,35x25,02	509,19	23,4°C	//	//	/	//	/	337181	662	/	//	//	FOW



Remarks / *Note:*	*UPPER SIDE – POSTION PC*
Legend / *Legenda*	**TT = Transverse Tension**/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura*
	TWT = Transverse Weld Tension/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SPA Welding Dept D. Conacchi	RINA A. Landi
- INSPECTA srl -	- INSPECTA srl -		
Laboratory Technician 28/09/2021	Service Responsible 28-09-2021		

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE
Prova di trazione trasversale a temperatura ambiente

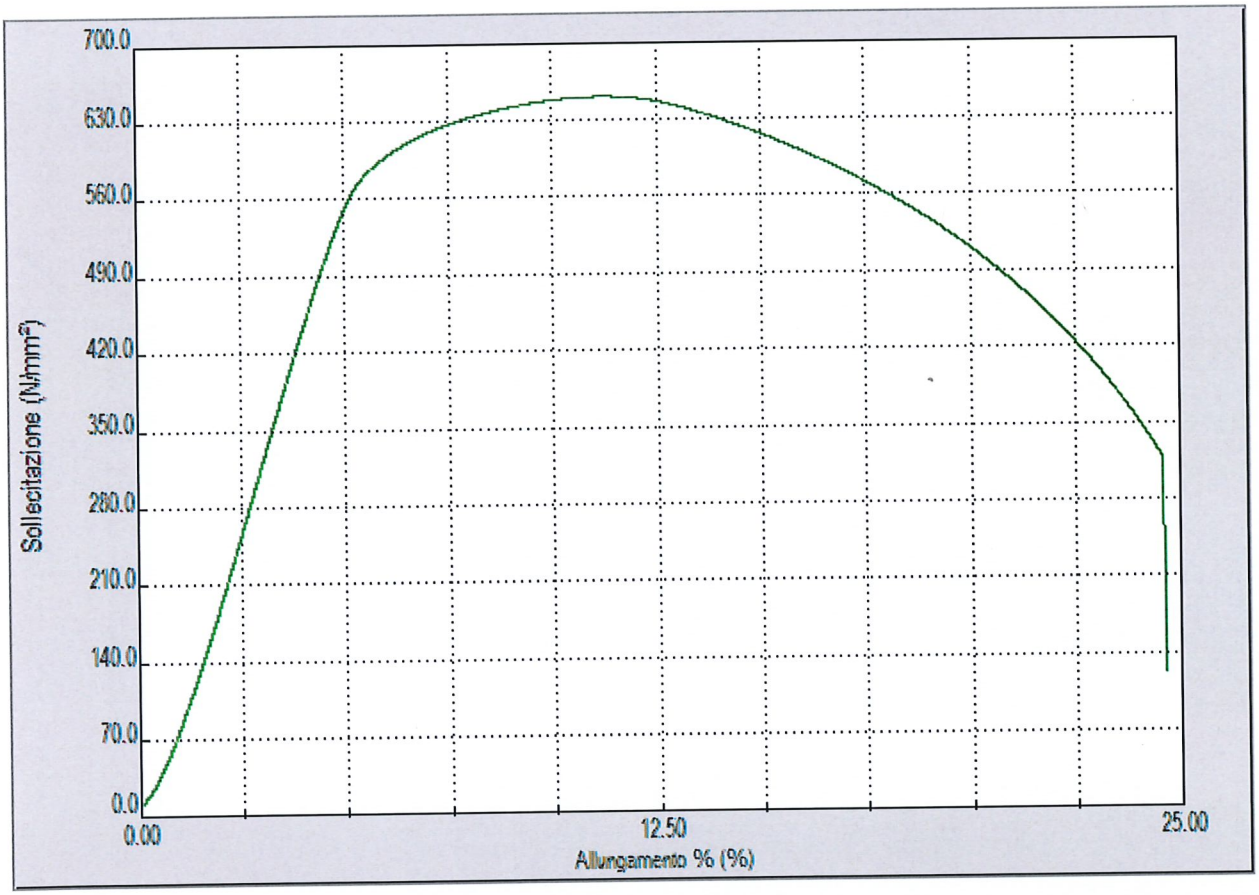
Date of Testing::28/09/2021
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *UNI EN ISO 4136:2012*

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Internal procedure *Procedura interna :* ***PP08 rev.13***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
472/21 B TWT	**20,06x25,02**	**501,90**	**23,4°C**	//	//	/	//	/	**326680**	**651**	/	//	//	**FOW**



Remarks / *Note:*	*LOWER SIDE – POSTION PC*
Legend / *Legenda*	**TT = Transverse Tension***/Trazione.trasversale;* **FOW = Failure Out of Weld***/Rottura fuori dalla saldatura*
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Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara	ROSETTI MARINO SpA Welding Dept D. Cenacchi	RINA A. Landi
- INSPECTA srl - Laboratory Technician 28/09/2021	- INSPECTA srl - 28-09-2021 Service Responsible		

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

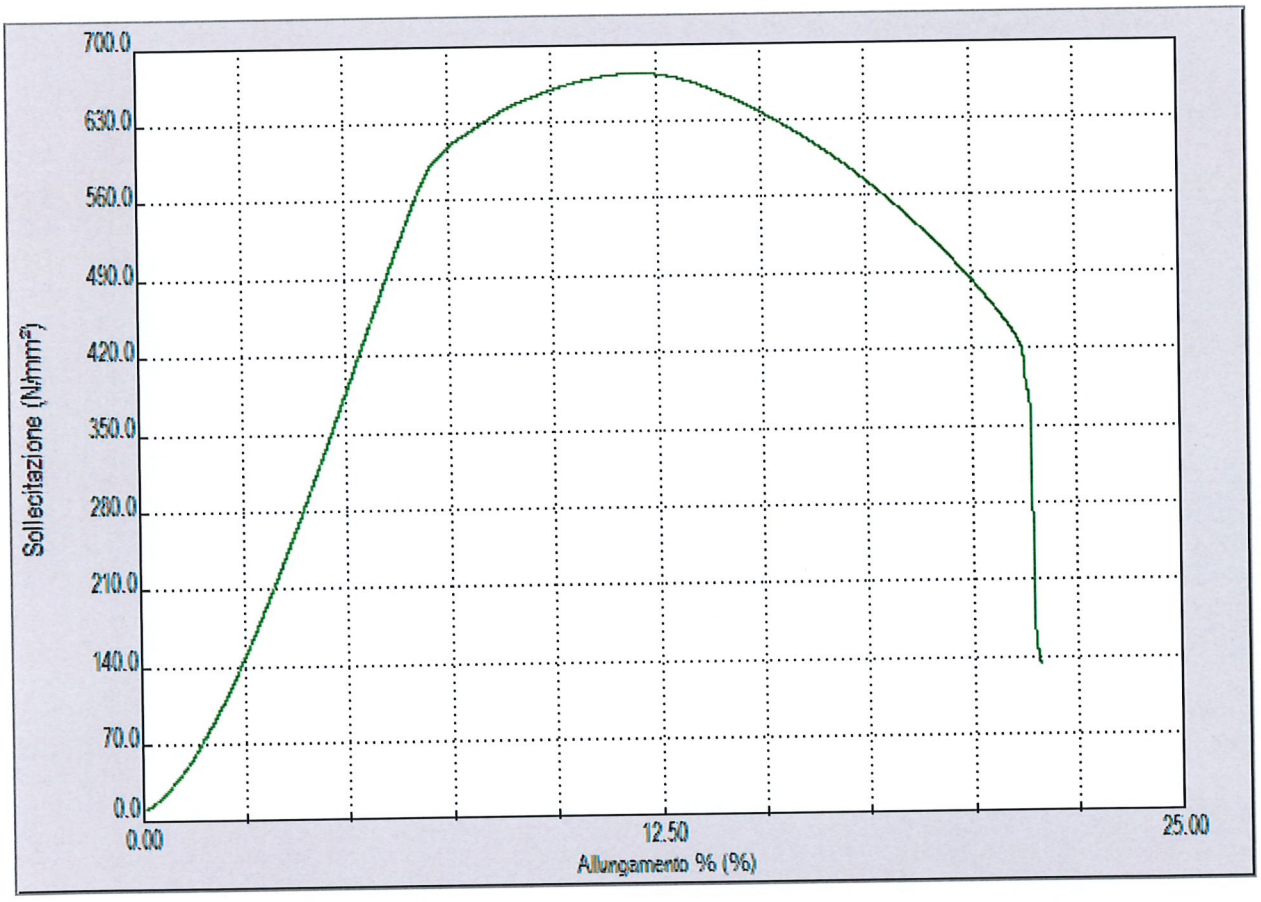
Date of Testing::28/09/2021
Data esecuzione prova:

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Internal procedure *Procedura interna :* ***PP08 rev.13***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
472/21 C TWT	**19,85x25,01**	**496,45**	**23,4°C**	//	//	/	//	/	**334438**	**674**	/	//	//	**FOW**



Remarks */ Note:*	*UPPER SIDE – POSTION PC*
Legend / *Legenda*	**TT = Transverse Tension***/Trazione.trasversale;* **FOW = Failure Out of Weld***/Rottura fuori dalla saldatura*
	TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;* **FIW = Failure in Weld***/Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Bacheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SpA Welding Dept D. Conaceni	RINA A. Landi
Laboratory Technician 28/09/2021	- INSPECTA srl - Service Responsible 28-09-2021		

Headquarter: Via Giolitti 10 – 48123 Ravenna (RA) Italy – Phone /Fax + 39 0544 464424
Registered Office: Via Ravegnana 379/A - 47122 Forlì (FC) Italy - Phone +39 0543 559027 - Phone/Fax +39 0543 784366
Mobile +39 393 9374013 - e-mail: inspectasrl@inspectasrl.com - www.inspectasrl.com - P.IVA 03944480403
Capital Stock € 50.000 - Chamber of Commerce registration Forlì/Cesena No. 03944480403 - R.E.A. No. 323109

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE
Prova di trazione trasversale a temperatura ambiente

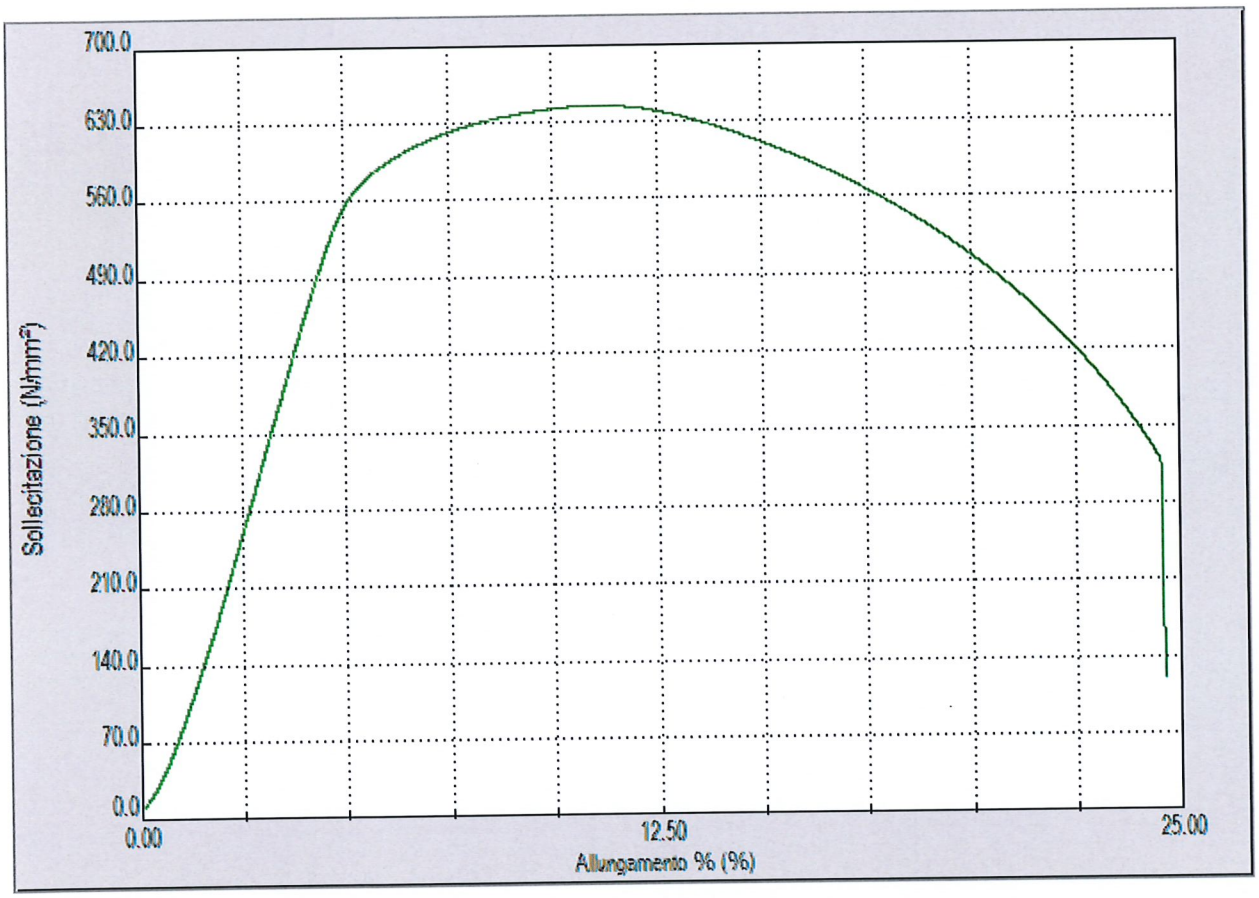
Date of Testing::28/09/2021
Data esecuzione prova:

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Internal procedure *Procedura interna :* ***PP08 rev.13***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
472/21 D TWT	**20,08x25,02**	**502,40**	**23,4°C**	//	//	/	//	/	**323850**	**645**	/	//	//	**FOW**



Remarks / *Note:*	*LOWER SIDE – POSTION PC*
Legend / *Legenda*	**TT = Transverse Tension***/Trazione.trasversale;* **FOW = Failure Out of Weld***/Rottura fuori dalla saldatura*
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Laboratory Technician *Tecnico di Laboratorio* Dott. Ing. Mauro Baccheschi	Laboratory Responsible *Responsabile Laboratorio* Sig. Giulio Bagnara	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
- INSPECTA srl - Laboratory Technician 28/09/2021	- INSPECTA srl - 28-09-2021 Service Responsible	ROSETTI MARINO SpA Welding Dept. D.Cenacchi	RS 28.09.21

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE
Prova di trazione trasversale a temperatura ambiente

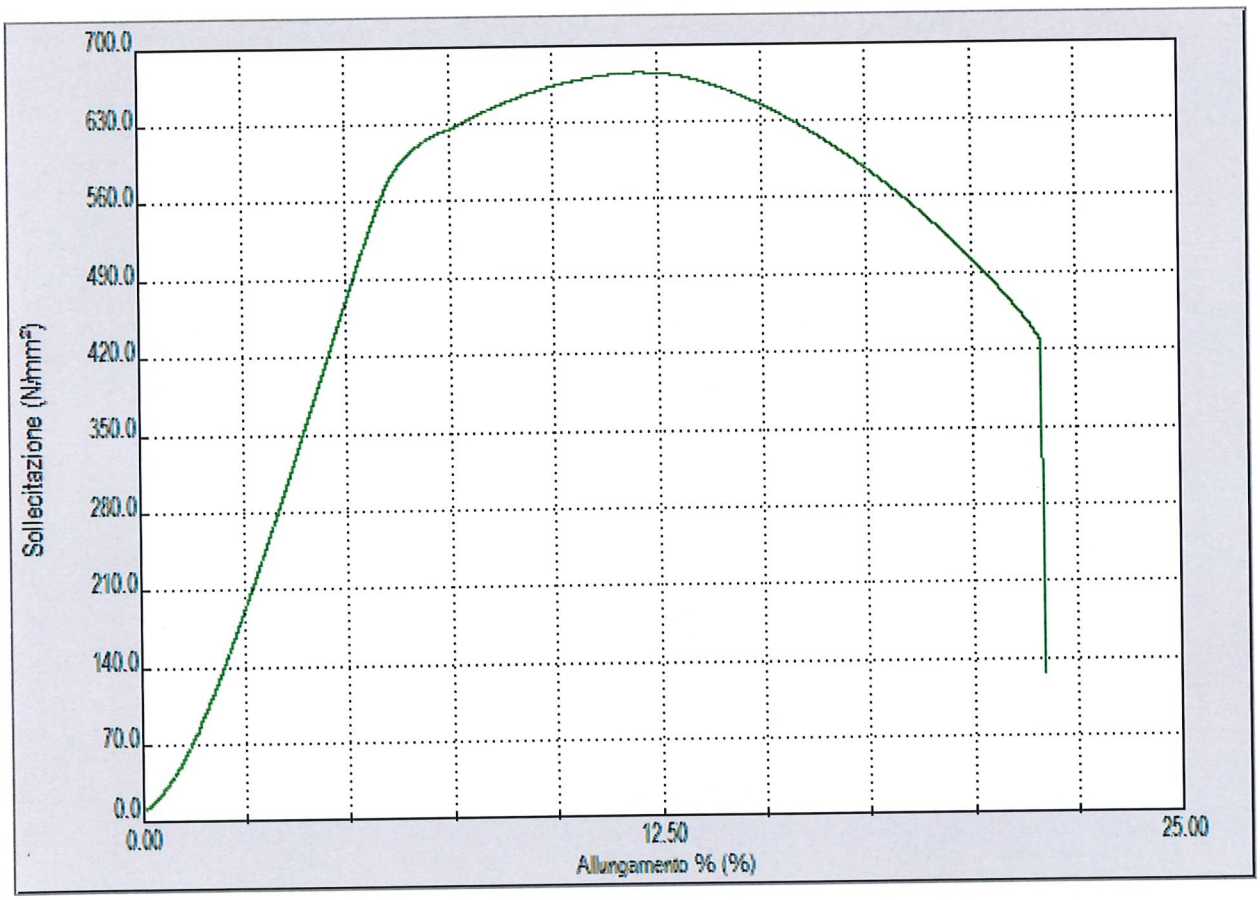
Date of Testing::28/09/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma*: UNI EN ISO 4136:2012

The test was performed using the Galdabini testing materials machine, model Quasar 600, s.n. VAUP/01 (2014)
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Internal procedure *Procedura interna* : ***PP08 rev.13***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
472/21 E TWT	20,00x25,03	500,60	23,4°C	//	//	/	//	/	337678	675	/	//	//	FOW



Remarks / *Note:*	*UPPER SIDE – POSTION PH*
Legend / *Legenda*	**TT = Transverse Tension**/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura* **TWT = Transverse Weld Tension**/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SpA Welding Dept. D. Cerracchi	
- INSPECTA srl - 28/09/2021	- INSPECTA srl - 28-09-2021 Service Responsible		РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА RUSSIAN MARITIME REGISTER OF SHIPPING 1230 РС 001

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE
Prova di trazione trasversale a temperatura ambiente

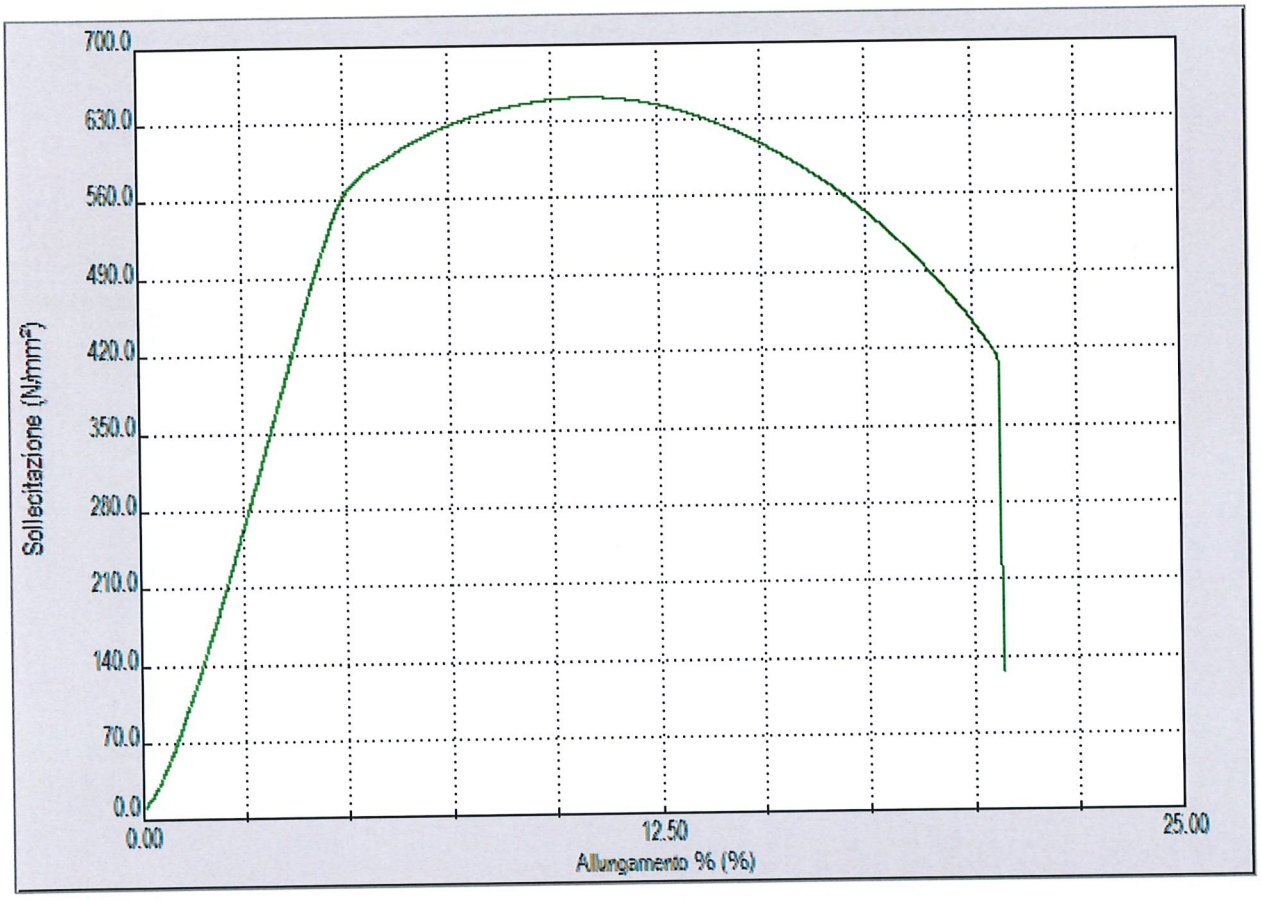
Date of Testing::28/09/2021
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Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
472/21 F TWT	20,09x25,02	502,65	23,4°C	//	//	/	//	/	327334	651	/	//	//	FOW



Remarks / *Note:*	*LOWER SIDE – POSTION PH*
Legend / *Legenda*	**TT = Transverse Tension**/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura* **TWT = Transverse Weld Tension**/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Marco Bacheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SPA Welding Dept. D. Cenacchi	RINA 280 001
Laboratory Technician	INSPECTA srl 28-09-2021 Service Responsible		

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE
Prova di trazione trasversale a temperatura ambiente

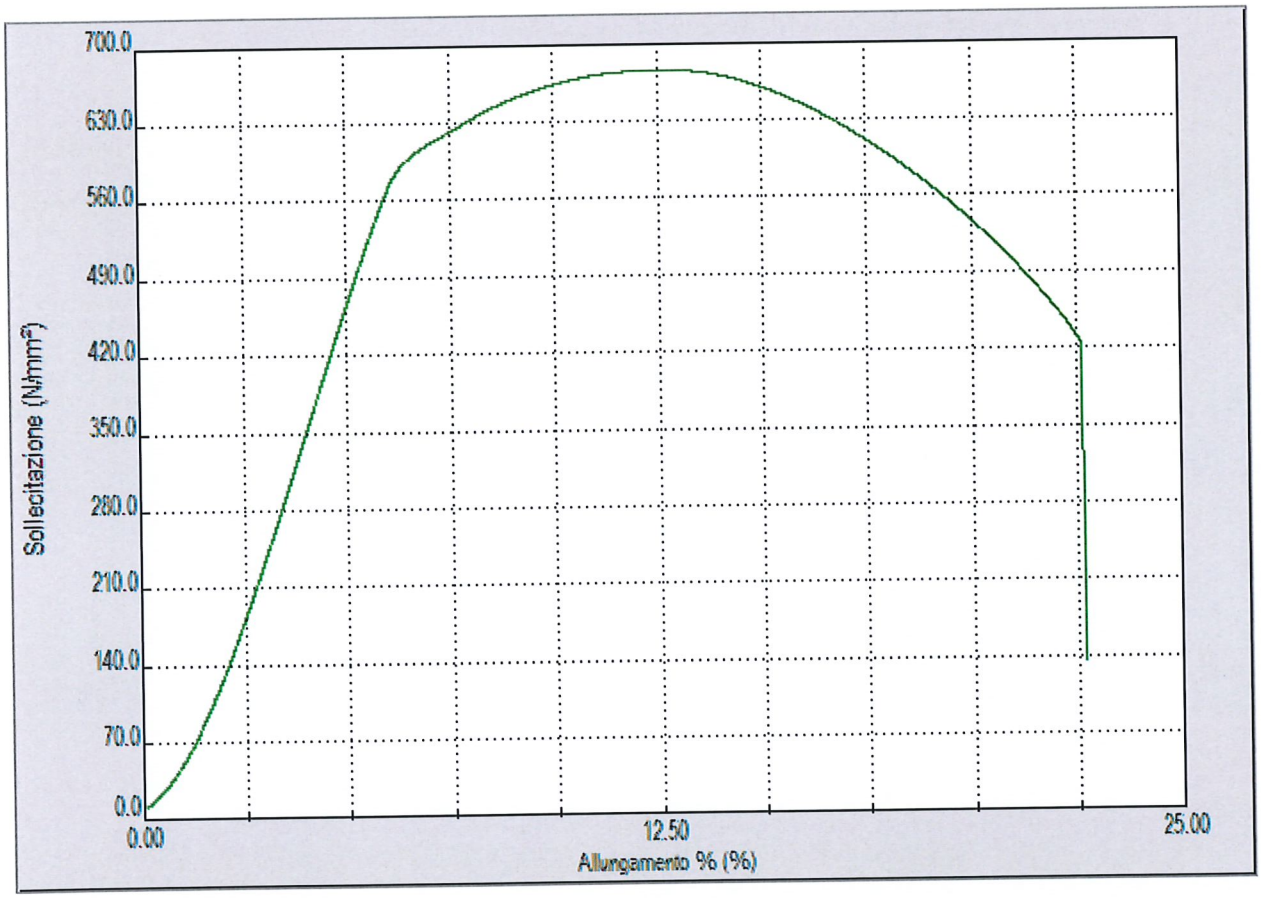
Date of Testing::28/09/2021
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Internal procedure *Procedura interna :* ***PP08 rev.13***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
472/21 G TWT	20,14x24,98	503.10	23,4°C	//	//	/	//	/	340028	676	/	//	//	FOW



Remarks / *Note:*	*UPPER SIDE – POSTION PH*
Legend / *Legenda*	**TT = Transverse Tension**/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura* **TWT = Transverse Weld Tension**/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Marco Baccheschi - INSPECTA srl - Laboratory Technician 28/09/2021	Sig. Giulio Bagnara - INSPECTA srl - 28-09-2021 Service Responsible	ROSETTI MARINO SpA Welding Dept. D. Cervacchi	RS SURVEYOR РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА RUSSIAN MARITIME REGISTER OF SHIPPING 28014 001 RINA A. Landi

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE
Prova di trazione trasversale a temperatura ambiente

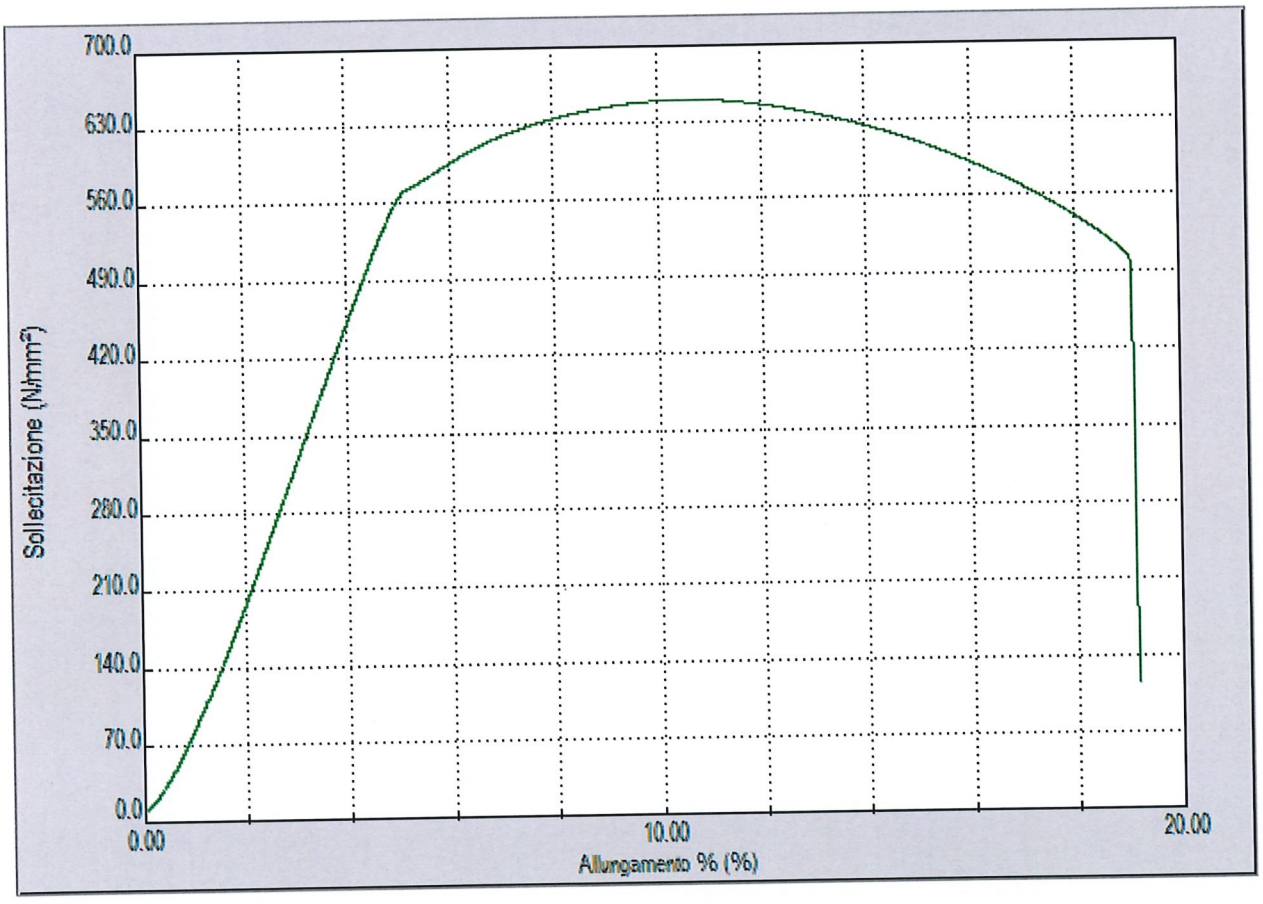
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Internal procedure *Procedura interna :* ***PP08 rev.13***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
472/21 H TWT	20,06x24,99	501,30	23,4°C	//	//	/	//	/	325984	650	/	//	//	FIW



Remarks / *Note:*	*LOWER SIDE – POSTION PH*
Legend / *Legenda*	**TT = Transverse Tension**/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura* **TWT = Transverse Weld Tension**/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
- INSPECTA srl - Dott. Ing. Mauro Baccheschi Laboratory Technician 28/09/2021	Sig. Giulio Bagnara - INSPECTA srl - 28-09-2021 Service Responsible	ROSETTI MARINO SPA Welding Dept. D. Cerracchi	RS Surveyor A. Lazzara

Headquarter: Via Giolitti 10 – 48123 Ravenna (RA) Italy – Phone /Fax + 39 0544 451424
Registered Office: Via Ravegnana 379/A - 47122 Forlì (FC) Italy - Phone +39 0543 559827 - Phone/Fax +39 0543 724366
Mobile +39 393 9374013 - e-mail: inspectasrl@inspectasrl.com - www.inspectasrl.com - P.I.a 03944480403
Capital Stock € 50.000 - Chamber of Commerce registration Forlì/Cesena No. 03944480403 - R.E.A. No. 2219

RINA A. Landi

BEND TEST
Prova di piega

Date of Testing::28/09/2021
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* UNI EN ISO 5173:2012

The test was performed using the Galdabini testing materials machine, model Quasar 600, s.n. VAUP/01 (2014)
La prova è stata eseguita utilizzando la macchina per prove materiali Galdabini, modello Quasar 600, s.n. VAUP/01 (2014)

Internal procedure *Procedura interna* **:PP11 rev.05**

Specimen id. *Identificazione provino*		Dimension *Dimensioni (mm)*	Test Temp. *Temp.test °C*	Bend Angle *Angolo di piega*	Ø Former *ø Mandrino (mm)*	Distance between rollers *Distanza appoggi (mm)*	Remarks *Note*
472/2021 SBB	A	35,00x10,00	23,4°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone
472/2021 SBB	B	35,00x10,00	23,4°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone
472/2021 SBB	C	35,00x10,00	23,4°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone
472/2021 SBB	D	35,00x10,00	23,4°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone

Remarks *Note:* POSITION PC

Legend *Legenda*

SBB. = Transverse Side Bend/*Piega Trasversale laterale*
TRB. = Transverse Root Bend/*Piega Trasversale al rovescio*
TFB. = Transverse Face Bend/*Piega Trasversale al dritto*
LRB = Longitudinal Root Bend / *Piega Longitudinale al rovescio*
LFB. = Longitudinal Face Bend / *Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara	ROSETTI MARINO SPA Welding Dept. D. Cenacchi	RS surveyor
Laboratory Technician 28/09/2021	- INSPECTA srl - Service Responsible 28-09-2021		РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА RUSSIAN MARITIME REGISTER OF SHIPPING 1890 001

BEND TEST
Prova di piega

Date of Testing::28/09/2021
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* UNI EN ISO 5173:2012

The test was performed using the Galdabini testing materials machine, model Quasar 600, s.n. VAUP/01 (2014)
La prova è stata eseguita utilizzando la macchina per prove materiali Galdabini, modello Quasar 600, s.n. VAUP/01 (2014)

Internal procedure *Procedura interna* ***:PP11 rev.05***

Specimen id. *Identificazione provino*		Dimension *Dimensioni (mm)*	Test Temp. *Temp.test °C*	Bend Angle *Angolo di piega*	Ø Former *ø Mandrino (mm)*	Distance between rollers *Distanza appoggi (mm)*	Remarks *Note*
472/2021 SBB	E	35,00x10,00	23,4°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone
472/2021 SBB	F	35,00x10,00	23,4°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone
472/2021 SBB	G	35,00x10,00	23,4°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone
472/2021 SBB	H	35,00x10,00	23,4°C	180°	40	63	No open discontinuities have been found in weld metal and heat affected zone

Remarks *Note:* POSITION PH

Legend *Legenda*

SBB. = Transverse Side Bend/*Piega Trasversale laterale*
TRB. = Transverse Root Bend/*Piega Trasversale al rovescio*
TFB. = Transverse Face Bend/*Piega Trasversale al dritto*
LRB = Longitudinal Root Bend */ Piega Longitudinale al rovescio*
LFB. = Longitudinal Face Bend */ Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baceheschi	Sig. Giulio Bagnara	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RINA A. Landi
28/09/2021 Laboratory Technician	28-09-2021 Service Responsible		

IMPACT TEST
Prova di resilienza

Date of Testing:28/09/2021
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* UNI EN ISO 9016:2012

The test was performed using the Galdabini Charpy pendulum machine, model Impact 450, s.n. VAUP/02
La prova è stata eseguita utilizzando macchina pendolo Charpy marca Galdabini, modello Impact 450, s.n. VAUP/02

Internal procedure *Procedura interna* **:PP09 rev.07**

Specimen id. *Identificazione provino*	Direction *Direzione*	Dimension *Dimensioni (mm)*	Test Temp. *Temp .test*	Notch Type *Intaglio*	Knife / *coltello*	Requirement / Requisiti: Energy absorbed/ / Energia assorbita – Individual *Individuale Joule* 1	2	3	Average *Media Joule*	U	Lateral Expansion *Espansione laterale (mm)* 1	2	3	Shear Area *Area fragile %* 1	2	3	Remarks *Note*
472/21 VWT 0/2	T	10x10x55	-60°C	V	2	85	80	77	81	/	//	//	//	//	//	//	CAP
472/21 VHT 0/2	T	10x10x55	-60°C	V	2	39	43	38	40	/	//	//	//	//	//	//	CAP
472/21 VHT2/2	T	10x10x55	-60°C	V	2	220	225	239	228	/	//	//	//	//	//	//	CAP
472/21 VHT 5/2	T	10x10x55	-60°C	V	2	262	313	259	278	/	//	//	//	//	//	//	CAP
472/21 VWT 0/23	T	10x10x55	-60°C	V	2	58	68	67	64	/	//	//	//	//	//	//	ROOT
472/21 VHT 2/23	T	10x10x55	-60°C	V	2	70	95	92	86	/	//	//	//	//	//	//	ROOT

Remarks *Note:* ***POSITION PC***

Legend *Legenda*

L= Longitudinal / Longitudinale
T= Trasversal / Trasversale
VWT 0/2 = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
VHT 0/2 = Impact Test on Fusion Line */ Resilienza Trasversale in linea di fusione*
VHT 1/2 = Impact Test at 1mm from Fusion Line */ Resilienza trasversale a 1 mm dalla linea di fusione*
VHT 2/2 = Impact Test at 2 mm from Fusion Line */ Resilienza trasversale a 2 mm dalla linea di fusione*
VHT 5/2 = Impact Test at 5 mm from Fusion Line */ Resilienza trasversale a 5 mm dalla linea di fusione*
WM = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
HAZ = Impact Test on Heat Affected Zone */ Resilienza Trasversale in zona termicamente alterata*
BM = Impact Test on Base Metal */ Resilienza Trasversale in materiale base*

FL = Fusion Line/ *Linea di fusione*
FL+1 = Fusion Line + 1mm/ *Linea di fusione+ 1mm*
FL+2 = Fusion Line + 2mm/ *Linea di fusione+ 2mm*
FL +5= Fusion Line + 5mm/ *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Marco Baccheschi	Sig. Giulio Bagnara	ROSETTI MARINO S.p.A. Welding Dept. D. Canacchi	
Laboratory Technician 28/09/2021	Service Responsible 28-09-2021		

IMPACT TEST
Prova di resilienza

Date of Testing:28/09/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* UNI EN ISO 9016:2012

The test was performed using the Galdabini Charpy pendulum machine, model Impact 450, s.n. VAUP/02
La prova è stata eseguita utilizzando macchina pendolo Charpy marca Galdabini, modello Impact 450, s.n. VAUP/02

Internal procedure *Procedura interna* :***PP09 rev.07***

Specimen id. *Identificazione provino*	Direction *Direzione*	Dimension *Dimensioni (mm)*	Test Temp. *Temp .test*	Notch Type *Intaglio*	Knife / *coltello*	Requirement / Requisiti: Energy absorbed/ / Energia assorbita – Individual *Individuale Joule* 1	2	3	Average *Media Joule*	U	Lateral Expansion *Espansione laterale (mm)* 1	2	3	Shear Area *Area fragile %* 1	2	3	Remarks *Note*
472/21 VWT 0/2	T	10x10x55	-60°C	V	2	62	67	74	68	/	//	//	//	//	//	//	CAP
472/21 VHT 0/2	T	10x10x55	-60°C	V	2	98	87	77	87	/	//	//	//	//	//	//	CAP
472/21 VHT2/2	T	10x10x55	-60°C	V	2	247	249	240	245	/	//	//	//	//	//	//	CAP
472/21 VHT 5/2	T	10x10x55	-60°C	V	2	281	301	308	297	/	//	//	//	//	//	//	CAP
472/21 VWT 0/23	T	10x10x55	-60°C	V	2	54	52	51	52	/	//	//	//	//	//	//	ROOT
472/21 VHT 2/23	T	10x10x55	-60°C	V	2	70	88	70	76	/	//	//	//	//	//	//	ROOT

Remarks *Note:* ***POSITION PH***

Legend *Legenda*

L= Longitudinal / Longitudinale
T= Trasversal / Trasversale
VWT 0/2 = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
VHT 0/2 = Impact Test on Fusion Line */ Resilienza Trasversale in linea di fusione*
VHT 1/2 = Impact Test at 1mm from Fusion Line */ Resilienza trasversale a 1 mm dalla linea di fusione*
VHT 2/2 = Impact Test at 2 mm from Fusion Line */ Resilienza trasversale a 2 mm dalla linea di fusione*
VHT 5/2 = Impact Test at 5 mm from Fusion Line */ Resilienza trasversale a 5 mm dalla linea di fusione*
WM = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
HAZ = Impact Test on Heat Affected Zone */ Resilienza Trasversale in zona termicamente alterata*
BM = Impact Test on Base Metal */ Resilienza Trasversale in materiale base*

FL = Fusion Line/ *Linea di fusione*
FL+1 = Fusion Line + 1mm/ *Linea di fusione+ 1mm*
FL+2 = Fusion Line + 2mm/ *Linea di fusione+2mm*
FL +5= Fusion Line + 5mm/ *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Marco Baceheschi	Sig. Giulio Bagnara		
INSPECTA	- INSPECTA srl -	ROSETTI MARINO SPA Welding Dept. D Conocchi	
Laboratory Technician 28/09/2021	Service Responsible 28-09-2021		

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing: 23/09/2021
Data esecuzione prova:

performed in accordance with the standard / eseguita in conformità alla norma UNI EN ISO 9015-1:2011

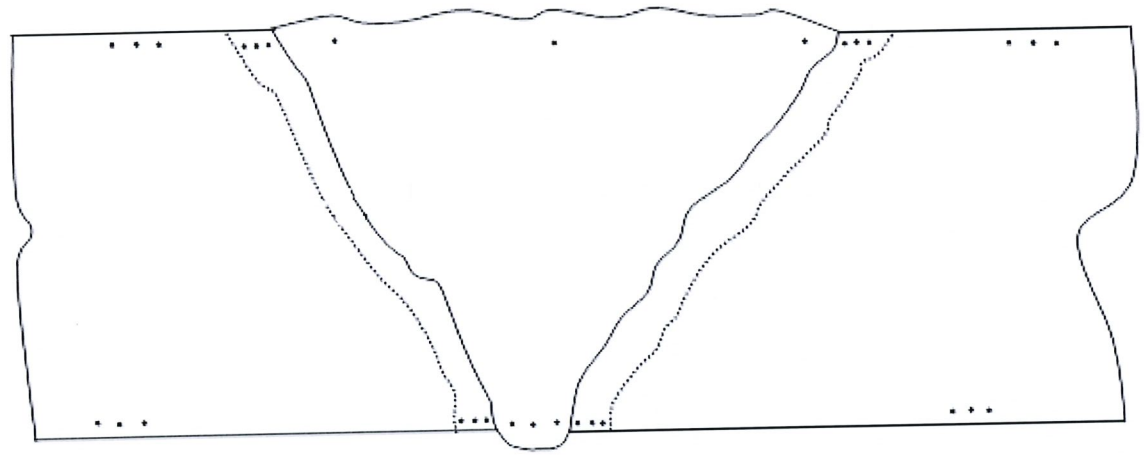
The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure / Procedura interna	PP10 rev.05	Sample Identification / Identificazione provino	472/21 A	Hardness test type / Tipo di durezza	HV10	Test Temp. / Temp.test	24,3°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: EN 10225 S460G1+M — **Base Material Side B: EN 10225 S460G1+M**

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6	7 – 8 – 9	10 – 11 – 12	13 – 14 – 15
16 – 17 – 18	19 – 20 – 21	22 – 23 – 24	25 – 26 – 27	28 – 29 – 30



Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U
1 – 2 – 3	238-236-235	/	16 – 17 – 18	244-233-232	/	//	//	/
4 – 5 – 6	269-270-262	/	19 - 20 – 21	210-222-237	/	//	//	/
7 – 8 – 9	262-230-237	/	22 – 23 – 24	247-251-235	/	//	//	/
10 – 11 – 12	258-247-216	/	25 - 26 – 27	228-214-219	/	//	//	/
13 – 14 – 15	240-238-247	/	28 – 29 – 30	236-235-248	/	//	//	/

Remarks/ *Note:* POSITION PC

Laboratory Technician / Tecnico di Laboratorio	Laboratory Responsible / Responsabile Laboratorio	Customer Inspector / Ispettore del cliente	Third part Inspector / Ispettore Terza parte
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara	ROSETTI MARINO SpA Welding Dept. D. Conacchi	
- INSPECTA srl - Laboratory Technician 28/09/2021	- INSPECTA srl - Service Responsible 28-09-2021		RS ... РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА RUSSIAN MARITIME REGISTER OF SHIPPING 280 001

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::23/09/2021
Data esecuzione prova:

performed in accordance with the standard / eseguita in conformità alla norma UNI EN ISO 9015-1:2011

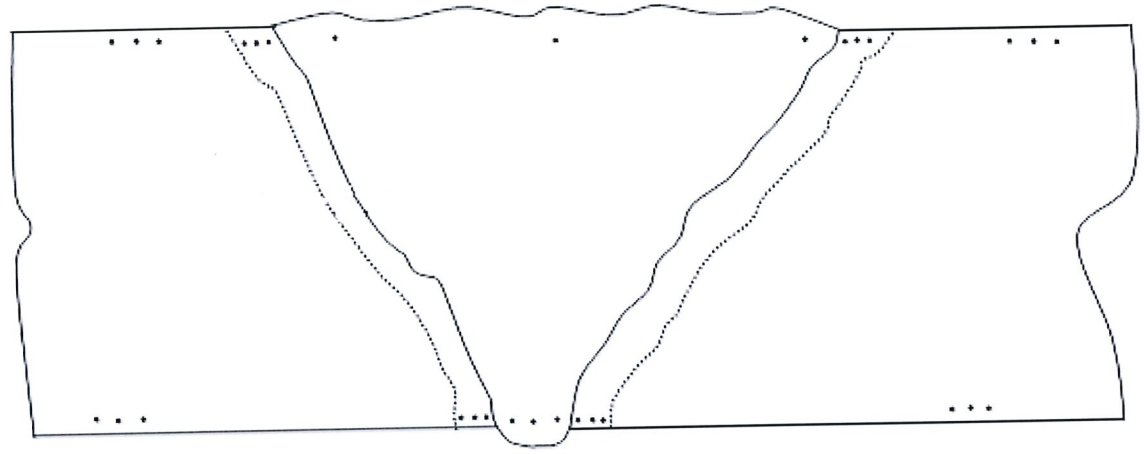
The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure / Procedura interna	PP10 rev.05	Sample Identification / Identificazione provino	472/21 C	Hardness test type / Tipo di durezza	HV10	Test Temp. / Temp.test	24,3°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: EN 10225 S460G1+M — **Base Material Side B: EN 10225 S460G1+M**

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6	7 – 8 – 9	10 – 11 – 12	13 – 14 – 15
16 – 17 – 18	19 – 20 – 21	22 – 23 – 24	25 – 26 – 27	28 – 29 – 30



Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U
1 – 2 – 3	257-250-239	/	16 – 17 – 18	272-267-265	/	//	//	/
4 – 5 – 6	211-222-265	/	19 - 20 – 21	214-224-214	/	//	//	/
7 – 8 – 9	275-266-279	/	22 – 23 – 24	200-197-202	/	//	//	/
10 – 11 – 12	263-221-216	/	25 - 26 – 27	217-212-214	/	//	//	/
13 – 14 – 15	244-249-258	/	28 – 29 – 30	222-237-239	/	//	//	/

Remarks/ *Note:* POSITION PH – H.3

Laboratory Technician / Tecnico di Laboratorio	Laboratory Responsible / Responsabile Laboratorio	Customer Inspector / Ispettore del cliente	Third part Inspector / Ispettore Terza parte
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara	ROSETTI MARINO SpA Welding Dept D.Cenacchi	RS RUSSIAN MARITIME REGISTER OF SHIPPING 280 001
- INSPECTA srl - Laboratory Technician 28/09/2021	- INSPECTA srl - Service Responsible 28-09-2021		

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::23/09/2021
Data esecuzione prova:

performed in accordance with the standard / eseguita in conformità alla norma UNI EN ISO 9015-1:2011

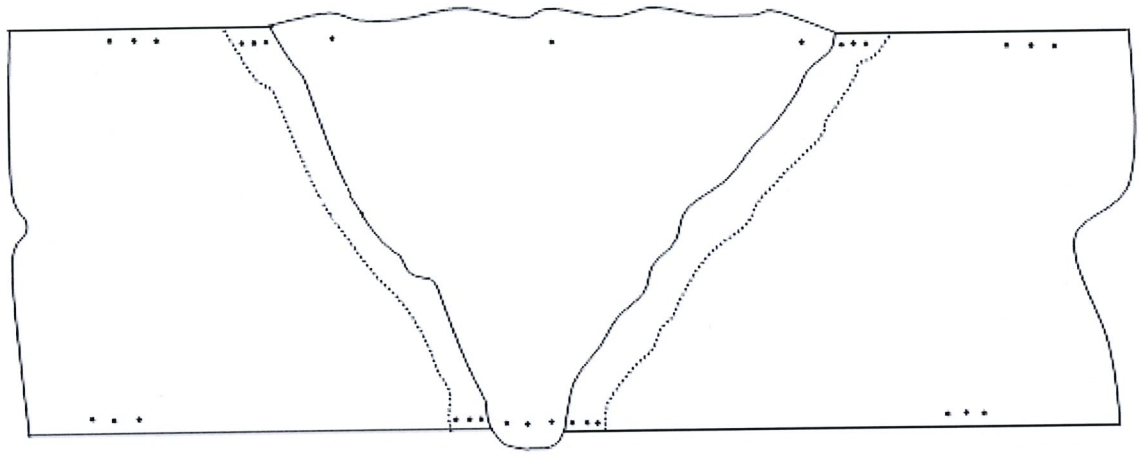
The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure / Procedura interna	PP10 rev.05	Sample Identification / Identificazione provino	472/21 D	Hardness test type / Tipo di durezza	HV10	Test Temp. / Temp.test	24,3°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: EN 10225 S460G1+M — **Base Material Side B: EN 10225 S460G1+M**

BM	HAZ	WM	HAZ	BM
1 – 2 – 3	4 – 5 – 6	7 – 8 – 9	10 – 11 – 12	13 – 14 – 15
16 – 17 – 18	19 – 20 – 21	22 – 23 – 24	25 – 26 – 27	28 – 29 – 30



Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U
1 – 2 – 3	247-256-264	/	16 – 17 – 18	239-238-228	/	//	//	/
4 – 5 – 6	232-245-265	/	19 - 20 – 21	218-219-221	/	//	//	/
7 – 8 – 9	279-229-274	/	22 – 23 – 24	232-234-245	/	//	//	/
10 – 11 – 12	270-274-259	/	25 - 26 – 27	225-224-212	/	//	//	/
13 – 14 – 15	259-262-265	/	28 – 29 – 30	239-255-250	/	//	//	/

Remarks/ *Note:* POSITION PH – H.6

Laboratory Technician / Tecnico di Laboratorio	Laboratory Responsible / Responsabile Laboratorio	Customer Inspector / Ispettore del cliente	Third part Inspector / Ispettore Terza parte
Dott. Ing. Maura Baccheschi - INSPECTA srl - Laboratory Technician 28/09/2021	Sig. Giulio Bagnara - INSPECTA srl - Service Responsible 28-09-2021	ROSETTI MARINO SPA Welding Dept. D. Cenacchi	RS Surveyor РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА 280 РС 001 RUSSIAN MARITIME REGISTER OF SHIPPING

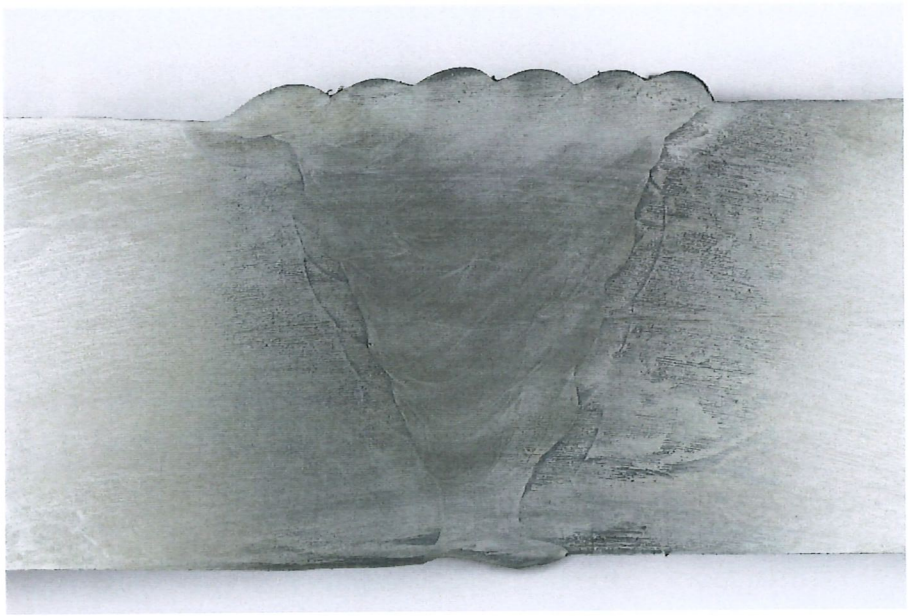
MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::23/09/2021
Data esecuzione prova:

performed in accordance with the standard / eseguita in conformità alla norma UNI EN ISO 17639:2013

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.03* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,3°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**472/2021 A**	**Magnification:** *Ingrandimento:*	**Photo at: 1.75x** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639 - A - E – 6 - 2.1 / 6 / 2.1 / A1**		



Remarks / *Note:*	**POSITION PC** **No defects have been found in Macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO S.p.A. Welding Dept. D. Cenacchi	RS surveyor
- INSPECTA srl - Laboratory Technician 28/09/2021	- INSPECTA srl - Service Responsible 28-09-2021		РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА RUSSIAN MARITIME REGISTER OF SHIPPING 2001 001

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::23/09/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* *UNI EN ISO 17639:2013*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.03* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,3°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**472/2021 B**	**Magnification:** *Ingrandimento:*	**Photo at: 1.75x** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639 - A - E – 6 - 2.1 / 6 / 2.1 / A1**		



Remarks / *Note:*	**POSITION PC** **No defects have been found in Macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott.Ing. Marco Baccheschi	*Sig. Giulio Bagnara*		
- INSPECTA srl -	- INSPECTA srl -	BOSETTI MARINO SPA Welding Dept D. Gonacchi	РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА RUSSIAN MARITIME REGISTER OF SHIPPING 280 001
Laboratory Technician	Service Responsible		
28/09/2021	28-09-2021		2034

O. LAZAREV

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::23/09/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* UNI EN ISO 17639:2013

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.03* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,3°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**472/2021 C**	**Magnification:** *Ingrandimento:*	**Photo at: 1.75x** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639 - A - E – 6 - 2.1 / 6 / 2.1 / A1**		



Remarks / *Note:*	**POSITION PH – H.3** **No defects have been found in Macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Bacheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RS Российский морской регистр судоходства 001
INSPECTA srl Laboratory Technician 28/09/2021	- INSPECTA srl - Service Responsible 28-09-2021		

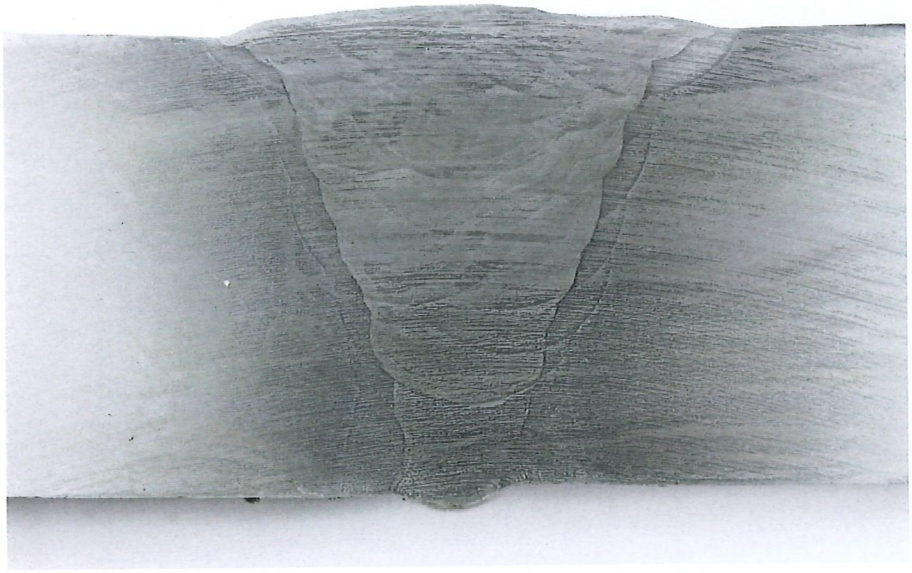
MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::23/09/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* UNI EN ISO 17639:2013

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *Procedura internal*	PP12 rev.03	**Test temperatura** *Temperature Test*	24,3°C
Surface finish: *Finitura superficiale:*	POLISHED WITH SANDPAPER	**Type and chemical composition:** *Tipo e composizione chimica:*	Nital 5% (A1)
Etching methods: *Metodo di attacco:*	IMMERSION	**Etching time:** *Tempo di attacco:*	10 sec.
Sample Identification: *Identificazione provino:*	472/2021 D	**Magnification:** *Ingrandimento:*	Photo at: 1.75x Examination at: 21.0x
Designation: *Designazione:*	ISO 17639 - A - E – 6 - 2.1 / 6 / 2.1 / A1		



Remarks / *Note:*	**POSITION PH – H.6** **No defects have been found in Macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RUSSIAN MARITIME REGISTER OF SHIPPING 280 P 001
- INSPECTA srl - 28/09/2021	- INSPECTA srl - Service Responsible 23-09-2021		

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::23/09/2021
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* UNI EN ISO 17639:2013

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.03* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,3°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5% (A1)**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**472/2021 E**	**Magnification:** *Ingrandimento:*	**Photo at: 1.75x** **Examination at: 21.0x**
Designation: *Designazione:*	**ISO 17639 - A - E – 6 - 2.1 / 6 / 2.1 / A1**		



Remarks / *Note:*	**POSITION PH – H.12** **No defects have been found in Macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third-part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO S.p.A. Welding Dept. D. Cenacchi	RINA A. Landi
- INSPECTA srl - Laboratory Technician 28/09/2021	- INSPECTA srl - Service Responsible 28-09-2021		

END OF TEST REPORT
FINE DEL RAPPORTO DI PROVA

voestalpine Böhler Welding Italia S.r.l.

Via Palizzi, 90
I – 20157 MILANO MI
Tel. +39 02 39017.1
Fax +39 02 39017244

www.voestalpine.com/welding

Certificato di prova 3.1
Inspection certificate 3.1

secondo / as per : EN 10204
No. : No. : 2021-2014568877-10-939012-014
Rev. 0 Page / Page : 1 / 1

ROSETTI MARINO S.p.A.

Via Trieste 230
48100 RAVENNA
Italia

Ordine N°	PO no.	Campionatura gratuita	del / of	28.06.2021
Ordine N°	Order no.	1014243616		
Bolla di consegna/Pos./Splitt.	Delivery note/pos./split	2014568877/000000/000010	del / of	07.07.2021
Oggetto test	Product	filo animato / Tubular cored electrode		
Denominazione commerciale	Trade name	**diamondspark Ni1 RC**		208593 27098 CU05110F 0140
Classificazione norma	Standard designation	EN ISO 17632-A: T50 6 1Ni P M 1 H5 AWS A5.36: E81T1-M21A8-Ni1-H4		
Dimensione	Dimension	1,2 mm		
Colata	Serial no.	939012		
Quantità fornita	Quantity	48,0 KG		

Composizione chimica in % del deposito **Chemical composition in % of the weld metal**

C	Si	Mn	P	S	Cr	Mo	Ni	Cu	Al					
0,05	0,30	1,04	0,009	0,013	0,03	< 0,01	0,93	0,10	< 0,01					

proprietà meccaniche **Mechanical properties** **EN 10204 - 2.2**

Prova di trazione Tensile test

T	ReL / Rp 0,2 MPa	Rp 1,0 MPa	Rm MPa	A (Lo = 5d) %	Z %	WBH PWHT	Note Remarks
20°C	≥ 500		560 - 690	≥ 18			

Prova di resilienza Impact test

T	Energia di impatto Impact energy KV / J	Medio Average KV / J	Espansione lat. Lateral expansion mm	Frattura cristalliina Shear fracture %	WBH PWHT	Note Remarks
-60°C	≥ 47					

Questo certificate è stato emesso con sistema automatizzato e non richiede firma
This certificate was issued by DP-equipment and does not require signature.

Centro / Town: Milano
Data / Date: 02.08.2021
Q.A. representative / Authorized representative: Zuin

voestalpine
ONE STEP AHEAD.

CIMOLAI

San Giorgio di Nogaro (UD)

WORKS TEST CERTIFICATE 3.2 (EN 10204:2005)

CERTIFICATO DI CONTROLLO 3.2 (EN 10204:2005)

CERT. No. / *ATTESTATO No.*: 2018237/VIS/07 rev. 01

DATE - *DATA*: 13/03/19

PAGE - *PAGINA*: 1 di 1

CLIENT / *CLIENTE*: **Rosetti Marino**

Cimolai JOB / *COMMESSA CIMOLAI*: **2018237**

P.O. No. / *Nr. ORDINE*: **1718001265 rev. 04**

PROJECT / *PROGETTO*: **Toulmount Platform**

We declare that the material hereunder listed has been produced and controlled in accordance with P.O. 1718001265 rev. 04 and documents referenced therein.

Order specifications: **EEMUA 158 III ed. 2015**

ITEM: See below

TYPE AND GRADE: See below

ENDS: Square ends

BASE MATERIAL: See plate cert.

PIPES DESCRIPTION AND TEST REPORTS TRACEABILITY

P.O. Item	Cimolai Mark	Nominal Dimensions (mm)	Grade	Heat Number	Plate Number	Plate certificate number	Supplier	Vis. and Dim. Number	VT Report Number	MT Report Number	UT Report Number	Mechanicat test Report Number	RT report Number	Hydrostatic test report number
40	18-5167	900 x 35 x 12000	EN 10225 : S460 G1 + M	710384	391371/1	A0362647	Voest Alpine	2018237-DIM-18-5167	2018237/VT/07	2018237/MT/07	2018237/UT/07	-	N.A.	N.A.
50	18-5177	900 x 25 x 12000	EN 10225:S355G9+M	904639	393418/1	A0362686	Voest Alpine	2018237-DIM-18-5177	2018237/VT/07	2018237/MT/07	2018237/UT/07	-	N.A.	N.A.
50	18-5178	900 x 25 x 12000	EN 10225:S355G9+M	904639	391769/1	A0362648	Voest Alpine	2018237-DIM-18-5178	2018237/VT/07	2018237/MT/07	2018237/UT/07	-	N.A.	N.A.
120	18-5231	800 x 20 x 12000	EN 10225:S355G9+M	710433	393545/2	A0362648	Voest Alpine	2018237-DIM-18-5231	2018237/VT/07	2018237/MT/07	2018237/UT/07	-	N.A.	N.A.
160	18-5254	700 x 30 x 12000	EN 10225:S355G9+M	815170	393438/1	A0362753	Voest Alpine	2018237-DIM-18-5254	2018237/VT/07	2018237/MT/07	2018237/UT/07	-	N.A.	N.A.
150	18-5255	700 x 30 x 12000	EN 10225:S460 G1 + M	814829	392546/2	A0362647	Voest Alpine	2018237-DIM-18-5255	2018237/VT/07	2018237/MT/07	2018237/UT/07	-	N.A.	N.A.
160	18-5256	700 x 30 x 12000	EN 10225:S355G9+M	815170	391748/1	A0362648	Voest Alpine	2018237-DIM-18-5256	2018237/VT/07	2018237/MT/07	2018237/UT/07	-	N.A.	N.A.
210	18-5270	600 x 30 x 11500	EN 10225:S355G9+M	904638	393353/21	A0362648	Voest Alpine	2018237-DIM-18-5270	2018237/VT/07	2018237/MT/07	2018237/UT/07	-	N.A.	N.A.

Cimolai Stamp:

SGS 05

SGS Italia S.p.A
WITNESSED ☐ REVIEWED ☐
DATE 13/03/2019
M. NOGARIN

CIMOLAI s.p.a.
Quality Control Department
Date 13/03/2019
Signature

Rev. 01: revised where underlined

Certificate Number: **VNA 1800122 / 12**
Page: 1 of 1

Inspection Certificate

Project: ----------
Client: **voestalpine Grobblech GmbH**
voestalpine-Straße 3, 4020 Linz, Austria

Office: **Vienna**

Clients Order Number: **8500978**

Date: **12-12-2018**

Order Status: **incomplete**

Inspection Dates
First: **22-11-2018**

final: **11-12-2018**

This certificate is issued to voestalpine Grobblech GmbH, Linz/Austria, to certify that the undersigned Surveyor attended their works Linz for the purpose of testing and inspecting the undernoted material with satisfactory results as stated below.

Purchaser: **CIMOLAI spa**
Corso Lino Zanussi 26
I-33080 PORCIA

Order No.: **2018102419 - Rev. 1**

Description:

14 piece(s) of steel plate(s) **99579 kg** , as per attached inspection Certificate no.: **A0362647**

Specification

S460G1+M EN 10225 : 2009

Heat treatment/Delivery Condition: thermomechanical rolled + accelerated cooled

Scope of inspection:

witness mechanical testing: yes ☑
review manufacturer's declared analysis: yes ☑
witness / verify ultrasonic examination: yes ☑ n/a ☐
witness / verify microstructure examination: yes ☐ n/a ☒
witness /verify corrosion testing: yes ☐ n/a ☒
random visual and dimensional control and check of hard stamping: yes ☑

Identification:

Makers Brand voestalpine
Material Quality
Heat No.
Plate No.
Brand of LR

06/02/2019 Review
ROSETTI MARINO SpA
Alberto Lucchi
Supply Management Dept.

SGS Italia S.p.A.
WITNESSED ☐ REVIEWED ☒
DATE .. 06/02/2019
M. NOGARIN

Lloyd's Register EMEA
Vienna Office
K. EDER
Lloyd's Register

Helmut Berger 14 DEC 2018
Surveyor to Lloyd's Register EMEA

a member of the Lloyd's Register group.

K. EDER

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Form 1123 (2017.07)

voestalpine Grobblech GmbH

A02
Inspection certificate
EN 10204 - 3.2

VNA1800122-12

Z02 Date 12-12-2018

voestalpine-Straße 3
4020 Linz, Austria
www.voestalpine.com/grobblech

A03 Document number	A0362647	A08 Order-No.:	8500978	A07 OrderDat.	24-10-2018

4F

A06 Customer	CIMOLAI spa Corso Lino Zanussi 26 I-33080 PORCIA	B01 Product	Plate		
		B02 Material	S460G1+M	B03 Standard	EN 10225 : 2009
A07 OrderNo.	2018102419 - Rev. 1	B04 Delivery condition	thermomechanical rolled + accelerated cooled		
A06 Consignee	CIMOLAI S.p.A. Via Ettore Maiorana 7 Zona Industr. I-33058 SAN GIORGIO DI NOGARO (UD)				

A10 - Supplementary information
TOLMOUNT

B03 - Supplementary requirements
MATERIAL IS FINE GRAINED, VACUUM DEGASSED AND FULLY KILLED, PRODUCED BY BOF // MATERIAL IS PRE-QUALIFIED AS PER EN10225 OPTION 18, ANNEX E // FINAL ROLLING DIRECTION IS PERPENDICULAR TO DIE STAMPING // MATERIAL IS ACCORDING TO AB-TO-ROS-TE-ST-SP-0006 REV.A01 AND AB-TO-PMO-TE-MT-SP-0001 REV.B01 // MATERIAL IS ACCORDING TO EN10225 OPTIONS 2, 6, 9, 12, 13, 15, 16 AND 18.

D01 - Visual Examination and dimensional checking: satisfactory. The results of tests performed are in compliance with the requirements.

Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Date of Tests	reference no.
709621	392543/1	120	30,00	2450,0	11050	1		6.400	76112	11-12-2018	2018237 01
709621	392543/2	120	30,00	2450,0	11050	1		6.397	76112	11-12-2018	2018237 01
709621	392547/2	120	30,00	2450,0	11050	1		6.377	76069	11-12-2018	2018237 01
710041	392221/2	120	30,00	2450,0	11050	1		6.397	76112	11-12-2018	2018237 01
710041	392221/1	120	30,00	2450,0	11050	1		6.398	76112	11-12-2018	2018237 01
710041	392222/2	120	30,00	2450,0	11050	1		6.397	76112	11-12-2018	2018237 01
710041	392222/1	120	30,00	2450,0	11050	1		6.397	76112	11-12-2018	2018237 01
710042	392544/21	180	30,00	2135,0	12050	1		6.063	75992	11-12-2018	2018237 01
710042	392544/11	180	30,00	2135,0	12050	1		6.066	75992	11-12-2018	2018237 01

SGS Italia S.p.A.
WITNESSED ☐ REVIEWED ☐
DATE 06/02/2019
M. NOGARIN

CIMOLAI S.p.A. QUALITY CONTROL
RECEIVED ☐
WITNESSED ☐ DATE 18.12.2018
REVIEWED ☐
SIGNATURE R. Sandini

A04
Symbol of the manufacturer's work

voestalpine

Z03
Stamp of the inspection representative

LR 14 DEC 2018
Lloyd's Register EMEA
Vienna Office
Initials: KE

Z02
Inspection representative voestalpine Grobblech
LINTNER Norbert

06/02/2019
ROSETTI MARINO SpA
Alberto Lucchi
Supply Management Dept.
Review

voestalpine
ONE STEP AHEAD.

Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Date of Tests	reference no.
710384	391353/1	50	35,00	2745,0	12050	1		9.192	76134	22-11-2018	2018237 01
710384	391367/1	50	35,00	2745,0	12050	1		9.141	76134	22-11-2018	2018237 01
710384	391369/1	50	35,00	2745,0	12050	1		9.141	76134	22-11-2018	2018237 01
710384	391371/1	50	35,00	2745,0	12050	1		9.146	76134	22-11-2018	2018237 01
814829	392546/2	180	30,00	2135,0	12050	1		6.067	76023	22-11-2018	2018237 01
		Sum				14		99.579			

B14 - Supplementary information
Dimensional tolerances acc. EN 10029/10
Flatness acc. EN 10029/10 class N
EN10163-2: Class A3 - Repair-welding not permitted.
Thicknesstolerance acc. EN 10029/10 tab. 1 class A

Chemical composition (Heat analysis) - part 1 of 2

B07 Heat No.		C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %	Pb %	Cae %	Pcm %
	>=		.150				.015																
Set values	<=	.140	.550	1.650	.020	.0100	.055	.250	.700	.250	.300	.080	.040	.025	.0100	.0005	.0200	.0050	.0300	.0100	.010	.43	.22
709621		.036	.343	1.650	.006	.0004	.035	.166	.170	.023	.166	.004	.035	.012	.0052	.0002	.0020	.0019	.0020	.0020	.002	.37	.15
710041		.032	.327	1.620	.006	.0006	.030	.170	.170	.008	.158	.004	.035	.012	.0057	.0002	.0050	.0023	.0020	.0020	.002	.36	.15
710042		.030	.316	1.610	.005	.0004	.030	.162	.170	.007	.161	.004	.035	.012	.0048	.0002	.0070	.0021	.0020	.0020	.002	.36	.14
710384		.060	.364	1.500	.007	.0007	.037	.169	.260	.004	.162	.003	.027	.012	.0047	.0002	.0070	.0018	.0020	.0020	.002	.37	.17
814829		.030	.337	1.640	.007	.0010	.034	.187	.180	.010	.160	.004	.036	.012	.0053	.0002	.0050	.0022	.0030	.0020	.002	.37	.15

06/02/2018 reviewed
ROSETTI MARINO SpA
Alberto Lucchi
Supply Management Dept

SGS Italia S.p.A
WITNESSED ☐ REVIEWED ☐
DATE 06/02/2018
M. NOGARIN

CIMOLAI S.p.A. QUALITY CONTROL
RECEIVED ☐
WITNESSED ☐ DATE 18.12.2018
REVIEWED ☐
SIGNATURE R. Sandini

Z03
Stamp of the inspection representative

LR
14 DEC 2018
Lloyd's Register EMEA
Vienna Office
Initials: KE

Z02
Inspection representative voestalpine
Grobblech
LINTNER Norbert

voestalpine
ONE STEP AHEAD.

Chemical composition (Heat analysis) - part 2 of 2

B07 Heat No.	LF01 %	LF02 %	LF03 %
Set values >=			
Set values <=	.090	.110	.900
709621	.039	.051	.525
710041	.039	.051	.506
710042	.039	.051	.500
710384	.030	.042	.595
814829	.040	.052	.537

C99 - Supplementary information
BI <= 0,01%
C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF03: Cr+Ni+Cu+Mo
LF02: Nb+V+Ti
LF01: Nb+V

06/02/2019 review
ROSETTI MARINO SpA
Alberto Lucchi
Supply Management Dept.

SGS Italia S.p.A.
WITNESSED ☐ REVIEWED ☒
DATE 06/02/2019
M. NOGARIN

CIMOLAI S.p.A. QUALITY CONTROL
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WITNESSED ☐ DATE 18.12.2018
REVIEWED ☑
SIGNATURE R. Sandini

Z03
Stamp of the inspection representative

LR 14 DEC 2018
Lloyd's Register EMEA
Vienna Office
Initials: KE

Z02
Inspection representative voestalpine Grobblech
LINTNER Norbert

voestalpine
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Test results: C10-C29 Tensile Test acc. EN ISO 6892-1

B07 Heat No.	B06 Plate No	C41 Width	SpThickn mm	C01 loc.	PosTh.	C02 Dir	C11 Reh MPa	C11 Rp0,2 MPa	C12 Rm MPa	L0	C13 E %	C11 Reh/Rm %	C11 Rp0,2/Rm %
	>=						420	420	520		17.0		
Set values	<=								680			90.00	90.00
709621	392547	Ø	10.01	F	V	L		501	574	A5	25.8		87.28
	386817	30,0	30.11	F	O	T		528	600	A5	24.5		88.05
710041	392222	Ø	9.99	F	V	L		489	561	A5	29.7		87.22
	392222	30,0	30.08	F	O	T		518	578	A5	23.0		89.69
710042	392544	Ø	10.00	F	V	L		492	551	A5	29.4		89.20
	392544	30,0	29.97	F	O	T		528	588	A5	26.0		89.71
710384	391359	Ø	10.02	F	V	L		476	626	A5	26.4		76.14
	391363	Ø	10.00	F	V	L		458	621	A5	28.5		73.67
	391365	Ø	9.99	F	V	L		462	622	A5	28.7		74.24
	391359	30,0	35.31	F	O	T		503	652	A5	23.4		77.16
	391363	30,0	35.29	F	O	T		494	651	A5	23.2		75.87
	391365	30,0	35.42	F	O	T		491	657	A5	21.4		74.71
814829	392546	Ø	10.00	F	V	L	494	487	551	A5	29.8	89.55	88.30
	392546	30,0	30.09	F	O	T		512	580	A5	26.3		88.34

SpThickn: specimen thickness
C01;loc.:
F: Bottom
PosTh.: Pos Thickness
O: surface
V: ¼
C02;Dir:
L: longitudinal
T: transverse
C12; Rm: Tensile Strength
L0: gauge
A5: Length = 5.65 * sqr (area) mm
C13;E: elongation

06/02/2019 ROVIGO
ROSETTI MARINO SpA
Alberto Lucchi
Supply Management Dept.

SGS Italia S.p.A.
WITNESSED ☑ REVIEWED ☑
DATE 06/02/2019
M. NOGARIN

QUALITY CONTROL
CIMOLAI S.p.A.
RECEIVED ☐
WITNESSED ☐ DATE 18.12.2018
REVIEWED ☑
SIGNATURE R. Sandini

Z03
Stamp of the inspection representative

LR 14 DEC 2018
Lloyd's Register EMEA
Vienna Office
Initials: KE

Z02
Inspection representative voestalpine Grobblech
LINTNER Norbert

voestalpine
ONE STEP AHEAD.

Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No.	B06 Plate No	C40 shape	C01 loc.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	samp.cond.
>=						-40	42	42	42	60	
Set values <=											
709621	392547	CV 10x10	F	O	T	-40	325	360	341	342	
710041	392222	CV 10x10	F	O	T	-40	350	341	354	349	
710042	392544	CV 10x10	F	O	T	-40	353	365	336	351	
710384	391359	CV 10x10	F	O	T	-40	337	344	353	345	
	391363	CV 10x10	F	O	T	-40	335	348	326	336	
	391365	CV 10x10	F	O	T	-40	335	331	331	332	
814829	392546	CV 10x10	F	O	T	-40	212	351	348	304	
>=						-40	29	29	29	46	
Set values <=											
709621	392547	CV 10x10	F	ZB2	T	-40	304	293	46	214	strain aged 5%, 60 min. at 250°C
710041	392222	CV 10x10	F	ZB2	T	-40	317	320	320	319	strain aged 5%, 60 min. at 250°C
710042	392544	CV 10x10	F	ZB2	T	-40	322	320	311	318	strain aged 5%, 60 min. at 250°C
710384	391361	CV 10x10	F	ZB2	T	-40	268	264	302	278	strain aged 5%, 60 min. at 250°C

SGS Italia S.p.A.
WITNESSED ☐ REVIEWED ☒
DATE .. 06/02/2019
M. NOGARIN

06/02/2019 REVIEW

ROSETTI MARINO SpA
Alberto Lucchi
Supply Management Dept.

voestalpine

Z03
Stamp of the inspection representative

LR
14 DEC 2018
Lloyd's Register EMEA
Vienna Office
Initials: KE

Z02
Inspection representative voestalpine Grobblech
LINTNER Norbert

QUALITY CONTROL
CIMOLAI S.p.A.
RECEIVED ☐
WITNESSED ☐ DATE 18.12.2018
REVIEWED ☑
SIGNATURE R. Sandini

voestalpine
ONE STEP AHEAD.

Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07	B06	C40	C01		C02	C03	C42	C42	C42	C43		
Heat No.	Plate No	shape	loc.	PosTh.	Dir	temp	SV	SV	SV	AV		samp.cond.
						°C	J	J	J	J		
>=						-40	29	29	29	46		
Set values <=												
814829	392546	CV 10x10	F	ZB2	T	-40	313	325	320	319	strain aged 5%, 60 min. at 250°C	

C40;shape:
CV 10x10: Test shape , Dimensions
C01;loc.:
F: Bottom
PosTh.: Pos Thickness
0: surface
ZB2: 2mm below surface
C02;Dir:
T: transverse
C42;SV: single value
C43;AV: average value
samp.cond.: sample condition

06/02/2019 REVIEW
ROSETTI MARINO SpA
Alberto Lucchi
Supply Management Dept.

SGS Italia S.p.A
WITNESSED ☐ REVIEWED ☒
DATE 06/2/2019
F. NOGARIN

CIMOLAI S.p.A. QUALITY CONTROL
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WITNESSED ☐ DATE 18.12.2018
REVIEWED ☑
SIGNATURE R. Sandini

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Stamp of the inspection representative

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Initials: KE

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Inspection representative voestalpine Grobblech
HANNER Norbert

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Chemical composition (Product analysis) - part 1 of 2

B07 Heat No.	B06 Plate No	C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %
>=			.150				.015													
Set values <=		.140	.550	1.650	.020	.0100	.055	.250	.700	.250	.300	.080	.040	.025	.0100	.0005	.0200	.0050	.0300	.0100
709621	386817	.037	.332	1.650	.008	.0013	.034	.179	.180	.027	.166	.004	.035	.012	.0065	.0002	.0020	.0018	.0030	.0020
710041	392222	.030	.328	1.610	.006	.0010	.027	.174	.170	.008	.156	.003	.035	.011	.0066	.0002	.0020	.0020	.0020	.0020
710042	392544	.029	.332	1.630	.007	.0008	.032	.180	.180	.008	.160	.004	.037	.013	.0051	.0003	.0040	.0018	.0030	.0020
710384	391359	.058	.357	1.510	.007	.0007	.041	.175	.270	.004	.160	.003	.026	.012	.0035	.0002	.0020	.0016	.0020	.0020
	391363	.057	.362	1.510	.007	.0007	.040	.175	.260	.003	.161	.003	.027	.012	.0037	.0002	.0020	.0015	.0030	.0020
814829	392535	.029	.335	1.600	.007	.0011	.033	.182	.180	.009	.157	.004	.035	.012	.0045	.0002	.0020	.0018	.0030	.0020

Chemical composition (Product analysis) - part 2 of 2

B07 Heat No.	B06 Plate No	Pb %	Cae %	Pcm %	LF01 %	LF02 %	LF03 %
>=							
Set values <=		.010	.43	.22	.090	.110	.900
709621	386817	.002	.38	.15	.039	.051	.552
710041	392222	.002	.36	.14	.038	.049	.508
710042	392544	.002	.36	.14	.041	.054	.528
710384	391359	.002	.37	.17	.029	.041	.609
	391363	.002	.37	.17	.030	.042	.599
814829	392535	.002	.36	.14	.039	.051	.528

C99 - Supplementary information
BI <= 0,01%

C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF03: Cr+Ni+Cu+Mo
LF02: Nb+V+Ti
LF01: Nb+V

06/02/2019 REVIEW

SGS Italia S.p.A.
WITNESSED ☐ REVIEWED ☐
DATE 06/02/2019
M. NOGARIN

Remarks

ROSETTI MARINO SpA
Alberto Lucchi
Supply Management Dept.

CIMOLAI S.p.A. QUALITY CONTROL
RECEIVED ☐ WITNESSED ☐ DATE 18.12.2018
REVIEWED ☑ SIGNATURE R. Sondini

Z03 Stamp of the inspection representative

LR 14 DEC 2018

Lloyd's Register EMEA
Vienna Office
Initials: KE

Z02 Inspection representative voestalpine Grobblech
LANNER Norbert

voestalpine
ONE STEP AHEAD.

Remarks

We confirm that the above-mentioned delivery corresponds to the order (and standard).

C70 - Method of steelmaking: Basic oxygen furnace (BOF) steelmaking, continuous casting, steel is fully killed, vacuum degassed and melted by fine grain practice, austenitic grain size 5 or finer.

The signature of the inspection representative from voestalpine Grobblech GmbH is substituted by a electronic Signature, because the certificates of voestalpine Grobblech GmbH are prepared by a suitable data processing system (EN 10204, Pt.5).

QUALITY CONTROL
CIMOLAI S.p.A.
RECEIVED ☐
WITNESSED ☐ DATE 18.12.2018
REVIEWED ☑
SIGNATURE R. Sandini

06/02/2019

ROSETTI MARINO SpA
Alberto Lucchi
Supply Management Dept.

SGS Italia S.p.A.
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DATE 06/02/2019
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Z02
Inspection representative voestalpine Grobblech
LINTNER Norbert

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D02-D50 - ULTRASONIC EXAMINATION PLATE(S)

SPECIFICATION

Ultrasonic test acc. EN 10160, EN 10160 class S1/Body, Grid 200 mm, EN 10160 class E2/Edge Zone, Edge zone longitudinal 50 mm, Edge zone transverse 50 mm; satisfactory

VALID TEST EQUIPMENT
mechanized ultrasonic "In-Line testing system" (Manufacturer: NDT-Systems & Services) and
mechanized ultrasonic "off-line - testing system" (manufacturer: Windhoff Bahn- und Anlagentechnik GmbH) and
MUT (optional): Sonatest D20 no. 90006523 or Sonatest D20 no. 90007346 or Sonatest Masterscan 380 no. 90007347 or Sonatest Masterscan 380 no. 90006522 or Sonatest D50 no. 90010231 or GE - USM 36 no. 90010775

PROBE
(in-line AUT): 3STSE 18.3/8 P5, SEZ5R10RS, SE3 18.3/10 5A, (5MHz)
(off-line AUT): S140 (4MHz) 3T/1R
(MUT): SEB4E (4MHz), SEB4E0° (4MHz), MSEB4E (4MHz), B2SO (2MHz)
watergapcoupling

SURFACE CONDITION
Scaled surface - cleaned surface and free of loose scale.

RESULT
Plate(s) comply with the specification.

INSPECTION OPERATOR
Operators Level 1 or 2: qualified and certified according EN ISO 9712 (since 01.01.2013) respectively according the Written Practice „NDT-WP" (in accordance to Recommended Practice SNT-TC-1A). Operators Level 2 for ASME/ASTM.

INSPECTION SUPERVISOR
Responsible Level 3: Bindreiter Erich

06/02/2018
ROSETTI MARINO SpA
Alberto Lucchi
Supply Management Dept.

SGS Italia S.p.A
WITNESSED ☐ REVIEWED ☒
DATE 06/02/2018
M. NOGARIN

CIMOLAI S.p.A. QUALITY CONTROL
RECEIVED ☐
WITNESSED ☐ DATE 18.12.2018
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SIGNATURE R. Sandini

Z03
Stamp of the inspection representative

LR 14 DEC 2018
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Initials: KE

Z02
Inspection representative voestalpine
Grobbloh
LINNAEI Norbert

voestalpine
ONE STEP AHEAD.

CIMOLAI
Pordenone - Italy
Site: San Giorgio di Nogaro (UD) - ITALY

DIMENSIONAL CONTROL REPORT

RAPPORTO DI CONTROLLO DIMENSIONALE

REPORT No.	2018237-DIM-18-5167
REV.	0
DATE - *DATA*	22.02.2019
PAGE - *PAGINA*	1 of 1

INTERNAL JOB / COMMESSA INTERNA	OPERATING PROCEDURE / PROCEDURA OPERATIVA	PIPE N.	NOMINAL DIMENSION		
			NOMINAL DIAMETER	NOMINAL THICKNESS	NOMINAL LENGHT
2018237	IOP-DIM-2018237-01 (118A50-1265-QA-P03-0003)	18-5167	900	35	12000

REFERENCE STANDARD	CLIENT ITEM
EEMUA 158 ed.3	40

DIAMETER	NOMINAL DIAMETER	TOLERANCE				ACTUAL MEASUREMENT							
		ENDS		BODY		END A	1/3 L	2/3 L	END B	END A	1/3 L	2/3 L	END B
		LOWER LIMIT	UPPER LIMIT	LOWER LIMIT	UPPER LIMIT	DIAMETER CALCULATED BASED ON CIRCUMFERENCE MEASUREMENT				DIAMETER CALCULATED BASED ON AVERAGE DIAMETER			
	900	896,8	903,2	895,2	904,8	899,9	900,7	900,5	899,9	899,8	900,7	900,5	899,9

OUT OF ROUNDNESS (OVALITY)	TOLERANCE	ACTUAL MEASUREMENT											
		END A			1/3 L			2/3 L			END B		
	OVALITY	MIN. DIAMETER	MAX DIAMETER	OVALITY	MIN. DIAMETER	MAX DIAMETER	OVALITY	MIN. DIAMETER	MAX DIAMETER	OVALITY	MIN. DIAMETER	MAX DIAMETER	OVALITY
	6,8	895,8	901,8	6,0	899,5	901,9	2,4	898,5	903,0	4,5	898,4	900,9	2,5

THICKNESS	NOMINAL THICKNESS	TOLERANCE		ACTUAL MEASUREMENT	
		LOWER LIMIT	UPPER LIMIT	MIN. THICKNESS	MAX THIKNESS
	35	34,3	-	34,4	35,9

LENGHT	NOMINAL LENGHT	TOLERANCE		ACTUAL MEASUREMENT
		LOWER LIMIT	UPPER LIMIT	
	12000	12000	12020	12020

FULL-LENGHT STRAIGHTNESS	TOLERANCE	ACTUAL MEASUREMENT
	UPPER LIMIT	
	10,0	10,0

LOCAL OUT OF STRAIGHTNESS	TOLERANCE	ACTUAL MEASUREMENT
	UPPER LIMIT	
	-	2,0

OUT OF SQUARENESS	TOLERANCE	ACTUAL MEASUREMENT	
	UPPER LIMIT	END A	END B
	3,0	0	0

EXTERNAL WELD BEAD HEIGHT	TOLERANCE		ACTUAL MEASUREMENT			
	LOWER LIMIT	UPPER LIMIT	END A	1/3L	2/3L	END B

WELD EDGE MISALIGNMENT	TOLERANCE	ACTUAL MEASUREMENT			
	UPPER LIMIT	END A	1/3L	2/3L	END B

LOCAL OUT OF ROUNDNESS	TOLERANCE	ACTUAL MEASUREMENT			
	UPPER LIMIT	END A	1/3L	2/3L	END B

END BEVEL ANGLES	TOLERANCE		ACTUAL MEASUREMENT	
	LOWER LIMIT	UPPER LIMIT	END A	END B
	90°	90°	90°	90°

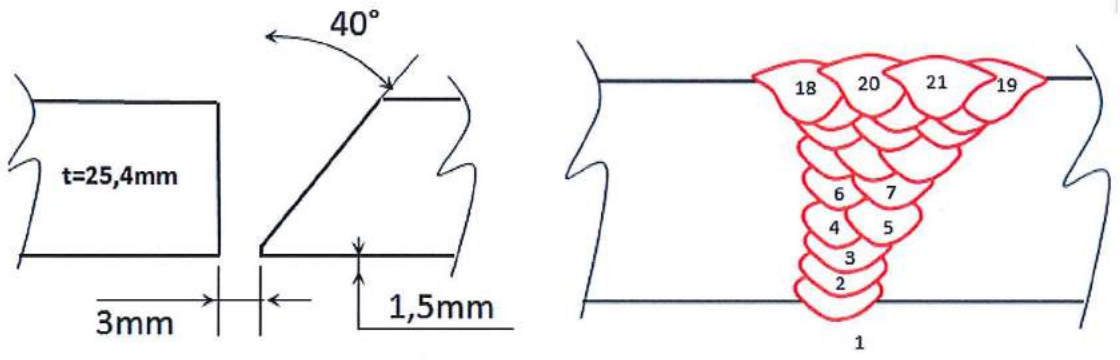
NOTES:
All dimensions are expressed in mm
The report was automatically generated and is valid without signature of the manufacturer

FIELD FOR THIRD PARTY OR CLIENTS SIGNATURE

SGS ITALIA S.p.A.
WITNESSED ☐ REVIEWED ☒
MONITORING SW ☐
DATE 27 FEB. 2019
5

ROSETTI MARINO	PQR N°	22/16
PROCEDURE QUALIFICATION RECORD	Sheet: 1	Of:2
	Prepared by: AKK	Date 10/02/2016

COMPANY NAME:	ROSETTI MARINO SPA		
WPS N°	22/16 Rev.0	DATE:	21/01/2016
WELDING PROCESS(ES):	GTAW+FCAW		
TYPES:	MANUAL+SEMIAUTOMATIC		



BASE METAL

Material Specification:	EN10225	(see notes)
Type or grade:	S355 G15+NZ	
Thickness of Test Coupon:	25,4 mm	
Diameter of Test Coupon:	323,9 mm	
Base metal maker	ARCELORMITTAL	
CEQ:	0,41	
Base metal Heat No.	48976	

FILLER METALS

	GTAW	FCAW
SFA Specification	A5.18	A5.36 (A5.29)
AWS Classification	ER 70S-6	E81T1-Ni1 M21 A6
Filler Metal F-No	6	6
Weld Metal Analysis A-No.	1	10
Size of Filler Metal	2.4	1.2
filler metal	OK Tigrod 12.64	OK Tubrod 15.19
Filler metal Maker:	ESAB	ESAB
Deposited Weld Metal	4 mm	21,4 mm
Heat No.	PV542894513	PNP02019

POSITION

Position of Groove 6G
Weld progression (Uphill, Downhill) UP-HILL
Other *NONE*

PREHEAT

Preheat temperature: 65°C
Interpass temperature: 250°C

POSTWELD HEAT TREATMENT

Temperature: N.A.
Time: N.A.
Other N.A.

GAS

	Gas(es)	Percent composition (Mixture)	Flow rate
Shielding	GTAW: Ar	99,9%	12 lt./1'
Shielding	FCAW: AR+CO_2	80%+20%	15 lt./1'
Backing	N.A.	N.A.	N.A.

ELECTRICAL CHARACTERISTICS

Current DC
Polarity SP / RP
Amps. **See welding sheet** *Volts* **See welding sheet**
Tungsten Electrode Size
Other ***HEAT INPUT*** kJ/mm *:* **GTAW 1,32-1,37 KJ/mm**
FCAW 1,14-1,28 KJ/mm

TECHNIQUE

Travel speed (mm/1)'	See welding sheet	
String or Weave Bead	STRING	
Oscillation	N.A.	
Single or Multi Pass :	MULTIPASS	
Single or multiple electrodes	SINGLE	
Stick-Out Length:	FCAW 15mm	

NOTES: Parent material used for testing with double classification:
API 5L Grade X52N (Group II)

RINA Services SpA
D. Cimatti

IIW
A.KHALIFA
IWT 070154A
INTERNATIONAL WELDING TECHNOLOGIST

ROSETTI MARINO	PQR N°	22/16
PROCEDURE QUALIFICATION RECORD	Sheet: 2	Of: 2
	Prepared by: AKK	Date: 10/02/2016

TENSILE TEST

SPECIMEN No.	WIDTH (mm)	THICKNESS (mm)	AREA (mm^2)	ULTIMATE TOTAL LOAD N	ULTIMATE UNIT STRESS N/mm2	TYPE OF FAILURE & LOCATION
TWT	20.0	24.0	480.0	268880	560	Broken out of weld
TWT	20.1	24.1	484.4	266480	550	Broken out of weld

TOUGHNESS TESTS

SPECIMEN No.	NOTCH LOCATION	NOTCH TYPE	TEST TEMP.	JOULE INDIVIDUAL- (AVERAGE) MIN. 27J				LATERAL EXP.		DROP WEIGHT	
								% SHEAR	MILS	BREAK	No. BREAK
10x10	WELD METAL	KV	-50°C	80	61	64	68	/	/	/	/
10x10	FUSION LINE	KV	-50°C	33	160	130	108	/	/	/	/
10x10	FUSION LINE +1	KV	-50°C	63	52	48	54	/	/	/	/
10x10	FUSION LINE +2	KV	-50°C	83	120	71	91	/	/	/	/
10x10	FUSION LINE +5	KV	-50°C	82	93	108	94	/	/	/	/

GUIDED BEND TEST – NOT APPLICABLE

TYPE & FIGURE No.	RESULT
No. 4 SIDE BEND TEST (Figure 4.13)	NO DEFECTS

FILLET WELD

Result – Satisfactory; Yes N.A. No. N.A. Penetration into Parent Metal; Yes N.A. No. N.A.

Macro – Results N.A.

OTHER TESTS

Type of test	**VISUAL EXAMINATION TEST:** ACCEPTABLE; **MACROGRAPHIC EXAMINATION:** N°3 sections SATISFACTORY see Control certificate No. 02 of 09th Feb 2016; **HARDNESS TEST:** MAX VALUE 317 HV10 (Macro h12), SEE CERTIFICATE No. 02 of 09th Feb 2016;
Deposit Analysis	N.A.
Other:	**N.D.E.** Acceptable, see certificates: **MT** report 01-2016 of 05/02/16; **UT** report 02-16 of 05/02/16;
Welder's Name	Giulianini Dario — Stamp No. AX21
Test conducted by	**Control RMB - Ravenna** — Laboratory Test report No. 02 of 9th Feb 2016;

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of AWS D1.1 Ed. 2015

Date: 10/02/2016

Manufacturer:

By:

RINA Services SpA
D. Cimatti

IIW
A.KHALIFA
IWT 070154A
INTERNATIONAL WELDING TECHNOLOGIST

ROSETTI MARINO	pWPS for STRUCTURE	

PQR ref.:	22/16 to be qualified AWS D1.1	pWPS N°	22/16	REV.:	0	Data /date	21/01/2016

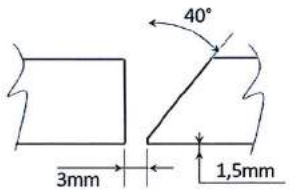
Procedimento di saldatura / Welding process: GTAW+GS FCAW — Tipo / Type: SEMIAUTOMATIC

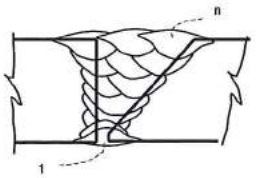
GIUNTO - JOINT

Tipo di giunto / Joint Design: ½V — Supporto / Backing: ☐ Si / Yes ☒ No

Materiale di supporto (tipo) / Backing material (type): ☐ Metallico / Metal ☐ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:





MATERIALE BASE - BASE MATERIAL

Group	II	Group	II

Da Tipo e grado / From type and grade: EN10225 S355G15+NZ / API 5L X52N - MS012711-() - CE.0.41

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove 25.4mm

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove 323mm

METALLO D'APPORTO - FILLER METAL

	GTAW	GS FCAW	
Spec. N° (SFA)	5.18	5.29	
AWS N° (CLASS)	ER 70S-6	E81T1-Ni1M	
F-N°	6	6	
A-N°	1	1	
Diametro mat. d'apporto / Size of filler metal	1,2	1,2	
Metallo depositato / Deposit weld metal			
Gamma spessori /Thick. range	Up to 4mm	Up to completion (>20mm)	
Accoppiamento filo-flusso / Electrode-flux (CLASS)	NA	NA	
Denom. Comm. flusso / FLUX trade name	NA	NA	
Inserto consumabile / Consumable insert	NA	NA	
Altro / other	Wirde: Tigrod 12.64 ESAB	WIRE: ESAB OK Tubrod 15.19	Diffusible H2 < 5 ml/100gr

giunto / Joint: Cianfrino / groove — Posizione / position: 6G — Progressione / weld progression: Uphill

PRERISCALDO - PRE-HEAT (QW406)

Temp.preriscaldo minima / Min. pre-heat temp:	Max temp. Di interpass / Max interpass temp.:	Mantenimento interpass / Interpass maintenance:	Tempo di mantenimento prerisc. / Maintenance timing:
65°C	250°C	N.A.	N.A.

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs):	Temperatura di stasi / Holding temperature °C:	Tempo di stasi / Holding time (min.):	Velocità di raffreddamento / Cooling rate (°C/Hrs):
N.A.	N.A.	N.A.	N.A.

GAS DI PROTEZIONE - GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar	99.9	8-12
Protezione / Shielding:	Ar+CO2	80-20	16-20
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current:	DC	Polarità / Polarity	SP/RP
Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type:	EWTh2 dia.2,4mm		
Metodo di trasferimento per GMAW / GMAW metal tranfer mode:	Spray arc		
Velocità alimentazione filo / Electr. Wire feed speed range:	self regulatd with current		

TECNICA - TECHNIQUE

Passata / Bead:	Dimensione bocchello gas / Orifice of gas cup size:	Pulizia iniziale e fra le passate / Initial and interpass cleaning:	
Tirata-Larga/String-Wave	½"	Spazzolatura e Molatura/Brushing Grinding	
Metodo di solcatura a rovescio / Method of back gouging:	Oscillazione / Oscillation:	Distanza tra zona di contatto e pezzo / Contact tube to work distance:	
N.A.	N.A.	12-18mm	
N°Passate / Passes nr.:	Elettrodo multiplo o singolo / Multiple or single electrodes:	Martellatura / Peening:	
Multipla/Multiple	Singolo/Single	N.A.	

Altro / Other: During sample welding parameters can be out of range

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range	Vel. avanzamento / Travel speed range (mm/min)	Apporto termico / Heat input (KJ/mm)
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. range			
1	GTAW	ER 70S-6	2,4	DC/SP	100-130	11-13	50-70	0.9-2.0
2	GTAW	ER 70S-6	2,4	DC/SP	120-140	12-14	70-110	0.8-1.7
3-n	GS FCAW	E81T1-Ni1M	1,2	DC/RP	190-230	25-27	200-300	1.2-1.9

Preparato da / prepared by:		CPY approval:
A.KHALIFA		

ROSETTI MARINO

TABELLA DI SALDATURA
Welding sheet

WPS N.	pWPS 22/16	Posizione Position	6G Up hill
Tipo di saldatura Welding Process	GTAW+GS FCAW	Cliente Client	ROSETTI MARINO
Bacchetta Rod	ESAB OK TIGROD 12.64	Codice code	AWS D1.1 & Company Spec.
FILO WIRE	ESAB OK TUBROD 15.19	Materiale base Base material	EN 10025 S355G15+NZ / API 5L X52N lot/batch 48976

	Gas Gas (es)	Miscela Mixture	Portata Flow Rate
Protezione/Shielding	AR	99,90%	12 lt/1'
Protezione/Shielding	AR+CO2	80+20%	15 lt/1'
Al rovescio/Backing	N.A.	N.A.	N.A.

Saldatore/Operatore:
Welder Name/Welding Operator: Giulianini Dario

Prerisc:
Preheat: 65°C

Temp. Max. interpass: 250°C

Corrente AC o DC Current AC or DC	DC
Polarità Polarity	SP/RP
Joint Design	

PQR 022-16

Date of weld:
27th Jan. 2016

Max weld bead:
14mm

Pass. N. Pass N.	Proced. Process	Elettr. Electr.	Preheat plate °C	Interpass run °C	Ampere Amps A	Volts Volts V	Vel.mm/1 Trav.Sp. mm/min	H.I. KJ/mm
1	GTAW	2,4	65	/	120	11	60	1,32
2	GTAW	2,4	80	95	140	13	80	1,37
3	FCAW	1,2	75	122	240	24	280	1,23
4-5	FCAW	1,2	85	125	240	24	270	1,28
6-8	FCAW	1,2	100	150	240	24	270	1,28
9-12	FCAW	1,2	70	170	230	24	280	1,18
13-16	FCAW	1,2	85	250	230	24	290	1,14
17-21	FCAW	1,2	110	150	230	24	280	1,18

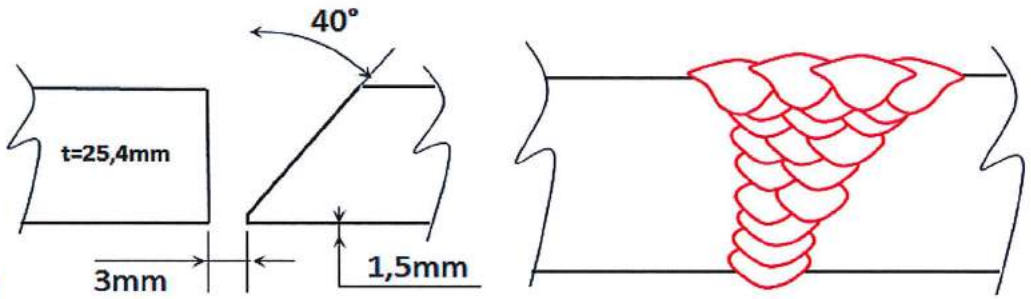
OK TIGROD 12.64 batch no.PV542894513 /// OK TUBROD 15.19 batch no.PNP02019

the parameters recorded are average values for each pass along the entire length

travel speed on overhead position around 20% less (root run overhead 48mm/min)

travel speed on flat/horizontal position around 20% more (root run h12: 72-75 mm/min)

travel speed on vertical up position around average value (root run h3: 60 mm/min)



CSWIP
A.K. KHALIFA
69505
WI 3.1

RINA Services SpA
D. Cinatti

Control Snc Sede Amministrativa - Laboratorio Via Attilio Monti, 15 - 48100 Ravenna Telefono - 0544 590597	**LABORATORIO DI CONTROLLI E PROVE** **CERTIFICATO PROVE MATERIALI** *TEST CERTIFICATE*	**N. 02 Sh.1/5** DATA / Date **9-feb-2016**

COMMITTENTE / *CUSTOMER*: **ROSETTI MARINO S.P.A.**

OGGETTO / *OBJECT*	**Dimensione Provino mm.** Size Test mm. :	**Heat**	**Materiale** Type Material
PQR 22/16	Diam.: **323,9** Spess.: **25,4**	**48976-Ceq.0.41**	**API 5L X52 - S355 G15+N+Z**

NORME DI COLLAUDO / *SPECIFICATIONS*	*ENTE COLLAUDO* / *INSPECTOR*
AWS D1.1: 2010 and Company spec.	**RINA Services S.p.A**

PROVE MECCANICHE / *MECHANICAL TESTS*

CARATTERISTICHE RICHIESTE / *REQUIREMENTS* ---------->	*Snervamento* *Yeld stress* *Fs(N)*	*Rs* *N/mmq*	*Massimo* *Total Load* *Fm(N)*	*Rm* *N/mmq*		*Allung* *Elong.* *%*	*Resilienza/Impact Test* **JOULE at - 50 °C** *Minimum*	*Average*
				510-680			**24 J**	**36 J**

Pos. *Pos.*	*Prova Nr* *Test N°*	*Dimensioni* *Size mm*	*Area* *So* *mmq*	*L0* *mm*	*LU* *mm*	*RISULTATI / RESULT* *Fs*	*Rs*	*Fm*	*Rm*		*A%*		
REDUCED-SECTION TENSION TEST 4.9.3.4 (Tensile Machine SN 7395-83)													
TWT	A	20,0 x 24,0	**480,0**					268880	**560**	**FOW**			
TWT	B	20,1 x 24,1	**484,4**					266480	**550**	**FOW**			

BEND TEST 4.9.3.1 (Bend Machine SN 7395-83)

SBB	n° 4	25 x 10	ANGLE: 180° DIAMETER OF THE FORMER 40 mm

CVN TESTING ASTM A 370 (Charpy Machine SN 7279-83)

WM	n°3	10 x 10	80	61	64	**68**
FL	n°3	10 x 10	33	160	130	**108**
FL+1	n°3	10 x 10	63	52	48	**54**
FL+2	n°3	10 x 10	83	120	71	**91**
FL+5	n°3	10 x 10	82	93	108	**94**

SATISFACTORY

NOTES:

AWT=TRAZIONE LONGITUDINALE SALDATURA/LONGITUDINAL ALL WELD TENSILE TEST

WM = ZONA FUSA/WELD MATERIAL

FL+1 = LINEA DI FUSIONE + 1 mm /FUSION LINE + 1 mm

FL+5 = LINEA DI FUSIONE + 5 mm /FUSION LINE + 5 mm

TWT=TRAZIONE TRASVERSALE SALDATURA/TRANSVERSE WELD TENSILE TEST

FIW=ROTTURA DUTTILE IN SALDATURA/ DUCTILE FAILURE IN WELD

FOW=ROTTURA DUTTILE FUORI SALDATURA/ DUCTILE FAILURE OUT OF WELD

RBB=PIEGA TRASVERSALE AL ROVESCIO/TRANSVERSE ROOT BEND TEST

FBB= PIEGA TRASVERSALE AL DIRITTO/TRANSVERSE FACE BEND TEST

SBB=PIEGA LATERALE TRASVERSALE/TRANSVERSE SIDE BEND TEST

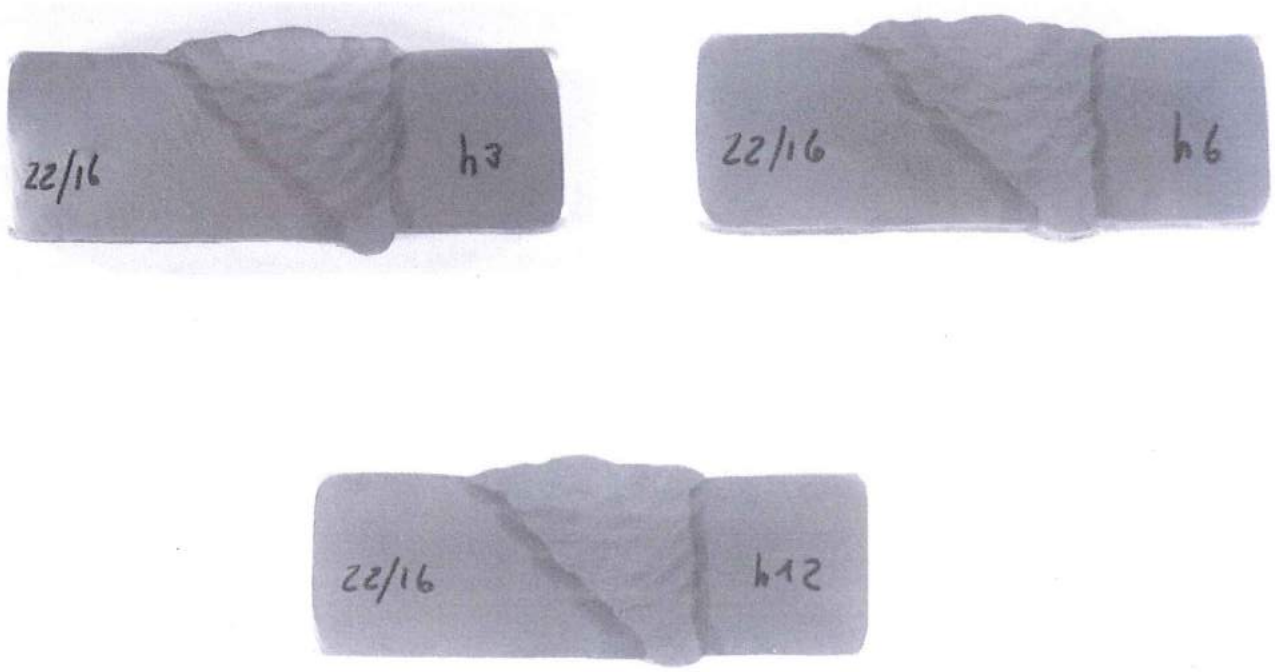
OPERATORE / Operator	COMMITTENTE / Customer	ISPETTORE / Inspector
CONTROL S.N.C. Sez. Laboratorio Prove Materiali Il Tecnico	ROSETTI MARINO S.p.A. Welding Dpt. A. Khalifa	RINA Services SpA D. Cimatti

Control Snc Sede Amministrativa - Laboratorio Via Attilio Monti, 15 - 48100 Ravenna Telefono - 0544 590597	***LABORATORIO DI CONTROLLI E PROVE***	
	CERTIFICATO PROVE MATERIALI *TEST CERTIFICATE*	**N. 02 Sh. 2/5** DATA / Date **9-feb-2016**

COMMITTENTE *CUSTOMER*	**ROSETTI MARINO S.P.A.**		Materiale/Material
OGGETTO *OBJECT*	**PQR 22/16**	Dimensione Provino/Size Test mm. Diam.: **323,9** Spess.: **25,4**	Heat 48976-Ceq.0.41	**API 5L X52 - S355 G15+N+Z**

ESAME MACROGRAFICO

MACRO EXAMINATION



MACROETCH TEST 4.6.8

MACROEXAMINATION:	**ACCEPTABLE**
VISUAL EXAMINATION:	**ACCEPTABLE**
ETCH:	**NITAL 5%**
ACCEPTANCE CRITERIA MACROEXAMINATION:	**4.6.9**
MAGNIFICATION PHOTO:	**1X**

OPERATORE / Operator	COMMITTENTE / Customer	ISPETTORE / Inspector
CONTROL S.N.C. Sez. Laboratorio Prove Materiali Il Tecnico	ROSETTI MARINO S.p.A. Welding Dpt. A. Khalifa	RINA Services SpA D. Cimetti

Control Snc
Sede Amministrativa - Laboratorio
Via Attilio Monti, 15 - 48100 Ravenna
Telefono - 0544 590597

LABORATORIO DI CONTROLLI E PROVE

CERTIFICATO PROVE MATERIALI
TEST CERTIFICATE

N. 02 Sh. 3/5

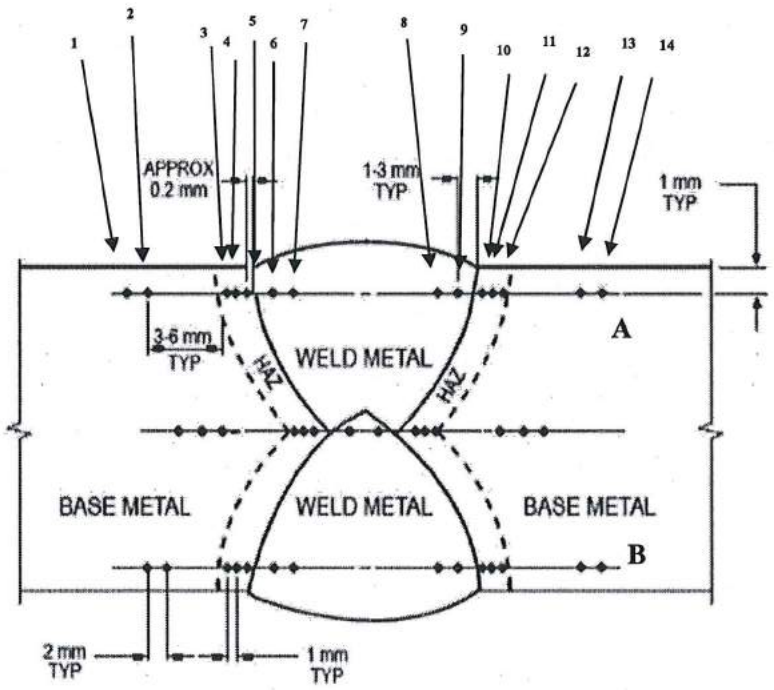
DATA / Date
9-feb-2016

COMMITTENTE / *CUSTOMER*	**ROSETTI MARINO S.P.A.**		Materiale/Material
OGGETTO / *OBJECT*	**PQR 22/16**	Dimensione Provino/Size Test mm Diam.: **323,9** Spess.: **25,4**	Heat 48976-Ceq.0.41 **API 5L X52 - S355 G15+N+Z**

PROVA DI DUREZZA
HARDNESS TEST

HARDNESS TEST HV10 - CAMERON STANDARD SPECIFICATION X-027224
FIGURE 4-1 SAMPLE VICKERS HARDNESS TRAVERSE - Inst.Galileo SN 5981

HARDNESS MAX =350 HV10



Point	LINE A	LINE B
1	186	184
2	186	186
3	193	191
4	236	206
5	262	212
6	251	193
7	243	193
8	258	194
9	243	201
10	266	209
11	236	209
12	190	198
13	188	186
14	188	185

PQR 22/16 H.3

OPERATORE / Operator	COMMITTENTE / Customer	ISPETTORE / Inspector
CONTROL S.N.C. Sez. Laboratorio Prove Materiali Il Tecnico	ROSETTI MARINO S.p.A. Welding Dpt. A. Khalifa	RINA Services SpA D. Cimatti

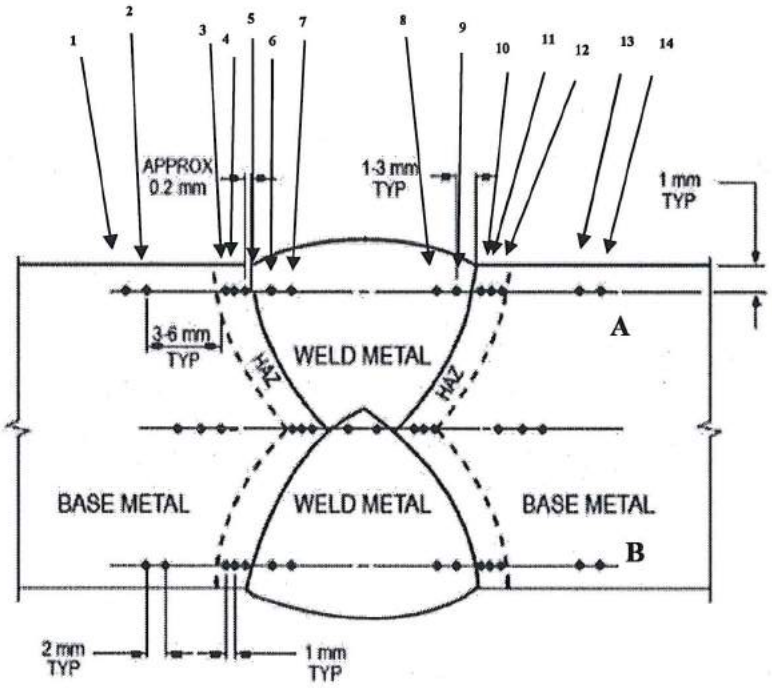
Control Snc Sede Amministrativa - Laboratorio Via Attilio Monti, 15 - 48100 Ravenna Telefono - 0544 590597	LABORATORIO DI CONTROLLI E PROVE CERTIFICATO PROVE MATERIALI TEST CERTIFICATE	N. 02 Sh. 4/5 DATA / Date 9-feb-2016

COMMITTENTE / CUSTOMER	ROSETTI MARINO S.P.A.	Materiale/Material
OGGETTO / OBJECT: PQR 22/16	Dimensione Provino/Size Test mm Diam.: 323,9 Spess.: 25,4	Heat 48976-Ceq.0.41
		API 5L X52 - S355 G15+N+Z

PROVA DI DUREZZA
HARDNESS TEST

HARDNESS TEST HV10 - CAMERON STANDARD SPECIFICATION X-027224
FIGURE 4-1 SAMPLE VICKERS HARDNESS TRAVERSE - Inst.Galileo SN 5981

HARDNESS MAX =350 HV10



Point	LINE A	LINE B
1	191	188
2	193	191
3	191	206
4	230	209
5	287	218
6	251	209
7	254	221
8	254	201
9	254	201
10	297	212
11	236	196
12	198	181
13	193	181
14	193	181

PQR 22/16 H.6

OPERATORE / Operator	COMMITTENTE / Customer	ISPETTORE / Inspector
CONTROL S.N.C. Sez. Laboratorio Prove Materiali Il Tecnico	ROSETTI MARINO S.p.A. Welding Dpt. A. Khalifa	RINA Services SpA D. Cimatti

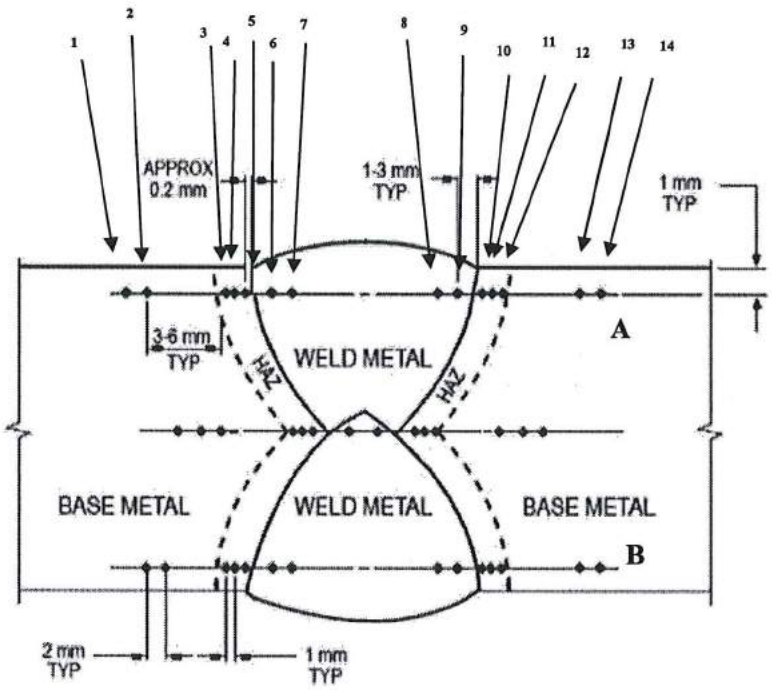
Control Snc	LABORATORIO DI CONTROLLI E PROVE	
Sede Amministrativa - Laboratorio Via Attilio Monti, 15 - 48100 Ravenna Telefono - 0544 590597	CERTIFICATO PROVE MATERIALI TEST CERTIFICATE	N. 02 Sh. 5/5 DATA / Date 9-feb-2016

COMMITTENTE / CUSTOMER	ROSETTI MARINO S.P.A.	Materiale/Material
OGGETTO / OBJECT: PQR 22/16	Dimensione Provino/Size Test mm Diam.: 323,9 Spess.: 25,4	Heat: 48976-Ceq.0.41
		API 5L X52 - S355 G15+N+Z

PROVA DI DUREZZA
HARDNESS TEST

HARDNESS TEST HV10 - CAMERON STANDARD SPECIFICATION X-027224
FIGURE 4-1 SAMPLE VICKERS HARDNESS TRAVERSE - Inst.Galileo SN 5981

HARDNESS MAX =350 HV10



Point	LINE A	LINE B
1	181	181
2	186	183
3	215	201
4	279	227
5	317	228
6	243	198
7	233	201
8	240	201
9	240	206
10	254	206
11	206	209
12	201	196
13	198	181
14	191	181

PQR 22/16 H.12

OPERATORE / Operator	COMMITTENTE / Customer	ISPETTORE / Inspector
CONTROL S.N.C. Sez. Laboratorio Prove Materiali Il Tecnico	ROSETTI MARINO S.p.A. Welding Dpt. A. Khalifa	RINA Services SpA D. Cimatti

ROSETTI MARINO	VERBALE DI CONTROLLO VISIVO/DIMENSIONALE visual/dimensional inspection report	VDR N° 22-16 data: 30.01.2016
progetto / project	cliente / client	commessa / job
disegno / dwg	ITP N° /	fase / step

oggetto - item

Procedure Qualification Record (PQR) 22/16

Certificato di Qualifica di Procedimento di Saldatura (PQR) 22/16

WE CERTIFY THAT:

ITEMS INDICATED ABOVE HAVE UNDERGONE A VISUAL INSPECTION AND HAVE BEEN ACCEPTED ACCORDING TO THE SPECIFICATION / PROCEDURE MENTIONED AND TO ACCEPTANCE CRITERIA DEFINED IN IT

SI CERTIFICA CHE LA SALDATURA DEL SAGGIO SOPRA CITATO E' STATA SOTTOPOSTA AD ESAME VISIVO AL 100% ALLO STATO COME SALDATO IN ACCORDO ALLE SPECIFICHE E STANDARD CITATI.

note - remarks

No visible defects have been detected.

Non sono stati rilevati difetti visibili.

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

AWS D1.1

Operatore - Operator	Controllo Qualita' - Quality Control	Cliente - Client
CSWIP A.K. KHALIFA 69505 WI 3.1		

CONTROL Snc
Via Attilio Monti 15
48122 Ravenna

NDE ACTIVITIES - TEST SHEET

RAPPORTO CND - MAGNETOSCOPICO
NDT REPORT - MAGNETIC PARTICLE TEST

Data / Date 05 Feb **2016**
Report No **01-2016**
foglio / sheet n° 1 of 1

COMMITTENTE / Customer	OGGETTO / Object	COMMESSA N°/Job No	ORDINE N°/Order No	Cliente Finale/Client
ROSETTI M. SpA	PQR	115A70	-	-

PROGETTO / Project	DISEGNO n° / Dwg n°	CODICE / PROCEDURA/In accordance with	ACCETTABILITA'/Acceptance levels
Bahr Essalam - OSS	-	115A70-QC-PRO-0008	115A70-QC-PRO-0008

ITP No / PCQ No	FASE ITP/ Phase ITP		
-	-	● PRIMA ESECUZIONE/ First test	○ PRIMA DEL TT/ Before PWHT
		○ DOPO RIPARAZIONE/ After repair	○ DOPO IL TT/ After PWHT

ILLUMINATORE / Lighting Equipment	DIAMETRO/Diameter	MATERIALE/Material	SPESSORE/Thickness
Si/*yes* ☐ No/*none* ■ ≥ 1000 lux (Daylight)	-	-	-

STATO DELLA SUPERFICIE / Surface condition

● COME SALDATO / As welded — ● SPAZZOLATO / Brushed — ○ LAVORATO DI MACCHINA / Machined — ○ COME CALANDRATO / As bent
○ MOLATO / Ground — ○ COME LAMINATO / Rolled — ○ GREZZO / As forged — ○ -

METODO DI MAGNETIZZAZIONE / Magnetizzazion method

☐ PUNTALI / Prods — ■ GIOGO / Yoke — ☐ BOBINA / Coil — ☐ CONDUTTORE CENTRALE / Neutral Wire

TEMPERATURA SUPERFICI/ Temperature surface (°C)	SMAGNETIZZAZIONE FINALE/ Final Demagnetizzazion
AMBIENT	N.A
CORRENTE/ Current (V)	**INTENSITA'/ Intensity (A)**
A.C.	N.A.
DISTANZA PUNTALI / Pole Spacing	**TIPO APPARECCHIO/ Magnetic Equipment**
100 mm	CGM - TWIST YOKE SN.12289

MEZZO DI ISPEZIONE / Examination medium

☐ SECCO / Dry — ■ UMIDO / Wet — ☐ FLUORESCENTE / Fluorescent — ☐

COLORE / Color : ☐ GRIGIA / Grey — ■ NERA / Black — ☐ ROSSA / Red

MARCA / Trade : CGM TIPO / Type : LK 35 DIMENSIONE / Dimension : 50 Micron	VERNICE DI CONTRASTO / Surface Contrast Enhancement : MARCA / Trade : CGM TIPO / Type : VECOPLAST V42

SALDATURA CONTROLLATA / Weld tested

SAMPLE	DIAMETER	THICKNESS	MATERIAL	RESULT	NOTES
PQR 21/16	323.9 mm	25 mm	API 5L X52 - S355 G15+N+Z	CONFORMING	-
PQR 22/16	323.9 mm	25 mm	API 5L X52 - S355 G15+N+Z	CONFORMING	-
PQR 23/16	323.9 mm	8 mm	API 5L X52 - S355 G15+N+Z	CONFORMING	-
PQR 24/16	323.9 mm	10 mm	API 5L X52 - S355 G15+N+Z	CONFORMING	-

TECNICO II° livello CND - IMPRESA Operator NDE II° Level SNT-TC-1A / EN473	CONTROLLO QUALITA' Q.C. Supervisor	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Sutera Marco II LEVEL MT - PT	ROSETTI MARINO S.p.A. Welding Dpt.		RINA Services SpA D. Cinatti

file:01-16 AWS

CONTROL Snc - Via Attilio Monti 15 - 48122 Ravenna

UT N°: 02/16

RAPPORTO D'ESAME CON ULTRASUONI
Ultrasonic Examination Report

DATA – Date: 05/02/2016

FOGLIO – Sheet: 1/1

CLIENTE - Customer	ORDINE - Order	PROGETTO - Project	COMMESSA - Job
ROSETTI MARINO	-	**Bahr Essalam - OSS**	**115A70**

OGGETTO - Object	DISEGNO - Dwg	I.T.P.	FASE - Step
PQR 22/16	-	-	-

MATERIAL: **API 5L X52 – S355 G15+N+Z** (Material)
DIAMETRO: **323,9** (Diameter)
SPESSORE: **25** (Thickness)

STATO SUPERFICIALE: **AS WELDED** (Surface Condition)
LIQUIDO DI ACCOPPIAMENTO: **WATER + METHYL CELLULOSE** (Couplant)

APPARECCHIO: **KRAUTKRAMER** (Equipment)
TIPO: **USN 60 00TM9L** (Type)
TECNICA DI CONTROLLO: **REFLECTION** (Control technique)

TRASDUTTORE Search unit	TIPO Type	FREQ. Frequency (MHz)	SEZIONE Size (mm)	ANGOLO Angle (°)	ONDE Waves
DOPPLER	DA4P	4	3,5 x 10	0°	LONGITUDINAL
SIUI	AFP2-1414-70L	2	14x14	70°	SHEAR
SIUI	AFP2-1414-60L	2	14x14	60°	SHEAR

BLOCCO CAMPIONE: **I.I.W. – V1 - V2** (Reference Block)
TARATURA DELLA SCALA: **ON DISTANCE** (Scale calibration)

SENSIBILITA' DI TARATURA: **DAC ON SIDE DRILLED HOLES Ø1,5 + 6 Db** (Calibration sensitivity)

NOTE - Remarks

RISULTATI (Results)
[X] CONFORME – Conforming to Spec.
[ ] NON CONFORME – Non conforming to Spec.

PROCEDURA DI CONTROLLO (Application Procedure)
CODE: 115A70-QC-PRO-007 Rev.1
ACCEPTANCE: 115A70-QC-PRO-007 Rev.1

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
LUCA BARCHI Level II NDT	ROSETTI MARINO S.p.A. Welding Dpt. A. Khalifa		RINA Services SpA D. Cimatti

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2015-12-02

Numero certificato/Cert no: EC24127528 rev. 0

Nostro ordine/Our order:	1218819	Vostro ordine/Your order:	Various
Nostro riferimento/Our ref:	Web user - Movex CMP020 ITB	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB01056	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20151201	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address
ESAB SALDATURA SpA

VIA ROSA LUXEMBURG 49
20085 LOCATE DI TRIULZI (MI)
20085 ITALY
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
TECHNO SERVICE S.R.L.

VIA DELLA MERENDA,32 FOR.ZARATTINI
48124 RAVENNA RA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PV542894513 Quantità/Quantity: 50 KG

PRODOTTO/PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK Tigrod 12.64 2.4x1000mm 5kg
Codice/Item no:	126424R150

CLASSIFICAZIONE/CLASSIFICATIONS

EN ISO 636-A	W 46 3 W4Si1
EN ISO 636-A	W4Si1
SFA/AWS A5.18	ER70S-6

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results
in accordo a/acc to EN 10204 - 3.1

Wire/strip

Altro/Auxiliary:

C	0.08%
Si	0.94%
Mn	1.69%
P	0.009%
S	0.008%
Cr	0.04%
Ni	0.01%
Mo <	0.01%
Cu	0.05%
V <	0.01%
Al <	0.01%
Ti+Zr	0.02%

CARATTERISTICHE MECCANICHE/MECHANICAL PROPS

Valori tipici/Typical data
in accordo a/acc to EN 10204 - 2.2

Norma/Standard:	EN
Altro/Auxiliary:	I1
Condizione/Condition:	

TRAZIONE/TENSILE

ReL	Rm	A4-A5
525 MPa	595 MPa	26 %

RESILIENZA/IMPACT

Temp	KV
-30 °C	70 J

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:
ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1
Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis		Validazione - altro/Validation - Others	
Josef Moravek	Quality Manager	Mikael Mimer	Product Manager

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2015-12-02

Numero certificato/Cert no: EC24127527 rev. 0

Nostro ordine/Our order: 1218384
Nostro riferimento/Our ref: Web user - Movex CMP020 ITB
Codice Cliente/Cust no: ITB01056
Data ordine Cliente/Your date: 20151201

Vostro ordine/Your order: Various
Vostro riferimento/Your ref:
Vostro numero fax/Your fax
Vostra e-mail/Your e-mail:

Indirizzo di fatturazione/Invoice address
ESAB SALDATURA SpA

VIA ROSA LUXEMBURG 49
20085 LOCATE DI TRIULZI (MI)
20085 ITALY
Italy

Destinatario del certificato/Cert.receiver

Indirizzo di spedizione/Delivery address
TECHNO SERVICE S.R.L.

VIA DELLA MERENDA,32 FOR.ZARATTINI
48124 RAVENNA RA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PNP02019 Quantità/Quantity: 2000 KG

PRODOTTO/PRODUCT

Marchio/Brand: ESAB
Descrizione/Desc: OK Tubrod 15.19 1.2mm 16kg
Codice/Item no: 1519127730

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.36 E81T1-M21A6-Ni1
EN ISO 17632-A T 50 5 Z P M 2 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results
in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary: M21 (EN ISO 14175)

C	0.053%
Si	0.40%
Mn	1.38%
P	0.013%
S	0.017%
Cr	0.03%
Ni	0.90%
Mo	0.02%
Nb	< 1%
V	0.02%

CARATTERISTICHE MECCANICHE/MECHANICAL PROPS

Valori tipici/Typical data
in accordo a/acc to EN 10204 - 2.2

Norma/Standard:
Altro/Auxiliary: M21 (EN ISO 14175)
Condizione/Condition: As welded

TRAZIONE/TENSILE

Rp0.2	Rm	A5
604 MPa	663 MPa	26 %

RESILIENZA/IMPACT

Temp	KV
-50 °C	106 J

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:
ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1
Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis
Dariusz Kijowski Quality Assurance Manager

Validazione - altro/Validation - Others
Neil Farrow Product Manager

PO 1713003606 112A40D

Manufacturer: ArcelorMittal Tubular Products Roman S.A. STEFAN CEL MARE STR. BL 15. SC. A. PARTER 1.ROMAN, NEAMT ROMANIA	**MILL TEST CERTIFICATE** according to EN 10204/3.2/2004	Page 1/4 D 737/1. 17.09.2013	ArcelorMittal

Buyer: STEEL PLATE & SECTIONS LTD Mill House. Forge Lane. Minworth SU. West Midlands. United Kingdom	SEAMLESS STEEL LINE PIPES	Total weight: 20.070 tons 0 lbs	Total Length: 107.33 meters 0.00 feets	Pieces 12	Bundles -

Standard: API 5L Ed. 44/ ISO 3183/2007-PSL 2; API 5L Ed.45/2012; NORSOK M120 Ed. 5,November 2008-Y 22 Rev.5,June 2007; EN 10225-2009; Specification TUBE SPEC T006 REV.2/26.03.2013; NACE MR 0175/ISO 15156/2009;

Buyer's reference	PO NO. : 62063	Dimensions: 323.90 x 25.40 mm 12.750 x 1.000 inch	Schedule: -	Length: 8.00 - 10.00 m	26.25 - 32.81 feet
Contract	50001121				

Item	Item Client	Hydro Test:	Bar	PSI	MPa	Time(sec).	Steel Grade: X52N / S355G15+N
7	-		205	2970	20.5	5	-
					Bill:		Transport:

Chemical Analysis(%)

Heat	Bulletin No.	Product Req.		C	Mn	Si	S	P	Cr	Ni	Cu	As	Al	Mo	V	Nb	Ti	Cu	B	N	Sn	Pb	Sb	Bi
			Max	0.16	1.40	0.55	0.008	0.025	0.20	0.20	0.20	-	0.055	0.08	0.080	0.040	0.010	-	0.0005	0.0140	-	-	-	-
			Min	-	-	0.25	-	-	-	0.01	-	-	0.020	-	-	-	-	-	-	-	-	-	-	-
48708		Heat analysis		0.13	1.29	0.30	0.003	0.012	0.04	0.10	0.18	0.018	0.031	0.02	0.060	0.002	0.002	0.0025	0.0003	0.0100	0.0000	0.0000	0.0043	0.0000
48976		Heat analysis		0.15	1.30	0.30	0.003	0.009	0.04	0.10	0.16	0.009	0.026	0.02	0.060	0.002	0.002	0.0034	0.0004	0.0100	0.0000	0.0000	0.0017	0.0000
48708	13-1864	Product analysis		0.13	1.27	0.29	0.005	0.012	0.06	0.08	0.17	0.006	0.037	0.01	0.060	0.003	0.000	0.0015	0.0000	0.0097	0.0000	0.0020	0.0000	0.0000
48708	13-1864	Product analysis		0.13	1.27	0.28	0.005	0.013	0.05	0.08	0.17	0.006	0.036	0.01	0.060	0.003	0.000	0.0013	0.0000	0.0097	0.0000	0.0020	0.0000	0.0000
48976	13-1839	Product analysis		0.15	1.24	0.25	0.004	0.010	0.08	0.07	0.15	0.002	0.036	0.01	0.055	0.003	0.000	0.0005	0.0001	0.0098	0.0000	0.0020	0.0000	0.0000
48976	13-1839	Product analysis		0.14	1.24	0.25	0.004	0.009	0.08	0.07	0.14	0.001	0.037	0.01	0.055	0.003	0.000	0.0003	0.0000	0.0098	0.0000	0.0020	0.0000	0.0000

Chemical Analysis(%)

Heat	Bulletin No.	Product Req.		Al / N	Nb + V	Nb + Ti + V	Cr + Mo + Ni + Cu	CE_IIW
			Max	- -	0.100	0.120	0.800	0.43
			Min	2.00	-	-	-	-
48708		Heat analysis		3.10	0.062	0.064	0.340	0.39
48976		Heat analysis		2.60	0.062	0.064	0.320	0.41
48708	13-1864	Product analysis		3.81	0.063	0.063	0.320	0.38
48708	13-1864	Product analysis		3.71	0.063	0.063	0.310	0.38
48976	13-1839	Product analysis		3.67	0.058	0.058	0.310	0.40
48976	13-1839	Product analysis		3.78	0.058	0.058	0.300	0.39

CEpcm = C+Si/30+Mn/20+Cu/20+Ni/60+Cr/20+Mo/15+V/10+5B

CE_S = C+Mn/6

CEnw = C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative
Eng. Iesanu Cristian

Formular 12A

WITNESSED

24/09/2013

GALATZ

Manufacturer: ArcelorMittal Tubular Products Roman S.A. STEFAN CEL MARE STR. BL 15, SC. A, PARTER I.ROMAN, NEAMT ROMANIA	**MILL TEST CERTIFICATE** according to EN 10204/3.2/2004	Page 2/4 D 737/1 17.09.2013	ArcelorMittal

Buyer: STEEL PLATE & SECTIONS LTD Mill House, Forge Lane, Minworth SU, West Midlands, United Kingdom	SEAMLESS STEEL LINE PIPES	Total weight: 20.079 tons .0 lbs	Total Length: 107.33 meters 0.00 feets	Pieces 12	Bundles -

Buyer's reference: PO NO.: 62063	Standard: API 5L Ed. 44/ ISO 3183/2007-PSL 2; API 5L Ed.45/2012; NORSOK M120 Ed. 5,November 2008+Y 22 Rev.5,June 2007; EN 10225-2009; Specification TUBE SPEC T006 REV.2/26.03.2013; NACE MR 0175/ISO 15156/2009;
Contract 50001121	Dimensions: 323.90 x 25.40 mm 12.750 x 1.000 inch — Schedule: - — Length: 8.00 - 10.00 m 26.25 - 32.81 feet

Item	Item Client	Hydro Test:	Bar	PSI	MPa	Time(sec)	Steel Grade: X52N / S355G15+N
7	-		205	2970	20.5	5	-

Tensile Test

Heat	Orientation	Length mm	Length inch	Width/Diameter mm	Width/Diameter inch	Thickness mm	Thickness inch	Section mm²	Section inch²	Mechanical test. Bulletin No.	YS MPa	YS (PSI:1000)	UTS MPa	UTS (PSI:1000)	E %	YS/UTS max: -
48708	Longitudinal Round	50.8	2	12.50	0.492	0.00	0.000	122.7	4.831	13-2400	392.00	56.9	529.00	76.7	32.50	0.74
48708	Longitudinal Round	-	-	10.00	0.394	0.00	0.000	78.5	3.091	13-2135	394.90	57.3	535.00	77.6	33.30	0.74
48976	Longitudinal Round	50.8	2	12.50	0.492	0.00	0.000	122.7	4.831	13-2316	375.00	54.4	548.00	79.5	34.80	0.68
48976	Longitudinal Round	-	-	10.00	0.394	0.00	0.000	78.5	3.091	13-2051	394.90	57.3	547.80	79.5	33.70	0.72

Impact Test

Heat	Impact Test Bulletin No.	Orientation	Size (mm)	Temp. (°C)	Req.KV (min. J)	KV values (J)			Req.Avr. (min. ft/lbf)	Avr. fracture energy (J)	KCU min:-J/cm² T:°C			Shear Area min. %			Lateral Expansion min. mm		
48708	13-5417	Transversal	10x10x55	-50	0	144	159	164	27	156	-	-	-	95	95	95	1.34	1.44	1.49
48708	13-5418	Longitudinal	10x10x55	-50	0	162	205	204	50	190	-	-	-	95	100	100	1.55	1.78	1.74
48976	13-5273	Transversal	10x10x55	-50	0	124	170	167	27	154	-	-	-	90	95	95	1.28	1.64	1.68
48976	13-5274	Longitudinal	10x10x55	-50	0	144	135	129	50	136	-	-	-	95	95	95	1.48	1.37	1.33

Hardness Test

Heat	Hardness Test Bulletin No.	HB max.-	HV 10 max.-	HV 10 max.- OD	Midwall	ID	End A	End B	HRC max.22
48708	13-2364	-	-	-	-	-	-	-	<22
48976	13-2274	-	-	-	-	-	-	-	<22

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative
Engr. Iesanu Cristian
Formular 12A2 rev. 3

WITNESSED
24/09/2013

GALATZI

Manufacturer: ArcelorMittal Tubular Products Roman S.A. STEFAN CEL MARE STR. BL 15. SC. A. PARTER I.ROMAN. NEAMT ROMANIA.	MILL TEST CERTIFICATE according to EN 10204/3.2/2004	Page 3/4 D 737/1 17.09.2013	ArcelorMittal

Buyer: STEEL PLATE & SECTIONS LTD Mill House. Forge Lane. Minworth SU. West Midlands. United Kingdom	SEAMLESS STEEL LINE PIPES	Total weight: 20.070 tons 0 lbs	Total Length: 107.33 meters 0.00 feets	Pieces 12	Bundles -

Buyer's reference	PO NO. : 62063
Contract	50001121

Standard: API 5L Ed. 44/ ISO 3183/2007-PSL 2: API 5L Ed.45/2012: NORSOK M120 Ed. 5.November 2008-Y 22 Rev.5.June 2007: EN 10225-2009: Specification TUBE SPEC T006 REV.2/26.03.2013: NACE MR 0175/ISO 15156/2009:

Dimensions: 323.90 x 25.40 mm 12.750 x 1.000 inch | Schedule: - | Length: 8.00 - 10.00 m | 26.25 - 32.81 feet

Item	Item Client
7	-

Hydro Test:	Bar	PSI	MPa	Time(sec)
	205	2970	20.5	5

Steel Grade: X52N / S355G15+N -

Heat

Heat	Pieces	Length (m)	Weight (kg)
48708	11	-	-
48976	1	-	-

WITNESSED
ABS GALATZI
24/09/2013

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative
Ing. Iesanu Cristian

Inspector/Buyer representative

Formular 124/2 rev. 2

Manufacturer: ArcelorMittal Tubular Products Roman S.A. STEFAN CEL MARE STR. BL 15. SC. A. PARTER LROMAN, NEAMT ROMANIA	**MILL TEST CERTIFICATE** according to EN 10204/3.2/2004	Page 4/4 D 737/1 17.09.2013	ArcelorMittal

Buyer: STEEL PLATE & SECTIONS LTD Mill House. Forge Lane. Minworth SU, West Midlands. United Kingdom	SEAMLESS STEEL LINE PIPES	Total weight: 20.070 tons 0 lbs	Total Length: 107.33 meters 0.00 feets	Pieces 12	Bundles -

Buyer's reference: PO NO. : 62063	Standard: API 5L Ed. 44/ ISO 3183/2007-PSL 2; API 5L Ed.45/2012; NORSOK M120 Ed, 5,November 2008-Y 22 Rev.5 June 2007; EN 10225-2009; Specification TUBE SPEC T006 REV.2/26.03.2013; NACE MR 0175/ISO 15156/2009;
Contract: 50001121	Dimensions: 323.90 x 25.40 mm (12.750 x 1.000 inch) Schedule: - Length: 8.00 - 10.00 m (26.25 - 32.81 feet)

Item	Item Client	Hydro Test:	Bar	PSI	MPa	Time(sec)	Steel Grade: X52N / S355G15+N
7	-		205	2970	20.5	5	

Remarks Steel manufacturing process.
The steel shall be made by the basic electric arc furnace process.All steels shall be fully killed and made to fine grain practice . Arcelor Mittal Hunedoara S A – Piata Iancu de Hunedoara, nr.1 – Hunedoara .
Heat treatment: normalizing at temperature 870-900°C– time 56 min.
NDT full body: - 100% ultrasonic Le + Li with reference standard 5%(U2/c) of WT
- Detection of laminar imperfection on the pipe body with 100% surface coverage (U3/c).
NDT ends inspection with wet magnetic powder non-inspected on installation.
Magnetism residual max 30 Gauss.
Hydrostatic test hold for 5 sec: no leakage noticed.
Heat no .48708-Through Thickness Test Buletin No.40
- Z >= 25% values: 68.09;67.84;68.38
- Z >= 35% values:68.10
- UTS (N/mm²) values: 524.6;521.1;513.4

Heat no .48976-Through Thickness Test Buletin No. 36
- Z >= 25% values: 68.14;68.97;68.41
- Z >= 35% values:68.50
- UTS (N/mm²) values:548.6;537.2;531.1

STEEL PLATE SECTIONS LTD
VERIFY THIS IS A TRUE
COPY OF THE ORIGINAL CERTIFICATE
SPS QA DEPARTMENT

WITNESSED
ABS GALATZI
24/09/2013
VGALES

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative
Eng. Iusuay Cristian

Inspector/Buyer representative

Formular F242 rev.3

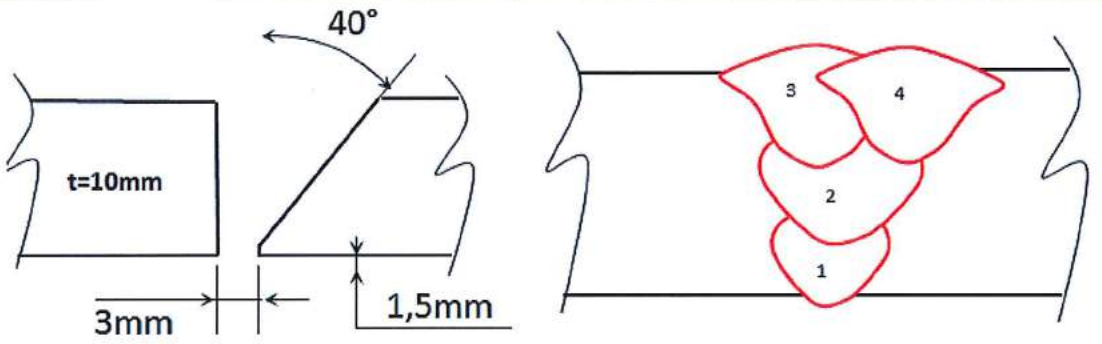
ROSETTI MARINO	PQR N°	24/16
PROCEDURE QUALIFICATION RECORD	Sheet: 1	Of:2
	Prepared by: AKK	Date 10/02/2016

COMPANY NAME: ROSETTI MARINO SPA

WPS N° 24/16 Rev.0 DATE: 21/01/2016

WELDING PROCESS(ES): GTAW+FCAW

TYPES: MANUAL + SEMIAUTOMATIC



BASE METAL

Material Specification:	EN10225	(see notes)
Type or grade:	S355 G15+NZ	
Thickness of Test Coupon:	10 mm (machined from 25.4mm)	
Diameter of Test Coupon:	323,9 mm	
Base metal maker	ARCELORMITTAL	
CEQ:	0,41	
Base metal Heat No.	48976	

FILLER METALS

	GTAW	FCAW
SFA Specification	A5.18	A5.36 (A5.29)
AWS Classification	ER 70S-6	E81T1-Ni1 M21 A6
Filler Metal F-No	6	6
Weld Metal Analysis A-No.	1	10
Size of Filler Metal	2.4	1.2
filler metal	OK Tigrod 12.64	OK Tubrod 15.19
Filler metal Maker:	ESAB	ESAB
Deposited Weld Metal	2 mm	8 mm
Heat No.	PV542894513	PNP02019

POSITION

Position of Groove 6G

Weld progression (Uphill, Downhill) UP-HILL

Other NONE

PREHEAT

Preheat temperature: 20°C

Interpass temperature: 230°C

POSTWELD HEAT TREATMENT

Temperature: N.A.

Time: N.A.

Other N.A.

GAS

	Gas(es)	Percent composition (Mixture)	Flow rate
Shielding	GTAW: Ar	99,9%	12 lt./1'
Shielding	FCAW: AR+CO_2	80%+20%	15 lt./1'
Backing	N.A.	N.A.	N.A.

ELECTRICAL CHARACTERISTICS

Current DC

Polarity SP / RP

Amps. **See welding sheet** *Volts* **See welding sheet**

Tungsten Electrode Size

Other ***HEAT INPUT*** kJ/mm *:* **GTAW 1,57 KJ/mm**
FCAW 1,22-1,38 KJ/mm

TECHNIQUE

Travel speed (mm/1)'	See welding sheet	
String or Weave Bead	STRING	
Oscillation	N.A.	
Single or Multi Pass :	MULTIPASS	
Single or multiple electrodes	SINGLE	
Stick-Out Length:	FCAW 15mm	

NOTES: Parent material used for testing with double classification:
API 5L Grade X52N (Group II)

IIW
A.KHALIFA
IWT 070154A
INTERNATIONAL WELDING TECHNOLOGIST

RINA Services SpA
D. Cimatti

ROSETTI MARINO	PQR N°	24/16
PROCEDURE QUALIFICATION RECORD	Sheet: 2	Of: 2
	Prepared by: AKK	Date: 10/02/2016

TENSILE TEST

SPECIMEN No.	WIDTH (mm)	THICKNESS (mm)	AREA (mm^2)	ULTIMATE TOTAL LOAD N	ULTIMATE UNIT STRESS N/mm2	TYPE OF FAILURE & LOCATION
TWT	20.1	9.8	197.0	105210	534	Broken out of weld
TWT	20.0	9.3	186.0	95690	514	Broken out of weld

TOUGHNESS TESTS

SPECIMEN No.	NOTCH LOCATION	NOTCH TYPE	TEST TEMP.	JOULE INDIVIDUAL- (AVERAGE) MIN. 19J (70% of 27J)				LATERAL EXP.		DROP WEIGHT	
								% SHEAR	MILS	BREAK	No. BREAK
10x7	WELD METAL	KV	-54.6°C	88	86	85	86	/	/	/	/
10x7	FUSION LINE	KV	-54.6°C	130	104	34	89	/	/	/	/
10x7	FUSION LINE +1	KV	-54.6°C	98	50	106	85	/	/	/	/
10x7	FUSION LINE +2	KV	-54.6°C	61	88	130	93	/	/	/	/
10x7	FUSION LINE +5	KV	-54.6°C	84	73	92	83	/	/	/	/

GUIDED BEND TEST – NOT APPLICABLE

TYPE & FIGURE No.	RESULT
No. 4 SIDE BEND TEST (Figure 4.13)	NO DEFECTS

FILLET WELD

Result – Satisfactory; Yes N.A. No. N.A. Penetration into Parent Metal; Yes N.A. No. N.A.

Macro – Results N.A.

OTHER TESTS

Type of test	**VISUAL EXAMINATION TEST:** ACCEPTABLE; **MACROGRAPHIC EXAMINATION:** N°3 sections SATISFACTORY see Control certificate No. 04 of 09th Feb 2016; **HARDNESS TEST:** MAX VALUE 262 HV10 (Macro h12), SEE CERTIFICATE No. 04 of 09th Feb 2016;
Deposit Analysis	N.A.
Other:	**N.D.E.** Acceptable, see certificates: **MT** report 01-2016 of 05/02/16; **UT** report 04-16 of 05/02/16;
Welder's Name	Giulianini Dario — Stamp No. AX21
Test conducted by	**Control RMB - Ravenna** — Laboratory Test report No. 04 of 9th Feb 2016;

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of AWS D1.1 Ed. 2015

Date: 10/02/2016

Manufacturer:

By:

RINA Services SpA
D. Cimatti

IIW
A.KHALIFA
IWT 070154A
INTERNATIONAL WELDING TECHNOLOGIST

ROSETTI MARINO

TABELLA DI SALDATURA
Welding sheet

WPS N.	pWPS 24/16	Posizione Position	6G Up hill
Tipo di saldatura Welding Process	GTAW+GS FCAW	Cliente Client	ROSETTI MARINO
Bacchetta Rod	ESAB OK TIGROD 12.64	Codice code	AWS D1.1 & Company Spec.
FILO WIRE	ESAB OK TUBROD 15.19	Materiale base Base material	EN 10025 S355G15+NZ / API 5L X52N lot/batch 48976

	Gas Gas (es)	Miscela Mixture	Portata Flow Rate
Protezione/Shielding	AR	99,90%	12 lt/1'
Protezione/Shielding	AR+CO2	80+20%	15 lt/1'
Al rovescio/Backing	N.A.	N.A.	N.A.

Saldatore/Operatore:
Welder Name/Welding Operator: Giulianini Dario

Prerisc: Preheat	20°C	Temp. Max. interpass:	230°C
Corrente AC o DC Current AC or DC	DC		
Polarità Polarity	SP/RP		
Joint Design			

PQR 024-16

Pass. N. Pass N.	Proced. Process	Elettr. Electr.	Preheat plate °C	Interpass run °C	Ampere Amps A	Volts Volts V	Vel.mm/1 Trav.Sp. mm/min	H.I. KJ/mm
1	GTAW	2,4	20	/	120	12	55	1,57
2	FCAW	2,4	68	126	220	24	230	1,38
3	FCAW	1,2	75	195	220	24	260	1,22
4	FCAW	1,2	95	230	220	24	260	1,22

Date of weld:

28th Jan. 2016

Max weld bead:

14mm

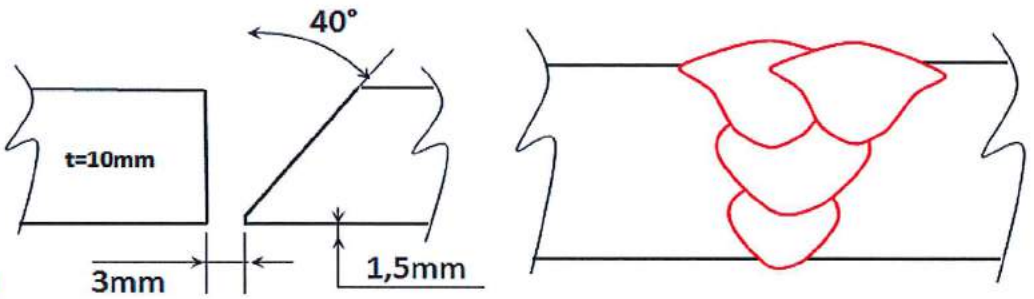
OK TIGROD 12.64 batch no.PV542894513 /// OK TUBROD 15.19 batch no.PNP02019

the parameters recorded are average values for each pass along the entire length

travel speed on overhead position around 20% les

travel speed on flat/horizontal position around 20% more

travel speed on vertical up position around average value



CSWIP
A.K. KHALIFA
69505
WI 3.1

RINA Services SpA
D. Cimatti

ROSETTI MARINO

pWPS for STRUCTURE

PQR ref.:	22/16 to be qualified AWS D1.1	pWPS N°	24/16	REV.:	0	Data /date	21/01/2016

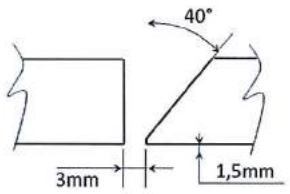
Procedimento di saldatura / Welding process: GTAW+GS FCAW — Tipo / Type: SEMIAUTOMATIC

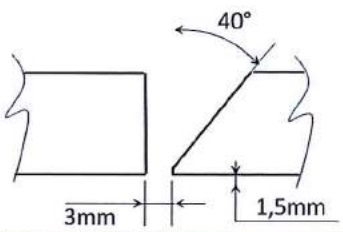
GIUNTO - JOINT

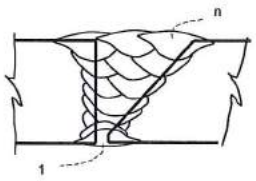
Tipo di giunto / Joint Design: ½V — Supporto / Backing: ☐ Si / Yes ☒ No

Materiale di supporto (tipo) / Backing material (type): ☐ Metallico / Metal ☐ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:







MATERIALE BASE - BASE MATERIAL

Group	II	Group	II

Da Tipo e grado / From type and grade: EN10225 S355G15+NZ / API 5L X52N - MS012711-() - CE.0.41

Gamma spessori / Thickness range:
- ► Materiale base / Base material: Piena penetrazione / Groove 10mm (obtained from 25.4mm machined)
- ► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove 323mm

METALLO D'APPORTO - FILLER METAL

	GTAW	GS FCAW	
Spec. N° (SFA)	5.18	5.29	
AWS N° (CLASS)	ER 70S-6	E81T1-Ni1M	
F-N°	6	6	
A-N°	1	1	
Diametro mat. d'apporto / Size of filler metal	1,2	1,2	
Metallo depositato / Deposit weld metal			
Gamma spessori /Thick. range	Up to 2mm	8mm	
Accoppiamento filo-flusso / Electrode-flux (CLASS)	NA	NA	
Denom. Comm. flusso / FLUX trade name	NA	NA	
Inserto consumabile / Consumable insert	NA	NA	
Altro / other	Wirde: Tigrod 12.64 ESAB	WIRE: ESAB OK Tubrod 15.19	Diffusible H2 < 5 ml/100gr

giunto / Joint: Cianfrino / groove — Posizione / position: 6G — Progressione / weld progression: Uphill

PRERISCALDO - PRE-HEAT (QW406)

Temp.preriscaldo minima / Min. pre-heat temp: 20°C — Max temp. Di interpass / Max interpass temp.: 250°C — Mantenimento interpass / Interpass maintenance: N.A. — Tempo di mantenimento prerisc. / Maintenance timing: N.A.

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs): N.A. — Temperatura di stasi / Holding temperature °C: N.A. — Tempo di stasi / Holding time (min.): N.A. — Velocità di raffreddamento / Cooling rate (°C/Hrs): N.A.

GAS DI PROTEZIONE - GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar	99.9	8-12
Protezione / Shielding:	Ar+CO2	80-20	16-20
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current: DC — Polarità / Polarity: SP/RP

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: EWTh2 dia.2,4mm

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: Spray arc

Velocità alimentazione filo / Electr. Wire feed speed range: self regulatd with current

TECNICA - TECHNIQUE

Passata / Bead: Tirata-Larga/String-Wave — Dimensione bocchello gas / Orifice of gas cup size: ½" — Pulizia iniziale e fra le passate / Initial and interpass cleaning: Spazzolatura e Molatura/Brushing Grinding

Metodo di solcatura a rovescio / Method of back gouging: N.A. — Oscillazione / Oscillation: N.A. — Distanza tra zona di contatto e pezzo / Contact tube to work distance: 12-18mm

N°Passate / Passes nr.: Singola/Single/Multipla/Multiple — Elettrodo multiplo o singolo / Multiple or single electrodes: Singolo/Single — Martellatura / Peening: N.A.

Altro / Other: During sample welding parameters can be out of range

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range	Vel. avanzamento / Travel speed range (mm/min)	Apporto termico / Heat input (KJ/mm)
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. range			
1	GTAW	ER 70S-6	2,4	DC/SP	100-130	11-13	50-70	0.9-2.0
2-n	GS FCAW	E81T1-Ni1M	1,2	DC/RP	190-230	25-27	200-300	1.2-1.9

Preparato da / prepared by:		CPY approval:
A.KHALIFA		

Control Snc Sede Amministrativa - Laboratorio Via Attilio Monti, 15 - 48100 Ravenna Telefono - 0544 590597	***LABORATORIO DI CONTROLLI E PROVE***	
	CERTIFICATO PROVE MATERIALI *TEST CERTIFICATE*	**N. 04 Sh.1/5** DATA / Date **9-feb-2016**

COMMITTENTE / *CUSTOMER*: **ROSETTI MARINO S.P.A.**

OGGETTO / *OBJECT*	**Dimensione Provino mm.** Size Test mm. :	**Heat**	**Materiale** Type Material
PQR 24/16	Diam.: **323,9** Spess.: **10**	**48976-Ceq.0.41**	**API 5L X52 - S355 G15+N+Z**

NORME DI COLLAUDO / *SPECIFICATIONS*	*ENTE COLLAUDO* / *INSPECTOR*
AWS D1.1: 2010 and Company spec.	**RINA Services S.p.A**

PROVE MECCANICHE / *MECHANICAL TESTS*

CARATTERISTICHE RICHIESTE	*Snervamento*		*Massimo*			*Allung*	*Resilienza/Impact Test* JOULE at - 54,6 °C	
	Yeld stress Fs(N)	*Rs* N/mmq	*Total Load* Fm(N)	*Rm* N/mmq		*Elong.* %	*Minimum*	*Average*
REQUIREMENTS ---------->				**510-680**			**17 J**	**26 J**

Pos.	*Prova Nr*	*Dimensioni*	*Area*			*RISULTATI / RESULT*							
Pos.	*Test N°*	*Size mm*	*So* mmq	*L0* mm	*LU* mm	*Fs*	*Rs*	*Fm*	*Rm*		*A%*		
REDUCED-SECTION TENSION TEST 4.9.3.4 (Tensile Machine SN 7395-83)													
TWT	A	20,1 x 9,8	**197,0**					105210	**534**		**FOW**		
TWT	B	20,0 x 9,3	**186,0**					95690	**514**		**FOW**		
BEND TEST 4.9.3.1 (Bend Machine SN 7395-83)													
SBB	n° 4	10 x 10	ANGLE: 180° DIAMETER OF THE FORMER 40 mm										
CVN TESTING ASTM A 370 (Charpy Machine SN 7279-83)													
WM	n°3	10 x 7								88	86	85	**86**
FL	n°3	10 x 7								130	104	34	**89**
FL+1	n°3	10 x 7								98	50	106	**85**
FL+2	n°3	10 x 7								61	88	130	**93**
FL+5	n°3	10 x 7								84	73	92	**83**

SATISFACTORY

NOTES:

AWT=TRAZIONE LONGITUDINALE SALDATURA/LONGITUDINAL ALL WELD TENSILE TEST

WM = ZONA FUSA/WELD MATERIAL

FL+1 = LINEA DI FUSIONE + 1 mm /FUSION LINE + 1 mm

FL+5 = LINEA DI FUSIONE + 5 mm /FUSION LINE + 5 mm

TWT=TRAZIONE TRASVERSALE SALDATURA/TRANSVERSE WELD TENSILE TEST

FIW=ROTTURA DUTTILE IN SALDATURA/ DUCTILE FAILURE IN WELD

FOW=ROTTURA DUTTILE FUORI SALDATURA/ DUCTILE FAILURE OUT OF WELD

RBB=PIEGA TRASVERSALE AL ROVESCIO/TRANSVERSE ROOT BEND TEST

FBB= PIEGA TRASVERSALE AL DIRITTO/TRANSVERSE FACE BEND TEST

SBB=PIEGA LATERALE TRASVERSALE/TRANSVERSE SIDE BEND TEST

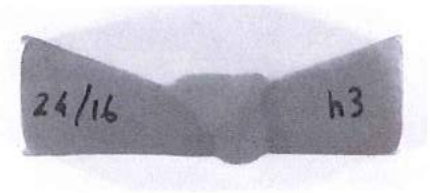
OPERATORE / Operator	COMMITTENTE / Customer	ISPETTORE / Inspector
CONTROL S.N.C. Sez. Laboratorio Prove Materiali Il Tecnico	ROSETTI MARINO S.p.A. Welding Dpt. A. Khalifa	RINA Services SpA D. Cimatti

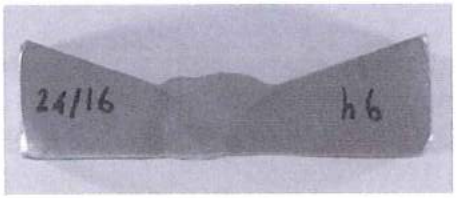
Control Snc Sede Amministrativa - Laboratorio Via Attilio Monti, 15 - 48100 Ravenna Telefono - 0544 590597	***LABORATORIO DI CONTROLLI E PROVE***	
	CERTIFICATO PROVE MATERIALI *TEST CERTIFICATE*	**N. 04 Sh. 2/5** DATA / Date **9-feb-2016**

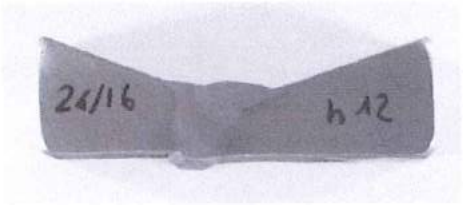
COMMITTENTE *CUSTOMER*	**ROSETTI MARINO S.P.A.**		Materiale/Material
OGGETTO *OBJECT*	**PQR 24/16**	Dimensione Provino/Size Test mm. Diam.: **323,9** Spess.: **10**	Heat **48976-Ceq.0.41**	**API 5L X52 - S355 G15+N+Z**

ESAME MACROGRAFICO

MACRO EXAMINATION







MACROETCH TEST 4.6.8

MACROEXAMINATION:	**ACCEPTABLE**
VISUAL EXAMINATION:	**ACCEPTABLE**
ETCH:	**NITAL 5%**
ACCEPTANCE CRITERIA MACROEXAMINATION:	**4.6.9**
MAGNIFICATION PHOTO:	**1X**

OPERATORE / Operator	COMMITTENTE / Customer	ISPETTORE / Inspector
CONTROL S.N.C. Sez. Laboratorio Prove Materiali Il Tecnico	ROSETTI MARINO S.p.A. Welding Dpt A. Khalifa	RINA Services SpA D. Cimatti

Control Snc Sede Amministrativa - Laboratorio Via Attilio Monti, 15 - 48100 Ravenna Telefono - 0544 590597	***LABORATORIO DI CONTROLLI E PROVE***	
	CERTIFICATO PROVE MATERIALI *TEST CERTIFICATE*	**N. 04 Sh. 5/5** DATA / Date **9-feb-2016**

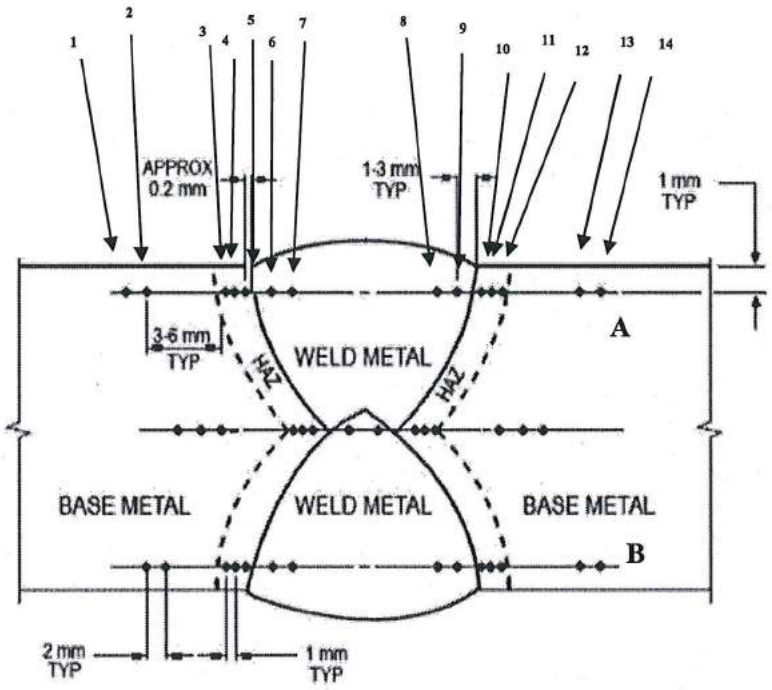
COMMITTENTE *CUSTOMER*	**ROSETTI MARINO S.P.A.**		Materiale/Material
OGGETTO *OBJECT*	**PQR 24/16**	Dimensione Provino/Size Test mm Diam.: **323,9** Spess.: **10**	Heat 48976-Ceq.0.41 **API 5L X52 - S355 G15+N+Z**

PROVA DI DUREZZA

HARDNESS TEST

HARDNESS TEST HV10 - CAMERON STANDARD SPECIFICATION X-027224
FIGURE 4-1 SAMPLE VICKERS HARDNESS TRAVERSE - Inst.Galileo SN 5981

HARDNESS MAX =350 HV10



Point	LINE A	LINE B
1	177	170
2	181	170
3	195	199
4	224	215
5	254	233
6	216	216
7	207	216
8	209	215
9	218	218
10	262	227
11	230	210
12	207	194
13	186	188
14	183	181

PQR 24/16 H.12

OPERATORE / Operator	COMMITTENTE / Customer	ISPETTORE / Inspector
CONTROL S.N.C. Sez. Laboratorio Prove Materiali Il Tecnico	ROSETTI MARINO S.p.A. Welding Dpt. A. Khalifa	RINA Services SpA D. Cimatti

Control Snc
Sede Amministrativa - Laboratorio
Via Attilio Monti, 15 - 48100 Ravenna
Telefono - 0544 590597

LABORATORIO DI CONTROLLI E PROVE

CERTIFICATO PROVE MATERIALI
TEST CERTIFICATE

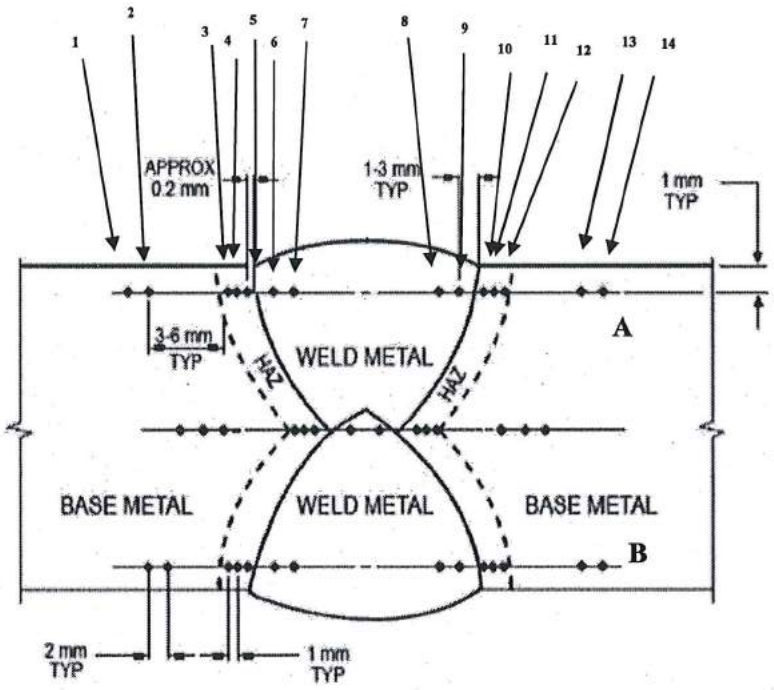
N. 04 Sh. 4/5
DATA / Date 9-feb-2016

COMMITTENTE / *CUSTOMER*	**ROSETTI MARINO S.P.A.**		Materiale/Material
OGGETTO / *OBJECT*	**PQR 24/16**	Dimensione Provino/Size Test mm Diam.: **323,9** Spess.: **10**	Heat 48976-Ceq.0.41 **API 5L X52 - S355 G15+N+Z**

PROVA DI DUREZZA
HARDNESS TEST

HARDNESS TEST HV10 - CAMERON STANDARD SPECIFICATION X-027224
FIGURE 4-1 SAMPLE VICKERS HARDNESS TRAVERSE - Inst.Galileo SN 5981

HARDNESS MAX =350 HV10



Point	LINE A	LINE B
1	**177**	**175**
2	**181**	**177**
3	**203**	**201**
4	**212**	**209**
5	**227**	**212**
6	**206**	**201**
7	**215**	**203**
8	**212**	**211**
9	**227**	**209**
10	**258**	**230**
11	**235**	**215**
12	**209**	**193**
13	**175**	**177**
14	**175**	**170**

PQR 24/16 H.6

OPERATORE / Operator	COMMITTENTE / Customer	ISPETTORE / Inspector
CONTROL S.N.C. Laboratorio Prove Materiali Tecnico	ROSETTI MARINO S.p.A. Welding Dpt. A. Khalifa	RINA Services SpA D. Cimatti

Control Snc
Sede Amministrativa - Laboratorio
Via Attilio Monti, 15 - 48100 Ravenna
Telefono - 0544 590597

LABORATORIO DI CONTROLLI E PROVE

CERTIFICATO PROVE MATERIALI
TEST CERTIFICATE

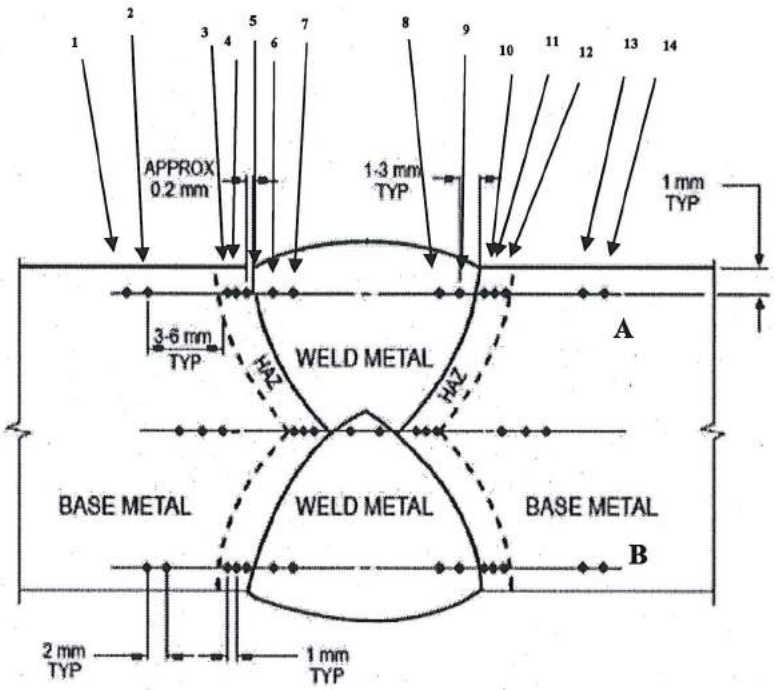
N. 04 Sh. 3/5
DATA / Date 9-feb-2016

COMMITTENTE / *CUSTOMER*	**ROSETTI MARINO S.P.A.**		Materiale/Material
OGGETTO / *OBJECT*	**PQR 24/16**	Dimensione Provino/Size Test mm Diam.: **323,9** Spess.: **10**	Heat 48976-Ceq.0.41 **API 5L X52 - S355 G15+N+Z**

PROVA DI DUREZZA
HARDNESS TEST

HARDNESS TEST HV10 - CAMERON STANDARD SPECIFICATION X-027224
FIGURE 4-1 SAMPLE VICKERS HARDNESS TRAVERSE - Inst.Galileo SN 5981

HARDNESS MAX =350 HV10



Point	LINE A	LINE B
1	179	183
2	181	186
3	193	201
4	221	212
5	240	230
6	242	221
7	232	209
8	221	201
9	236	201
10	243	221
11	193	209
12	178	195
13	175	178
14	170	175

PQR 24/16 H.3

OPERATORE / Operator	COMMITTENTE / Customer	ISPETTORE / Inspector
CONTROL S.N.C. Sez. Laboratorio Prove Materiali Il Tecnico	ROSETTI MARINO S.p.A. Welding Dpt. A. Khalifa	RINA Services SpA D. Cimatti

ROSETTI MARINO	VERBALE DI CONTROLLO VISIVO/DIMENSIONALE visual/dimensional inspection report	VDR N° 24-16 data: 30.01.2016
progetto / project /	cliente / client /	commessa / job /
disegno / dwg /	ITP N° /	fase / step /

oggetto - item

Procedure Qualification Record (PQR) 24/16

Certificato di Qualifica di Procedimento di Saldatura (PQR) 24/16

WE CERTIFY THAT:

ITEMS INDICATED ABOVE HAVE UNDERGONE A VISUAL INSPECTION AND HAVE BEEN ACCEPTED ACCORDING TO THE SPECIFICATION / PROCEDURE MENTIONED AND TO ACCEPTANCE CRITERIA DEFINED IN IT

SI CERTIFICA CHE LA SALDATURA DEL SAGGIO SOPRA CITATO E' STATA SOTTOPOSTA AD ESAME VISIVO AL 100% ALLO STATO COME SALDATO IN ACCORDO ALLE SPECIFICHE E STANDARD CITATI.

note - remarks

No visible defects have been detected.

Non sono stati rilevati difetti visibili.

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

AWS D1.1

Operatore - Operator	Controllo Qualita' - Quality Control	Cliente - Client
CSWIP A.K. KHALIFA 69505 WI 3.1		

CONTROL Snc
Via Attilio Monti 15
48122 Ravenna

NDE ACTIVITIES - TEST SHEET

RAPPORTO CND - MAGNETOSCOPICO
NDT REPORT - MAGNETIC PARTICLE TEST

Data / Date 05 Feb 2016
Report No 01-2016
foglio / sheet n° 1 of 1

COMMITTENTE / Customer	OGGETTO / Object	COMMESSA N°/Job No	ORDINE N°/Order No	Cliente Finale/Client
ROSETTI M. SpA	PQR	115A70	-	-

PROGETTO / Project	DISEGNO n° / Dwg n°	CODICE / PROCEDURA/In accordance with	ACCETTABILITA'/Acceptance levels
Bahr Essalam - OSS	-	115A70-QC-PRO-0008	115A70-QC-PRO-0008

ITP No / PCQ No	FASE ITP/ Phase ITP	
-	-	● PRIMA ESECUZIONE/ First test ○ PRIMA DEL TT/ Before PWHT ○ DOPO RIPARAZIONE/ After repair ○ DOPO IL TT/ After PWHT

ILLUMINATORE / Lighting Equipment	DIAMETRO/Diameter	MATERIALE/Material	SPESSORE/Thickness
Si / *yes* ☐ No / *none* ■ ≥ 1000 lux (Daylight)	-	-	-

STATO DELLA SUPERFICIE / Surface condition

● COME SALDATO / As welded ● SPAZZOLATO / Brushed ○ LAVORATO DI MACCHINA / Machined ○ COME CALANDRATO / As bent
○ MOLATO / Ground ○ COME LAMINATO / Rolled ○ GREZZO / As forged ○ -

METODO DI MAGNETIZZAZIONE / Magnetizzazion method

☐ PUNTALI / Prods ■ GIOGO / Yoke ☐ BOBINA / Coil ☐ CONDUTTORE CENTRALE / Neutral Wire

TEMPERATURA SUPERFICI/ Temperature surface (°C)	SMAGNETIZZAZIONE FINALE/ Final Demagnetizzazion
AMBIENT	N.A
CORRENTE/ Current (V)	**INTENSITA'/ Intensity (A)**
A.C.	N.A.
DISTANZA PUNTALI / Pole Spacing	**TIPO APPARECCHIO/ Magnetic Equipment**
100 mm	CGM - TWIST YOKE SN.12289

MEZZO DI ISPEZIONE / Examination medium

☐ SECCO / Dry ■ UMIDO / Wet ☐ FLUORESCENTE / Fluorescent ☐

COLORE / Color : ☐ GRIGIA / Grey ■ NERA / Black ☐ ROSSA / Red

MARCA / Trade : CGM TIPO / Type : LK 35 DIMENSIONE / Dimension : 50 Micron	VERNICE DI CONTRASTO / Surface Contrast Enhancement : MARCA / Trade : CGM TIPO / Type : VECOPLAST V42

SALDATURA CONTROLLATA / Weld tested

SAMPLE	DIAMETER	THICKNESS	MATERIAL	RESULT	NOTES
PQR 21/16	323.9 mm	25 mm	API 5L X52 - S355 G15+N+Z	CONFORMING	-
PQR 22/16	323.9 mm	25 mm	API 5L X52 - S355 G15+N+Z	CONFORMING	-
PQR 23/16	323.9 mm	8 mm	API 5L X52 - S355 G15+N+Z	CONFORMING	-
PQR 24/16	323.9 mm	10 mm	API 5L X52 - S355 G15+N+Z	CONFORMING	-

TECNICO II° livello CND - IMPRESA Operator NDE II° Level SNT-TC-1A / EN473	CONTROLLO QUALITA' Q.C. Supervisor	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Sutera Marco II LEVEL MT - PT	ROSETTI MARINO S.p.A. Welding Dpt. A. Khalifa		RINA Services SpA D. Cinatti

file:01-16 AWS

CONTROL Snc - Via Attilio Monti 15 - 48122 Ravenna

UT N°: 04/16

RAPPORTO D'ESAME CON ULTRASUONI
Ultrasonic Examination Report

DATA – Date: 05/02/2016

FOGLIO – Sheet: 1/1

CLIENTE - Customer	ORDINE - Order	PROGETTO - Project	COMMESSA - Job
ROSETTI MARINO	-	**Bahr Essalam - OSS**	**115A70**
OGGETTO - Object	**DISEGNO - Dwg**	**I.T.P.**	**FASE - Step**
PQR 24/16	-	-	-

MATERIAL: **API 5L X52 – S355 G15+N+Z** (Material)

DIAMETRO: **323,9** (Diameter)

SPESSORE: **10** (Thickness)

STATO SUPERFICIALE: **AS WELDED** (Surface Condition)

LIQUIDO DI ACCOPPIAMENTO: **WATER + METHYL CELLULOSE** (Couplant)

APPARECCHIO: **KRAUTKRAMER** (Equipment)

TIPO: **USN 60 00TM9L** (Type)

TECNICA DI CONTROLLO: **REFLECTION** (Control technique)

TRASDUTTORE Search unit	TIPO Type	FREQ. Frequency (MHz)	SEZIONE Size (mm)	ANGOLO Angle (°)	ONDE Waves
DOPPLER	DA4P	4	3,5 x 10	0°	LONGITUDINAL
IMG	TA n.2176	4	8x9	70°	SHEAR
DOPPLER	ALC001	4	8x9	60°	SHEAR

BLOCCO CAMPIONE: **I.I.W. – V1 - V2** (Reference Block)

TARATURA DELLA SCALA: **ON DISTANCE** (Scale calibration)

SENSIBILITA' DI TARATURA: **DAC ON SIDE DRILLED HOLES Ø1,5 + 6 Db** (Calibration sensitivity)

NOTE - Remarks

RISULTATI (Results)

[X] CONFORME (Conforming to Spec.)

[ ] NON CONFORME (Non conforming to Spec.)

PROCEDURA DI CONTROLLO (Application Procedure)

CODE: 115A70-QC-PRO-007 Rev.1

ACCEPTANCE: 115A70-QC-PRO-007 Rev.1

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
LUCA BARCHI Level II NDT	ROSETTI MARINO S.p.A. Welding Dpt. A. Khalifa		RINA Services SpA D. Ciriatti

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2015-12-02

Numero certificato/Cert no: EC24127528 rev. 0

Nostro ordine/Our order:	1218819	Vostro ordine/Your order:	Various
Nostro riferimento/Our ref:	Web user - Movex CMP020 ITB	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB01056	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20151201	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address
ESAB SALDATURA SpA

VIA ROSA LUXEMBURG 49
20085 LOCATE DI TRIULZI (MI)
20085 ITALY
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
TECHNO SERVICE S.R.L.

VIA DELLA MERENDA,32 FOR.ZARATTINI
48124 RAVENNA RA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PV542894513 Quantità/Quantity: 50 KG

PRODOTTO/PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK Tigrod 12.64 2.4x1000mm 5kg
Codice/Item no:	126424R150

CLASSIFICAZIONE/CLASSIFICATIONS

EN ISO 636-A	W 46 3 W4Si1
EN ISO 636-A	W4Si1
SFA/AWS A5.18	ER70S-6

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results
in accordo a/acc to EN 10204 - 3.1

Wire/strip

Altro/Auxiliary:

C	0.08%
Si	0.94%
Mn	1.69%
P	0.009%
S	0.008%
Cr	0.04%
Ni	0.01%
Mo	< 0.01%
Cu	0.05%
V	< 0.01%
Al	< 0.01%
Ti+Zr	0.02%

CARATTERISTICHE MECCANICHE/MECHANICAL PROPS

Valori tipici/Typical data
in accordo a/acc to EN 10204 - 2.2

Norma/Standard:	EN
Altro/Auxiliary:	I1
Condizione/Condition:	

TRAZIONE/TENSILE

ReL	Rm	A4-A5
525 MPa	595 MPa	26 %

RESILIENZA/IMPACT

Temp	KV
-30 °C	70 J

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis		Validazione - altro/Validation - Others	
Josef Moravek	Quality Manager	Mikael Mimer	Product Manager

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2015-12-02

Numero certificato/Cert no: EC24127527 rev. 0

Nostro ordine/Our order: 1218384
Nostro riferimento/Our ref: Web user - Movex CMP020 ITB
Codice Cliente/Cust no: ITB01056
Data ordine Cliente/Your date: 20151201

Vostro ordine/Your order: Various
Vostro riferimento/Your ref:
Vostro numero fax/Your fax
Vostra e-mail/Your e-mail:

Indirizzo di fatturazione/Invoice address
ESAB SALDATURA SpA

VIA ROSA LUXEMBURG 49
20085 LOCATE DI TRIULZI (MI)
20085 ITALY
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
TECHNO SERVICE S.R.L.

VIA DELLA MERENDA,32 FOR.ZARATTINI
48124 RAVENNA RA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PNP02019 Quantità/Quantity: 2000 KG

PRODOTTO/PRODUCT

Marchio/Brand: ESAB
Descrizione/Desc: OK Tubrod 15.19 1.2mm 16kg
Codice/item no: **1519127730**

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.36 E81T1-M21A6-Ni1
EN ISO 17632-A T 50 5 Z P M 2 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results
in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary: M21 (EN ISO 14175)

C	0.053%
Si	0.40%
Mn	1.38%
P	0.013%
S	0.017%
Cr	0.03%
Ni	0.90%
Mo	0.02%
Nb	< 1%
V	0.02%

CARATTERISTICHE MECCANICHE/MECHANICAL PROPS

Valori tipici/Typical data
in accordo a/acc to EN 10204 - 2.2

Norma/Standard:
Altro/Auxiliary: M21 (EN ISO 14175)
Condizione/Condition: As welded

TRAZIONE/TENSILE

Rp0.2	Rm	A5
604 MPa	663 MPa	26 %

RESILIENZA/IMPACT

Temp	KV
-50 °C	106 J

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:
ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1
Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis
Dariusz Kijowski Quality Assurance Manager

Validazione - altro/Validation - Others
Neil Farrow Product Manager

PO 1713003606 · 112A40D

Manufacturer: ArcelorMittal Tubular Products Roman S.A. STEFAN CEL MARE STR. BL 15. SC. A. PARTER I.ROMAN, NEAMT ROMANIA	**MILL TEST CERTIFICATE** according to EN 10204/3.2/2004	Page 1/4 · D 737/1 · 17.09.2013	ArcelorMittal

Buyer: STEEL PLATE & SECTIONS LTD, Mill House, Forge Lane, Minworth SU. West Midlands, United Kingdom	SEAMLESS STEEL LINE PIPES	Total weight: 20.070 tons / 0 lbs	Total Length: 107.33 meters / 0.00 feets	Pieces: 12	Bundles: -

Standard: API 5L Ed. 44/ ISO 3183/2007-PSL 2; API 5L Ed.45/2012; NORSOK M120 Ed. 5,November 2008-Y 22 Rev.5,June 2007; EN 10225-2009; Specification TUBE SPEC T005 REV.2/26.03.2013; NACE MR 0175/ISO 15156/2009;

Buyer's reference: PO NO. : 62063	Dimensions: 323.90 x 25.40 mm / 12.750 x 1.000 inch	Schedule: -	Length: 8.00 - 10.00 m	26.25 - 32.81 feet
Contract: 50001121				

Item	Item Client	Hydro Test:	Bar	PSI	MPa	Time(sec)	Steel Grade: X52N / S355G15+N
7	-		205	2970	20.5	5	
				Bill:			Transport:

Chemical Analysis(%)

Heat	Bulletin No.	Product Req.		C	Mn	Si	S	P	Cr	Ni	Cu	As	Al	Mo	V	Nb	Ti	Ca	B	N	Sn	Pb	Sb	Bi
			Max	0.16	1.40	0.55	0.008	0.025	0.20	0.20	0.20	-	0.055	0.08	0.080	0.040	0.010	-	0.0005	0.0140	-	-	-	-
			Min	-	-	0.25	-	-	-	0.01	-	-	0.020	-	-	-	-	-	-	-	-	-	-	-
48708		Heat analysis		0.13	1.29	0.30	0.003	0.012	0.04	0.10	0.18	0.018	0.031	0.02	0.060	0.002	0.002	0.0025	0.0003	0.0100	0.0000	0.0000	0.0043	0.0000
48976		Heat analysis		0.15	1.30	0.30	0.003	0.009	0.04	0.10	0.16	0.009	0.026	0.02	0.060	0.002	0.002	0.0034	0.0004	0.0100	0.0000	0.0000	0.0017	0.0000
48708	13-1864	Product analysis		0.13	1.27	0.29	0.005	0.012	0.06	0.08	0.17	0.006	0.037	0.01	0.060	0.003	0.000	0.0015	0.0000	0.0097	0.0000	0.0020	0.0000	0.0000
48708	13-1864	Product analysis		0.13	1.27	0.28	0.005	0.013	0.05	0.08	0.17	0.006	0.036	0.01	0.060	0.003	0.000	0.0013	0.0000	0.0097	0.0000	0.0020	0.0000	0.0000
48976	13-1839	Product analysis		0.15	1.24	0.25	0.004	0.010	0.08	0.07	0.15	0.002	0.036	0.01	0.055	0.003	0.000	0.0005	0.0001	0.0098	0.0000	0.0020	0.0000	0.0000
48976	13-1839	Product analysis		0.14	1.24	0.25	0.004	0.009	0.08	0.07	0.14	0.001	0.037	0.01	0.055	0.003	0.000	0.0003	0.0000	0.0098	0.0000	0.0020	0.0000	0.0000

Chemical Analysis(%)

Heat	Bulletin No.	Product Req.		Al / N	Nb + V	Nb + Ti + V	Cr + Mo + Ni + Cu	CE_IIW
			Max	-	0.100	0.120	0.800	0.43
			Min	2.00	-	-	-	-
48708		Heat analysis		3.10	0.062	0.064	0.340	0.39
48976		Heat analysis		2.60	0.062	0.064	0.320	0.41
48708	13-1864	Product analysis		3.81	0.063	0.063	0.320	0.38
48708	13-1864	Product analysis		3.71	0.063	0.063	0.310	0.38
48976	13-1839	Product analysis		3.67	0.058	0.058	0.310	0.40
48976	13-1839	Product analysis		3.78	0.058	0.058	0.300	0.39

CEpcm = C+Si/30+Mn/20+Cu/20+Ni/60+Cr/20+Mo/15+V/10+5B

CE = C+Mn/6

CEnw = C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative
Eng. Iesanu Cristian

WITNESSED
21/09/2013

GALATZI

Manufacturer: ArcelorMittal Tubular Products Roman S.A. STEFAN CEL MARE STR. BL 15, SC. A, PARTER I.ROMAN, NEAMT ROMANIA	**MILL TEST CERTIFICATE** according to EN 10204/3.2/2004	Page 2/4 D 737/I 17.09.2013	ArcelorMittal

Buyer: STEEL PLATE & SECTIONS LTD Mill House, Forge Lane, Minworth SU, West Midlands, United Kingdom	SEAMLESS STEEL LINE PIPES	Total weight: 20.079 tons / .0 lbs	Total Length: 107.33 meters / 0.00 feets	Pieces: 12	Bundles: -

Standard: API 5L Ed. 44/ ISO 3183/2007-PSL 2; API 5L Ed.45/2012; NORSOK M120 Ed. 5,November 2008-Y 22 Rev.5,June 2007; EN 10225-2009; Specification TUBE SPEC T006 REV.2/26.03.2013; NACE MR 0175/ISO 15156/2009;

Buyer's reference: PO NO.: 62063	Dimensions: 323.90 x 25.40 mm / 12.750 x 1.000 inch	Schedule: -	Length: 8.00 - 10.00 m	26.25 - 32.81 feet
Contract: 50001121				

Item	Item Client	Hydro Test:	Bar	PSI	MPa	Time(sec)	Steel Grade: X52N / S355G15+N
7	-		205	2970	20.5	5	-

Tensile Test

Heat	Orientation	Length mm	Length inch	Width/Diameter mm	Width/Diameter inch	Thickness mm	Thickness inch	Section mm²	Section inch²	Mechanical test Bulletin No.	YS MPa	YS (PSI:1000)	UTS MPa	UTS (PSI:1000)	E %	YS/UTS max: -
48708	Longitudinal Round	50.8	2	12.50	0.492	0.00	0.000	122.7	4.831	13-2400	392.00	56.9	529.00	76.7	32.50	0.74
48708	Longitudinal Round	-	-	10.00	0.394	0.00	0.000	78.5	3.091	13-2135	394.90	57.3	535.00	77.6	33.30	0.74
48976	Longitudinal Round	50.8	2	12.50	0.492	0.00	0.000	122.7	4.831	13-2316	375.00	54.4	548.00	79.5	34.80	0.68
48976	Longitudinal Round	-	-	10.00	0.394	0.00	0.000	78.5	3.091	13-2051	394.90	57.3	547.80	79.5	33.70	0.72

Impact Test

Heat	Impact Test Bulletin No.	Orientation	Size (mm)	Temp. (°C)	Req.KV (min. J)	KV values (J)			Req.Avr. (min. fix/lbf)	Avr. fracture energy (J)	KCU min:-J/cm² T:°C			Shear Area min. %			Lateral Expansion min. mm		
48708	13-5417	Transversal	10x10x55	-50	0	144	159	164	27	156	-	-	-	95	95	95	1.34	1.44	1.49
48708	13-5418	Longitudinal	10x10x55	-50	0	162	205	204	50	190	-	-	-	95	100	100	1.55	1.78	1.78
48976	13-5273	Transversal	10x10x55	-50	0	124	170	167	27	154	-	-	-	90	95	95	1.28	1.64	1.68
48976	13-5274	Longitudinal	10x10x55	-50	0	144	135	129	50	136	-	-	-	95	95	95	1.48	1.37	1.33

Hardness Test

Heat	Hardness Test Bulletin No.	HB max.-	HV 10 max.-	HV 10 max.- OD	Midwall	ID	End A	End B	HRC max.22
48708	13-2364	-	-	-	-	-	-	-	<22
48976	13-2274	-	-	-	-	-	-	-	<22

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative
Eng. Iesan Cristian

Formular 12A2 rev. 3.4

WITNESSED
24/09/2013

GALATZI

Manufacturer: ArcelorMittal Tubular Products Roman S.A. STEFAN CEL MARE STR. BL 15. SC. A. PARTER 1.ROMAN. NEAMT ROMANIA.	**MILL TEST CERTIFICATE** according to EN 10204/3.2/2004	Page 3/4 D 737/1 17.09.2013	ArcelorMittal

Buyer: STEEL PLATE & SECTIONS LTD Mill House. Forge Lane. Minworth SU. West Midlands. United Kingdom	SEAMLESS STEEL LINE PIPES	Total weight: 20.070 tons 0 lbs	Total Length: 107.33 meters 0.00 feets	Pieces: 12	Bundles: -

Buyer's reference: PO NO. : 62063	Standard: API 5L Ed. 44/ ISO 3183/2007-PSL 2: API 5L Ed.45/2012: NORSOK-M120 Ed. 5.November 2008-Y 22 Rev.5.June 2007: EN 10225-2009: Specification TUBE SPEC T006 REV.2/26.03.2013: NACE MR 0175/ISO 15156/2009:
Contract: 50001121	Dimensions: 323.90 x 25.40 mm 12.750 x 1.000 inch — Schedule: - — Length: 8.00 - 10.00 m / 26.25 - 32.81 feet

Item	Item Client	Hydro Test:	Bar	PSI	MPa.	Time(sec)	Steel Grade: X52N / S355G15+N
7	-		205	2970	20.5	5	-

Heat

Heat	Pieces	Length (m)	Weight (kg)
48708	11	-	-
48976	1	-	-

WITNESSED
24/09/2013
ABS GALATZI

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative
Ing. Iesanu Cristian

Inspector/Buyer representative

Formular 1249 rev 3

Manufacturer: ArcelorMittal Tubular Products Roman S.A. STEFAN CEL MARE STR. BL 15. SC. A. PARTER LROMAN, NEAMT ROMANIA	**MILL TEST CERTIFICATE** according to EN 10204/3.2/2004	Page 4/4 D 737/1 17.09.2013	ArcelorMittal

Buyer: STEEL PLATE & SECTIONS LTD Mill House. Forge Lane. Minworth SU, West Midlands, United Kingdom	SEAMLESS STEEL LINE PIPES	Total weight: 20.070 tons 0 lbs	Total Length: 107.33 meters 0.00 feets	Pieces 12	Bundles -
	Standard: API 5L Ed. 44/ ISO 3183/2007-PSL 2: API 5L Ed.45/2012; NORSOK M120 Ed. 5,November 2008-Y 22 Rev.5,June 2007; EN 10225-2009; Specification TUBE SPEC T006 REV.2/26.03.2013; NACE MR 0175/ISO 15156/2009;				
Buyer's reference PO NO. : 62063	Dimensions: 323.90 x 25.40 mm 12.750 x 1.000 inch	Schedule: -	Length: 8.00 - 10.00 m	26.25 - 32.81 feet	
Contract 50001121					

Item	Item Client	Hydro Test:	Bar	PSI	MPa	Time(sec)	Steel Grade: X52N / S355G15+N
7	-		205	2970	20.5	5	-

Remarks Steel manufacturing process.
The steel shall be made by the basic electric arc furnace process.All steels shall be fully killed and made to fine grain practice . Arcelor Mittal Hunedoara S A – Piata Iancu de Hunedoara, nr.1 – Hunedoara .
Heat treatment: normalizing at temperature 870-900°C– time 56 min.
NDT full body: - 100% ultrasonic Le + Li with reference standard 5%(U2/c) of WT
- Detection of laminar imperfection on the pipe body with 100% surface coverage.(U3/c).
NDT ends inspection with wet magnetic powder non-inspected on installation.
Magnetism residual max 30 Gauss.
Hydrostatic test hold for 5 sec: no leakage noticed.
Heat no .48708-Through Thickness Test Buletin No.40
- Z >= 25% values: 68.09;67.84;68.38
- Z >= 35% values:68.10
- UTS (N/mm²) values: 524.6;521.1;513.4

Heat no .48976-Through Thickness Test Buletin No. 36
- Z >= 25% values: 68.14;68.97;68.41
- Z >= 35% values:68.50
- UTS (N/mm²) values:548.6;537.2;531.1

STEEL PLATE SECTIONS LTD
VERIFY THIS IS A TRUE
COPY OF THE ORIGINAL CERTIFICATE
SPS QA DEPARTMENT

WITNESSED
ABS GALATZI
24/09/2013
VIGILEA

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative
Ing. Ivanu Cristian

Inspector/Buyer representative

Formular FAQ /rev.3

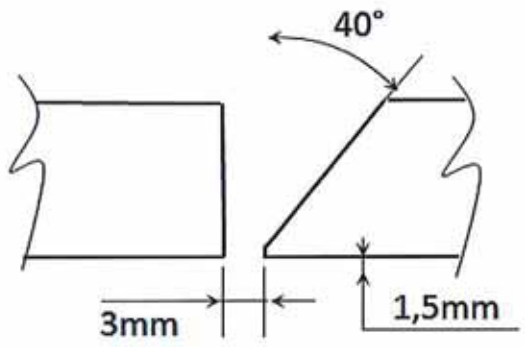
ROSETTI MARINO	PQR N°	26/16
PROCEDURE QUALIFICATION RECORD	Sheet: 1	Of:2
	Prepared by: AKK	Date 29/04/2016

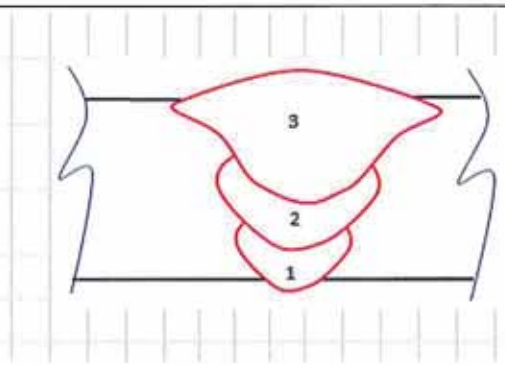
COMPANY NAME: ROSETTI MARINO SPA

WPS N° 26/16 Rev.2 DATE: 07/04/2016

WELDING PROCESS(ES): GTAW+FCAW

TYPES: MANUAL + SEMIAUTOMATIC





BASE METAL

Material Specification:	API 5L
Type or grade:	X60 Q -PSL2
Thickness of Test Coupon:	6 mm (machined from 17.12mm)
Diameter of Test Coupon:	114,3 mm
Base metal maker	VOESTALPINE
CEQ:	0,35
Base metal Heat No.	189686

FILLER METALS

	GTAW	FCAW
SFA Specification	A5.18	A5.36 (A5.29)
AWS Classification	ER 70S-6	E81T1-Ni1 M21 A6
Filler Metal F-No	6	6
Weld Metal Analysis A-No.	1	10
Size of Filler Metal	2.4	1.2
filler metal	OK Tigrod 12.64	OK Tubrod 15.19
Filler metal Maker:	ESAB	ESAB
Deposited Weld Metal	2 mm	4 mm
Heat No.	PV542894513	PNP03028

POSITION

Position of Groove 6G

Weld progression (Uphill, Downhill) UP-HILL

Other NONE

PREHEAT

Preheat temperature: 25°C

Interpass temperature: 200°C

POSTWELD HEAT TREATMENT

Temperature: N.A.

Time: N.A.

Other N.A.

GAS

	Gas(es)	Percent composition (Mixture)	Flow rate
Shielding	GTAW: Ar	99,9%	12 lt./1'
Shielding	FCAW: AR+CO_2	80%+20%	13 lt./1'
Backing	N.A.	N.A.	N.A.

ELECTRICAL CHARACTERISTICS

Current DC

Polarity SP / RP

Amps. **See welding sheet** *Volts* **See welding sheet**

Tungsten Electrode Size

Other ***HEAT INPUT*** kJ/mm : **GTAW 1,32 KJ/mm**
FCAW 1,19-1,44 KJ/mm

TECHNIQUE

Travel speed (mm/1)'	See welding sheet	
String or Weave Bead	STRING	
Oscillation	N.A.	
Single or Multi Pass :	MULTIPASS	
Single or multiple electrodes	SINGLE	
Stick-Out Length:	FCAW 12mm	

NOTES: /

IIW
A.KHALIFA
IWT 070154A
INTERNATIONAL WELDING TECHNOLOGIST

RINA Services SpA
D. Cinatti

ROSETTI MARINO	PQR N°	26/16
PROCEDURE QUALIFICATION RECORD	Sheet: 2	Of: 2
	Prepared by: AKK	Date: 29/04/2016

TENSILE TEST

SPECIMEN No.	WIDTH (mm)	THICKNESS (mm)	AREA (mm^2)	ULTIMATE TOTAL LOAD N	ULTIMATE UNIT STRESS N/mm2	TYPE OF FAILURE & LOCATION
TWT	20.0	6.0	120.0	67200	560	Broken out of weld
TWT	20.0	6.0	120.0	71760	598	Broken out of weld

TOUGHNESS TESTS

SPECIMEN No.	NOTCH LOCATION	NOTCH TYPE	TEST TEMP.	JOULE INDIVIDUAL- (AVERAGE) MIN. 13J (70% of 20J)				LATERAL EXP.		DROP WEIGHT	
								% SHEAR	MILS	BREAK	No. BREAK
10x5	WELD METAL	KV	-50.0°C	48	44	51	48	/	/	/	/
10x5	FUSION LINE	KV	-50.0°C	79	86	80	82	/	/	/	/
10x5	FUSION LINE +1	KV	-50.0°C	57	68	43	56	/	/	/	/
10x5	FUSION LINE +2	KV	-50.0°C	50	62	68	60	/	/	/	/
10x5	FUSION LINE +5	KV	-50.0°C	84	85	76	82	/	/	/	/

GUIDED BEND TEST – NOT APPLICABLE

TYPE & FIGURE No.	RESULT
No. 2 ROOT BEND TEST	NO DEFECTS
No. 2 FACE BEND TEST	NO DEFECTS

FILLET WELD

Result – Satisfactory; Yes N.A. No. N.A. Penetration into Parent Metal; Yes N.A. No. N.A.

Macro – Results N.A.

OTHER TESTS

Type of test	**VISUAL EXAMINATION TEST:** ACCEPTABLE; **MACROGRAPHIC EXAMINATION:** N°3 sections SATISFACTORY see Control certificate No. 06 of 29th Apr 2016; **HARDNESS TEST:** MAX VALUE 227 HV10 (Macro h12), SEE CERTIFICATE No. 06 of 29th Apr 2016;
Deposit Analysis	N.A.
Other:	**N.D.E.** Acceptable, see certificates: **MT** report 03-2016 of 18/04/16; **RT** report 01-15 of 18/04/16;
Welder's Name	DRAGOMIR JULIAN — Stamp No. NC258
Test conducted by	**Control RMB - Ravenna** — Laboratory Test report No. 06 of 29th Apr 2016;

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of AWS D1.1 Ed. 2015

Date: 29/04/2016

IIW A.KHALIFA IWT 070154A INTERNATIONAL WELDING TECHNOLOGIST

Manufacturer:

By:

RINA Services SpA D. Cipriani

ROSETTI MARINO

TABELLA DI SALDATURA
Welding sheet

WPS N.	pWPS 26/16	Posizione Position	6G Up hill
Tipo di saldatura Welding Process	GTAW+FCAW	Cliente Client	ROSETTI MARINO
FILO WIRE	ESAB Filarc 88S	Codice code	AWS D1.1 & Company Spec.
FILO WIRE	OK TIGROD 12.64	Materiale base Base material	API 5L X60 N lot/batch 189686

	Gas Gas (es)	Miscela Mixture	Portata Flow Rate
Protezione/Shielding	Ar	99,99%	12 Lt/1"
Protezione/Shielding	Ar+CO2	80+20%	13 Lt/1"
Al rovescio/Backing	N.A.	N.A.	N.A.

Saldatore/Operatore: Welder Name/Welding Operator	DRAGOMIR JULIAN Stamp. NC258		
Prerisc: Preheat	25°C	Temp. Max. interpass:	200°C
Corrente AC o DC Current AC or DC	DC		
Polarità Polarity	RP		
Joint Design			

PQR 026-16

Date of weld:

15th April 2016

Max weld bead:

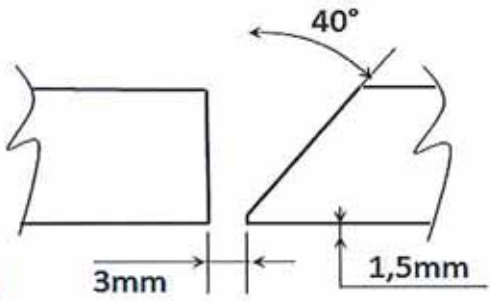
12mm

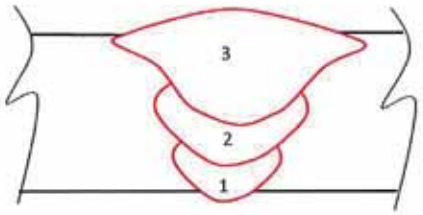
Pass. N. Pass N.	Proced. Process	Elettr. Electr.	Preheat plate °C	Interpass run °C	Ampere Amps A	Volts Volts V	Vel.mm/1 Trav.Sp. mm/min	H.I. KJ/mm
1	GTAW	2,4	25	/	110	12	60	1,32
2	GS FCAW	1,2	50	115	180	24	180	1,44
3	GS FCAW	1,2	85	180	190	24	230	1,19

OK TIGROD 12.64 batch no.PV542894513 /// Esab Tubrod 15.19 batch no. PNP03028

the parameters recorded are average values for each pass along the entire length

PARENT MATERIAL ORIGINAL SIZE OD114,3mm x 17,12mm MACHINED TO 6mm thickness for Qualification





CSWIP
A.K. KHALIFA
69505
WI 3.1

RINA Services S.p.A.

ROSETTI MARINO | **Proposal WPS for PQR qualification** | OneSubsea A Cameron & Schlumberger Company

PQR ref.:	26/16 TBQ	OSS code		pWPS	26/16	REV.:	2	Data /date	07/04/2016

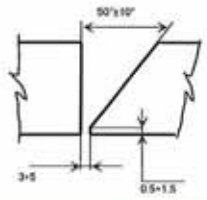
Procedimento di saldatura / Welding process: GTAW+GS FCAW — Tipo / Type: MANUAL+SEMIAUTOMATIC — scopo / scope: CJP, BW

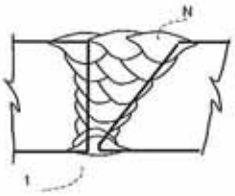
GIUNTO - JOINT

Tipo di giunto / Joint Design: V — Supporto / Backing: ☐ Si / Yes ☒ No

Materiale di supporto (tipo) / Backing material (type). ☐ Metallico / Metal ☐ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:





MATERIALE BASE - BASE MATERIAL

Applicable WS-000754-01 — SC1, SC2, SC3, SC3A, SC4 — DC1, DC2, DC3, DC4 — Group II

Da Tipo e grado / From type and grade: API 5L X60 Ceq.0.35,

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove 6mm

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove 4" (114 mm)

METALLO D'APPORTO - FILLER METAL

	GTAW	GS FCAW
Spec. N° (SFA)	5.18	5.29
AWS N° (CLASS)	ER70S-6	E81T1-Ni1M
F-N°	6	6
A-N°	1	10
Diametro mat. d'apporto / Size of filler metal	2,4	1,2
Metallo depositato / Deposit weld metal		
Gamma spessori /Thick. range	up to 2mm	up to completion
Accoppiamento filo-flusso / Electrode-flux (CLASS)	NA	NA
Denom. Comm. flusso / FLUX trade name	NA	NA
Inserto consumabile / Consumable insert	NA	NA
Altro / other	ESAB OK TIGROD 12.64	WIRE: ESAB OK Tubrod 15.19

giunto / Joint: Cianfrino / groove — Posizione / position: 6G — Progressione / weld progression: Uphill

PRERISCALDO - PRE-HEAT (QW406)

Temp.preriscaldo minima / Min. pre-heat temp: Thk ≤ 20mm= 10°C — Max temp. Di interpass / Max interpass temp.: 250 °C — Mantenimento interpass / Interpass maintenance: N.A. — Tempo di mantenimento preris.: / Maintenance timing: N.A.

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs): N.A. — Temperatura di stasi / Holding temperature °C: N.A. — Tempo di stasi / Holding time (min.): N.A. — Velocità di raffreddamento: / Cooling rate (°C/Hrs): N.A.

GAS DI PROTEZIONE - GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar	99,99	8-14lt/1'
Protezione / Shielding:	Ar+CO2	80-20	12-20lt/1'
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current: DC - CV — Polarità / Polarity: SP - RP

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: N.A.

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: Spray arc

Velocità alimentazione filo / Electr. Wire feed speed range: self regulatd

TECNICA - TECHNIQUE

Passata / Bead: Tirata-Larga/String-Wave — Dimensione bocchello gas / Orifice of gas cup size: ½"-3/8" — Pulizia iniziale e fra le passate / Initial and interpass cleaning: Spazzolatura e Molatura/Brushing Grindin

Metodo di solcatura a rovescio / Method of back gouging: N.A. — Oscillazione / Oscillation: N.A. — Distanza tra zona di contatto e pezzo / Contact tube to work distance: 13-18mm

N°Passate / Passes nr.: Multipla/Multiple — Elettrodo multiplo o singolo / Multiple or single electrodes: Singolo/Single — Martellatura / Peening: N.A.

Altro / Other: Max. width of weld bead 14mm, during PQR qualification weld deposit parameters can be out of proposed range subject to Engineer approval

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range	Vel. avanzamento / Travel speed range (mm/min)	Apporto termico / Heat input (KJ/mm)
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. range			
1	GTAW	ER70S-6	2,4	DC/SP	70-110	10-12	50-70	Max 1.60
3-N	GS FCAW	E81T1-Ni1M	1,2	DC/RP	180-220	24-25	180-250	Max 1.83

Preparato da / prepared by:	Approvato da / approved by:	CPY approval:
A.KHALIFA	AK	

Control Snc Sede Amministrativa - Laboratorio Via Attilio Monti, 15 - 48100 Ravenna Telefono - 0544 590597	***LABORATORIO DI CONTROLLI E PROVE***	
	CERTIFICATO PROVE MATERIALI *TEST CERTIFICATE*	**N. 06 Sh.1/5** DATA / Date **29-apr-2016**

COMMITTENTE *CUSTOMER*	**ROSETTI MARINO S.P.A.**		
OGGETTO *OBJECT* **PQR 26/16**	**Dimensione Provino mm.** Size Test mm. : Diam.: **114,3** Spess.: **6**	**Heat** **189686-Ceq.0.35**	**Materiale** Type Material **API 5L X60 Q PSL2**

NORME DI COLLAUDO *SPECIFICATIONS*	**AWS D1.1: 2015 and Company spec.**	*ENTE COLLAUDO* *INSPECTOR*	**RINA Services S.p.A**

PROVE MECCANICHE
MECHANICAL TESTS

CARATTERISTICHE RICHIESTE													
					Snervamento		*Massimo*			*Allung*	*Resilienza/Impact Test*	
					Yeld stress	*Rs*	*Total Load*	*Rm*		*Elong.*	**JOULE at - 50 °C**	
					Fs(N)	*N/mmq*	*Fm(N)*	*N/mmq*		*%*	*Minimum*	*Average*
REQUIREMENTS ---------->						**>420**		**>520**			**13 J**	**20 J**
Pos. *Pos.*	*Prova Nr* *Test N°*	*Dimensioni* *Size mm*	*Area* *So* *mmq*	*L0* *mm*	*LU* *mm*	***RISULTATI / RESULT***						
						Fs	*Rs*	*Fm*	*Rm*	*A%*		
REDUCED-SECTION TENSION TEST 4.9.3.4 (Tensile Machine SN 7395-83)												
TWT	A	20,0 x 6,0	**120,0**			55440	**462**	67200	**560**	**FOW**		
TWT	B	20,0 x 6,0	**120,0**			57960	**483**	71760	**598**	**FOW**		

BEND TEST 4.9.3.1 (Bend Machine SN 7395-83)			
FBB	n° 2	19 x 6	ANGLE: 180° DIAMETER OF THE FORMER 25 mm
RBB	n° 2	19 x 6	ANGLE: 180° DIAMETER OF THE FORMER 25 mm

CVN TESTING ASTM A 370 (Charpy Machine SN 7279-83)							
WM	n°3	10 x 5		48	44	51	48
FL	n°3	10 x 5		79	86	80	82
FL+1	n°3	10 x 5		57	68	43	56
FL+2	n°3	10 x 5		50	62	68	60
FL+5	n°3	10 x 5		84	85	76	82

SATISFACTORY

NOTES:

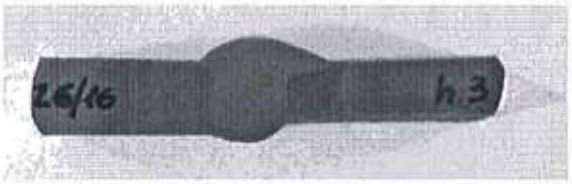
AWT=TRAZIONE LONGITUDINALE SALDATURA/LONGITUDINAL ALL WELD TENSILE TEST
WM = ZONA FUSA/WELD MATERIAL
FL+1 = LINEA DI FUSIONE + 1 mm /FUSION LINE + 1 mm
FL+5 = LINEA DI FUSIONE + 5 mm /FUSION LINE + 5 mm
TWT=TRAZIONE TRASVERSALE SALDATURA/TRANSVERSE WELD TENSILE TEST
FIW=ROTTURA DUTTILE IN SALDATURA/ DUCTILE FAILURE IN WELD
FOW=ROTTURA DUTTILE FUORI SALDATURA/ DUCTILE FAILURE OUT OF WELD
RBB=PIEGA TRASVERSALE AL ROVESCIO/TRANSVERSE ROOT BEND TEST
FBB= PIEGA TRASVERSALE AL DIRITTO/TRANSVERSE FACE BEND TEST
SBB=PIEGA LATERALE TRASVERSALE/TRANSVERSE SIDE BEND TEST

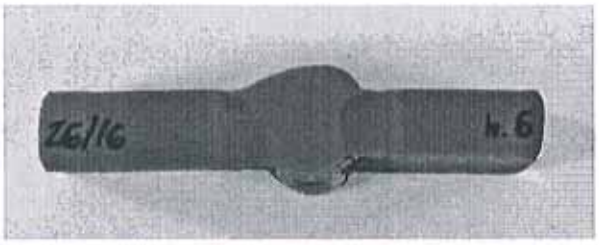
OPERATORE / Operator	COMMITTENTE / Customer	ISPETTORE / Inspector
CONTROL S.N.C. Sez Laboratorio Prove N. Il Tecnico	ROSETTI MARINO S.p.A. Welding Dpt. A. Khalifa	RINA Services SpA D. Cimarti

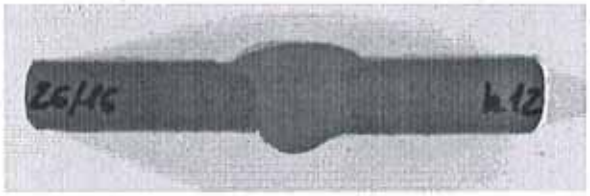
Control Snc Sede Amministrativa - Laboratorio Via Attilio Monti, 15 - 48100 Ravenna Telefono - 0544 590597	LABORATORIO DI CONTROLLI E PROVE CERTIFICATO PROVE MATERIALI TEST CERTIFICATE	N. 06 Sh. 2/5 DATA / Date 29-apr-2016

COMMITTENTE / CUSTOMER	ROSETTI MARINO S.P.A.		Materiale/Material
OGGETTO / OBJECT: PQR 26/16	Dimensione Provino/Size Test mm. Diam.: 114,3 Spess.: 6	Heat 189686-Ceq.0.35	API 5L X60 Q PSL2

ESAME MACROGRAFICO
MACRO EXAMINATION







MACROETCH TEST 4.6.8

MACROEXAMINATION:	**ACCEPTABLE**
VISUAL EXAMINATION:	**ACCEPTABLE**
ETCH:	**NITAL 5%**
ACCEPTANCE CRITERIA MACROEXAMINATION:	**4.6.9**
MAGNIFICATION PHOTO:	**2X**

OPERATORE / Operator	COMMITTENTE / Customer	ISPETTORE / Inspector
CONTROL S.N.C. Sez. Laboratorio Prove Materiali	ROSETTI MARINO S.p.A. Welding Dpt. A. Khalifa	RINA Services SpA D. Gimatt

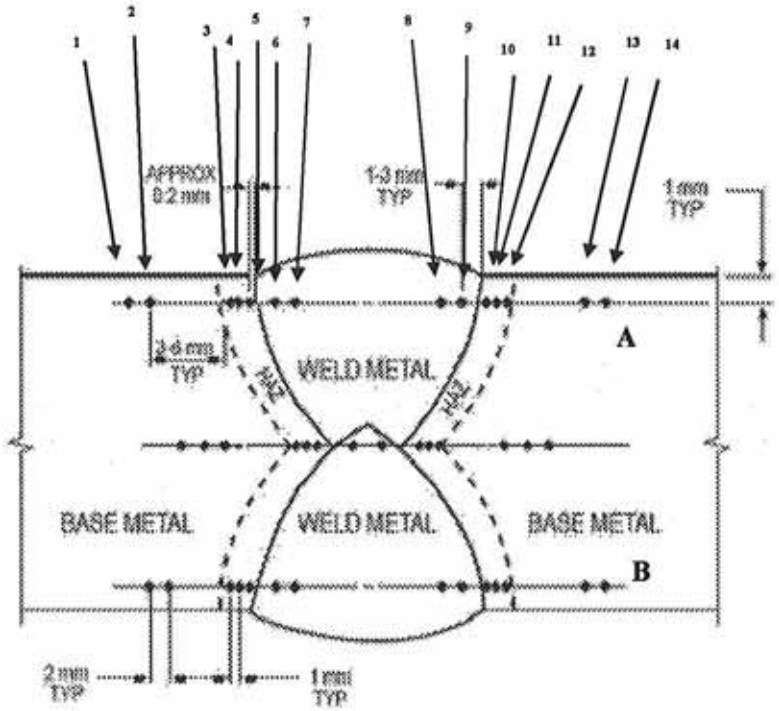
Control Snc	LABORATORIO DI CONTROLLI E PROVE	
Sede Amministrativa - Laboratorio Via Attilio Monti, 15 - 48100 Ravenna Telefono - 0544 590597	CERTIFICATO PROVE MATERIALI TEST CERTIFICATE	N. 06 Sh. 3/5 DATA / Date 29-apr-2016

COMMITTENTE / CUSTOMER	ROSETTI MARINO S.P.A.	Materiale/Material
OGGETTO / OBJECT: PQR 26/16	Dimensione Provino/Size Test mm. Diam.: 114,3 Spess.: 6	Heat 189686-Ceq.0.35
		API 5L X60 Q PSL2

PROVA DI DUREZZA
HARDNESS TEST

HARDNESS TEST HV10 - CAMERON STANDARD SPECIFICATION X-027224
FIGURE 4-1 SAMPLE VICKERS HARDNESS TRAVERSE - Inst.Galileo SN 5981

HARDNESS MAX =350 HV10



Point	LINE A	LINE B
1	176	173
2	176	170
3	176	164
4	186	181
5	203	196
6	203	177
7	203	170
8	207	168
9	221	168
10	227	175
11	215	191
12	209	191
13	179	166
14	179	160

PQR 26/16 H.3

OPERATORE / Operator	COMMITTENTE / Customer	ISPETTORE / Inspector
CONTROL S.N.C. Sez. Laboratorio Prove Materiali Il Tecnico	ROSETTI MARINO S.p.A.	RINA Services SpA D. Rinaldi

Control Snc
Sede Amministrativa - Laboratorio
Via Attilio Monti, 15 - 48100 Ravenna
Telefono - 0544 590597

LABORATORIO DI CONTROLLI E PROVE

CERTIFICATO PROVE MATERIALI
TEST CERTIFICATE

N. 06 Sh. 4/5

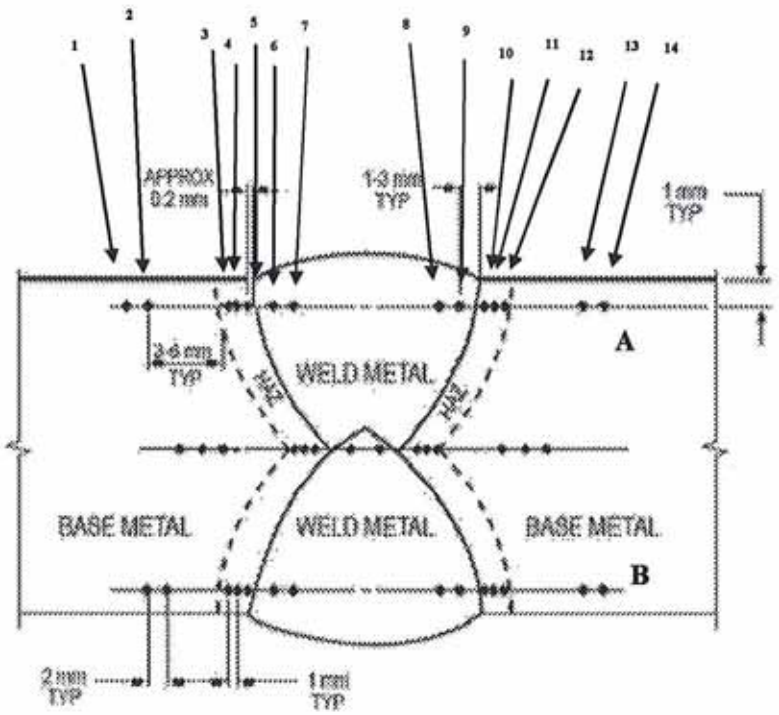
DATA / Date
29-apr-2016

COMMITTENTE / CUSTOMER	**ROSETTI MARINO S.P.A.**		Materiale/Material
OGGETTO / OBJECT	**PQR 26/16**	Dimensione Provino/Size Test mm. Diam.: **114,3** Spess.: **6**	Heat 189686-Ceq.0.35 — **API 5L X60 Q PSL2**

PROVA DI DUREZZA
HARDNESS TEST

HARDNESS TEST HV10 - CAMERON STANDARD SPECIFICATION X-027224
FIGURE 4-1 SAMPLE VICKERS HARDNESS TRAVERSE - Inst.Galileo SN 5981

HARDNESS MAX =350 HV10



Point	LINE A	LINE B
1	**160**	**168**
2	**164**	**168**
3	**166**	**175**
4	**177**	**188**
5	**185**	**188**
6	**212**	**170**
7	**212**	**170**
8	**221**	**172**
9	**206**	**170**
10	**210**	**181**
11	**210**	**180**
12	**191**	**176**
13	**160**	**170**
14	**160**	**157**

PQR 26/16 H.6

OPERATORE / Operator
CONTROL S.N.C.
Sez Laboratorio Prove Materiali
Il Tecnico

COMMITTENTE / Customer
ROSETTI MARINO S.p.A.
Welding Spl.
A. Khalifa

ISPETTORE / Inspector
RINA Services SpA
D. Cinatti

Control Snc
Sede Amministrativa - Laboratorio
Via Attilio Monti, 15 - 48100 Ravenna
Telefono - 0544 590597

LABORATORIO DI CONTROLLI E PROVE

CERTIFICATO PROVE MATERIALI
TEST CERTIFICATE

N. 06 Sh. 5/5

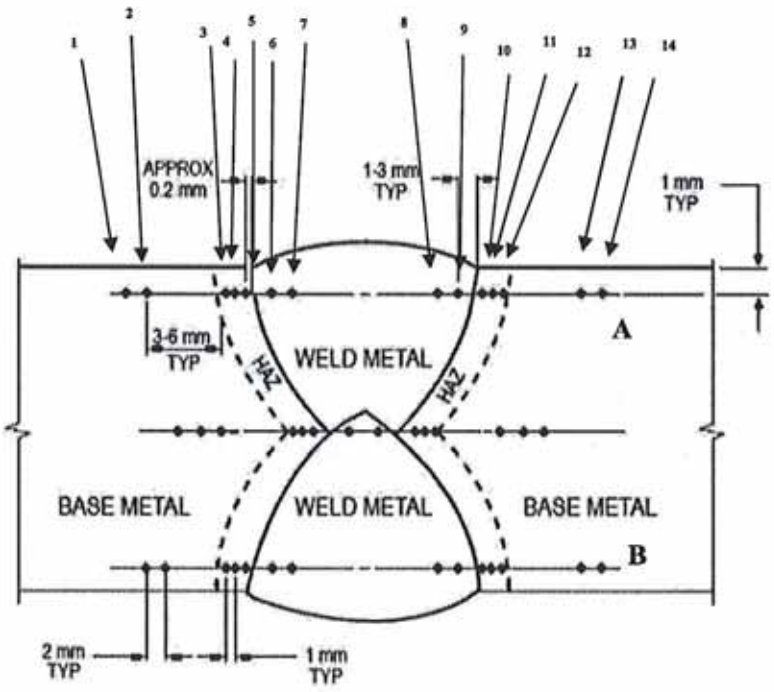
DATA / Date
29-apr-2016

COMMITTENTE / *CUSTOMER*	**ROSETTI MARINO S.P.A.**		Materiale/Material
OGGETTO / *OBJECT*	**PQR 26/16**	Dimensione Provino/Size Test mm Diam.: **114,3** Spess.: **6**	Heat 189686-Ceq.0.35 **API 5L X60 Q PSL2**

PROVA DI DUREZZA
HARDNESS TEST

HARDNESS TEST HV10 - CAMERON STANDARD SPECIFICATION X-027224
FIGURE 4-1 SAMPLE VICKERS HARDNESS TRAVERSE - Inst.Galileo SN 5981

HARDNESS MAX =350 HV10



Point	LINE A	LINE B
1	168	170
2	170	170
3	170	188
4	177	201
5	181	213
6	227	181
7	206	173
8	218	188
9	212	198
10	221	221
11	206	206
12	191	193
13	164	166
14	164	165

PQR 26/16 H.12

OPERATORE / Operator	COMMITTENTE / Customer	ISPETTORE / Inspector
CONTROL S.N.C. Sez. Laboratorio Prove Materiali Il Tecnico	ROSETTI MARINO S.p.A. Welding Dpt. A. Khalifa	RINA Services SpA D. Cimatti

Control SNC
Via Attilio Monti, 15
48122 Ravenna

NDT ACTIVITIES - TEST REPORT
RAPPORTO DI ESAME RADIOGRAFICO
RADIOGRAPHIC TEST REPORT

Data / Date: 18/04/2016
NDT-RT Report No: 01/15
foglio / sheet n° 1 of 1

COMMITTENTE / Customer	PROGETTO / Project	COMMESSA N°/Job No	ORDINE N°/Order N°	OGGETTO / Object
DM OFFICINE	-	-	-	WELDING PROCEDURE QUALIFICATION AWS D1.1: 2010 and Company spec.
CLIENTE / Client	**DWG N° / DWG No**	**CODICE - PROCEDURA / Code - Procedure**		**ACCETTABILITA'/Acceptance levels**
-	-	115A70-QC-PRO-0006 Rev.1		115A70-QC-PRO-0006 Rev.1

ITP No	FASE ITP/ Phase ITP	PROCESSO DI SALDATURA / Welding process
-	-	-

■ PRIMA ESECUZIONE/ First test
□ DOPO RIPARAZIONE/ After repair
□ PRIMA DEL TT/ Before PWHT
□ DOPO IL TT/ After PWHT

TRACEABILITY		JOINT TYPE				RESULT		
weld No - dwg - item	Rad. Techinques	material	Φ	thickness	welder stamp	position film	defect	judgment
PQR 25/16A	Contact	API 5L X60	4"	6	-	0-1		A
		Q PSL2				1-2		A
						0-1		A
PQR 25/16 B	Contact	API 5L X60	4"	6	-	0-1	DF	A
		Q PSL2				1-2		A
						0-1		A
PQR 26/16A	Contact	API 5L X60	4"	6	-	0-1		A
		Q PSL2				1-2		A
						0-1		A
PQR 26/16 B	Contact	API 5L X60	4"	6	-	0-1		A
		Q PSL2				1-2		A
						0-1		A

COPY CONFORMING TO THE ORIGINAL

CLASSIFICAZIONE DIFETTI
Classification defects

Aa	Soffiattura tondeggiante/Porosity < Φ 1mm
	Uniformly distributed porosity
	Localized porosity (Clustered)
	Linear porosity
	Surface pore
Ab	Cavità allungata/Elongated cavity
	Tarli/Worm-hole
	Inclusione solide/Solid inclusion
Ba	Inclusione di scoria/Slag inclusion
Bb	Scoria d'orient. diverso/Of any shape in.
Be	Difetto di ripresa/ 1st run irregular
C	Mancanza di fusione/Lack of fusion
D	Mancanza di penetrazione/Lack of penet.
E	Cricca o fessura/Crack
Ea	Cricca longitudinale/Longitudinal crack
Eb	Cricca trasversale/Transverse crack
Ec	Cricca di cratere/Crater crack
	Sovrametallo in eccesso/Excess weld metal
Ex	Eccesso di penetrazione/Penetration excess.
	Sgocciolamento/Local protrusion
F	Solco o incisione/Undercut
Fa	Irregolarità superficiale/Surface irregularity
	Avvallamento/Sagging
	Incom. riempimento/Incom. Filled groove
In	Insellamento/Root concavity
	Ripresa difettosa/Poor restart
K	Cavità di ritiro/Shrinkage cavity
	Traboccamento/Overlap
Sl	Slivellamento/Misalignment
W	Inclusione di tungsteno/Tungsten inclusion
	Innesco d'arco/Arc strike

GIUDIZIO / Judgment

NX-CF	To repeat to confirm defect
A	Accettabile/Acceptable
R	Riparare/To repair
NT	Tagliare/To cut
NX	Ripetere film/To repeat film
EX	Estendere il controllo/Extende test
DF	Difetto film/Film defect
TM	Taglio o modifica/Cut or modification

NOTE / Remarks

RADIOGRAPHIC TECHNIQUE DETAILS

Film: 12
TIPO FILM / Type film: KODAK T200
Data esposizione - Exposure date: 18/04/2016
Indicator Quality Image - Type: ■ ASTM 1B-11 □ 10 Fe EN

Sorgente X - Unità X-Ray Unit -	Pellicole per cassetta (Nr) Films box 1	I.Q.I. - Posizione / I.Q.I. - Location ■ Lato film/Film side □ Lato sorgente/Source side	I.Q.I. - Sensibilità richiesta/ottenuta (%) I.Q.I. - Required/reading Sensibility -
Energia / Energy (Kvp) -	Densità film / Film density 2,0-4,0	Schermi di rinforzo (mm) Intensifying screens Pb 0,10 x 0,10 Front-Back	Penombra Ug (mm) / Unsharpness geom. Ug -
Sorgente γ γ-Ray Ir 192 Activity	Sviluppo / Development ■ Automatic □ Manual	Tecnica radiografica / Radiographic techniques T-271.1 □ Panoramic □ Direct ■ Contact □ Ellipse □ Super Imposed	Distanza sorgente-oggetto (mm) Distance Source-Object Øe - 1 Thk.
Macchia Focale (mm) Focal Spot 3	Tempo di esposizione (s) Exposure time -		Distanza pezzo lato sorgente-pellicola (mm) Distance Object (source side)-Film Weld Thk.

TECNICO Livello 2 CND NDT Technician Level 2	CONTROLLO QUALITA' Q.C. Supervisor	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
PARTISANI RICCARDO Level II RT ISO 9712/SNT-TC-1A	ROSETTI MARINO S.p.A. Welding Dpt. A. Khalifa		RINA Services SpA D. Cimatti

CONTROL Snc
Via Attilio Monti 15
48122 Ravenna

NDE ACTIVITIES - TEST SHEET

RAPPORTO CND - MAGNETOSCOPICO
NDT REPORT - MAGNETIC PARTICLE TEST

Data / Date 18 04 2016
Report No 03-2016
foglio / sheet n° 1 of 1

COMMITTENTE / Customer	OGGETTO / Object	COMMESSA N°/Job No	ORDINE N°/Order No	Cliente Finale/Client
ROSETTI M. SpA	PQR	115A70	-	-

PROGETTO / Project	DISEGNO n° / Dwg n°	CODICE / PROCEDURA/In accordance with	ACCETTABILITA'/Acceptance levels
Bahr Essalam - OSS	-	115A70-QC-PRO-0008	115A70-QC-PRO-0008

ITP No / PCQ No	FASE ITP/ Phase ITP		
-	-	● PRIMA ESECUZIONE/ First test	○ PRIMA DEL TT/ Before PWHT
		○ DOPO RIPARAZIONE/ After repair	○ DOPO IL TT/ After PWHT

ILLUMINATORE / Lighting Equipment	DIAMETRO/Diameter	MATERIALE/Material	SPESSORE/Thickness
Si / *yes* ☐ No / *none* ■ ≥ 1000 lux (Daylight)	-	-	-

STATO DELLA SUPERFICIE / Surface condition

● COME SALDATO — As welded	● SPAZZOLATO — Brushed	○ LAVORATO DI MACCHINA — Machined	○ COME CALANDRATO — As bent
○ MOLATO — Ground	○ COME LAMINATO — Rolled	○ GREZZO — As forged	○ -

METODO DI MAGNETIZZAZIONE / Magnetizzazion method

☐ PUNTALI — Prods	■ GIOGO — Yoke	☐ BOBINA — Coil	☐ CONDUTTORE CENTRALE — Neutral Wire

TEMPERATURA SUPERFICI/ Temperature surface (°C)	SMAGNETIZZAZIONE FINALE/ Final Demagnetizzazion
AMBIENT	N.A
CORRENTE/ Current (V)	**INTENSITA'/ Intensity (A)**
A.C.	N.A.
DISTANZA PUNTALI / Pole Spacing	**TIPO APPARECCHIO/ Magnetic Equipment**
100 mm	CGM - TWIST YOKE SN.12289

MEZZO DI ISPEZIONE / Examination medium

☐ SECCO — Dry	■ UMIDO — Wet	☐ FLUORESCENTE — Fluorescent	☐
COLORE / Color :	☐ GRIGIA — Grey	■ NERA — Black	☐ ROSSA — Red

MARCA / Trade : CGM TIPO / Type : LK 35 DIMENSIONE / Dimension : 50 Micron	VERNICE DI CONTRASTO / Surface Contrast Enhancement : MARCA / Trade : CGM TIPO / Type : VECOPLAST V42

SALDATURA CONTROLLATA / Weld tested

SAMPLE	DIAMETER	THICKNESS	MATERIAL	RESULT	NOTES
PQR 25/16 A	4"	6 mm	API 5L X60 Q PSL2	CONFORMING	-
PQR 25/16 B	4"	6 mm	API 5L X60 Q PSL2	CONFORMING	-
PQR 26/16 A	4"	6 mm	API 5L X60 Q PSL2	CONFORMING	-
PQR 26/16 B	4"	6 mm	API 5L X60 Q PSL2	CONFORMING	-

COPY CONFORMING TO THE ORIGINAL

TECNICO II° livello CND - IMPRESA Operator NDE II° Level SNT-TC-1A / EN473	CONTROLLO QUALITA' Q.C. Supervisor	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Sabara Mesco II livello CND	ROSETTI MARINO S.p.A. Engineering Dpt. Halifa		RINA Services SpA D. Cimarelli

file:03-16 AWS.XLS

ROSETTI MARINO	VERBALE DI CONTROLLO VISIVO/DIMENSIONALE visual/dimensional inspection report	VDR N° 26-16 data: 18.04.2016
progetto / project	cliente / client	commessa / job
disegno / dwg	ITP N° /	fase / step

oggetto - item

Procedure Qualification Record (PQR) 26/16 (2 samples as welded)

Certificato di Qualifica di Procedimento di Saldatura (PQR) 26/16 (2 samples as welded)

WE CERTIFY THAT:

ITEMS INDICATED ABOVE HAVE UNDERGONE A VISUAL INSPECTION AND HAVE BEEN ACCEPTED ACCORDING TO THE SPECIFICATION / PROCEDURE MENTIONED AND TO ACCEPTANCE CRITERIA DEFINED IN IT

SI CERTIFICA CHE LA SALDATURA DEL SAGGIO SOPRA CITATO E' STATA SOTTOPOSTA AD ESAME VISIVO AL 100% ALLO STATO COME SALDATO IN ACCORDO ALLE SPECIFICHE E STANDARD CITATI.

note - remarks

No visible defects have been detected.

Non sono stati rilevati difetti visibili.

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

AWS D1.1:2015

Operatore - Operator	Controllo Qualita' - Quality Control	Cliente - Client
CSWIP A.K. KHALIFA 69505 WI 3.1		

ROSETTI MARINO

MATERIAL CERTIFICATES BOOK

Supplier	Purchase Order nr.	job	Barcode
C.T.A. SPA	1714002624	113A10B	Q011400834

ROSETTI MARINO

ROSETTI MARINO

Conforme alla spec. **PO**

According to the spc.

TMUGF Firma / MTSMD Signature

Data / Date **15/09/14**

Sonia Emiliani

[X] REVIEW

[ ] WITNESS

CUSTOMER

NOTE

COMMERCIALE TUBI ACCIAIO Viale Lidice 40-Grugliasco(TO)	Kg 436	Mt 10,7	Pcs No.: 1
This document is reproduced by a computerized system and is conform to the original	Heat No.: 1014457676	Cta's job: OX0000881	Date: 09/09/2014
Customer : ROSETTI MARINO SPA	P.O. No.: PO: 1714002624 - 112A70B		Item: 10

voestalpine Tubulars GmbH & Co KG

Alpinestrasse 17
8652 Kindberg-Aumuehl
T. +43/3865/22 15-0
F. +43/3865/2215-532
www.vatubulars.com

Legal Structure: Limited Partnership
Location: Kindberg/Austria
Company Registry Number 165400k
Commercial Court of Leoben
DPR 0592684, VAT Nr. ATU 43630406

General Partner: voestalpine Tubulars GmbH
Legal Structure: Limited Liability Company
Location: Linz, Company Registry Number 106933f
Commercial Court of Linz

INSPECTION - CERTIFICATE 3.1

(according to EN 10204)

ABNAHMEPRUEFZEUGNIS 3.1 - Rev.1 -

(gem. EN 10204)

No. 100925

CERTIFICAT DE CONTROLE DES PRODUITS PAR L'USINE 3.1

(selon EN 10204)

Hersteller:
Manufacturer: voestalpine Tubulars GmbH & Co KG, Austria
Producteur:

Besteller:
Purchaser: COMMERCIALE TUBI ACCIAIO S.P.A.
Archeteur: 10095 Grugliasco (TO) Italien

Pruefgegenstand:
Object of tests: **Seamless hot rolled steel tube**
Eprouvette:

Werkstoff:
Material: GRADE-X60Q-PSL2
Matières:

Anforderungen:
Requirements: API-5-L
Exigence:

Ausführung:
Condition: bevelled, temporarly rust protected, with inside plastic caps. Length: 9.000 - 11.800 mm
Cond. de livraison:

Wärmebehandlung: QUENCHED & TEMPERED
Heat treatment:
Traitment de chaleur:

Coupl.die stamped:
Coupl.paint stencilling:
Coupl.Colour coding: Fully painted: Bands:

Tube die stamped:
Tube paint stencilling: va SPEC 5L-0033 API 07/14 4.500" x 0.674" X60Q PSL2 SMLS length m, weight , Heat No., Lot No.

Tube Colour coding: Fully painted: Bands:
Label: "Ordine SB40446/LA0000184"
Remarks:

Auftrags-Nr.: 16441 / 1
Our works order No.:
No usine:

Bestellnr.: "Ordine
Your order No.: SB40446/LA0000184"
No de la commande:

Zeichen des Lieferwerks: va
Marking of producer:
Marque du fabricant:

Erschmelzungsart: BOF
Melting process:
Procédé d'élaboration: fully killed, produced to fine grain practice

Kindberg, 28.07.2014

Page 1 of 5

No. 100925

voestalpine Tubulars GmbH & Co KG
Qualitätsstelle / Quality Department
WEITZER
Abnahmebeauftragter
authorized inspection representative
représentant autorisé du controle

voestalpine
ONE STEP AHEAD.

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voestalpine Tubulars GmbH & Co KG

Umfang der Lieferung / Volume of delivery / Contenu de la livraison:

Versandanzeige: Dispatch advice No. Avis d'expédition:	Pos.: Pos.:	Abmessung: Dimension: Dimension:	Bundnr.: Bundle No.: Nombre Fret:	Stückzahl: Number Of: Pièces:	Länge: Length: Longueur:	Gewicht: Weight: Poids:	Los: Lot: Lot:
057126	1	114,3 x 17,12 mm		8	85,198 m	3483,2 kg	189686

Volume of delivery

Heat	Lot		Remark
1014457676	189686	-- 01	
1014457679	188075	-- 01	

Kindberg, 28.07.2014

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voestalpine Tubulars GmbH & Co KG

Additional tests and inspections performed on pipe

1 Dimensionskontrolle/ Dimensional Inspection: bestanden/passed

2 Magnetpulverpruefung der Rohrenden/Magnetic particle inspection (12" each end): bestanden/passed

3 Streuflusspruefung / Flux Leakage testing: bestanden/passed

4 Ultraschallpruefung (Wanddicke - 100 % Umfang)/Ultrasonic inspection acc. API-5-CT (wallthickness - 100 % circumference): bestanden/passed

5 Visuelle Inspektion/ Visual Inspection: bestanden/passed

6 Wasserinnendruckversuch/Hydrostatic test: bestanden/passed 2970 PSI 5 sec.

Test remarks

Wir bestätigen, dass die gelieferten Erzeugnisse den Anforderungen der Bestellung entsprechen.
We hereby certify that the goods delivered are in compliance with the requirements of the order.

Kindberg, 28.07.2014

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voestalpine Tubulars GmbH & Co KG

Tensile testing

Lot No	Test Type	Heat treatment	Temp	Specimen			Yield Strength	Tensile Strength	Elong.	Reduct. in area	Rt/Rm
			[°C]	No.	Type	Dimension[mm]	[MPa]	[MPa]	[%]	[%]	
							Requ. from	**415**	**520**	**23.00**	
							Requ. to	**565**	**760**		
188075 -- 01	Standard	quenched & tempered	20	1	Strip	25.42 x 16.98	Rt0.50	535	625	32.10	0.86
189686 -- 01	Standard	quenched & tempered	20	1	Strip	25.4 x 16.77	Rt0.50	513	616	39.90	0.83

Impact testing

Requirement:	**Length [mm]**	**Wide [mm]**	**Height [mm]**	**Specimen Orientation**	**Type**	**Temp. [°C]**	**Single min[J]**		**Average min[J]**	**Factor**
	55	**10**	**10**	**transv.**	**CH-V**	**0**		**20**	**27**	

Lot No	Test Type	Heat Treatment	No.			Single1	Single2	Single3	Average	Unit
188075 -- 01	Standard	quenched & tempered	1	transv.	Imp. Values:	235	226	231	231	[J]
					Including Factor:					
					Shear-Area [%]:					
					Lateral Expansion (un-/broken):					
					Lateral Expansion: [mm]				H: 10	[mm]

Lot No	Test Type	Heat Treatment	No.			Single1	Single2	Single3	Average	Unit
189686 -- 01	Standard	quenched & tempered	1	transv.	Imp. Values:	216	221	227	221	[J]
					Including Factor:					
					Shear-Area [%]:					
					Lateral Expansion (un-/broken):					
					Lateral Expansion: [mm]				H: 10	

Kindberg, 28.07.2014

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voestalpine Tubulars GmbH & Co KG

Chemical testing

Heat analysis

	C	Si	Mn	P	S	Cr	Ni	Cu	Al	Ti	Mo	V	Sn	B	N2	Nb	Ca	CEQ
max. Requ.	0.1800	0.4500	1.7000	0.0250	0.0150					0.0400		0.0700				0.0500		
min. Requ.																		
1014457676	0.1473	0.2722	1.1228	0.0079	0.0047	0.0431	0.0202	0.0271	0.0439	0.0021	0.0075	0.0407	0.0013	0.0003	0.0051	0.0297	0.0017	0.3558
1014457679	0.1506	0.2596	1.1127	0.0094	0.0039	0.0375	0.0193	0.0245	0.0301	0.0021	0.0057	0.0385	0.0012	0.0002	0.0054	0.0311	0.0016	0.3553

Chemical testing

Product analysis

	C	Si	Mn	P	S	Cr	Ni	Cu	Al	Ti	Mo	V	Sn	B	N2	Nb	Ca	CEQ
Lot No. 188075 -- 01 1 Standard Heat No. 1014457679	0.1509	0.2402	1.0704	0.0104	0.0039	0.0342	0.0197	0.0212	0.0246	0.0020	0.0056	0.0394	0.0016	0.0005	0.0000	0.0261	0.0000	0.3479
Lot No. 188075 -- 01 2 Standard Heat No. 1014457679	0.1495	0.2393	1.0730	0.0106	0.0036	0.0339	0.0198	0.0213	0.0234	0.0020	0.0054	0.0389	0.0015	0.0005	0.0000	0.0267	0.0000	0.3467
Lot No. 189686 -- 01 1 Standard Heat No. 1014457676	0.1522	0.2507	1.0759	0.0088	0.0040	0.0416	0.0206	0.0220	0.0325	0.0021	0.0093	0.0408	0.0013	0.0005	0.0000	0.0251	0.0000	0.3527
Lot No. 189686 -- 01 2 Standard Heat No. 1014457676	0.1535	0.2496	1.0714	0.0085	0.0036	0.0404	0.0209	0.0216	0.0331	0.0020	0.0097	0.0402	0.0015	0.0004	0.0000	0.0252	0.0000	0.3530

Kindberg, 28.07.2014

Page 5 of 5

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Legal Structure: Limited Partnership
Location: Kindberg/Austria,
Company Registry Number 165400k
Commercial Court of Leoben
DPR 0592684, VAT Nr. ATU 43830406

General Partner: voestalpine Tubulars GmbH
Legal Structure: Limited Liability Company
Location: Linz, Company Registry Number 106933 f
Commercial Court of Linz

Commerciale Tubi Acciaio S.P.a
10095 Gruglaisco (To)
Italy

Kindberg, August 4, 2014

Stenciling authorization for pipes of mill order 16441/1, P.O. SB40466/LA0000184

Dear Business Partner,

voestalpine Tubulars first would like to apologize for any inconvenience incurred due to our error not stenciled the pipes of above mentioned order with the wrong Grade designation (X65Q instead of X60Q).
We hereby guarantee that the pipes have been produced to Grade X60Q.

We, voestalpine Tubulars kindly ask you to stencil the pipes with the right Grade designation and herewith give you the official authorization to perform this repair and will carry the costs of this operation.

Best regards,

voestalpine Tubulars GmbH & Co KG

Gerald Gfrerer
General Manager QA/QC

i.V.
Jürgen Klarner
General Manager R & D

voestalpine
ONE STEP AHEAD.

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2015-12-02

Numero certificato/Cert no: EC24127528 rev. 0

Nostro ordine/Our order:	1218819	Vostro ordine/Your order:	Various
Nostro riferimento/Our ref:	Web user - Movex CMP020 ITB	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB01056	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20151201	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address
ESAB SALDATURA SpA

VIA ROSA LUXEMBURG 49
20085 LOCATE DI TRIULZI (MI)
20085 ITALY
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
TECHNO SERVICE S.R.L.

VIA DELLA MERENDA,32 FOR.ZARATTINI
48124 RAVENNA RA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PV542894513 Quantità/Quantity: 50 KG

PRODOTTO/PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK Tigrod 12.64 2.4x1000mm 5kg
Codice/Item no:	126424R150

CLASSIFICAZIONE/CLASSIFICATIONS

EN ISO 636-A	W 46 3 W4Si1
EN ISO 636-A	W4Si1
SFA/AWS A5.18	ER70S-6

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results
in accordo a/acc to EN 10204 - 3.1

Wire/strip

Altro/Auxiliary:

C	0.08%
Si	0.94%
Mn	1.69%
P	0.009%
S	0.008%
Cr	0.04%
Ni	0.01%
Mo <	0.01%
Cu	0.05%
V <	0.01%
Al <	0.01%
Ti+Zr	0.02%

CARATTERISTICHE MECCANICHE/MECHANICAL PROPS

Valori tipici/Typical data
in accordo a/acc to EN 10204 - 2.2

Norma/Standard:	EN
Altro/Auxiliary:	I1
Condizione/Condition:	

TRAZIONE/TENSILE

ReL	Rm	A4-A5
525 MPa	595 MPa	26 %

RESILIENZA/IMPACT

Temp	KV
-30 °C	70 J

COPY CONFORMING TO THE ORIGINAL

COMMENTI/COMMENTS

RINA Services SpA
D. Cimatti

ON BEHALF OF ESAB SALDATURA S.p.A.
☐ WITNESS ☐ NOTED
☒ REVIEW
NAME: Daniele Bursotti
DATE 19-01-16

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:
ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1
Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis		Validazione - altro/Validation - Others	
Josef Moravek	Quality Manager	Mikael Mimer	Product Manager

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2016-03-04

Numero certificato/Cert no: EC24229578 rev. 0

Nostro ordine/Our order:	1282270	Vostro ordine/Your order:	Various
Nostro riferimento/Our ref:	Web user - Movex CMP020 ITB	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB01056	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20160225	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address	Destinatario del certificato/Cert receiver	Indirizzo di spedizione/Delivery address
ESAB SALDATURA SpA . VIA ROSA LUXEMBURG 49 20085 LOCATE DI TRIULZI (MI) 20085 ITALY Italy		TECHNO SERVICE S.R.L. . VIA DELLA MERENDA,32 FOR.ZARATTINI 48124 RAVENNA RA Italy

CONSEGNA/DELIVERY — Numero di lotto/Lot no: PNP03028 — Quantità/Quantity: 896 KG

PRODOTTO/PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK Tubrod 15.19 1.2mm 16kg
Codice/Item no:	1519127730

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.36: E81T1-M21A6-Ni1
EN ISO 17632-A: T 50 5 Z P M 2 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:		M21 (EN ISO 14175)
C		0.061%
Si		0.43%
Mn		1.48%
P	<	1%
S	<	1%
Cr		0.03%
Ni		0.98%
Mo		0.02%
Nb		0.02%
Cu		0.03%
V		0.02%

CARATTERISTICHE MECCANICHE/MECHANICAL PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:	
Altro/Auxiliary:	M21 (EN ISO 14175)
Condizione/Condition:	As welded

TRAZIONE/TENSILE

Rp0.2	Rm	A5
604 MPa	663 MPa	26 %

RESILIENZA/IMPACT

Temp	-50 °C
KV	106 J

RINA Services SpA
D. Cimatti

TECHNO SERVICE S.R.L.
QUESTO CERTIFICATO E' VALIDO PER
UNA QUANTITA' DI KG/PZ 896
VEDI DDT N. 418 DEL 10/03/16

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:
ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1
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COPIA CONFORME ALL'ORIGINALE

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Dariusz Kijowski	Quality Assurance Manager	Neil Farrow	Product Manager

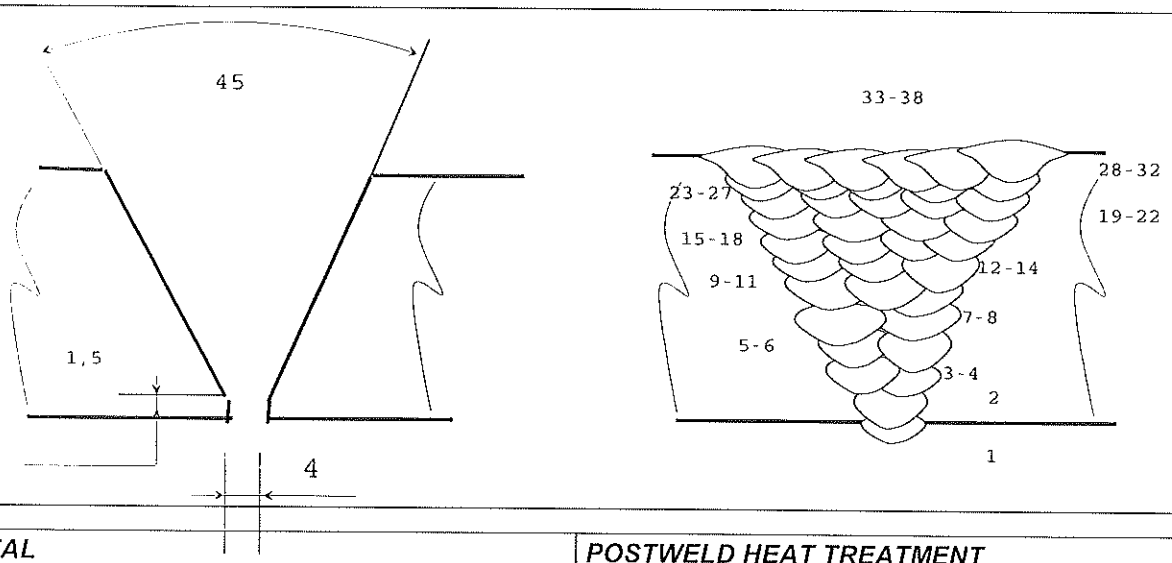
ROSETTI MARINO SPA	PQR N°	45A/10
PROCEDURE QUALIFICATION RECORD	Sheet: 1	Of: 2
	Prepared by: SS	Date:25/06/2010

COMPANY NAME: ROSETTI MARINO SPA

WPS N° 45A/10 DATE: 25/05/2010

WELDING PROCESS(ES): GTAW+FCAW

TYPES: MANUAL + SEMIAUTOMATIC



BASE METAL

Material Specification: EN 10225

Type or grade: S460G1+M (thermomechanical)

Thickness of Test Coupon: t= 40 mm

Diameter of Test Coupon: ∅= /

Base metal maker DILLINGER HÜTTE

Base metal heat No. 343497-95540-02

CEQ: 0,38

FILLER METALS

	GTAW	FCAW
SFA Specification	5.18	5.29
AWS Classification	ER70S-6	ER81T1-Ni1
Filler Metal F-No	6	6
Weld Metal Analysis A-No.	1	10
Size of Filler Metal	∅2,4	∅1,2

Other: Wire GTAW: ESAB OK Tigrod 12.64 Heat PV9050446883
Wire FCAW: ESAB OK Tubrod 15.64 Heat PN950036

Deposited Weld Metal 2 mm 38 mm

POSITION

Position of Groove 3G

Weld progression (Uphill, Downhill) Uphill

Other NONE

PREHEAT

Preheat temperature: 100°

Interpass temperature: 200°

OTHER: NONE

POSTWELD HEAT TREATMENT

Temperature: N.A.

Time: N.A.

Other N.A.

GAS

	Gas(es)	Percent composition (Mixture)	Flow rate
Shielding	Ar	99,9	10
Shielding	Ar+CO2	80-20	20
Backing	N.A.		

ELECTRICAL CHARACTERISTICS

Current DC

Polarity DP/RP

Amps. GTAW: 130 Volts 12

FCAW: 160÷190 24÷26

Tungsten Electrode Size 2,4 mm

HEAT INPUT: GTAW: 1,56 Kj/mm

FCAW: 1.21÷1,48 Kj/mm

TECHNIQUE

Travel speed GTAW: 60 mm/1'

FCAW: 180÷220 mm/1'

String or Weave Bead STRING

Oscillation N.A.

Multipass or single pass MULTIPASS

Single or multiple electrodes SINGLE

Stick-Out Length: FCAW 15

Orifice of gas cup size 3/8" - ½"

wire feed speed range Self controlled by current

Other

RINA C. Corsini p.p. ispettore

EWF S. SOLMI I EWT 30416 EUROPEAN WELDING FEDERATION

ROSETTI MARINO SPA	PQR N°	45A/10
PROCEDURE QUALIFICATION RECORD	Sheet: 2	Of: 2
	Prepared by: SS	Date: 25/06/2010

TENSILE TEST

SPECIMEN No.	WIDTH (mm)	THICKNESS (mm)	AREA (mm^2)	ULTIMATE TOTAL LOAD (N)	ULTIMATE UNIT STRESS N/mm2	TYPE OF FAILURE & LOCATION
TT1	25.0	39,0	975	585975	601	DUCTILE (FAILURE OUT OF WELD)
TT2	25.0	39,2	980	584080	596	DUCTILE (FAILURE OUT OF WELD)

ALL WELD METAL TENSILE TEST	AREA	YIELD LOAD (Rp 0,2%)	ULTIMATE LOAD	YIELD UNIT STRESS	ULTIMATE UNIT STRESS	ELONGATION
TWL (from 24A/10)		671		725		26,7

GUIDED BEND TEST

TYPE & FIGURE No.	RESULT
N.A.	/

TOUGHNESS TESTS

SPECIMEN No.	NOTCH LOCATION	NOTCH TYPE	TEST TEMP.	Individual values	average	LATERAL EXP.		DROP WEIGHT	
						% SHEAR	MILS	BREAK	No. BREAK
10X10x55	WELD METAL (cap)	KV	-40°C	147-142-153	147	/		/	
10X10x55	FUSION LINE (cap)	KV	-40°C	97-115-103	105	/		/	
10X10x55	FUSION LINE +2 (cap)	KV	-40°C	99-77-147	108	/		/	
10X10x55	FUSION LINE +5 (cap)	KV	-40°C	96-93-106	98	/		/	
10X10x55	WELD METAL (root)	KV	-40°C	142-85-117	115	/		/	
10X10x55	FUSION LINE (root)	KV	-40°C	202-204-196	201	/		/	
10X10x55	FUSION LINE +2 (root)	KV	-40°C	171-172-170	171	/		/	

FILLET WELD

Result – Satisfactory; Yes N.A. No. N.A. Penetration into Parent Metal; Yes N.A. No. N.A.

Macro – Results N.A.

OTHER TESTS

Type of test **VISUAL EXAMINATION TEST:**..... ACCEPTABLE

ULTRASONIC EXAMINATION TEST:..... ACCEPTABLE, see CONTROL Certificate No. 45A/10

MACROGRAPHIC EXAMINATION:..... SATISFACTORY see EXOVA certificate No. 156427 dated 24/06/2010

Deposit Analysis N.A.

Other **Hardness** HV 10 **Base Metal:** 200÷210 HV **Heat Affected Zone** 192÷313 HV **Weld Metal** 187÷205 HV

Welder's Name Chisota V. Petre Clock No. Stamp No.

Test conducted by **EXOVA** Laboratory Test No. 156427 dated 24/06/2010

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of EEMUA 158 Ed.1994 Reprinted 2005.

Date: 25/06/2010

Manufacturer: S. SOLMI

By: I EWT 30416

ROSETTI MARINO S.p.A.

Exova Srl
Via della Pierina 9/11
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Test report n° 156427 **Rev.0**
EN 10204, type : 3.2

Mrs
Cod. 1737

ROSETTI MARINO S.P.A
VIA TRIESTE, 230
48100 RAVENNA RA
Italy

Your ref.	Order n.	D.D.T. n. 1vts100525	data	09/06/2010
Our ref.	Report n.	**156427**	data	**24/06/2010**
	Job n.	50219	data	10/06/2010

Remarks Job No. 110A20
Test 45A/10 GTAW + FCAW pos.3G
Dimensions : 40mm

Project Jasmine Jacket

Client Reference EEMUA 158:1994 (Reprinted 2005) & Client's Request

Test standard UNI EN 895:1997 - UNI EN ISO 6892-1:2009 - UNI EN 875:1997 - UNI EN 10045-1:1992 - UNI EN ISO 6507-1:2006

This Report is made of n° 5 pages including this cover plus the following pages

Test	Pag.
(*) Macrographic examination	1
Hardness test	1
Tensile test	1
Impact test	1

This Report (RPR) contains tests results on the following materials

Ref.	Identification	Material	DN / Thk [mm]	Remarks
98013	PQR 45A/10	EN 10225 S460G1+Norsok M120		

Laboratory Manager | Customer | Inspector | Inspector

Exova s.r.l.

ROSETTI MARINO S.p.A.
Responsabile saldatura
Welding Engineer
S. Solmi

RINA S.p.A.
A. Landi

General conditions:

1. The Customer accepts general conditions and prices fixed by the laboratory to perform the tests.
2. Test results will be communicated only by means of test report except for different contractual agreement.
3. Tests sample will be destroyed 10 days after test except for different written Client request.
4. The spare will be destroyed 90 days after date of receipt for different written Client request.
5. The test results described in the following test report are referring only to the sample mentioned in it.
6. The date of material receivement is the same as the date of job opening. The date of testing is the same as the date of test report, except for different info.
7. If not specified the test is performed on material as received.

This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory

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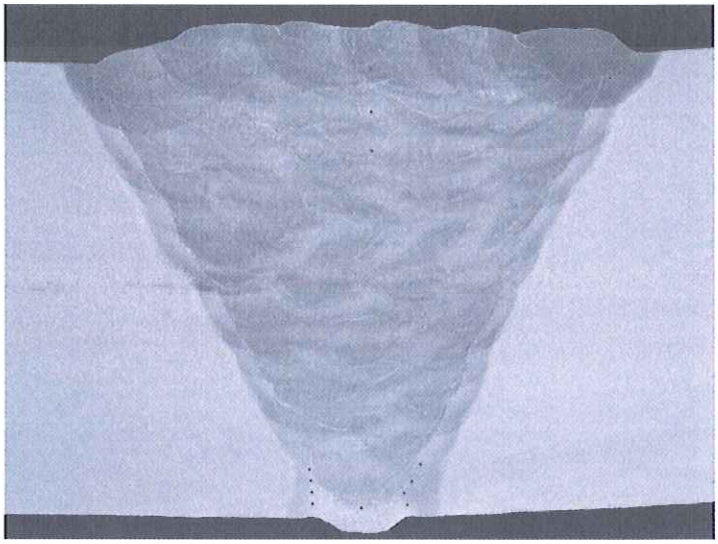
Test report n° 156427 Rev.0

Equipment n.	PHOTOGRAPHIC DOCUMENTATION	Pag. 1 of 1
1005		

Test Ref.	
Laboratory	Client
013.FO01.1	45A/10

Etching : NITAL 3%

Magnification : x 1.5



45A/10

M1

Comments The macrographic examination at 25x of the weld relevant to the subject welding procedure test has shown no defects.

Standard ref. EEMUA 158:1994 (Reprinted 2005) & Client's Request

Remarks

Operator	Customer	Inspector	Inspector
Exova S.r.l.	ROSETTI MARINO S.p.A. Responsabile saldatura / Welding Engineer S. Solmi	RINA S.p.A. A. Landi	

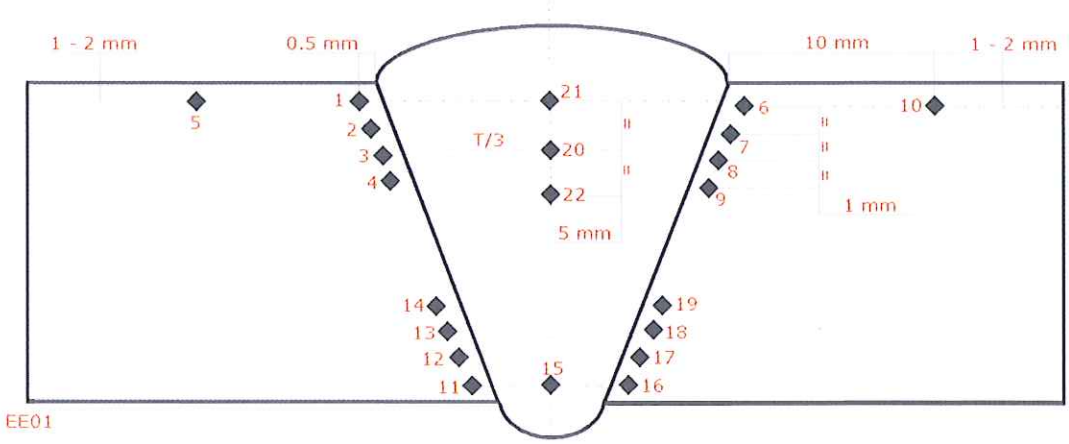
This page is binded to references n. *156427 (job 50219)* *whose details are indicated on the cover*

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Test report n° 156427 Rev.0

Equipment n.	**HARDNESS TEST** Internal procedure POI-07	Pag. 1 of 1
1311		



45A/10
M1

HV 10		HV 10		-		-		-	
Point #	**Value**	**Point #**	**Value**	**Point #**	**Value**	**Point #**	**Value**	**Point #**	**Value**
#1	269	#21	187	-	-	-	-	-	-
#2	279	#22	200	-	-	-	-	-	-
#3	274	-	-	-	-	-	-	-	-
#4	229	-	-	-	-	-	-	-	-
#5	200	-	-	-	-	-	-	-	-
#6	299	-	-	-	-	-	-	-	-
#7	311	-	-	-	-	-	-	-	-
#8	301	-	-	-	-	-	-	-	-
#9 Max	313	-	-	-	-	-	-	-	-
#10	210	-	-	-	-	-	-	-	-
#11	216	-	-	-	-	-	-	-	-
#12	192	-	-	-	-	-	-	-	-
#13	208	-	-	-	-	-	-	-	-
#14	209	-	-	-	-	-	-	-	-
#15	200	-	-	-	-	-	-	-	-
#16	225	-	-	-	-	-	-	-	-
#17	220	-	-	-	-	-	-	-	-
#18	215	-	-	-	-	-	-	-	-
#19	209	-	-	-	-	-	-	-	-
#20	205	-	-	-	-	-	-	-	-

Standard ref. EEMUA 158:1994 (Reprinted 2005) & Client's Request - UNI EN ISO 6507-1:2006

Remarks

Operator	Customer	Inspector	Inspector
Exova S.r.l.	ROSETTI MARINO S.p.A. Responsabile saldatura Welding Engineer S. Solmi	RINA S.p.A. A. Landi	

This page is binded to references n. *156427 (job 50219)* *whose details are indicated on the cover*

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Test report n° 156427 Rev.0

Equipment n. 1153

TENSILE TEST

Internal procedure POI-01

Richiesti *Required*													550÷700						

Test *Ref.*		T *Test*	Posizione *Position*	Dimensioni *Dimensions*			Lo	Re	Rp0.2%	Rp0.5%	Rt0.2%	Rt0.35%	Rt0.5%	E	Rm	A	Z	Rif. *Ref.*
Lab.	Client	°C		mm			mm	N/mm²	N/mm²	N/mm²	N/mm²	N/mm²	N/mm²		N/mm²	%	%	
013.TR1.01	45A/10	+20	T Weld	25.00	x	39.00		-	-	-	-	-	-		601	-		#
013.TR1.02	45A/10	+20	T Weld	25.00	x	39.20		-	-	-	-	-	-		596	-		#

Standard ref. EEMUA 158:1994 (Reprinted 2005) & Client's Request - UNI EN 895:1997 - UNI EN ISO 6892-1:2009

Remarks # Broken out of weld

If not specified the test considered proportional type

Operator	Customer	Inspector	Inspector
Exova S.r.l.	ROSETTI MARINO S.p.A. Responsabile saldatura Welding Engineer	RINA S.p.A. A. Landi	

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Test report n° 156427 Rev.0

Equipment n.	**IMPACT TEST** *Internal procedure POI-02*	Pag. 1 of 1
814		

Nominal machine energy : 450J

Test Ref.		T Test	Posizione Position	Dimensioni Dimensions			Intaglio Notch	A Single			B Single			C Single				
							Richiesti Required	32			32			32			45	
Lab.	Client	°C		mm				Valore Value J	Shear %	Lateral E.	Valore Value J	Shear %	Lateral E.	Valore Value J	Shear %	Lateral E.	Media Average J	Rif. Ref.
013.RE2.01	45A/10	-40	WM(2mm cap)	10	x	10.00	KV	147			142			153			147	
013.RE2.02	45A/10	-40	FL(2mm cap)	10	x	10.00	KV	97			115			103			105	
013.RE2.03	45A/10	-40	FL+2(2mm cap)	10	x	10.00	KV	99			77			147			108	
013.RE2.04	45A/10	-40	FL+5(2mm cap)	10	x	10.00	KV	96			93			106			98	
013.RE2.05	45A/10	-40	WM(2mm Root)	10	x	10.00	KV	142			85			117			115	
013.RE2.06	45A/10	-40	FL(2mm Root)	10	x	10.00	KV	202			204			196			201	
013.RE2.07	45A/10	-40	FL+2(2mm Root)	10	x	10.00	KV	171			172			170			171	

Standard ref. EEMUA 158:1994 (Reprinted 2005) & Client's Request - UNI EN 875:1997 - UNI EN 10045-1:1992

Remarks

Operator	Customer	Inspector	Inspector
Exova s.r.l.	ROSETTI MARINO S.p.A. Responsabile saldatura Welding Engineer	RINA S.p.A. A. Landi	

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ROSETTI MARINO

TABELLA DI SALDATURA
Welding sheet

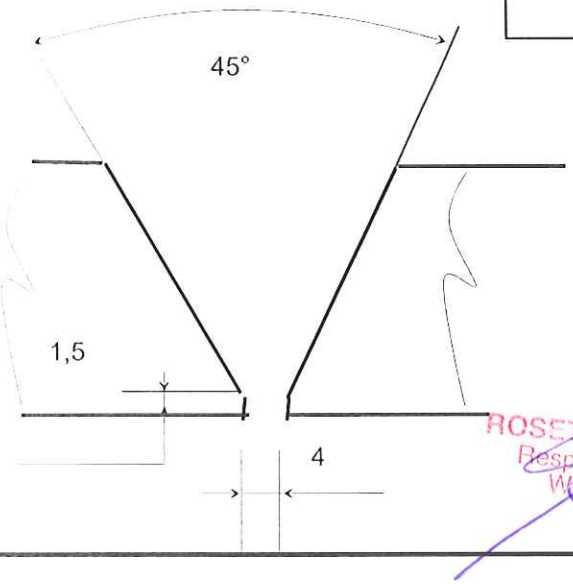
WPS N.	Pwps 45A-10	Posizione Position	3G
Tipo di saldatura Welding Process	GTAW+FCAW	Cliente Client	CONOCO PHILLIPS
Elettrodo Electrode		Commessa Job	110A20 — Jacket Jasmine
Flux Flusso		Materiale base Base material	Plate 40 mm, EN 10225 S460 heat 343497 plate 95540-02

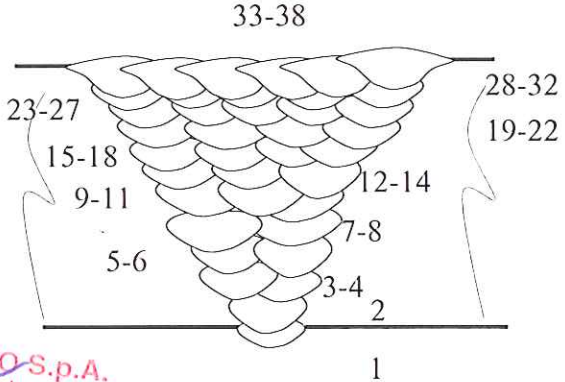
	Gas Gas (es)	Miscela Mixture	Portata Flow Rate
Protezione/Shielding	Ar	99,9	12
Protezione/Shielding	Ar+CO2	80-20	18
Al rovescio/Backing	N.A.	N.A.	N.A.

Saldatore/Operatore: Welder Name/Welding Operator	Chisota V. Petre
Prerisc: Preheat	100°C
Temp. Max. interpass:	200°C
Filo Wire	ESAB Tigrod 12.64 heat PV905046883 ESAB OK Tubrod 15.17 heat PN950036
	RAVENNA 27-28/05/2010
Corrente AC o DC Current AC or DC	DC
Polarità Polarity	DP/RP
Preparazione Joint Design	See details

TEST 45A-10

Pass. N. Pass N.	Proced. Process	Elettr. Electr.	Ampere Amps	Volts Volts	Vel.mm/1 Trav.Sp.	H.I. KJ/mm
1	GTAW	2,4	130	12	60	1,56
2	FCAW	1,2	180	25	180	1,50
3-4	FCAW	1,2	160	25	180	1,33
5-6	FCAW	1,2	190	25	200	1,43
7-8	FCAW	1,2	190	26	200	1,48
9-11	FCAW	1,2	190	26	220	1,35
12-14	FCAW	1,2	180	26	220	1,28
15-18	FCAW	1,2	180	26	200	1,40
19-22	FCAW	1,2	180	26	200	1,40
23-27	FCAW	1,2	190	26	220	1,35
28-32	FCAW	1,2	190	26	220	1,35
33-38	FCAW	1,2	160	24	190	1,21





ROSETTI MARINO S.p.A.
Responsabile saldatura
Welding Engineer
S. Solmi

ROSETTI MARINO

PROCEDURA DI SALDATURA (in accordo EEMUA 158)
Welding Procedure Specification (according EEMUA 158)

WPS N°:	45A/10
PQR ref.:	45A/10 to qualify
REV.:	0
Data /date	25-05-2010

Procedimento di saldatura / Welding process: GTAW + GS FCAW — Tipo / Type: MANUAL + SEMIAUTOMATIC

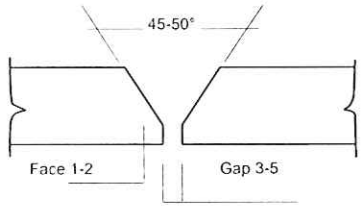
GIUNTO – JOINT (QW-402)

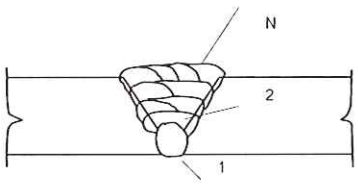
Tipo di giunto / Joint Design: V

Supporto / Backing: ☒ Si / Yes Only for second and other passes ☒ No Only for first pass

Materiale di supporto (tipo) / Backing material (type): ☒ Metallico / Metal ☐ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:





MATERIALE BASE – BASE MATERIAL (QW-403)

Da / from P-N°: NA — Group N°: 3 (as per EN 10225) — A / to P-N°: NA — Group N° 3 (as per EN 10225)

Da Tipo e grado / From type and grade: EN 10225 S460G1+M (heat number 343497 Ceq 0,38)

A Tipo e grado / To type and grade: EN 10225 S460G1+M (heat number 343497 Ceq 0,38)

Gamma spessori / Thickness range:
- ► Materiale base / Base material: Piena penetrazione / Groove 40 mm. Range 20 to 60
- ► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove > 600 mm

METALLO D'APPORTO – FILLER METAL (QW-404)

	GS FCAW	GTAW
Spec. N° (SFA)	5.29	5.18
AWS N° (CLASS)	E81T1-Ni1	ER 70S-6
F-N°	6	6
A-N°	10	1
Diametro mat. d'apporto / Size of filler metal	1,2	2,4
Metallo depositato / Deposit weld metal		
Gamma spessori /Thick. range Piena penetrazione / Groov	38 mm	2
Accoppiamento filo-flusso / Electrode-flux (CLASS)	N.A.	N.A.
Denom. Comm. flusso / FLUX trade name	N.A.	N.A.
Inserto consumabile / Consumable insert	N.A.	N.A.
Altro / other	WIRE: ESAB Tubrod 15.17	WIRE: ESAB OK Tigrod 12.64

POSIZIONI – POSITION (QW 405)

Posizione del giunto / Joint position: Cianfrino / groove — Posizione / position 3G — Progressione / weld progression: Ascendente / UP hill

PRERISCALDO – PRE-HEAT (QW406)

Temp.preriscaldo minima / Min. pre-heat temp: 100 °C — Max temp. Di interpass / Max interpass temp.: 200°C — Mantenimento postriscaldo / Postheat maintenance: N.A. — Tempo di mantenimento posriscaldo. / Postheat time: NA

TRATTAMENTO TERMICO DOPO SALDATURA – POST WELD HEAT TREATMENT(QW 407)

Riscaldamento / Heating rate (°C/Hrs): NA — Temperatura di stasi / Holding temperature °C: NA — Tempo di stasi / Holding time (min.): NA — Velocità di raffreddamento / Cooling rate (°C/Hrs): NA

GAS DI PROTEZIONE – GAS (QW 408)

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar Ar+CO2	99,9 80-20 %	10-12 16-20 lt/min.
Protezione al seguito / Trailing:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS (QW –409)

Corrente / Current: DC — Polarità / Polarity: DP-RP

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: EWTh2 dia.2,4mm

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: Spray arc

Velocità alimentazione filo / Electr. Wire feed speed range: Self controlled

TECNICA – TECHNIQUE (QW-410)

Passata / Bead: Tirata/String — Dimensione bocchello gas / Orifice of gas cup size: 3/8" 1/2" — Pulizia iniziale e fra le passate / Initial and interpass cleaning: Spazzolatura e Molatura/Brushing Grinding

Metodo di solcatura a rovescio / Method of back gouging: N.A. — Oscillazione / Oscillation: N.A. — Distanza tra zona di contatto e pezzo / Contact zone to work distance: N.A.

N°Passate / Passes nr.: Multipla/Multiple — Elettrodo multiplo o singolo / Multiple or single electrodes: Singolo/Single — Martellatura / Peening: N.A.

Altro / Other: Max. width of passes, 10-12 mm

N° Passate Weld layers nr.	Processo Process	Materiale d'apporto Filler metal		Corrente Current		Voltaggio Volt range	Vel. avanzamento Travel speed range (mm/min)	Apporto termico Heat Input (KJ/mm)
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. range			
1	GTAW	ER 70S-6	2,4	DP	130-150	12-14	50 ÷ 60	1,6-2,5
2	GS-FCAW	E81T1-Ni1	1,2	RP	160-170	24-26	150 ÷ 160	1,4- 1,7
Filling	GS-FCAW	E81T1-Ni1	1,2	RP	180-200	24-26	180 ÷ 200	1,3- 1,7

Preparato da / prepared by: A.KARIM

Approvato da / approved by: S.SOLMI

ROSETTI MARINO	UT N°: UT 45A/10	
RAPPORTO D'ESAME CON ULTRASUONI *Ultrasonic Examination Report*	DATA - Date 01/06/10	FOGLIO - Sheet 1 / 1

CLIENTE - Customer	ORDINE - Order	PROGETTO – Project	COMMESSA - Job
CONOCO PHILIPS	/	JASMINE JACKET	110A20
OGGETTO - Object	**DISEGNO - Dwg**	**P.F.C. / Q.C.P.**	**FASE - Step**
PQR 45A/10	/	/	/

MATERIAL Materiale	EN 10225 460G2	DIAMETER Diameter	PLATE	THICKNESS Spessore	40 mm
SURFACE CONDTION Stato Superficiale	AS WELDED	Couplant Liquido di accoppiamento	GLUE		
EQUIPMENT Apparecchio	PANAMETRICS	TYPE Tipo	EPOCH 4	CONTROL TECHNIQUE Tecnica di Controllo	CONTACT REFLECTION

TRASDUTTORE Search unit	TIPO Type	FREQ. Frequency (MHz)	SEZIONE Size (mm)	ANGOLO Angle	ONDE Waves
KRAUTKRAMER	MWB	2	14 x 14	45°-60°-70°	SHEAR

BLOCCO CAMPIONE: IIW-V1 (Reference Block)
TARATURA DELLA SCALA: ON DISTANCE (Scale calibration)

SENSIBILITA' DI TARATURA: DAC ON HOLES Φ 3 mm (Calibration sensitivity)

NOTE - Remarks	TECNICO I LIVELLO Level I Technician
TEST PERFORMED ON PQR 45A/10 AT 100%	

RISULTATI - Results		PROCEDURA DI CONTROLLO Application Procedure	
	[X] CONFORME According to Spec. [ ] NON CONFORME Non conforming to Spec.	110A20-QC-PRO-004	
TECNICO II° LIVELLO Level II° Technician	C. QUALITA' Q. Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
M.COMANDINI II level MT-PT-UT	ROSETTI M.S.p.A. controllo qualità quality control		

ROSETTI MARINO

MT N°: MT 45A/10

RAPPORTO D'ESAME MAGNETOSCOPICO
Magnetic Particle Examination Report

DATA - Date: 01/06/10

FOGLIO - Sheet: 1/1

CLIENTE - Customer	ORDINE - Order	PROGETTO - Project	COMMESSA - Job
CONOCO PHILIPS	/	JASMINE JACKET	110A20
OGGETTO - Object	**DISEGNO - Dwg**	**P.F.C. / Q.C.P.**	**FASE - Step**
PQR 45A/10	/	/	/

STATO SUPERFICIE - Surface Condition

- [x] COME SALDATO / As Welded
- [x] SPAZZOLATO / Brushed
- [ ] GREZZO / As Forged
- [ ] COME CALANDRATO / As Rolled
- [ ] MOLATO / Ground
- [ ] COME LAMINATO / As Rolled
- [ ] LAVORATO DI MAC. / Machined
- [ ] _____

- [ ] PUNTALI / Prods
- [x] GIOCO / Yoke
- [ ] BOBINA / Coil
- [ ] CONDUTTORE CENTRALE / Central Conductor

CORRENTE: _____ A.C. _____ / Current

INTENSITA': _____ / _____ / Intensity

DISTANZA: _____ 200 mm _____ / Spacing

TIPO APPARECCHIO: _____ CGM TWIST YOKE Matr. 6699 / Flow Detector

- [ ] SECCO / Dry
- [x] UMIDO / Wet
- [ ] FLUORESCENTE / Fluorescent

- [x] POLVERE / Powder
- [ ] GRIGIA / Grey
- [x] NERA / Black
- [ ] ROSSA / Red

MARCA: _____ CGM _____ / Trade

TIPO: _____ LK 35 _____ / Type

NOTE - Remarks

TEST PERFORMED ON PQR 45A-10 AT 100%

TECNICO I LIVELLO / Level I Technician

RISULTATI - Results

- [x] CONFORME / According to Spec.
- [ ] NON CONFORME / Non conforming to Spec.

PROCEDURA DI CONTROLLO / Application Procedure

110A20-QC-PRO-005

TECNICO II° LIVELLO / Level II° Technician	C. QUALITA' / Q. Control	ISPETTORE CLIENTE / Company Repr.	ISPETTORE A.I. / Inspection Agency
M.COMANDINI II level MT-PT-UT	ROSETTI M. S.p.A. controllo qualità quality control		

ESAB Saldatura SpA

Inspection certificate 3.1 – EN 10204

CERTIFICAZIONE / CERTIFICATION N° 09055

Ns. rif. / Our ref

Ns. ordine / Our order 230697 date 06/02/2009

Vs.Ordine n°/Your order N° 19/2009 date 06/02/2009

Cliente/ Customer
TECHNO SERVICE S.r.l.
Via DELLA MERENDA 32 FORN. ZARAT
48100 RAVENNA (RA)

Pos. No.	Codice/Item No.	Descrizione/description	Lotto/Lot	Quantity
1	12o424R150	Wire OK TIGROD 12.64 dia.2,4x1000	PV905046883	20,0 Kg

Analisi / Analysis

	C	Mn	Si	P	S	Mo	Ni	Cr	Cu	V	Nb
Metallo d'apporto All weld metal	0,077	1,63	0,83	0,020	0,010	0,002	0,01	0,06	0,069	0,001	0,004

Trazione/Tensile test. **AS WELDED**

	R_p 0,2 N/mm²	R_{et} N/mm²	R_{eH} N/mm²	R_m N/mm²	A4 %
Metallo d'apporto All weld metal	500			639	32

Resilienza/Impact test KV **AS WELDED**

	Temp. °C	Media/Average J	J
Metallo d'apporto All weld metal	- 40	71,6	70,9 – 71,5 – 72,5

Test addizionali/Additional tests.
NONE

Note/remarks
Il prodotto è conforme alle norme / This welding consumable conforms to:
Customer order
Classificazione
AWS SFA/5.18 ER70S-6

Mesero, 07/04/2009

Assicurazione Qualità
QA Department
M. Gherardi

ESAB SALDATURA SPA
M. GHERARDI
QA MANAGER

Certificazione - Certification
Confermiamo che i sopraelencati materiali sono conformi ai requisiti dell'ordine e forniti in accordo col ns. Sistema di Qualità approvato secondo UNI EN ISO 9001 e che i valori riportati sono stati verificati in accordo a quanto stabilito dalla vendita

We hereby certify that the above stated products conform to the sales contract and are supplied in accordance with our Quality System approved to UNI EN ISO 9001 and that the goods, with indicated results have been tested according to the instructions in the sales contract

20090 MEDIGLIANO (MI)
Via Mattei, 24 - tel. 02 97968.1
Fax 02 97289300
Commerciale@esab.it

Amministrazione: Fax 02 9789705
Divisione materiali d'apporto: Fax 02 97289300
Divisione impianti: Fax 02 97289181
Assistenza tecnica impianti: Fax 02 9789140
Produzione: Fax 02 97289950

Codice Fiscale / Partita IVA 00775990153
Capitale Sociale € 6.464.800,00 i.v.
Sede Leg. Via Monte Rosa, 60 - Milano
Reg. Imp. Milano REA 236795
N. Registro AEE IT08020000001273

ATTESTATO DI CONTROLLO/
TEST REPORT

in accordo a/acc to EN 10204 - 2.2

Data/Date: 2010-04-09

Numero certificato/Cert no: EC21568159 rev. 0

Nostro ordine/Our order:
Nostro riferimento/Our ref:
Codice Cliente/Cust no: NA
Data ordine Cliente/Your date:

Vostro ordine/Your order:
Vostro riferimento/Your ref:
Vostro numero fax/Your fax:
Vostra e-mail/Your e-mail:

Indirizzo di fatturazione/Invoice address
ROSETTI MARINO SPA
VIA TRIESTE 230
48100 RAVENNA
RA

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
ROSETTI MARINO SPA
VIA TRIESTE 230
48100 RAVENNA
RA

CONSEGNA/DELIVERY Numero di lotto/Lot no: PN950036 Quantità/Quantity:

PRODOTTO/PRODUCT

Marchio/Brand: ESAB
Descrizione/Desc: OK Tubrod 15.17 1.2mm 16kg
Codice/Item no: 1517127730

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.29	E81T1-Ni1M
EN ISO 17632-A	T 46 3 1Ni P C 2 H5
EN ISO 17632-A	T 46 4 1Ni P M 2 H5

CARATTERISTICHE MECCANICHE/MECHANICAL PROPS

Norma/Standard: EN
Altro/Auxiliary: M21 (EN ISO 14175)
Condizione/Condition: As welded

TRAZIONE/TENSILE

ReL	Rm	A5
544 MPa	613 MPa	26 %

RESILIENZA/IMPACT

Temp	KV
-40 °C	124 J

COMPOSIZIONE CHIMICA/
CHEMICAL COMPOSITION

All weld metal
Altro/Auxiliary: M21 (EN ISO 14175)

C	0.05%
Si	0.34%
Mn	1.15%
P	0.008%
S	0.008%
Cr	0.03%
Ni	0.96%
Mo	0.01%
Nb	0.02%
Cu	0.03%
Pb	0.002%
Ti	0.040%
V	0.02%
Al	0.01%
B	0.005%
As	< 0.005%
Sb	< 0.005%
N	0.0037%
Sn	< 0.005%

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:
ESAB Saldatura Spa Via E.Mattei 24, I-20010 Mesero (MI), +39 02 979 68.1
Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione/Validation
Shaun Studholme Product Manager

OK

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352677-16.02.10

A08/ Manufacturer's order/ A03 Certificate No.: 352901-001 Sheet: 1/...

A05 Established inspecting body: DH

A06 Purchaser: ROSETTI MAR.,RAVENNA A07.1 No. Z1RP 1709005640 231209

Final receiver: ROSETTI MAR.,RAVENNA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design.: S460G1+M

B03 Any suppl. requirements: BR-CDZZZZ-MT-SPE-5004:REV.D3
BS-EN10225:01

Conforme alle regole RINA
According to the RINA rules
Conforme aux règles RINA
Data
Date
25-FEB-2010
RINA Firma
Marchio/Stampiglia
REVIEW
WITNESS

B01-B99 Description of the product

B14 Item No.	B02 Number of pieces	B09 Thickness	B10 Width	B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
			MM						
06	1	40,00	x 2800	x 9400	8264	TM	343497	95540-01	ITEM 70 1PLATCS40026
06	1	40,00	x 2800	x 9400	8264	TM	343497	95540-02	ITEM 70 1PLATCS40026
**	2				16528				
07	1	40,00	x 2650	x 6200	5159	TM	343497	95539-01	ITEM 80 1PLATCS40026
07	1	40,00	x 2650	x 6200	5159	TM	343497	95539-02	ITEM 80 1PLATCS40026
07	1	40,00	x 2650	x 6200	5159	TM	343497	95539-03	ITEM 80 1PLATCS40025
**	3				15477				
10	1	30,00	x 2950	x 9000	6253	TM	343497	95541-02	ITM 110 1PLATCS30029
11	1	30,00	x 2600	x 9000	5511	TM	343497	95549-01	ITM 120 1PLATCS30029
11	1	30,00	x 2600	x 9000	5511	TM	343497	95549-02	ITM 120 1PLATCS30029
**	2				11022				
12	1	30,00	x 2500	x 6250	3680	TM	343497	95541-03	ITM 130 1PLATCS30029
12	1	30,00	x 2500	x 6250	3680	TM	343497	95541-04	ITM 130 1PLATCS30029
12	1	30,00	x 2500	x 6250	3680	TM	343497	95549-03	ITM 130 1PLATCS30029
12	1	30,00	x 2500	x 6250	3680	TM	343497	95549-04	ITM 130 1PLATCS30029
**	4				14720				
13	1	30,00	x 1750	x 6250	2576	TM	343496	95650-01	ITM 140 1PLATCS30029
13	1	30,00	x 1750	x 6250	2576	TM	343496	95650-02	ITM 140 1PLATCS30029
**	2				5152				
14	1	25,00	x 2780	x 10400	5674	TM	343496	95565-03	ITM 150 1PLATCS25032
15	1	25,00	x 2500	x 6250	3066	TM	343496	95560-01	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3066	TM	343496	95560-03	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3066	TM	343496	95560-04	ITM 160 1PLATCS25032

A01

A04 D H Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

AHB Inspector's stamp

AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Date 16.02.10 PP 1

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352677-16.02.10

A08/ Manufacturer's order/ A09 Certificate No.: 352801-001

Sheet: 1/...

A05 Established inspecting body: DH

A06 Purchaser: ROSETTI MAR.,RAVENNA A07.1 No. Z1RP 1709005640 231209

Final receiver: ROSETTI MAR.,RAVENNA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design: S460G1+M

B03 Any suppl. requirements: BR-CDZZZZ-MT-SPE-5004:REV.D3
BS-EN10225:01

Conforme all'ordine/ According to the order ..... DATA 25-FEB-2010

Data/ Date: 25-FEB-2010

IMAGE Firma/ Signature

CONTROLLATO/ CHECKED

REVIEW

WITNESS

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness	B10 Width		B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
			MM							
06	1	40,00	x 2800	x	9400	8264	TM	343497	95540-01	ITEM 70 1PLATCS40026
06	1	40,00	x 2800	x	9400	8264	TM	343497	95540-02	ITEM 70 1PLATCS40026
**	2					16528				
07	1	40,00	x 2650	x	6200	5159	TM	343497	95539-01	ITEM 80 1PLATCS40026
07	1	40,00	x 2650	x	6200	5159	TM	343497	95539-02	ITEM 80 1PLATCS40026
07	1	40,00	x 2650	x	6200	5159	TM	343497	95539-03	ITEM 80 1PLATCS40026
**	3					15477				
10	1	30,00	x 2950	x	9000	6253	TM	343497	95541-02	ITM 110 1PLATCS30029
11	1	30,00	x 2600	x	9000	5511	TM	343497	95549-01	ITM 120 1PLATCS30029
11	1	30,00	x 2600	x	9000	5511	TM	343497	95549-02	ITM 120 1PLATCS30029
**	2					11022				
12	1	30,00	x 2500	x	6250	3680	TM	343497	95541-03	ITM 130 1PLATCS30029
12	1	30,00	x 2500	x	6250	3680	TM	343497	95541-04	ITM 130 1PLATCS30029
12	1	30,00	x 2500	x	6250	3680	TM	343497	95549-03	ITM 130 1PLATCS30029
12	1	30,00	x 2500	x	6250	3680	TM	343497	95549-04	ITM 130 1PLATCS30029
**	4					14720				
13	1	30,00	x 1750	x	6250	2576	TM	343496	95650-01	ITM 140 1PLATCS30029
13	1	30,00	x 1750	x	6250	2576	TM	343496	95650-02	ITM 140 1PLATCS30029
**	2					5152				
14	1	25,00	x 2780	x	10400	5674	TM	343496	95565-03	ITM 150 1PLATCS25032
15	1	25,00	x 2500	x	6250	3066	TM	343496	95560-01	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x	6250	3066	TM	343496	95560-03	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x	6250	3066	TM	343496	95560-04	ITM 160 1PLATCS25032

A01

AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

A04 D H Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

AHB Inspector's stamp

Date 16.02.10 PP 1

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352677-16.02.10

A08/ Manufacturer's order/ A03 Certificate No.: 352801-001

Sheet: 2/...

A05 Established inspecting body: DH

A06 Purchaser: ROSETTI MAR.,RAVENNA A07.1 No. Z1RP 1709005640 231209

Final receiver: ROSETTI MAR.,RAVENNA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design: S460G1+M

B03 Any suppl. requirements: BR-CDZZZZ-MT-SPE-5004:REV.D3
BS-EN10225:01

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness	B10 Width MM	B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
15	1	25,00	x 2500	x 6250	3066	TM	343497	95553-01	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3066	TM	343497	95553-02	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3066	TM	343497	95553-03	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3066	TM	343497	95553-04	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3066	TM	343497	95553-05	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3066	TM	343497	95558-01	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3066	TM	343497	95558-02	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3066	TM	343497	95558-03	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3066	TM	343497	95558-04	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3066	TM	343497	95558-05	ITM 160 1PLATCS25032
**	13				39858				
16	1	25,00	x 1750	x 6550	2250	TM	343496	95560-05	ITM 170 1PLATCS25032
17	1	20,00	x 2900	x 10400	4735	TM	343498	95404-01	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95404-02	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95404-03	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95458-01	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95458-02	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95458-03	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95459-01	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95459-02	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95459-03	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95460-01	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95460-02	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498		

A04 Manufacturer's mark: D H

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

A H B
Inspector's stamp

Date 16.02.10

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

EP 1

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352677-16.02.10

A08/ Manufacturer's order/ A03 Certificate No.: 352601-001

Sheet: 3/...

A05 Established inspecting body: DH

A06 Purchaser: ROSETTI MAR.,RAVENNA A07.1 No.: Z1RP 1709005640 231209

Final receiver: ROSETTI MAR.,RAVENNA A07.2 No.:

B01 Product: HOT ROLLED PLATES

B02/ Steel design.: S460Gl+M

B03 Any suppl. requirements: BR-CDZ3ZZ-MT-SPE-5004:REV.D3
BS-EN10225:01

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness		B10 Width		B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
				MM							
17	1	20,00	x	2900	x	10400	4735	TM	343498	95460-03	ITM 180 1PLATCS20027
17	1	20,00	x	2900	x	10400	4735	TM	343498	95463-01	ITM 180 1PLATCS20027
17	1	20,00	x	2900	x	10400	4735	TM	343498	95463-02	ITM 180 1PLATCS20027
17	1	20,00	x	2900	x	10400	4735	TM	343498	95463-03	ITM 180 1PLATCS20027
17	1	20,00	x	2900	x	10400	4735	TM	343498	95466-01	ITM 180 1PLATCS20027
17	1	20,00	x	2900	x	10400	4735	TM	343498	95466-02	ITM 180 1PLATCS20027
17	1	20,00	x	2900	x	10400	4735	TM	343498	95466-03	ITM 180 1PLATCS20027
**	18						85230				
18	1	20,00	x	2550	x	8000	3203	TM	343498	95474-01	ITM 190 1PLATCS20027
18	1	20,00	x	2550	x	8000	3203	TM	343498	95474-02	ITM 190 1PLATCS20027
18	1	20,00	x	2550	x	8000	3203	TM	343498	95474-03	ITM 190 1PLATCS20027
18	1	20,00	x	2550	x	8000	3203	TM	343498	95474-04	ITM 190 1PLATCS20027
18	1	20,00	x	2550	x	8000	3203	TM	343498	95476-03	ITM 190 1PLATCS20027
**	5						16015				
19	1	20,00	x	2450	x	9200	3539	TM	343498	95360-05	ITM 200 1PLATCS20027
19	1	20,00	x	2450	x	9200	3539	TM	343500	52670-01	ITM 200 1PLATCS20027
19	1	20,00	x	2450	x	9200	3539	TM	343500	52670-02	ITM 200 1PLATCS20027
19	1	20,00	x	2450	x	9200	3539	TM	343500	52670-03	ITM 200 1PLATCS20027
**	4						14156				
20	1	20,00	x	1800	x	8000	2261	TM	343498	95360-02	ITM 210 1PLATCS20027
20	1	20,00	x	1800	x	8000	2261	TM	343499	95347-01	ITM 210 1PLATCS20027
20	1	20,00	x	1800	x	8000	2261	TM	343499	95347-02	ITM 210 1PLATCS20027
20	1	20,00	x	1800	x	8000	2261	TM	343499	95347-03	ITM 210 1PLATCS20027

A04 Manufacturer's mark: D H

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

AHB
Inspector's stamp

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Date 16.02.10

PP 1

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352677-16.02.10

A08/ Manufacturer's order/ A03 Certificate No.: 352801-001

Sheet: 4/...

A05 Established inspecting body: DH

A06 Purchaser: ROSETTI MAR.,RAVENNA A07.1 No. Z1RP 1709005640 231209

First receiver: ROSETTI MAR.,RAVENNA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design.: S460G1+M

B03 Any suppl. requirements: BR-CDZZZZ-MT-SPE-5004:REV.D3
BS-EN10225:01

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness	B10 Width	B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
			MM						
20	1	20,00	x 1800	x 8000	2261	TM	343499	95347-04	ITM 210 1PLATCS20027
20	1	20,00	x 1800	x 8000	2261	TM	343499	95347-05	ITM 210 1PLATCS20027
20	1	20,00	x 1800	x 8000	2261	TM	343499	95347-06	ITM 210 1PLATCS20027
20	1	20,00	x 1800	x 8000	2261	TM	343499	95347-07	ITM 210 1PLATCS20027
20	1	20,00	x 1800	x 8000	2261	TM	343499	95347-08	ITM 210 1PLATCS20027
**	9				20349				
22	1	20,00	x 3040	x 8100	3866	TM	343498	95476-01	ITM 300 1PLATCS20027
22	1	20,00	x 3040	x 8100	3866	TM	343498	95476-02	ITM 300 1PLATCS20027
**	2				7732				
23	1	15,00	x 3000	x 11000	3886	TM	343496	95673-01	ITM 310 1PLATCS15023
23	1	15,00	x 3000	x 11000	3886	TM	343496	95673-02	ITM 310 1PLATCS15023
**	2				7772				
24	1	15,00	x 2150	x 11000	2785	TM	343499	95328-02	ITM 320 1PLATCS15023
24	1	15,00	x 2150	x 11000	2785	TM	343499	95328-03	ITM 320 1PLATCS15023
24	1	15,00	x 2150	x 11000	2785	TM	343499	95328-04	ITM 320 1PLATCS15023
**	3				8355				
***	72				276543	Actual mass: 275504 KG			

B06 Marking of the product

ITEM NO.: 06-07,10-20,22-24
STEEL DESIGNATION S460G1+M
HEAT NO. / TRADEMARK / ROLLED PLATE NO.-TEST NO. / INSPECTOR'S STAMP

A04 D H Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

AHB Inspector's stamp

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Date 16.02.10 PP 1

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillingen.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352677-16.02.10

A08/ A03 Manufacturer's order/ Certificate No.: 352301-001

Sheet: 5/...

A05 Established inspecting body: DH

A06 Purchaser: ROSETTI MAR., RAVENNA A07.1 No. Z1RP 1709005640 231209

Final receiver: ROSETTI MAR., RAVENNA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design.: S460G1+M

B03 Any suppl. requirements: ER-CDZZZZ-MT-SPE-5004:REV.D3
BS-EN10225:01

C10-C29 Tensile test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C10 MPA RP02	C11 RM	C12 A % L0=5D	C13	C14-C15 RP02/RM
06	343497	95540		K4	Q	RT	469	581	27		0,81
10	343497	95541		K4	Q	RT	528	616	25		0,86
12	343497	95541		K4	Q	RT	528	616	25		0,86
13	343496	95650		K4	Q	RT	508	610	28		0,83
14	343496	95565		K4	Q	RT	515	612	26		0,84
14	343496	95614	*	K4	Q	RT	500	603	27		0,83
15	343496	95560		K4	Q	RT	509	609	27		0,84
15	343497	95558		K4	Q	RT	520	620	24		0,84
16	343496	95560		K4	Q	RT	509	609	27		0,84
17	343498	95404		K4	Q	RT	485	608	24		0,80
17	343498	95460		K4	Q	RT	499	617	27		0,81
17	343498	95466		K4	Q	RT	491	610	27		0,80
19	343498	95360		K4	Q	RT	466	595	29		0,78
19	343499	95346	*	K4	Q	RT	482	606	26		0,80
19	343500	62670		K4	Q	RT	481	612	24		0,79
20	343498	95360		K4	Q	RT	466	595	29		0,78
23	343496	95673		K4	Q	RT	537	636	25		0,84
24	343499	95328		K4	Q	RT	543	651	22		0,83

A04 D H Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

AHB Inspector's stamp

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Date 16.02.10 PP 1

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352677-16.02.10

A08/ Manufacturer's order/ A03 Certificate No.: 352801-001

Sheet: 6/...

A05 Established inspecting body: DH

A06 Purchaser: ROSETTI MAR.,RAVENNA A07.1 No. ZIRP 1709005640 231209

Final receiver: ROSETTI MAR.,RAVENNA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design.: S460G1+M

B03 Any suppl. requirements: BR-CDZZZZ-MT-SPE-5004:REV.D3
BS-EN10225:01

C40-C49 Impact test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C41 Width of test piece	C40 Type of test piece	C44 Testing method	C46 Energy Joule	C45	C42 Individual values AV=J			C43 Mean value
06	343497	95540		K4	QO	-40		CHP-V		600	AV	170	200	209	193
				K4	QO	-40		CHP-V	5%-250C-1H	750	AV	112	131	119	121
				K4	QO	-40		CHP-V	5%	600	AV	178	141	183	167
				K4	QO	-40		CHP-V		600	AV	148	172	139	153
10	343497	95541		K4	QO	-40		CHP-V		600	AV	148	172	139	153
12	343497	95541		K4	QO	-40		CHP-V		600	AV	128	190	179	166
13	343496	95650		K4	QO	-40		CHP-V		600	AV	111	128	120	120
14	343496	95565		K4	QO	-40		CHP-V		600	AV	138	118	169	142
14	343496	95614	*	K4	QO	-40		CHP-V		600	AV	175	171	149	165
15	343496	95560		K4	QO	-40		CHP-V	5%-250C-1H	600	AV	124	130	119	124
				K4	QO	-40		CHP-V	5%	600	AV	114	121	108	114
				K4	QO	-40		CHP-V		600	AV	149	133	158	147
15	343497	95558		K4	QO	-40		CHP-V		600	AV	175	171	149	165
16	343496	95560		K4	QO	-40		CHP-V	5%-250C-1H	600	AV	124	130	119	124
				K4	QO	-40		CHP-V	5%	600	AV	114	121	108	114
				K4	QO	-40		CHP-V		600	AV	98	95	89	94
17	343498	95404		K4	QO	-40		CHP-V		600	AV	80	77	83	80
17	343498	95460		K4	QO	-40		CHP-V		600	AV	117	110	100	109
17	343498	95466		K4	QO	-40		CHP-V		600	AV	136	143	103	127
19	343498	95360		K4	QO	-40		CHP-V		600	AV	112	113	129	118
19	343498	95361	*	K4	QO	-40		CHP-V		600	AV	83	92	93	89
19	343499	95346	*	K4	QO	-40		CHP-V		600	AV	89	98	87	91
19	343500	62570		K4	QO	-40		CHP-V		600	AV	136	143	103	127
20	343498	95360		K4	QO	-40		CHP-V	5%-250C-1H	600	AV	64	85	78	76
20	343499	95347													

A04 D H Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

AHB Inspector's stamp

A07 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Date 16.02.10 PP 1

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352677-16.02.10

A08/ Manufacturer's order/ A03 Certificate No.: 352801-001

Sheet: 7/...

A05 Established inspecting body: DH

A06 Purchaser: ROSETTI MAR.,RAVENNA A07.1 No. Z1RP 1709005640 231209

Final receiver: ROSETTI MAR.,RAVENNA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design. S460G1+M

S03 Any suppl. requirements: BR-CDZZZZ-MT-SPE-5004:REV.D3
BS-EN10225:01

C40-C49 Impact test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C41 Width of test piece	C40 Type of test piece	C44 Testing method	C46 Energy Joule	C45	C42 Individual values AV=J			C43 Mean value
20	343499	95347		K4	QO	-40		CHP-V	5%	600	AV	110	104	103	106
23	343496	95673		K4	QO	-40		CHP-V		600	AV	90	87	100	92
24	343499	95328		K4	QO	-40		CHP-V		600	AV	66	63	62	64

C66-C68 Supplementary tests on test samples

ITEM NO.: 06-07,10-20,22-24
DEEP ETCH TESTING AS PER DH-STANDARD <= 2B: SATISFACTORY.

C70-C99 Chemical composition % - Heat analysis

B07.2 Heat	C70	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	AS	SN
343495	Y	0,106	0,491	1,57	0,015	0,0008	0,0049	0,025	0,022	0,040	0,057	0,001	0,027	0,002	0,001
343497	Y	0,110	0,500	1,60	0,013	0,0007	0,0038	0,021	0,012	0,038	0,042	0,002	0,029	0,002	0,001
343498	Y	0,114	0,494	1,56	0,013	0,0006	0,0038	0,016	0,008	0,025	0,041	0,001	0,029	0,002	0,000
343499	Y	0,107	0,496	1,58	0,014	0,0008	0,0044	0,027	0,009	0,042	0,041	0,001	0,029	0,002	0,000
343500	Y	0,105	0,452	1,55	0,013	0,0006	0,0039	0,028	0,015	0,037	0,039	0,001	0,027	0,002	0,000

B07.2 Heat	C70	TI	PB	B	SS	CA	SI	AL-T
343496	Y	0,002	0,001	0,0002	0,0014	0,0028	0,0001	0,035
343497	Y	0,003	0,001	0,0003	0,0012	0,0023	0,0006	0,038
343498	Y	0,003	0,001	0,0002	0,0012	0,0024	0,0001	0,036
343499	Y	0,003	0,001	0,0002	0,0007	0,0021	0,0001	0,036
343500	Y	0,002	0,001	0,0002	0,0006	0,0021	0,0001	0,035

A01

A04 Manufacturer's mark: D H

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

AHB
Inspector's stamp

AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Date 16.02.10 PP 1

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352577-16.02.10

A08/ Manufacturer's order/ A03 Certificate No.: 352601-001 Sheet: 8/...

A05 Established inspecting body: DH

A06 Purchaser: ROSETTI MAR., RAVENNA A07.1 No. Z1RP 1709005640 231209

Final receiver: ROSETTI MAR., RAVENNA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design.: S460G1+M

B03 Any suppl. requirements: BR-CDZZZZ-MT-SPE-5004:REV.D3
BS-EN10225:01

C94 Heat analysis Carbon equivalent / Alloying restrictions

B07.2 Heat													
343496	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,14	FO-A1=	7,14
343497	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,11	FO-A1=	10,00
343498	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,09	FO-A1=	9,47
343499	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,12	FO-A1=	8,18
343500	FO-02=	0,38	FO-31=	0,20	FO-51=	0,03	FO-52=	0,03	FO-55=	0,12	FO-A1=	8,97

C70-C99 Chemical composition % - Product analysis

B07.2 Heat	B07.1 Test No.	C01	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	TI	B
343496	95560	K4	0,104	0,497	1,57	0,014	0,0008	0,0031	0,024	0,022	0,040	0,055	0,001	0,026	0,002	0,0000
343496	95563	K4	0,105	0,495	1,56	0,014	0,0009	0,0040	0,024	0,022	0,041	0,055	0,000	0,027	0,002	0,0001
343496	95614	K4	0,107	0,481	1,56	0,014	0,0008	0,0047	0,024	0,022	0,041	0,057	0,000	0,027	0,002	0,0001
343496	95650	K4	0,105	0,487	1,56	0,014	0,0006	0,0042	0,024	0,021	0,041	0,056	0,000	0,027	0,002	0,0000
343496	95650	K4	0,108	0,491	1,56	0,014	0,0006	0,0044	0,024	0,021	0,041	0,056	0,000	0,027	0,002	0,0000
343497	95539	K4	0,110	0,496	1,57	0,012	0,0005	0,0041	0,020	0,011	0,038	0,040	0,001	0,028	0,003	0,0001
343497	95540	K4	0,108	0,490	1,57	0,011	0,0004	0,0034	0,020	0,010	0,038	0,038	0,001	0,028	0,003	0,0001
343497	95541	K4	0,109	0,490	1,57	0,011	0,0007	0,0039	0,019	0,012	0,038	0,039	0,003	0,028	0,002	0,0000
343497	95558	K4	0,107	0,491	1,55	0,013	0,0006	0,0039	0,023	0,019	0,040	0,052	0,000	0,026	0,002	0,0001
343498	95360	K4	0,106	0,497	1,55	0,013	0,0009	0,0038	0,014	0,008	0,024	0,040	0,002	0,028	0,003	0,0001
343498	95404	K4	0,106	0,500	1,56	0,013	0,0007	0,0041	0,015	0,007	0,023	0,039	0,002	0,027	0,002	0,0000
343498	95460	K4	0,108	0,501	1,56	0,012	0,0008	0,0040	0,016	0,008	0,028	0,039	0,002	0,027	0,003	0,0000
343498	95466	K4	0,108	0,498	1,58	0,011	0,0010	0,0038	0,015	0,010	0,038	0,038	0,002	0,028	0,003	0,0000
343499	95346	K4	0,111	0,488	1,57	0,013	0,0011	0,0040	0,026	0,009	0,042	0,042	0,001	0,029	0,002	0,0001
343499	95347	K4	0,107	0,486	1,55	0,013	0,0010	0,0038	0,023	0,009	0,038	0,041	0,001	0,028	0,002	0,0001
343500	62670	K4	0,105	0,437	1,53	0,012	0,0005	0,0035	0,026	0,015	0,036	0,038	0,001	0,025	0,002	0,0001
343500	62670	K4	0,108	0,442	1,53	0,012	0,0007	0,0034	0,026	0,016	0,036	0,037	0,002	0,025	0,002	0,0001

A04 Manufacturer's mark: D H

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

A01
AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Inspector's stamp

Date 16.02.10 PP 1

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352677-16.02.10

A08/ A03 Manufacturer's order/ Certificate No.: 352601-001 Sheet: 9/...

A05 Established inspecting body: DH

A06 Purchaser: ROSETTI MAR.,RAVENNA A07.1 No. ZIRP 1709005640 231209

Final receiver: ROSETTI MAR.,RAVENNA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design.: S460G1+M

B03 Any suppl. requirements: BR-CDZZZZ-MT-SPE-5004:REV.D3
BS-EN10225:01

C70-C99 Chemical composition % - Product analysis

B07.2 Heat	B07.1 Test No.	C01	AL-T
343496	95560	K4	0,035
343496	95565	K4	0,035
343496	95614	K4	0,032
343496	95650	K4	0,034
343496	95650	K4	0,034
343497	95539	K4	0,037
343497	95540	K4	0,036
343497	95541	K4	0,035
343497	95558	K4	0,035
343498	95360	K4	0,034
343498	95404	K4	0,034
343498	95460	K4	0,034
343498	95466	K4	0,034
343499	95346	K4	0,035
343499	95347	K4	0,036
343500	62670	K4	0,035
343500	62670	K4	0,034

C94 Product analysis Carbon equivalent / Alloying restrictions

B07.2 Heat	B07.1 Test No.	C01											
343496	95560	K4	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,14	FO-A1= 11,29
343496	95565	K4	FO-02=	0,38	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,14	FO-A1= 8,75
343496	95614	K4	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,14	FO-A1= 6,81
343496	95650	K4	FO-02=	0,38	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,14	FO-A1= 8,10
343496	95650	K4	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,14	FO-A1= 7,73

A04 Manufacturer's mark: D H

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

AHB
Inspector's stamp

Date 16.02.10 PP 1

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352677-15.02.10

A08/ Manufacturer's order/ A03 Certificate No.: 352801-001 Sheet: 10/...

A05 Established inspecting body: DH

A06 Purchaser: ROSETTI MAR.,RAVENNA A07.1 No. Z1RP 1709005640 231209

Final receiver: ROSETTI MAR.,RAVENNA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design.: S460G1+M

B03 Any suppl. requirements: BR-CDZZZZ-MT-SPE-5004:REV.D3
BS-EN10225:01

C94 Product analysis Carbon equivalent / Alloying restrictions

B07.2 Heat	B07.1 Test No.	C01											
343497	95539	K4	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,11	FO-Al= 9,02
343497	95540	K4	FO-02=	0,38	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,11	FO-Al= 10,59
343497	95541	K4	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,11	FO-Al= 8,97
343497	95558	K4	FO-02=	0,38	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,13	FO-Al= 8,97
343498	95360	K4	FO-02=	0,38	FO-31=	0,20	FO-51=	0,03	FO-52=	0,03	FO-55=	0,09	FO-Al= 8,95
343498	95404	K4	FO-02=	0,38	FO-31=	0,20	FO-51=	0,03	FO-52=	0,03	FO-55=	0,08	FO-Al= 8,29
343498	95460	K4	FO-02=	0,38	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,09	FO-Al= 8,50
343498	95466	K4	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,11	FO-Al= 8,95
343499	95346	K4	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,12	FO-Al= 8,75
343499	95347	K4	FO-02=	0,38	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,11	FO-Al= 9,47
343500	62670	K4	FO-02=	0,37	FO-31=	0,20	FO-51=	0,03	FO-52=	0,03	FO-55=	0,12	FO-Al= 10,00
343500	62670	K4	FO-02=	0,38	FO-31=	0,20	FO-51=	0,03	FO-52=	0,03	FO-55=	0,12	FO-Al= 10,00

C94 Carbon equivalent formula / Alloying restrictions

FO-02 = C+(MN/6)+(CR+MO+V)/5+(NI+CU)/15
FO-31 = C+SI/30+(MN+CR+CU)/20+MO/15+V/10+NI/60+5B
FO-51 = V +NB
FO-52 = V +NB+TI
FO-55 = CU+MO+NI+CR
FO-Al = AT/N

A04 Manufacturer's mark: DH

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

AHB
Inspector's stamp

Date 16.02.10 PP 1

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 - AS PER ISO 10474:1991 MATERIAL TEST REPORT (MTR)	A10 Advice of dispatch No./ Date of dispatch 352677-16.02.10	A09/ Manufacturer's order/ A03 Certificate No. 352801-001	Sheet 11

A05 Established inspecting body DH	A06 Purchaser ROSETTI MAR.,RAVENNA A07.1 No. Z1RP 1709005640 231209 Final receiver ROSETTI MAR.,RAVENNA A07.2 No.	B01 Product HOT ROLLED PLATES

B02/ Steel design. S450G1+M
B03 Any suppl. requirements BR-CDZZZZ-MT-SPE-5004:REV.D3
BS-EN10225:01

D01 Marking and identification, surface appearance, shape and dimensional properties

ITEM NO.: 06-07,10-20,22-24
RESULT OF MARKING, SURFACE, SHAPE AND DIMENSIONS: NO REMARKS

SURFACE	AS PER EN-10225
THICKNESS	AS PER EN-10029-A
LENGTH AND WIDTH	AS PER EN-10029
FLATNESS	AS PER EN-10029-TSL

D02 Non-destructive tests - Ultrasonic testing

ITEM NO.: 06-07,10-20,22-24
UT-SPECIFICATION : EN-10160 CLASS S0 AND E1
SCANNING PLAN BODY : LONGITUDINALLY SCAN LINES SPACING 100 MM
EDGES : 100 MM
PERSONNEL QUALIFICATION : LEVEL 2 IN ACCORDANCE TO EN 473
THE TEST RESULTS MEET THE REQUIREMENTS OF THE ORDER.

A04 D H Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

AHB
Inspector's stamp

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Date 16.02.10 PP 1

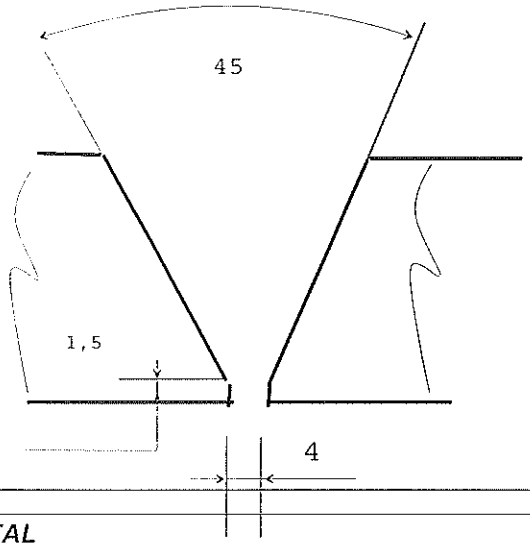
ROSETTI MARINO SPA	PQR N°	45B/10
PROCEDURE QUALIFICATION RECORD	Sheet: 1	Of: 2
	Prepared by: SS	Date:25/06/2010

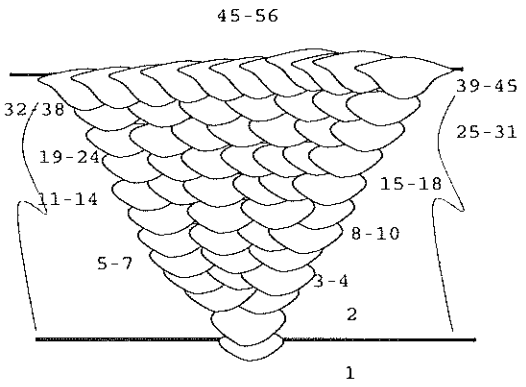
COMPANY NAME: ROSETTI MARINO SPA

WPS N° 45B/10 DATE: 25/05/2010

WELDING PROCESS(ES): GTAW+FCAW

TYPES: MANUAL + SEMIAUTOMATIC





BASE METAL

Material Specification: EN 10225
Type or grade: S460G1+M (thermomechanical)

Thickness of Test Coupon: t= 40 mm
Diameter of Test Coupon: ∅= /
Base metal maker DILLINGER HÜTTE
Base metal heat No. 343497-95540-02
CEQ: 0,38

FILLER METALS

	GTAW	FCAW
SFA Specification	5.18	5.29
AWS Classification	ER70S-6	ER81T1-Ni1
Filler Metal F-No	6	6
Weld Metal Analysis A-No.	1	10
Size of Filler Metal	∅2,4	∅1,2

Other: Wire GTAW: ESAB OK Tigrod 12.64 Heat PV9050446883
Wire FCAW: ESAB OK Tubrod 15.64 Heat PN950036

Deposited Weld Metal *2 mm* *38* mm

POSITION

Position of Groove 2G

Weld progression (Uphill, Downhill) N.A.
Other *NONE*

PREHEAT

Preheat temperature: 100°
Interpass temperature: 200°
OTHER: *NONE*

POSTWELD HEAT TREATMENT

Temperature: N.A.
Time: N.A.
Other N.A.

GAS

	Gas(es)	Percent composition (Mixture)	Flow rate
Shielding	Ar	99,9	10
Shielding	Ar+CO2	80-20	20
Backing	N.A.		

ELECTRICAL CHARACTERISTICS

Current DC
Polarity DP/RP
Amps. GTAW: 140 *Volts* 12
FCAW: 160÷190 24÷26

Tungsten Electrode Size 2,4 mm
HEAT INPUT: GTAW: 1,68 Kj/mm
FCAW: 1.08÷1,73 Kj/mm

TECHNIQUE

Travel speed GTAW: 60 mm/1'
FCAW: 180÷270 mm/1'
String or Weave Bead STRING
Oscillation N.A.
Multipass or single pass MULTIPASS
Single or multiple electrodes SINGLE
Stick-Out Length: FCAW 15
Orifice of gas cup size 3/8" - ½"
wire feed speed range Self controlled by current
Other

S. SOLMI I EWT-30416 EWF EUROPEAN WELDING TECHNOLOGIST

ROSETTI MARINO SPA	PQR N°	45B/10
PROCEDURE QUALIFICATION RECORD	Sheet: 2	Of: 2
	Prepared by: SS	Date: 25/06/2010

TENSILE TEST

SPECIMEN No.	WIDTH (mm)	THICKNESS (mm)	AREA (mm^2)	ULTIMATE TOTAL LOAD (N)	ULTIMATE UNIT STRESS N/mm2	TYPE OF FAILURE & LOCATION
TT1	25.0	39,0	975	585000	600	DUCTILE (FAILURE OUT OF WELD)
TT2	25.0	39,2	980	584080	596	DUCTILE (FAILURE OUT OF WELD)

ALL WELD METAL TENSILE TEST	AREA	YIELD LOAD (Rp 0,2%)	ULTIMATE LOAD	YIELD UNIT STRESS	ULTIMATE UNIT STRESS	ELONGATION
TWL (from 24A/10)		671		725		26,7

GUIDED BEND TEST

TYPE & FIGURE No.	RESULT
N.A.	/

TOUGHNESS TESTS

SPECIMEN No.	NOTCH LOCATION	NOTCH TYPE	TEST TEMP.	Individual values	average	LATERAL EXP.		DROP WEIGHT	
						% SHEAR	MILS	BREAK	No. BREAK
10X10x55	WELD METAL (cap)	KV	-40°C	141-113-134	129	/		/	
10X10x55	FUSION LINE (cap)	KV	-40°C	122-168-156	149	/		/	
10X10x55	FUSION LINE +2 (cap)	KV	-40°C	183-208-182	191	/		/	
10X10x55	FUSION LINE +5 (cap)	KV	-40°C	174-150-197	174	/		/	
10X10x55	WELD METAL (root)	KV	-40°C	131-131-111	124	/		/	
10X10x55	FUSION LINE (root)	KV	-40°C	170-133-102	135	/		/	
10X10x55	FUSION LINE +2 (root)	KV	-40°C	215-195-205	205	/		/	

FILLET WELD

Result – Satisfactory; Yes N.A. No. N.A. Penetration into Parent Metal; Yes N.A. No. N.A.

Macro – Results N.A.

OTHER TESTS

Type of test **VISUAL EXAMINATION TEST:**..... ACCEPTABLE

ULTRASONIC EXAMINATION TEST:..... ACCEPTABLE, see CONTROL Certificate No. 45B/10

MACROGRAPHIC EXAMINATION:..... SATISFACTORY see EXOVA certificate No. 156428 dated 24/06/2010

Deposit Analysis N.A.

Other **Hardness** HV 10 **Base Metal:** 190÷193 HV **Heat Affected Zone** 180÷317 HV **Weld Metal** 168÷222 HV

Welder's Name Chisota V. Petre Clock No. Stamp No.

Test conducted by **EXOVA** Laboratory Test No. 156428 dated 24/06/2010

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of EEMUA 158 Ed.1994 Reprinted 2005.

Date: 25/06/2010 Manufacturer By:

RINA Genova Sampierdarena

EWF EUROPEAN WELDING TECHNOLOGIST S. SOLMI I.EWT.30416

ROSETTI MARINO S.p.A

Exova Srl
Via della Pierina 9/11
26013 Crema (CR)
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Test report n° 156428 **Rev.0**
EN 10204, type : 3.2

Mrs
Cod. 1737

ROSETTI MARINO S.P.A
VIA TRIESTE, 230
48100 RAVENNA RA
Italy

Your ref.	Order n.	D.D.T. n. 1vts100525	data	09/06/2010
Our ref.	Report n.	**156428**	data	**24/06/2010**
	Job n.	50219	data	10/06/2010

Remarks Job No. 110A20
Test 45B/10 GTAW + FCAW pos.2G
Dimensions : 40mm

Project Jasmine Jacket

Client Reference EEMUA 158:1994 (Reprinted 2005) & Client's Request

Test standard UNI EN 895:1997 - UNI EN ISO 6892-1:2009 - UNI EN 875:1997 - UNI EN 10045-1:1992 - UNI EN ISO 6507-1:2006

This Report is made of n° 5 pages including this cover plus the following pages

Test	Pag.
(*) Macrographic examination	1
Hardness test	1
Tensile test	1
Impact test	1

This Report (RPR) contains tests results on the following materials

Ref.	Identification	Material	DN / Thk [mm]	Remarks
98014	PQR 45B/10	EN 10225 S460G1+Norsok M120		

Laboratory Manager | Customer | Inspector | Inspector

Exova s.r.l.

ROSETTI MARINO S.p.A.
Responsabile Saldatura
Welding Engineer
S. Solmi

RINA S.p.A.
A. Landi

General conditions:
1. The Customer accepts general conditions and prices fixed by the laboratory to perform the tests.
2. Test results will be communicated only by means of test report except for different contractual agreement.
3. Tests sample will be destroyed 10 days after test except for different written Client request.
4. The spare will be destroyed 90 days after date of receipt for different written Client request.
5. The test results described in the following test report are referring only to the sample mentioned in it.
6. The date of material receivement is the same as the date of job opening. The date of testing is the same as the date of test report, except for different info.
7. If not specified the test is performed on material as received.

This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory

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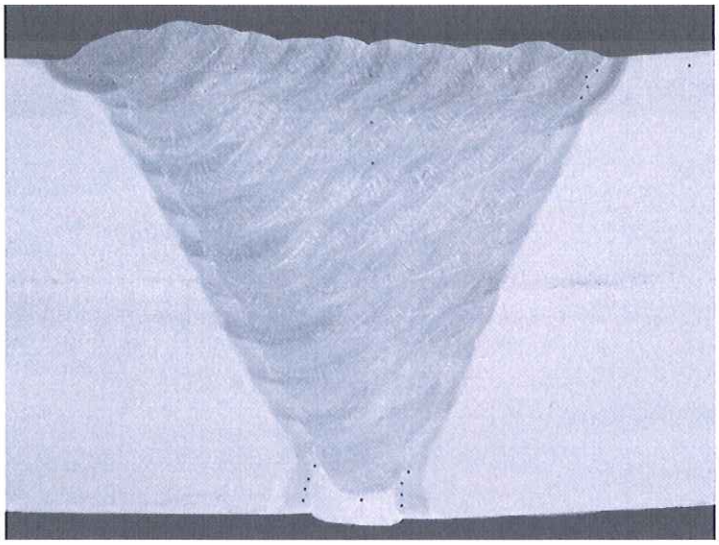
Test report n° 156428 Rev.0

Equipment n.	PHOTOGRAPHIC DOCUMENTATION	Pag. 1 of 1
1005		

Test Ref.	
Laboratory	Client
014.FO01.1	45B/10

Etching : NITAL 3%

Magnification : x 1.5



45B/10

M1

Comments The macrographic examination at 25x of the weld relevant to the subject welding procedure test has shown no defects.

Standard ref. EEMUA 158:1994 (Reprinted 2005) & Client's Request

Remarks

Operator	Customer	Inspector	Inspector
Exova S.r.l.	ROSETTI MARINO S.p.A. Responsabile saldatura Welding Engineer	RINA S.p.A. A. Landi	

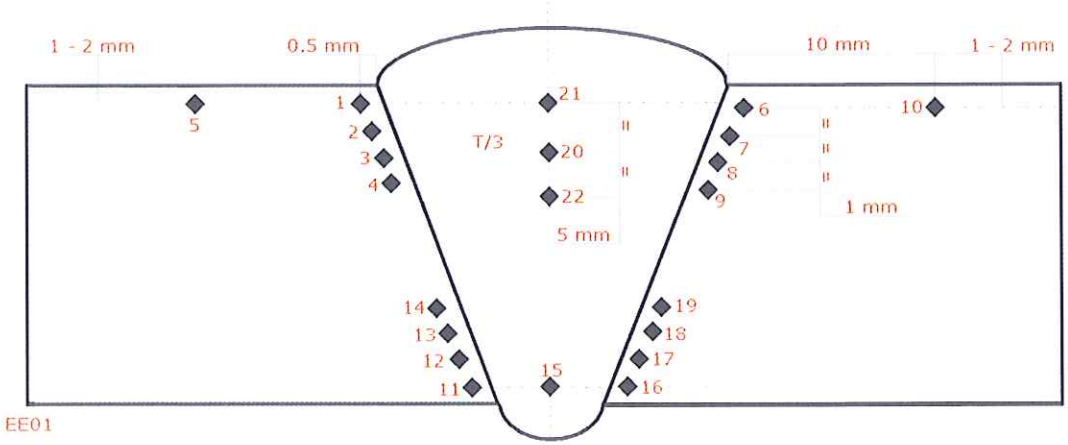
This page is binded to references n. *156428 (job 50219)* *whose details are indicated on the cover*

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Test report n° 156428 Rev.0

Equipment n.	HARDNESS TEST	Pag. 1 of 1
1311	Internal procedure POI-07	



45B/10
M1

HV 10		HV 10		-		-		-	
Point #	Value	Point #	Value	Point #	Value	Point #	Value	Point #	Value
#1 Max	317	#21	222	-	-	-	-	-	-
#2	312	#22	217	-	-	-	-	-	-
#3	305	-	-	-	-	-	-	-	-
#4	258	-	-	-	-	-	-	-	-
#5	190	-	-	-	-	-	-	-	-
#6	287	-	-	-	-	-	-	-	-
#7	254	-	-	-	-	-	-	-	-
#8	248	-	-	-	-	-	-	-	-
#9	258	-	-	-	-	-	-	-	-
#10	193	-	-	-	-	-	-	-	-
#11	199	-	-	-	-	-	-	-	-
#12	202	-	-	-	-	-	-	-	-
#13	170	-	-	-	-	-	-	-	-
#14	197	-	-	-	-	-	-	-	-
#15	168	-	-	-	-	-	-	-	-
#16	205	-	-	-	-	-	-	-	-
#17	196	-	-	-	-	-	-	-	-
#18	180	-	-	-	-	-	-	-	-
#19	211	-	-	-	-	-	-	-	-
#20	217	-	-	-	-	-	-	-	-

Standard ref. EEMUA 158:1994 (Reprinted 2005) & Client's Request - UNI EN ISO 6507-1:2006

Remarks

Operator	Customer	Inspector	Inspector
Exova S.r.l.	ROSETTI MARINO S.p.A. Responsabile saldatura Welding Engineer S. Solmi	RINA S.p.A. A. Landi	

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Test report n° 156428 Rev.0

Equipment n. 1153

TENSILE TEST

Internal procedure POI-01

Richiesti *Required*													550÷700					

Test *Ref.*		T *Test*	Posizione *Position*	Dimensioni *Dimensions*			Lo	Re	Rp0.2%	Rp0.5%	Rt0.2%	Rt0.35%	Rt0.5%	E	Rm	A	Z	Rif. *Ref.*
Lab.	Client	°C		mm			mm	N/mm²	N/mm²	N/mm²	N/mm²	N/mm²	N/mm²		N/mm²	%	%	
014.TR1.01	45B/10	+20	T Weld	25.00	x	39.00		-	-	-	-	-	-		600	-		#
014.TR1.02	45B/10	+20	T Weld	25.00	x	39.20		-	-	-	-	-	-		596	-		#

Standard ref. EEMUA 158:1994 (Reprinted 2005) & Client's Request - UNI EN 895:1997 - UNI EN ISO 6892-1:2009

Remarks # Broken out of weld

If not specified the test considered proportional type

Operator	Customer	Inspector	Inspector
Exova S.r.l.	ROSETTI MARINO S.p.A. Responsabile saldatura Welding Engineer	RINA S.p.A. A. Landi	

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Test report n° 156428 Rev.0

Equipment n. 814

IMPACT TEST

Internal procedure POI-02

Nominal machine energy : 450J

Test Ref. Lab.	Test Ref. Client	T Test °C	Posizione Position	Dimensioni Dimensions mm			Intaglio Notch	Richiesti Required	A Single Valore Value J	A Single Shear %	A Single Lateral E.	B Single Valore Value J	B Single Shear %	B Single Lateral E.	C Single Valore Value J	C Single Shear %	C Single Lateral E.	Media Average J	Rif. Ref.
									32			32			32			45	
014.RE2.01	45B/10	-40	WM(2mm cap)	10	x	10.00	KV		141			113			134			129	
014.RE2.02	45B/10	-40	FL(2mm cap)	10	x	10.00	KV		122			168			156			149	
014.RE2.03	45B/10	-40	FL+2(2mm cap)	10	x	10.00	KV		183			208			182			191	
014.RE2.04	45B/10	-40	FL+5(2mm cap)	10	x	10.00	KV		174			150			197			174	
014.RE2.05	45B/10	-40	WM(2mm Root)	10	x	10.00	KV		131			131			111			124	
014.RE2.06	45B/10	-40	FL(2mm Root)	10	x	10.00	KV		170			133			102			135	
014.RE2.07	45B/10	-40	FL+2(2mm Root)	10	x	10.00	KV		215			195			205			205	

Standard ref. EEMUA 158:1994 (Reprinted 2005) & Client's Request - UNI EN 875:1997 - UNI EN 10045-1:1992

Remarks

Operator	Customer	Inspector	Inspector
EXOVA S.r.l.	ROSETTI MARINO S.p.A. Responsabile saldatura Welding Engineer	RINA S.p.A. A. Landi	

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ROSETTI MARINO

TABELLA DI SALDATURA
Welding sheet

WPS N.	Pwps 45B-10	Posizione Position	2G

Tipo di saldatura Welding Process	GTAW+FCAW	Cliente Client	CONOCO PHILLIPS
Elettrodo Electrode		Commessa Job	110A20 — Jacket Jasmine
Flux Flusso		Materiale base Base material	Plate 40 mm, EN 10225 S460 heat 343497 plate 95540-02

	Gas Gas (es)	Miscela Mixture	Portata Flow Rate
Protezione/Shielding	Ar	99,9	12
Protezione/Shielding	Ar+CO2	80-20	18
Al rovescio/Backing	N.A.	N.A.	N.A.

Saldatore/Operatore: Welder Name/Welding Operator: **Chisota V. Petre**

Prerisc: Preheat: **100°C** — Temp. Max. interpass: **200°C**

Filo / Wire: **ESAB Tigrod 12.64 heat PV905046883 ESAB**
OK Tubrod 15.17 heat PN950036

RAVENNA **31/05/2010**

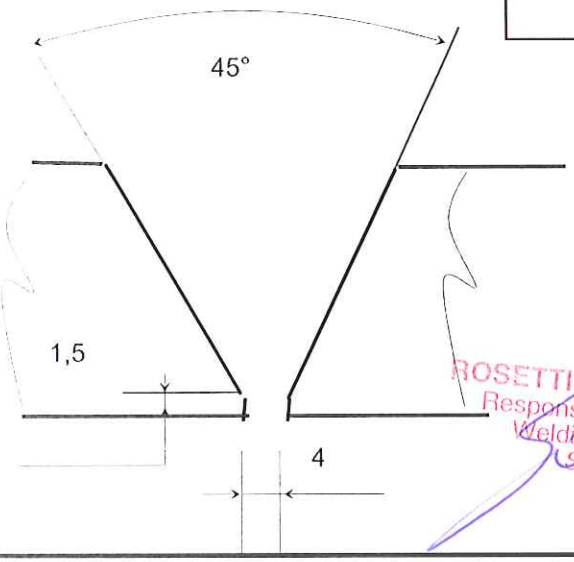
Corrente AC o DC / Current AC or DC: **DC**

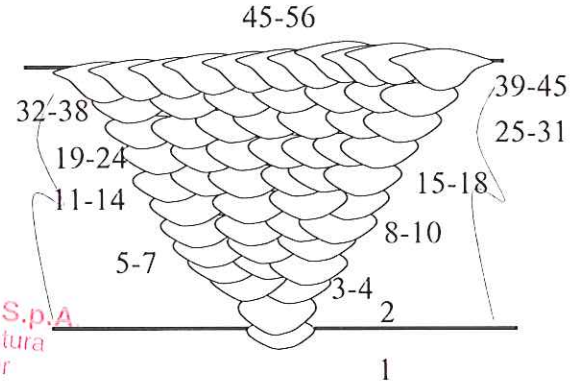
Polarità / Polarity: **DP/RP**

TEST 45B-10

Preparazione / Joint Design: See details

Pass. N. Pass N.	Proced. Process	Elettr. Electr.	Ampere Amps	Volts Volts	Vel.mm/1 Trav.Sp.	H.I. KJ/mm
1	GTAW	2,4	140	12	60	1,68
2	FCAW	1,2	200	26	180	1,73
3-4	FCAW	1,2	200	26	240	1,30
5-7	FCAW	1,2	200	25	250	1,20
8-10	FCAW	1,2	200	25	280	1,07
11-14	FCAW	1,2	200	26	280	1,11
15-18	FCAW	1,2	200	26	280	1,11
19-24	FCAW	1,2	200	26	270	1,16
25-31	FCAW	1,2	200	26	270	1,16
32-38	FCAW	1,2	200	26	270	1,16
39-45	FCAW	1,2	200	26	270	1,16
46-56	FCAW	1,2	180	25	250	1,08





RINA G. Corsini

ROSETTI MARINO S.p.A. Responsabile saldatura Welding Engineer S. Solmi

ROSETTI MARINO

PROCEDURA DI SALDATURA (in accordo EEMUA 158)
Welding Procedure Specification (according EEMUA 158)

WPS N°:	45B/10
PQR ref.:	45B/10 to qualify
REV.:	0
Data /date	25-05-2010

Procedimento di saldatura / Welding process: GTAW + GS FCAW — Tipo / Type: MANUAL + SEMIAUTOMATIC

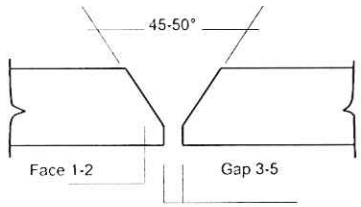
GIUNTO – JOINT (QW-402)

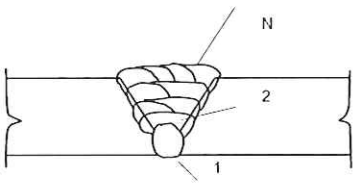
Tipo di giunto / Joint Design: V

Supporto / Backing: ☒ Si / Yes Only for second and other passes ☒ No Only for first pass

Materiale di supporto (tipo) / Backing material (type): ☒ Metallico / Metal ☐ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:





MATERIALE BASE – BASE MATERIAL (QW-403)

Da / from P-N°: NA — Group N°: 3 (as per EN 10225) — A / to P-N°: NA — Group N° 3 (as per EN 10225)

Da Tipo e grado / From type and grade: EN 10225 S460G1+M (heat number 343497 Ceq 0,38)

A Tipo e grado / To type and grade: EN 10225 S460G1+M (heat number 343497 Ceq 0,38)

Gamma spessori / Thickness range:
- ► Materiale base / Base material: Piena penetrazione / Groove 40 mm. Range 20 to 60
- ► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove > 600 mm

METALLO D'APPORTO – FILLER METAL (QW-404)

	GS FCAW	GTAW
Spec. N° (SFA)	5.29	5.18
AWS N° (CLASS)	E81T1-Ni1	ER 70S-6
F-N°	6	6
A-N°	10	1
Diametro mat. d'apporto / Size of filler metal	1,2	2,4
Metallo depositato / Deposit weld metal		
Gamma spessori /Thick. range Piena penetrazione / Groov	38 mm	2
Accoppiamento filo-flusso / Electrode-flux (CLASS)	N.A.	N.A.
Denom. Comm. flusso / FLUX trade name	N.A.	N.A.
Inserto consumabile / Consumable insert	N.A.	N.A.
Altro / other	WIRE: ESAB Tubrod 15.17	WIRE: ESAB OK Tigrod 12.64

POSIZIONI – POSITION (QW 405)

Posizione del giunto / Joint position: Cianfrino / groove — Posizione / position 2G — Progressione / weld progression: N.A.

PRERISCALDO – PRE-HEAT (QW406)

Temp.preriscaldo minima / Min. pre-heat temp: 100 °C — Max temp. Di interpass / Max interpass temp.: 200°C — Mantenimento postriscaldo / Postheat maintenance: N.A. — Tempo di mantenimento posriscaldo. / Postheat time: NA

TRATTAMENTO TERMICO DOPO SALDATURA – POST WELD HEAT TREATMENT(QW 407)

Riscaldamento / Heating rate (°C/Hrs): NA — Temperatura di stasi / Holding temperature °C: NA — Tempo di stasi / Holding time (min.): NA — Velocità di raffreddamento / Cooling rate (°C/Hrs): NA

GAS DI PROTEZIONE – GAS (QW 408)

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar Ar+CO2	99,9 80-20 %	10-12 16-20 lt/min.
Protezione al seguito / Trailing:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS (QW –409)

Corrente / Current: DC — Polarità / Polarity: DP-RP

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: EWTh2 dia.2,4mm

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: Spray arc

Velocità alimentazione filo / Electr. Wire feed speed range: Self controlled

TECNICA – TECHNIQUE (QW-410)

Passata / Bead: Tirata/String — Dimensione bocchello gas / Orifice of gas cup size: 3/8" 1/2" — Pulizia iniziale e fra le passate / Initial and interpass cleaning: Spazzolatura e Molatura/Brushing Grinding

Metodo di solcatura a rovescio / Method of back gouging: N.A. — Oscillazione / Oscillation: N.A. — Distanza tra zona di contatto e pezzo / Contact zone to work distance: 15-20

N°Passate / Passes nr.: Multipla/Multiple — Elettrodo multiplo o singolo / Multiple or single electrodes: Singolo/Single — Martellatura / Peening: N.A.

Altro / Other: None

N° Passate Weld layers nr.	Processo Process	Materiale d'apporto Filler metal		Corrente Current		Voltaggio Volt range	Vel. avanzamento Travel speed range (mm/min)	Apporto termico Heat Input (KJ/mm)
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. range			
1	GTAW	ER 70S-6	2,4	DP	130-150	12-14	60 ÷ 70	1,6-2,5
2-3	GS-FCAW	E81T1-Ni1	1,2	RP	180-200	24-26	200 ÷ 230	1,1- 1,5
Filling	GS-FCAW	E81T1-Ni1	1,2	RP	190-210	24-26	240 ÷ 270	1,0- 1,4

Preparato da / prepared by: A.KARIM

Approvato da / approved by: S.SOLMI

ROSETTI MARINO	UT N°: UT 45B/10	
RAPPORTO D'ESAME CON ULTRASUONI *Ultrasonic Examination Report*	DATA - Date 03/06/10	FOGLIO - Sheet 1 / 1

CLIENTE - Customer	ORDINE - Order	PROGETTO – Project	COMMESSA - Job
CONOCO PHILIPS	/	JASMINE JACKET	110A20
OGGETTO - Object	**DISEGNO - Dwg**	**P.F.C. / Q.C.P.**	**FASE - Step**
PQR 45B/10	/	/	/

MATERIAL Materiale	EN 10225 460G2	DIAMETER Diameter	PLATE	THICKNESS Spessore	40 mm
SURFACE CONDTION Stato Superficiale	AS WELDED	Couplant Liquido di accoppiamento	GLUE		
EQUIPMENT Apparecchio	PANAMETRICS	TYPE Tipo	EPOCH 4	CONTROL TECHNIQUE Tecnica di Controllo	CONTACT REFLECTION

TRASDUTTORE Search unit	TIPO Type	FREQ. Frequency (MHz)	SEZIONE Size (mm)	ANGOLO Angle	ONDE Waves
KRAUTKRAMER	MWB	2	14 x 14	45°-60°-70°	SHEAR

BLOCCO CAMPIONE: IIW-V1 TARATURA DELLA SCALA: ON DISTANCE
Reference Block Scale calibration

SENSIBILITA' DI TARATURA: DAC ON HOLES Φ 3 mm
Calibration sensitivity

NOTE - Remarks	TECNICO I LIVELLO Level I Technician
TEST PERFORMED ON PQR 45B/10 AT 100%	

RISULTATI - Results		PROCEDURA DI CONTROLLO Application Procedure
	[X] CONFORME According to Spec.	110A20-QC-PRO-004
	[ ] NON CONFORME Non conforming to Spec.	

TECNICO II° LIVELLO Level II° Technician	C. QUALITA' Q. Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
M.COMANDINI II level MT-PT-UT	ROSETTI M. S.p.A. controllo qualità quality control		

ROSETTI MARINO

MT N°: MT 45B/10

RAPPORTO D'ESAME MAGNETOSCOPICO
Magnetic Particle Examination Report

DATA - Date: 03/06/10

FOGLIO - Sheet: 1/1

CLIENTE - Customer	ORDINE - Order	PROGETTO - Project	COMMESSA - Job
CONOCO PHILIPS	/	JASMINE JACKET	110A20
OGGETTO - Object	**DISEGNO - Dwg**	**P.F.C. / Q.C.P.**	**FASE - Step**
PQR 45B/10	/	/	/

STATO SUPERFICIE - Surface Condition

- [x] COME SALDATO / As Welded
- [x] SPAZZOLATO / Brushed
- [ ] GREZZO / As Forged
- [ ] COME CALANDRATO / As Rolled
- [ ] MOLATO / Ground
- [ ] COME LAMINATO / As Rolled
- [ ] LAVORATO DI MAC. / Machined
- [ ] _____

- [ ] PUNTALI / Prods
- [x] GIOCO / Yoke
- [ ] BOBINA / Coil
- [ ] CONDUTTORE CENTRALE / Central Conductor

CORRENTE: _____ A.C. _____ / Current

INTENSITA': _____ / _____ / Intensity

DISTANZA: _____ **200 mm** _____ / Spacing

TIPO APPARECCHIO: _____ **CGM TWIST YOKE Matr. 6699** / Flow Detector

- [ ] SECCO / Dry
- [x] UMIDO / Wet
- [ ] FLUORESCENTE / Fluorescent

- [x] POLVERE / Powder
- [ ] GRIGIA / Grey
- [x] NERA / Black
- [ ] ROSSA / Red

MARCA: _____ **CGM** _____ / Trade

TIPO: _____ **LK 35** _____ / Type

NOTE - Remarks

TEST PERFORMED ON PQR 45B-10 AT 100%

TECNICO I LIVELLO / Level I Technician

RISULTATI - Results

- [x] CONFORME / According to Spec.
- [ ] NON CONFORME / Non conforming to Spec.

PROCEDURA DI CONTROLLO / Application Procedure

110A20-QC-PRO-005

TECNICO II° LIVELLO / Level II° Technician	C. QUALITA' / Q. Control	ISPETTORE CLIENTE / Company Repr.	ISPETTORE A.I. / Inspection Agency
M.COMANDINI II level MT-PT-UT	ROSETTI M. S.p.A. controllo qualità quality control		

Inspection certificate 3.1 – EN 10204

ESAB Saldatura SpA

CERTIFICAZIONE
CERTIFICATION

Nº 09055

Ns. rif. / Our ref

Ns. ordine / Our order
230697 date 06/02/2009

Vs.Ordine n°/Your order N°
19/2009 date 06/02/2009

Cliente/ Customer
TECHNO SERVICE S.r.l.
Via DELLA MERENDA 32 FORN. ZARAT
48100 RAVENNA (RA)

Pos. No.	Codice/Item No.	Descrizione/description	Lotto/Lot	Quantity
1	120424R150	Wire OK TIGROD 12.64 dia.2,4x1000	PV905046883	20,0 Kg

Analisi / Analysis

	C	Mn	Si	P	S	Mo	Ni	Cr	Cu	V	Nb
Metallo d'apporto All weld metal	0,077	1,63	0,83	0,020	0,010	0,002	0,01	0,06	0,069	0,001	0,004

Trazione/Tensile test. **AS WELDED**

	R_p 0,2 N/mm²	R_{et} N/mm²	R_{eH} N/mm²	R_m N/mm²	A4 %
Metallo d'apporto All weld metal	500			639	32

Resilienza/Impact test KV **AS WELDED**

	Temp. °C	Media/Average J	J
Metallo d'apporto All weld metal	- 40	71,6	70,9 – 71,5 – 72,5

Test addizionali/Additional tests.
NONE

Noteremarks
Il prodotto è conforme alle norme / This welding consumable conforms to:
Customer order
Classificazione
AWS SFA5 :8 ER70S-6

Mezzo, 07/04/2009

Assicurazione Qualità
QA Department
M. Gherardi

ESAB SALDATURA SPA
M. GHERARDI
QA MANAGER

Certificazione - Certification
Confermiamo che i sopraelencati materiali sono conformi ai requisiti dell'ordine e forniti in accordo col ns. Sistema di Qualità approvato secondo UNI EN ISO 9001 e che i valori riportati sono stati verificati in accordo a quanto stabilito dalla vendita

We hereby certify that the above stated products conform to the sales contract and are supplied in accordance with our Quality System approved to UNI EN ISO 9001 and that the goods, with indicated results have been tested according to the provisions in the sales contract

20010 MEZZERO (MI)
Via Mattei, 24 - tel. 02 97968 1
[illegible]

Amministrazione: Fax 02 9787065
Divisione materiali d'apporto: Fax 02 97289300
Divisione impianti: Fax 02 97289181
Assistenza tecnica impianti: Fax 02 9789140
Produzione: Fax 02 97289950

Codice Fiscale / Partita IVA 00775990153
Capitale Sociale € 6.404.600,00 i.v.
Sede Leg. Via Monte Rosa, 60 - Milano
Reg. Imp. Milano REA 236795
N. Registro AEE IT08020000001273

ATTESTATO DI CONTROLLO/ TEST REPORT

In accordo a/acc to EN 10204 - 2.2

Data/Date: 2010-04-09

Numero certificato/Cert no: EC21568159 rev. 0

Nostro ordine/Our order:
Nostro riferimento/Our ref:
Codice Cliente/Cust no: NA
Data ordine Cliente/Your date:

Vostro ordine/Your order:
Vostro riferimento/Your ref:
Vostro numero fax/Your fax:
Vostra e-mail/Your e-mail:

Indirizzo di fatturazione/Invoice address
ROSETTI MARINO SPA
VIA TRIESTE 230
48100 RAVENNA
RA

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
ROSETTI MARINO SPA
VIA TRIESTE 230
48100 RAVENNA
RA

CONSEGNA/DELIVERY Numero di lotto/Lot no: PN950036 Quantità/Quantity:

PRODOTTO/PRODUCT

Marchio/Brand: ESAB
Descrizione/Desc: OK Tubrod 15.17 1.2mm 16kg
Codice/Item no: 1517127730

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.29	E81T1-Ni1M
EN ISO 17632-A	T 46 3 1Ni P C 2 H5
EN ISO 17632-A	T 46 4 1Ni P M 2 H5

CARATTERISTICHE MECCANICHE/MECHANICAL PROPS

Norma/Standard: EN
Altro/Auxiliary: M21 (EN ISO 14175)
Condizione/Condition: As welded

TRAZIONE/TENSILE

Rel	Rm	A5
544 MPa	613 MPa	26 %

RESILIENZA/IMPACT

Temp	KV
-40 °C	124 J

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

All weld metal
Altro/Auxiliary: M21 (EN ISO 14175)

C	0.05%
Si	0.34%
Mn	1.15%
P	0.008%
S	0.008%
Cr	0.03%
Ni	0.96%
Mo	0.01%
Nb	0.02%
Cu	0.03%
Pb	0.002%
Ti	0.040%
V	0.02%
Al	0.01%
B	0.005%
As	< 0.005%
Sb	< 0.005%
N	0.0037%
Sn	< 0.005%

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:
ESAB Saldatura Spa Via E.Mattei 24, I-20010 Mesero (MI), +39 02 979 68.1
Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione/Validation
Shaun Studholme Product Manager

OK

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991-A1:1995 - AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352677-15.02.10

A08/ Manufacturer's order/ A09 Certificate No.: 352801-001

Sheet: 1/...

A05 Established inspecting body: DH

A06 Purchaser: ROSETTI MAR., RAVENNA A07.1 No. ZIRP 1709005640 231209

Final receiver: ROSETTI MAR., RAVENNA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design: S460G1+M

B03 Any suppl. requirements: BR-CD3ZZZ-MT-SPE-5004:REV.D3
BS-EN10225:01

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness	B10 Width	B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
			MM						
06	1	40,00	x 2800	x 9400	8264	TM	343497	95540-01	ITEM 70 1PLATCS40026
06	1	40,00	x 2800	x 9400	8264	TM	343497	95540-02	ITEM 70 1PLATCS40026
**	2				16528				
07	1	40,00	x 2650	x 6200	5159	TM	343497	95539-01	ITEM 80 1PLATCS40026
07	1	40,00	x 2650	x 6200	5159	TM	343497	95539-02	ITEM 80 1PLATCS40026
07	1	40,00	x 2650	x 6200	5159	TM	343497	95539-03	ITEM 80 1PLATCS40026
**	3				15477				
10	1	30,00	x 2950	x 9000	6252	TM	343497	95541-02	ITM 110 1PLATCS30029
11	1	30,00	x 2600	x 9000	5511	TM	343497	95549-01	ITM 120 1PLATCS30029
11	1	30,00	x 2600	x 9000	5511	TM	343497	95549-02	ITM 120 1PLATCS30029
**	2				11022				
12	1	30,00	x 2500	x 6250	3680	TM	343497	95541-03	ITM 130 1PLATCS30029
12	1	30,00	x 2500	x 6250	3680	TM	343497	95541-04	ITM 130 1PLATCS30029
12	1	30,00	x 2500	x 6250	3680	TM	343497	95549-03	ITM 130 1PLATCS30029
12	1	30,00	x 2500	x 6250	3680	TM	343497	95549-04	ITM 130 1PLATCS30029
**	4				14720				
13	1	30,00	x 1750	x 6250	2576	TM	343496	95650-01	ITM 140 1PLATCS30029
13	1	30,00	x 1750	x 6250	2576	TM	343496	95650-02	ITM 140 1PLATCS30029
**	2				5152				
14	1	25,00	x 2780	x 10400	5674	TM	343496	95565-03	ITM 150 1PLATCS25032
15	1	25,00	x 2500	x 6250	3065	TM	343496	95560-01	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3066	TM	343496	95560-03	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3066	TM	343496	95560-04	ITM 160 1PLATCS25032

A04 Manufacturer's mark: D H

ZD1/ZD2/ZD3 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

AHDB
Inspector's stamp

Date 16.02.10

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

PP 1

ACCEPTANCE WARRANTY
Conforme all'ordine
According to the order
Conforme à la commande
IMAGE Firma
Data
Date
25-FEB-2010
CONTROLLO QUALITÀ
QUALITY CONTROL
CONTRÔLE QUALITÉ

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explanations voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 - AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352677-15.02.10

A08/ Manufacturer's order/ A03 Certificate No.: 353801-001

Sheet: 2/...

A05 Established inspecting body: DH

A06 Purchaser: ROSETTI MAR.,RAVENNA A07.1 No. Z1RP 1709005640 231209

Final receiver: ROSETTI MAR.,RAVENNA A07.2 No.

B01 Product: ECT ROLLED PLATES

B02/ Steel design: S460G1+M

B03 Any suppl. requirements: BR-CDZZZZ-MT-SPE-5004:REV.DS
BS-EN10225:01

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness	B10 Width MM	B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
15	1	25,00	x 2500	x 6250	3056	TM	343497	95553-01	ITM 150 1PLATCS25032
15	1	25,00	x 2500	x 6250	3056	TM	343497	95553-02	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3056	TM	343497	95553-03	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3056	TM	343497	95553-04	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3056	TM	343497	95553-05	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3056	TM	343497	95558-01	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3056	TM	343497	95558-02	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3056	TM	343497	95558-03	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3056	TM	343497	95558-04	ITM 160 1PLATCS25032
15	1	25,00	x 2500	x 6250	3056	TM	343497	95558-05	ITM 160 1PLATCS25032
**	13				39858				
16	1	25,00	x 1750	x 6550	2250	TM	343496	95560-05	ITM 170 1PLATCS25032
17	1	20,00	x 2900	x 10400	4735	TM	343498	95404-01	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95404-02	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95404-03	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95458-01	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95458-02	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95458-03	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95459-01	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95459-02	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95459-03	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95460-01	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95460-02	ITM 180 1PLATCS20027

A04 Manufacturer's mark: DH

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

AHB
Inspector's stamp

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Date 15.02.10

PP 1

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352677-16.02.10

A08/ Manufacturer's order/ A09 Certificate No.: 352601-001

Sheet: 3/...

A05 Established inspecting body: DR

A06 Purchaser: ROSETTI MAR.,RAVENNA A07.1 No. ZIRP 1709003640 231209

Final receiver: ROSETTI MAR.,RAVENNA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design.: S460G1+M

B03 Any suppl. requirements: BR-CDZZZZ-MT-SPE-5004:REV.D3
BS-EN10225:01

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness	B10 Width MM	B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A08 Purchaser article number
17	1	20,00	x 2900	x 10400	4735	TM	343498	95460-03	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95463-01	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95463-02	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95463-03	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95466-01	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95466-02	ITM 180 1PLATCS20027
17	1	20,00	x 2900	x 10400	4735	TM	343498	95466-03	ITM 180 1PLATCS20027
**	18				85230				
18	1	20,00	x 2550	x 8000	3203	TM	343498	95474-01	ITM 190 1PLATCS20027
18	1	20,00	x 2550	x 8000	3203	TM	343498	95474-02	ITM 190 1PLATCS20027
18	1	20,00	x 2550	x 8000	3203	TM	343498	95474-03	ITM 190 1PLATCS20027
18	1	20,00	x 2550	x 8000	3203	TM	343498	95474-04	ITM 190 1PLATCS20027
18	1	20,00	x 2550	x 8000	3203	TM	343498	95475-03	ITM 190 1PLATCS20027
**	5				16015				
19	1	20,00	x 2450	x 9200	3539	TM	343498	95360-05	ITM 200 1PLATCS20027
19	1	20,00	x 2450	x 9200	3539	TM	343500	62670-01	ITM 200 1PLATCS20027
19	1	20,00	x 2450	x 9200	3539	TM	343500	62670-02	ITM 200 1PLATCS20027
19	1	20,00	x 2450	x 9200	3539	TM	343500	62670-03	ITM 200 1PLATCS20027
**	4				14156				
20	1	20,00	x 1800	x 8000	2261	TM	343498	95360-02	ITM 210 1PLATCS20027
20	1	20,00	x 1800	x 8000	2261	TM	343499	95347-01	ITM 210 1PLATCS20027
20	1	20,00	x 1800	x 8000	2261	TM	343499	95347-02	ITM 210 1PLATCS20027
20	1	20,00	x 1800	x 8000	2261	TM	343499	95347-03	ITM 210 1PLATCS20027

A01

A04 Manufacturer's mark: D H

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

AHB
Inspector's stamp

AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Date 16.02.10

PP 1

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 - AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352677-15.02.10

A02/ Manufacturer's order/ A03 Certificate No.: 352901-001

Sheet: 4/...

A05 Established inspecting body: DH

A06 Purchaser: ROSETTI MAR., RAVENNA A07.1 No. Z1RP 1709005640 231209

Final receiver: ROSETTI MAR., RAVENNA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design.: S460G1+M

B03 Any suppl. requirements: BR-CDZZZZ-MI-SPE-5004:REV.D3
BS-EN10225:01

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness	B10 Width	B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
			MM						
20	1	20,00	x 1800	x 8000	2261	TM	343499	95347-04	ITM 210 1PLATCS20027
20	1	20,00	x 1800	x 8000	2261	TM	343499	95347-05	ITM 210 1PLATCS20027
20	1	20,00	x 1800	x 8000	2261	TM	343499	95347-06	ITM 210 1PLATCS20027
20	1	20,00	x 1800	x 8000	2261	TM	343499	95347-07	ITM 210 1PLATCS20027
20	1	20,00	x 1800	x 8000	2261	TM	343499	95347-08	ITM 210 1PLATCS20027
**	5				20349				
22	1	20,00	x 3040	x 8100	3865	TM	343498	95476-01	ITM 300 1PLATCS20027
22	1	20,00	x 3040	x 8100	3866	TM	343498	95476-02	ITM 300 1PLATCS20027
**	2				7732				
23	1	15,00	x 3000	x 11000	3886	TM	343496	95673-01	ITM 310 1PLATCS15023
23	1	15,00	x 3000	x 11000	3886	TM	343496	95673-02	ITM 310 1PLATCS15023
**	2				7772				
24	1	15,00	x 2150	x 11000	2785	TM	343499	95328-02	ITM 320 1PLATCS15023
24	1	15,00	x 2150	x 11000	2785	TM	343499	95328-03	ITM 320 1PLATCS15023
24	1	15,00	x 2150	x 11000	2785	TM	343499	95328-04	ITM 320 1PLATCS15023
**	3				8355				
***	72				276543	Actual mass: 275504 KG			

B06 Marking of the product

ITEM NO.: 05-07,10-20,22-24
STEEL DESIGNATION S460G1+M
HEAT NO. / TRADEMARK / ROLLED PLATE NO.-TEST NO. / INSPECTOR'S STAMP

A01
AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

A04 D H Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

AHB Inspector's stamp

Date 15.02.10 PP 1

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations/ (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991-A1:1995 + AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352577-15.02.10

A08/ Manufacturer's order/ A03 Certificate No.: 352801-001

Sheet: 5/...

A05 Established inspecting body: DH

A06 Purchaser: ROSETTI MAR., RAVENNA A07.1 No. S1RP 1709005640 231209

Final receiver: ROSETTI MAR., RAVENNA A07.2 No.

907 Product: HOT ROLLED PLATES

S02/ Steel design: S460GL+M

S03 Any suppl. requirements: BR-CDZZZZ-MT-SPS-5004:REV.D3
BS-EN10225:01

C10-C29 Tensile test

S14 Item No.	S07.2 Heat No.	S07.1 Replaced/ Test No.	S05 Reference (heat) treatment	C01	C02/ C04	C03 Temp. GR.C	C10	C11 MPA RP02	C12 RM	C13 A % L0=5D	C14-C15 RP02/RM
06	343497	95540		K4	Q	RT		469	581	27	0,81
10	343497	95541		K4	Q	RT		528	616	25	0,86
12	343497	95541		K4	Q	RT		528	616	25	0,86
13	343496	95680		K4	Q	RT		508	610	28	0,83
14	343496	95565		K4	Q	RT		515	612	26	0,84
14A	343496	95614	*	K4	Q	RT		500	603	27	0,83
15	343496	95560		K4	Q	RT		509	609	27	0,84
15	343497	95558		K4	Q	RT		520	620	24	0,84
16	343496	95560		K4	Q	RT		509	609	27	0,84
17	343498	95404		K4	Q	RT		485	608	24	0,80
17	343498	95460		K4	Q	RT		499	617	27	0,81
17	343498	95465		K4	Q	RT		491	610	27	0,80
18	343498	95360		K4	Q	RT		466	595	29	0,78
19	343499	95346	*	K4	Q	RT		482	606	26	0,80
19	343500	52670		K4	Q	RT		481	612	24	0,79
20	343498	95350		K4	Q	RT		466	595	29	0,78
23	343496	95673		K4	Q	RT		537	636	25	0,84
24	343499	95328		K4	Q	RT		543	651	22	0,83

A04 Manufacturer's mark: D H

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

A H B
Inspector's stamp

Date 16.02.10

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

PP 1

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352677-16.02.10

A09/ A03 Manufacturer's order/ Certificate No.: 352801-001

Sheet: 6/...

A05 Established inspecting body: DH

A06 Purchaser: ROSETTI MAR.,RAVENNA A07.1 No. S1RP 1709005640 231209

Final receiver: ROSETTI MAR.,RAVENNA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design: S460GL+M

B03 Any suppl. requirements: BR-CDZZZZ-MT-SPE-5004:REV.D3
BS-EN10225:01

C40-C49 Impact test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C41 Width of test piece	C40 Type of test piece	C44 Testing method	C46 Energy Joule	C45	C42 Individual values AV=J			C43 Mean value
05	343497	95540		K4	QO	-40		CHP-V		600	AV	170	200	209	193
				K4	QO	-40		CHP-V	5%-250C-1E	750	AV	112	131	119	121
				K4	QO	-40		CHP-V	5%	600	AV	173	141	183	167
				K4	QO	-40		CHP-V		600	AV	148	172	139	153
10	343497	95541		K4	QO	-40		CHP-V		600	AV	149	172	139	153
12	343497	95541		K4	QO	-40		CHP-V		600	AV	128	190	179	166
13	343496	95650		K4	QO	-40		CHP-V		600	AV	111	128	120	120
14	343496	95565		K4	QO	-40		CHP-V		600	AV	136	116	169	142
14	343496	95614	*	K4	QO	-40		CHP-V		600	AV	175	171	149	165
15	343496	95560		K4	QO	-40		CHP-V	5%-250C-1E	600	AV	124	130	119	124
				K4	QO	-40		CHP-V	5%	600	AV	114	121	108	114
15	343497	95558		K4	QO	-40		CHP-V		600	AV	149	133	158	147
16	343496	95560		K4	QO	-40		CHP-V		500	AV	175	171	149	165
				K4	QO	-40		CHP-V	5%-250C-1E	600	AV	124	130	119	124
				K4	QO	-40		CHP-V	5%	600	AV	114	121	108	114
17	343498	95404		K4	QO	-40		CHP-V		600	AV	98	95	89	94
17	343498	95460		K4	QO	-40		CHP-V		600	AV	80	77	83	80
17	343498	95466		K4	QO	-40		CHP-V		600	AV	117	110	100	109
19	343498	95360		K4	QO	-40		CHP-V		600	AV	136	143	103	127
19	343498	95361	*	K4	QO	-40		CHP-V		600	AV	112	113	129	118
19	343499	95346	*	K4	QO	-40		CHP-V		600	AV	83	92	93	89
19	343500	62670		K4	QO	-40		CHP-V		600	AV	89	98	87	91
20	343498	95360		K4	QO	-40		CHP-V		600	AV	136	143	103	127
20	343499	95347		K4	QO	-40		CHP-V	5%-250C-1E	600	AV	54	85	78	76

A04 D H Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CE. DILG
Test House Manager

A H B Inspector's stamp

A07 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Date 16.02.10

PP I

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991-A1:1995 + AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352677-16.02.10

A09/ Manufacturer's order/ A03 Certificate No.: 352801-001

Sheet: 7/...

A05 Established inspecting body: DH

A06 Purchaser: ROSETTI MAR., RAVENNA A07.1 No. EIRP 1709005640 231209

Final receiver: ROSETTI MAR., RAVENNA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design.: S460G1+M

B03 Any suppl. requirements: ER-CDZZZZ-MT-SPE-5004:REV.D3
BS-EN10225:01

C40-C49 Impact test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C41 Width of test piece	C40 Type of test piece	C44 Testing method	C46 Energy Joule	C45	C42 Individual values AV=J			C43 Mean value
20	343499	95347		K4	QO	-40		CEP-V	5%	600	AV	110	104	103	106
23	343496	95673		K4	QO	-40		CEP-V		600	AV	90	87	100	92
24	343499	95328		K4	QO	-40		CEP-V		600	AV	66	63	62	64

C66-C68 Supplementary tests on test samples

ITEM NO.: 06-07,10-20,22-24
DEEP ETCH TESTING AS PER DH-STANDARD <= 2S: SATISFACTORY.

C70-C99 Chemical composition % - Heat analysis

B07.2 Heat	C70	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	AS	SN
343496	Y	0,106	0,491	1,57	0,015	0,0008	0,0049	0,025	0,022	0,040	0,057	0,001	0,027	0,002	0,001
343497	Y	0,110	0,500	1,60	0,013	0,0007	0,0038	0,021	0,012	0,038	0,042	0,002	0,029	0,002	0,001
343498	Y	0,114	0,494	1,56	0,013	0,0006	0,0038	0,016	0,008	0,025	0,041	0,001	0,029	0,002	0,000
343499	Y	0,107	0,496	1,58	0,014	0,0008	0,0044	0,027	0,009	0,042	0,041	0,001	0,029	0,002	0,000
343500	Y	0,105	0,452	1,55	0,013	0,0006	0,0039	0,028	0,015	0,037	0,039	0,001	0,027	0,002	0,000

B07.2 Heat	C70	TI	PB	B	SB	CA	BI	AL-T
343496	Y	0,002	0,001	0,0002	0,0014	0,0028	0,0001	0,035
343497	Y	0,003	0,001	0,0003	0,0012	0,0023	0,0006	0,038
343498	Y	0,003	0,001	0,0002	0,0012	0,0024	0,0001	0,036
343499	Y	0,003	0,001	0,0002	0,0007	0,0021	0,0001	0,036
343500	Y	0,002	0,001	0,0002	0,0006	0,0021	0,0001	0,035

A04 Manufacturer's mark: D H

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

Inspector's stamp: AHB

Date 16.02.10

AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

A01

PP 1.

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 - AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352577-16.02.10

A02/ Manufacturer's order/ A03 Certificate No.: 352801-001

Sheet: 8/...

A05 Established inspecting body: DH

A06 Purchaser: ROSETTI MAR., RAVENNA A07.1 No. ZIRP 1709005540 231209

Final receiver: ROSETTI MAR., RAVENNA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design. S460G1+M

B03 Any suppl. requirements: BR-CDZZZZ-MT-SPE-5004:REV.D3
BS-EN10225:01

C94 Heat analysis Carbon equivalent / Alloying restrictions

B07.2 Heat											
343496	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,14	FO-A1= 7,14
343497	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,11	FO-A1= 10,00
343498	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,09	FO-A1= 9,47
343499	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,12	FO-A1= 8,18
343500	FO-02=	0,38	FO-31=	0,20	FO-51=	0,03	FO-52=	0,03	FO-55=	0,12	FO-A1= 8,97

C70-C99 Chemical composition % - Product analysis

B07.2 Heat	B07.1 Test No.	C01	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	TI	B
343496	95560	K4	0,104	0,497	1,57	0,014	0,0008	0,0031	0,024	0,022	0,040	0,055	0,001	0,026	0,002	0,0000
343496	95565	K4	0,105	0,495	1,56	0,014	0,0009	0,0040	0,024	0,022	0,041	0,055	0,000	0,027	0,002	0,0001
343496	95614	K4	0,107	0,481	1,56	0,014	0,0008	0,0047	0,024	0,022	0,041	0,057	0,000	0,027	0,002	0,0001
343496	95650	K4	0,105	0,487	1,56	0,014	0,0006	0,0042	0,024	0,021	0,041	0,056	0,000	0,027	0,002	0,0000
343496	95650	K4	0,108	0,491	1,56	0,014	0,0006	0,0044	0,024	0,021	0,041	0,056	0,000	0,027	0,002	0,0000
343497	95539	K4	0,110	0,496	1,57	0,012	0,0005	0,0041	0,020	0,011	0,038	0,040	0,001	0,028	0,003	0,0001
343497	95540	K4	0,108	0,490	1,57	0,011	0,0004	0,0034	0,020	0,010	0,038	0,038	0,001	0,028	0,003	0,0001
343497	95541	K4	0,109	0,490	1,57	0,011	0,0007	0,0039	0,019	0,012	0,038	0,039	0,003	0,028	0,002	0,0000
343497	95558	K4	0,107	0,491	1,55	0,013	0,0006	0,0039	0,023	0,019	0,040	0,052	0,000	0,026	0,002	0,0001
343498	95360	K4	0,106	0,497	1,55	0,013	0,0009	0,0038	0,014	0,008	0,024	0,040	0,002	0,028	0,003	0,0001
343498	95404	K4	0,106	0,500	1,55	0,013	0,0007	0,0041	0,015	0,007	0,023	0,039	0,002	0,027	0,002	0,0000
343498	95460	K4	0,108	0,501	1,55	0,012	0,0008	0,0040	0,016	0,008	0,023	0,039	0,002	0,027	0,003	0,0000
343498	95466	K4	0,106	0,498	1,58	0,011	0,0010	0,0038	0,019	0,010	0,038	0,038	0,002	0,028	0,003	0,0000
343499	95346	K4	0,111	0,488	1,57	0,013	0,0011	0,0040	0,026	0,009	0,042	0,042	0,001	0,029	0,002	0,0001
343499	95347	K4	0,107	0,486	1,55	0,013	0,0010	0,0038	0,023	0,009	0,038	0,041	0,001	0,028	0,002	0,0001
343500	62670	K4	0,105	0,437	1,53	0,012	0,0005	0,0035	0,026	0,015	0,036	0,038	0,001	0,025	0,002	0,0001
343500	62670	K4	0,108	0,442	1,53	0,012	0,0007	0,0034	0,026	0,016	0,036	0,037	0,002	0,025	0,002	0,0001

A04 D H Manufacturer's mark

Z01/Z02/Z05 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

AHDB Inspector's stamp

Date 16.02.10

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

PP 1

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352577-15.03.10

A08/ Manufacturer's order/ A05 Certificate No.: 352801-001

Sheet: 9/...

A05 Established inspecting body: DH

A06 Purchaser: ROSETTI MAR.,RAVENNA A07.1 No. ZIRP 1709005640 231209

First receiver: ROSETTI MAR.,RAVENNA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design: S460G1+M

B03 Any suppl. requirements: BR-CDZZZZ-MT-SPE-5004:REV.D3
BS-EN10225:01

C70-C99 Chemical composition % - Product analysis

B07.2 Heat	B07.1 Test No.	C01	AL-T
343496	95560	K4	0,035
343496	95565	K4	0,035
343496	95614	K4	0,032
343496	95650	K4	0,034
343496	95650	K4	0,034
343497	95539	K4	0,037
343497	95540	K4	0,036
343497	95541	K4	0,035
343497	95558	K4	0,035
343498	95360	K4	0,034
343498	95404	K4	0,034
343498	95460	K4	0,034
343498	95465	K4	0,034
343499	95345	K4	0,035
343499	95347	K4	0,036
343500	62570	K4	0,035
343500	62570	K4	0,034

C94 Product analysis Carbon equivalent / Alloying restrictions

B07.2 Heat	B07.1 Test No.	C01											
343496	95560	K4	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,14	FO-A1= 11,29
343496	95565	K4	FO-02=	0,38	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,14	FO-A1= 6,75
343496	95614	K4	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,14	FO-A1= 6,81
343496	95650	K4	FO-02=	0,38	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,14	FO-A1= 8,10
343496	95650	K4	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,14	FO-A1= 7,73

A04 Manufacturer's mark: D H

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

A H B
Inspector's seal

Date 16.02.10

AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

A01

PP 1

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 - AS PER ISO 10474:1991
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 352677-15.02.10

A09/ Manufacturer's order/ A08 Certificate No.: 352801-001

Sheet: 10/...

A05 Established inspecting body: DE

A06 Purchaser: ROSETTI MAR.,RAVENNA

Final receiver: ROSETTI MAR.,RAVENNA

A07.1 No.: 81RP 1709005640 231209

A07.2 No.:

B01 Product: HOT ROLLED PLATES

B02/ Steel design.: S460G1+M

B03 Any suppl. requirements: SR-CDZZZZ-MT-SPE-5004:REV.D3
BS-EN10225:01

C54 Product analysis Carbon equivalent / Alloying restrictions

B07.2 Heat	B07.1 Test No.	C01											
343497	95539	K4	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,11	FO-A1= 9,02
343497	95540	K4	FO-02=	0,38	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,11	FO-A1= 10,59
343497	95541	K4	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,11	FO-A1= 8,97
343497	95558	K4	FO-02=	0,38	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,13	FO-A1= 8,97
343498	95360	K4	FO-02=	0,38	FO-31=	0,20	FO-51=	0,03	FO-52=	0,03	FO-55=	0,09	FO-A1= 8,95
343498	95404	K4	FO-02=	0,38	FO-31=	0,20	FO-51=	0,03	FO-52=	0,03	FO-55=	0,08	FO-A1= 8,29
343498	95460	K4	FO-02=	0,38	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,09	FO-A1= 8,50
343498	95466	K4	FO-02=	0,38	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,11	FO-A1= 8,95
343498	95466	K4	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,12	FO-A1= 8,75
343499	95346	K4	FO-02=	0,39	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,11	FO-A1= 9,47
343499	95347	K4	FO-02=	0,38	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,12	FO-A1= 10,00
343500	62570	K4	FO-02=	0,37	FO-31=	0,20	FO-51=	0,03	FO-52=	0,03	FO-55=	0,12	FO-A1= 10,00
343500	62670	K4	FO-02=	0,38	FO-31=	0,20	FO-51=	0,03	FO-52=	0,03	FO-55=	0,12	FO-A1= 10,00

C94 Carbon equivalent formula / Alloying restrictions

FO-02 = C+(MN/6)+(CR+MO+V)/5+(NI+CU)/15
FO-31 = C+SI/30+(MN+CR+CU)/20+MO/15+V/10+NI/60+5B
FO-51 = V +NB
FO-52 = V +NB+TI
FO-55 = CU+MO+NI+CR
FO-A1 = AT/N

A04 Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CH. DILG
Test House Manager

AHB Inspector's stamp

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Date 16.02.10

pp 1

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02	A10 Advice of dispatch No./ Date of dispatch	A03/ Manufacturer's order/ A03 Certificate No.	Sheet
INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991 MATERIAL TEST REPORT (MTR)	352677-16.02.10	352801-001	11

A05 Established inspecting body	A06 Purchaser	A07.1 No.	B01 Product
DE	ROSETTI MAR.,RAVENNA	81RP 1709005640 231209	HOT ROLLED PLATES
	Final receiver ROSETTI MAR.,RAVENNA	A07.2 No.	

B02/ Steel design.	S450Gl+M
S02 Any suppl. requirements	BR-CDZZZZ-MT-SPE-5004:REV.D3 BS-EN10225:01

D01 Marking and identification, surface appearance, shape and dimensional properties

ITEM NO.: 06-07,10-20,22-24
RESULT OF MARKING, SURFACE, SHAPE AND DIMENSIONS: NO REMARKS

SURFACE	AS PER EN-10225
THICKNESS	AS PER EN-10029-A
LENGTH AND WIDTH	AS PER EN-10029
FLATNESS	AS PER EN-10029-TSL

D02 Non-destructive tests - Ultrasonic testing

ITEM NO.: 06-07,10-20,22-24

UT-SPECIFICATION	: EN-10160 CLASS S0 AND E1
SCANNING PLAN BODY	: LONGITUDINALLY SCAN LINES SPACING 100 MM
EDGES	: 100 MM
PERSONNEL QUALIFICATION	: LEVEL 2 IN ACCORDANCE TO EN 473

THE TEST RESULTS MEET THE REQUIREMENTS OF THE ORDER.

A04 D H Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

DR. CE. DILG
Test House Manager

A H B
Inspector's stamp

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Date 16.02.10 PP 1

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 40/18	Sheet/Foglio 1/3

Manufacturer's Welding Procedure. Ref. no.	40/18 REV. 0					
Manufacturer	ROSETTI MARINO S.p.A.					
Address	VIA TRIESTE 230 - 48121 RAVENNA					
Code, Testing Standard	MAERSK OIL Specification MOG-FP-MET-STD-0012 Rev. 4.0; EN ISO 15614-1:2017 Lev. 2					
	Location of test specimen according to EN ISO 15614-1:2017 Section 7.2, Fig. 5 Essential variables according to EN ISO 15614-1:2017, Chapter 8 and MAERSK OIL Specification MOG-FP-MET-STD-0012 Rev. 4.0 par. 6.4					
Date of welding	Start: September 3rd , 2018 Complete: September 4th, 2018					
Examiner of examining body	Rina Services S.p.A.					
RANGE OF QUALIFICATION						
Welding process	136 - FCAW					
Type(s)	Manual					
Welding Equipment Type	HF inverter type					
Actual parent Material side A	Plate: EN 10225: S460G2+M Z35 (Heat: 882852)					
Actual parent Material side B	Plate: EN 10225: S460G2+M Z35 (Heat: 882852)					
Parent Material grade	Carbon steel with maximum strength of 520 MPa					
Supply condition	Thermomechanical rolled and accelerated cooled					
Carbon equivalent/Pcm/C	Max:0,44/0,19 (Heat Values: 0,41/0,17/ C for information only: 0,052)					
Groove design/configuration	Single Bevel Butt Joint (both sides welding), for groove dimension and details see page 4 of 6					
Parent material thickness (mm)	40 mm (obtained from parent material of 80 mm thk.)					
Weld metal thickness (mm)	136 - FCAW 40 mm					
Single or Multi-pass	136 - FCAW MULTIPLE					
Outside diameter	/					
Filler material Designation	**136 FCAW** EN ISO 17632-A: T 46 4 1Ni P M21 2 H5 (AWS 5.36: E81T1-M21A4-Ni1)					
Filler material Maker	136 - Esab OK Tubrod 15.17					
Filler material Size	136 - FCAW ∅ 1,2 mm					
Shielding gas/Flux	ISO 14175 :2008 M21 (80% Ar + 20% CO_2)					
Shielding gas flow rate	20 l/min.					
Backing gas (purging)	None					
Type of welding current & polarity	DC - RP	**Heat input / Apporto termico (kJ/mm) ± 25%**	Pass	Diameter mm	2G	3G
			Root	∅ 1,2	1,20 to 2,00	1,41 to 2,35
			Hot	∅ 1,2	0,82 to 1,38	1,36 to 2,28
			Filll	∅ 1,2	0,79 to 1,33	1,34 to 2,24
			Cap	∅ 1,2	0,69 to 1,15	1,38 to 2,31
Welding position	All, vertical down progression excluded					
Preheat (°C)	50	**Interpass temperature / Temp. di interpass (°C)**	250			
Post-Weld Heat Treatment and/or ageing	NONE					
Weld bead width	12 mm for 2G position , 15 mm for 3G position					
Welder's detail	Siringo Massimo AX82 (3G Test Coupon) Loffredo Francesco AX61 (2G Test Coupon)					
Time lapse between root and hot pass	N.A.					
Other information / Altre informazioni	- Preheat performed by propane torch -Accelerate weld cooling not permitted; -Base material origin: plate - Grinding 3 mm depth from base metal, before performing reverse passes					

Manufacturer's Welding Procedure. Ref. no.	40/18 REV. 0		
Test result (WPQR) N°	40/18	Date/Data	12/09/2018
Manufacturer's WPS No.	pWPS 40/18 REV. 0	Date/Data	19/07/2018

TESTS CARRIED OUT ON SAMPLE 40/18 WELDED IN 2G POSITION (PC)

NON DESTRUCTIVE EXAMINATIONS

	Judgemen	Report No.
Visual examinations	Acceptable	VDR 40/18
Penetrant test	Acceptable	/
Magnetic particle test	N.A.	01-18205
Radiographic test	Acceptable	/
Ultrasonic test	Acceptable	01-18205

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2] ≥ 420	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 520	A [%] ≥ 18	Z [%] /	Fracture Location /	Remarks /
TRANSVERSE 1	449	/	552	/	/	Base metal	/
TRANSVERSE 2	449	/	563	/	/	Base metal	/
TRANSVERSE 3	448	/	553	/	/	Base metal	/
TRANSVERSE 4	447	/	565	/	/	Base metal	/

BEND TEST

Type & N.	Bend angle	Remarks	Results
4 Side bend	180°	Former Ø 40 mm	Satisfactory

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] ≥ 35J			Avarage value [J] ≥ 50J	Remarks
10x10x55	Weld metal cap	KV	-40°C	78	79	76	78	/
10x10x55	FL cap	KV	-40°C	48	59	177	95	/
10x10x55	FL+1 cap	KV	-40°C	256	261	269	262	/
10x10x55	FL+2 cap	KV	-40°C	270	260	269	266	/
10x10x55	FL+5 cap	KV	-40°C	266	288	229	261	/
10x10x55	Weld metal root	KV	-40°C	89	105	108	101	/
10x10x55	FL root	KV	-40°C	95	92	35	74	/
10x10x55	FL+1 root	KV	-40°C	258	227	232	239	/
10x10x55	FL+2 root	KV	-40°C	216	204	203	208	/
10x10x55	FL+5 root	KV	-40°C	295	260	224	260	/

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
1 Macro examination+Hardness test	Satisfactory-See Inspecta Certificate No. 0319-00850-18
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Inspecta S.r.l. - Ravenna
Laboratory report reference N.	Report No. 0319-00850-18 dated SEPTEMBER 12th 2018
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of MOG-FP-MET-STD-0012 Rev. 4.0 Specification; EN ISO 13847:2013; EN ISO 15614-1:2017 Lev. 2

Date/Data
12-09-2018
ROSETTI MARINO SpA Welding Dept. D. Cenacchi
ROSETTI MARINO S.p.A.

Examiner or Examination Body
RINA Services S.p.A.
RINA F. Lago
Name and signature / Nome e firma

Test result (WPQR) N°	40/18	Date/Data	12/09/2018 & 19/09/2018
Manufacturer's WPS No.	pWPS 40/18 REV. 0	Date/Data	19/07/2018

TESTS CARRIED OUT ON SAMPLE 40/18 WELDED IN 3G POSITION (PF)

NON DESTRUCTIVE EXAMINATIONS

	Judgemen	Report No.
Visual examinations	Acceptable	VDR 40/18
Penetrant test	Acceptable	/
Magnetic particle test	N.A.	01-18205
Radiographic test	Acceptable	/
Ultrasonic test	Acceptable	01-18205

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2] ≥ 420	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 520	A [%] ≥ 18	Z [%] /	Fracture Location /	Remarks /
TRANSVERSE 1	448	/	564	/	/	Base metal	/
TRANSVERSE 2	452	/	558	/	/	Base metal	/
TRANSVERSE 3	445	/	562	/	/	Base metal	/
TRANSVERSE 4	448	/	561	/	/	Base metal	/

BEND TEST

Type & N.	Bend angle	Remarks	Results
4 Side bend	180°	Former Ø 40 mm	Satisfactory

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] ≥ 35J			Avarage value [J] ≥ 50J	Remarks
10x10x55	Weld metal cap	KV	-40°C	68	97	85	83	/
10x10x55	FL cap	KV	-40°C	107	71	30 (*)	69	(*)
10x10x55	FL cap (retest)	KV	-40°C	280	262	201	248	/
10x10x55	FL cap (retest)	KV	-40°C	185	89	118	131	/
10x10x55	FL+1 cap	KV	-40°C	290	250	260	267	/
10x10x55	FL+2 cap	KV	-40°C	300	294	304	299	/
10x10x55	FL+5 cap	KV	-40°C	280	268	290	279	/
10x10x55	Weld metal root	KV	-40°C	75	88	94	86	/
10x10x55	FL root	KV	-40°C	171	16 (*)	72	87	(*)
10x10x55	FL root (retest)	KV	-40°C	52	65	73	63	/
10x10x55	FL root (retest)	KV	-40°C	136	59	48	81	/
10x10x55	FL+1 root	KV	-40°C	307	287	241	278	/
10x10x55	FL+2 root	KV	-40°C	255	270	265	263	/
10x10x55	FL+5 root	KV	-40°C	285	292	280	286	/

(*) Values under the minimum required. Two retests have been performed with positive results, as per Standard requirements. See report nr. 0330-00850-18

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
1 Macro examination+Hardness test	Satisfactory-See Inspecta Certificate No. 0320-00850-18
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Inspecta S.r.l. - Ravenna
Laboratory report reference N.	Report No. 0320-00850-18 dated SEPTEMBER 12th 2018 & 0330-00850-18 dated SEPTEMBER 19th 2018
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of MOG-FP-MET-STD-0012 Rev. 4.0 Specification; EN ISO 13847:2013; EN ISO 15614-1:2017 Lev. 2

Date/Data
19-09-2018
ROSETTI MARINO S.p.A.

Examiner or Examination Body
RINA Services S.p.A.
Name and signature / Nome e firma

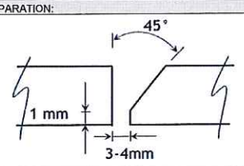
PQR - AS- RUN PARAMETER SHEET

pWPS 40/18			
PQR 40/18			
Coupon Nr. 40/18 (2G)			
Date:	Start 03/09/2018 Finish 04/09/2018	Page:	1 of 2

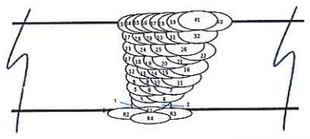
REFERENCE CODE AND PROJECT SPECIFICATIONS: **EN 15614-1 Ed.2017+MOTS 12 Rev. 4.0**

Welder Name(s):	LOFFREDO FRANCESCO		Welder Id No(s):	AX 61	
Welding Process(es):	136-FCAW		Type(s):	SEMIAUTOMATIC	
Welding Position:	2G		Progression:	NA	
Base Materials:	EN10225: S460 G2+M		Wall Thickness:	40 mm (*)	Diameter: NA
Heat No(s):	882852	PLATE:186899\1	Joint Type:	1/2V	

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNS24006	ESAB OK TUBROD 15.17
Hot Pass	1,2	PNS24006	ESAB OK TUBROD 15.17
Filling Runs	1,2	PNS24006	ESAB OK TUBROD 15.17
Cap	1,2	PNS24006	ESAB OK TUBROD 15.17

GAS:

Shielding Gas:	MIXTURE
Composition:	Ar+CO2 80%+20%
Flow:	20 lt/min
Gas Backing:	None
Flow:	_
Gas Size Nozzle:	1/2"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
12 mm	String	MULTIPLE	SINGLE

Preheat °C :	Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature °C	Holding Time °C	Heating Rate °C	Cooling Rate °C
50°C	PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER	NA	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (Kj/mm) Average	Arc Thermal Efficiency Factor As per EN 1011-1 (CRA Clad PQR's) (Kj/mm)	Interpass Temperature °C	REMARKS
NA	1	FCAW	1	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	166	180	173	26	28	27	_	_	14	1,60	0,8	50	_MANUAL MONITORING
NA	2	FCAW	2	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	230	245	237,5	26	28	27	_	_	28	1,10	0,8	70	_CAP PASSES FROM 33TO 41
NA	3	FCAW	3	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	230	240	235	26	28	27	_	_	30	1,02	0,8	85	(*) MACHINED FROM BASE MATERIAL THICKNESS 80mm
NA	3	FCAW	4	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	230	240	235	27	28	27,5	_	_	33	0,94	0,8	97	HEAT INP. MEAN VALUE FOR FILL (Kj/mm) 1,06
NA	4	FCAW	5	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	240	250	245	27	28	27,5	_	_	35	0,92	0,8	110	HEAT INP. MEAN VALUE FOR CAP (Kj/mm) 0,92
NA	4	FCAW	6	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	250	280	265	27	28	27,5	_	_	38	0,92	0,8	125	Both sides welding
NA	4	FCAW	7	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	36	0,99	0,8	135	
NA	5	FCAW	8	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	30	1,19	0,8	75	
NA	5	FCAW	9	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	33	1,08	0,8	110	
NA	5	FCAW	10	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	35	1,02	0,8	150	
NA	5	FCAW	11	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	38	0,94	0,8	177	
NA	6	FCAW	12	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	36	0,99	0,8	100	
NA	6	FCAW	13	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	30	1,19	0,8	140	
NA	6	FCAW	14	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	33	1,08	0,8	160	
NA	6	FCAW	15	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	35	1,02	0,8	180	
NA	6	FCAW	16	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	38	0,94	0,8	200	
NA	7	FCAW	17	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	36	0,99	0,8	218	
NA	7	FCAW	18	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	30	1,19	0,8	230	
NA	7	FCAW	19	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	33	1,08	0,8	250	
NA	7	FCAW	20	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	35	1,02	0,8	120	
NA	7	FCAW	21	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	38	0,94	0,8	135	
NA	7	FCAW	22	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	36	0,99	0,8	150	
NA	8	FCAW	23	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	30	1,19	0,8	165	
NA	8	FCAW	24	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	33	1,08	0,8	175	
NA	8	FCAW	25	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	35	1,02	0,8	186	
NA	8	FCAW	26	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	38	0,94	0,8	198	

SIGNED BY ROSETTI REPRESENTATIVE:	SIGNED BY TOTAL REPRESENTATIVE:	SIGNED BY ROSETTI THIRD PARTY REPRESENTATIVE:	SIGNED BY TOTAL THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA Welding Dept. D. Cenacchi	Signature:	Signature:	Signature:
Date:	Date:	Date:	Date:

RINA Services SpA No. Re. 0474 Date 04/09/2018 File
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐
Signature, Cimatti Davide

PQR - AS- RUN PARAMETER SHEET

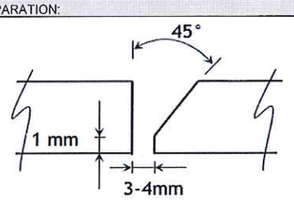
pWPS 40/18			
PQR 40/18			
Coupon Nr. 40/18 (2G)			
Date:	Start 03/09/2018 Finish 04/09/2018	Page:	2 of 2

REFERENCE CODE AND PROJECT SPECIFICATIONS: **EN 15614-1 Ed.2017+MOTS 12 Rev. 4.0**

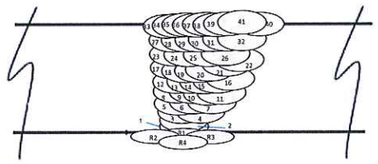
Welder Name(s):	LOFFREDO FRANCESCO	Welder Id No(s):	AX 61
Welding Process(es):	136-FCAW	Type(s):	SEMIAUTOMATIC
Welding Position:	2G	Progression:	NA
Base Materials:	EN10225: S460 G2+M	Wall Thickness:	40 mm (*)
Heat No(s):	882852 PLATE:186899\1	Joint Type:	1/2V

Diameter: NA

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNS24006	ESAB OK TUBROD 15.17
Hot Pass	1,2	PNS24006	ESAB OK TUBROD 15.17
Filling Runs	1,2	PNS24006	ESAB OK TUBROD 15.17
Cap	1,2	PNS24006	ESAB OK TUBROD 15.17

GAS:

Shielding Gas:	MIXTURE
Composition:	Ar+CO2 80%+20%
Flow:	20 lt/min
Gas Backing:	None
Flow:	_
Gas Size Nozzle:	1/2"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
12 mm	String	MULTIPLE	SINGLE

Preheat °C :	Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
50°C	PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER	NA	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (Kj/mm) Average	Arc Thermal Efficiency Factor As per EN 1011-1 (CRA Clad PQR's) (Kj/mm)	Interpass Temperature °C	REMARKS
NA	9	FCAW	27	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	36	0,99	0,8	210	
NA	9	FCAW	28	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	30	1,19	0,8	80	
NA	9	FCAW	29	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	33	1,08	0,8	95	
NA	9	FCAW	30	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	35	1,02	0,8	116	
NA	9	FCAW	31	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	38	0,94	0,8	130	
NA	9	FCAW	32	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	38	0,94	0,8	150	
NA	10	FCAW	33	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	39	0,91	0,8	110	started welding finish
NA	10	FCAW	34	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	38	0,94	0,8	130	
NA	10	FCAW	35	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	39	0,91	0,8	145	
NA	10	FCAW	36	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	39	0,91	0,8	159	
NA	10	FCAW	37	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	39	0,91	0,8	170	
NA	10	FCAW	38	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	38	0,94	0,8	186	
NA	10	FCAW	39	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	39	0,91	0,8	197	
NA	10	FCAW	40	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	39	0,91	0,8	213	
NA	10	FCAW	41	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	39	0,91	0,8	221	
NA	1	FCAW	R1	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	230	240	235	27	29	28	_	_	16	1,97	0,8	50	
NA	2	FCAW	R2	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	240	270	255	27	29	28	_	_	35	0,98	0,8	70	
NA	2	FCAW	R3	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	240	270	255	27	29	28	_	_	40	0,86	0,8	90	
NA	3	FCAW	R4	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	240	270	255	27	29	28	_	_	38	0,90	0,8	100	

SIGNED BY ROSETTI REPRESENTATIVE:	SIGNED BY TOTAL REPRESENTATIVE:	SIGNED BY ROSETTI THIRD PARTY REPRESENTATIVE:	SIGNED BY TOTAL THIRD PARTY REPRESENTATIVE:
Name: ROSETTI MARINO SpA Welding Dept. D. Benacchio	Name:	Name: RINA Services SpA No. Bo. 0474	Name:
Signature:	Signature:	Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	Signature:
Date:	Date:	Date: 04/09/2018 File Signature Cimatti Davide	Date:

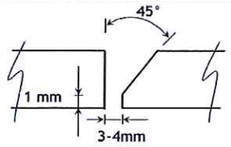
PQR - AS- RUN PARAMETER SHEET

pWPS 40/18			
PQR 40/18			
Coupon Nr. 40/18 (3G)			
Date:	Start 03/09/2018 Finish 04/09/2018	Page:	1_ of _1

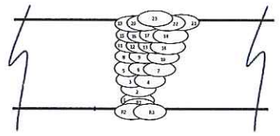
REFERENCE CODE AND PROJECT SPECIFICATIONS: **ISO 15614-1 Ed.2017+MOTS-12 Rev 4.0**

Welder Name(s):	SIRINGO MASSIMO	Welder Id No(s):	AX82
Welding Process(es):	136-FCAW	Type(s):	SEMIAUTOMATIC
Welding Position:	3G	Progression:	UP hill
Base Materials:	EN10225: S460 G2+M	Wall Thickness:	40 mm (*) — Diameter: NA
Heat No(s):	882852 PLATE:186899\1	Joint Type:	1/2V

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNS24006	ESAB OK TUBROD 15.17
Hot Pass	1,2	PNS24006	ESAB OK TUBROD 15.17
Filling Runs	1,2	PNS24006	ESAB OK TUBROD 15.17
Cap	1,2	PNS24006	ESAB OK TUBROD 15.17

GAS:

Shielding Gas:	MIXTURE
Composition:	Ar+CO2 80%+20%
Flow:	20 lt/min
Gas Backing	None
Flow:	_
Gas Size Nozzle:	1/2"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
15mm	String	MULTIPLE	SINGLE

Preheat °C:	Preheat Method:	Max Interpass Temperature:	Check / Control Method:
50°C	PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER

Heat Treatment Required	Holding Temperature °C	Holding Time °C	Heating Rate °C	Cooling Rate °C
NA	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (Kj/mm) Average	Arc Thermal Efficiency Factor As per EN 1011-1 (CRA Clad PQR's) (Kj/mm)	Interpass Temperature °C	REMARKS
NA	1	FCAW	1	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	166	182	174	26	28	27	_	_	12	1,88	0,80	50	_MANUAL MONITORING
NA	2	FCAW	2	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	210	240	225	26	28	27	_	_	16	1,82	0,80	70	_CAP PASSES FROM 19 TO 23
NA	3	FCAW	3	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	215	240	227,5	26	28	27	_	_	18	1,64	0,80	85	(*) MACHINED FROM BASE MATERIAL THICKNESS 80mm
NA	3	FCAW	4	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	17	1,75	0,80	90	HEAT INP. MEAN VALUE FOR FILL (Kj/mm) 1,79
NA	4	FCAW	5	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	16	1,86	0,80	95	HEAT INP. MEAN VALUE FOR CAP (Kj/mm) 1,85
NA	4	FCAW	6	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	16	1,86	0,80	110	Both sides welding
NA	4	FCAW	7	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	17	1,75	0,80	115	
NA	5	FCAW	8	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	18	1,66	0,80	120	
NA	5	FCAW	9	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	16	1,86	0,80	135	
NA	5	FCAW	10	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	17	1,75	0,80	160	
NA	6	FCAW	11	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	18	1,66	0,80	180	
NA	6	FCAW	12	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	16	1,86	0,80	210	
NA	6	FCAW	13	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	17	1,75	0,80	250	
NA	6	FCAW	14	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	17	1,75	0,80	150	
NA	7	FCAW	15	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	16	1,86	0,80	170	
NA	7	FCAW	16	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	17	1,75	0,80	190	
NA	7	FCAW	17	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	16	1,86	0,80	215	
NA	7	FCAW	18	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	18	1,66	0,80	225	
NA	8	FCAW	19	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	20	1,78	0,80	170	started welding finish
NA	8	FCAW	20	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	20	1,78	0,80	190	
NA	8	FCAW	21	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	21	1,70	0,80	200	
NA	8	FCAW	22	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	20	1,78	0,80	218	
NA	8	FCAW	23	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	20	1,78	0,80	235	
NA	1	FCAW	R1	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	235	245	240	27	29	28	_	_	15	2,15	0,80	50	
NA	2	FCAW	R2	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	240	270	255	27	29	28	_	_	16	2,14	0,80	70	
NA	2	FCAW	R3	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	240	270	255	27	29	28	_	_	20	1,71	0,80	95	

SIGNED BY ROSETTI REPRESENTATIVE:	SIGNED BY TOTAL REPRESENTATIVE:	SIGNED BY ROSETTI THIRD PARTY REPRESENTATIVE:	SIGNED BY TOTAL THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA Welding Dept. D. Cenacchi	Signature:	Signature:	Signature:
Date:	Date:	Date:	Date:

RINA Services SpA No. Bo. 0474 Date: 04/09/2018
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐
File
Signature
Cimatti Davide

ROSETTI MARINO

PQR 40/18

PQR attachments index:

Base material certificate (Plate S460G2+M)

Shielding gas certificate

Consumables certificate

preliminary WPS

NDE certificate

Mechanical test report

ROSETTI MARINO

PQR 40/18

Base material certificate (Plate S460G2+M)

Certificate Number:VNA 1700015 / 9
Page: 1 of 1

Inspection Certificate

Project: ————
Client: voestalpine Grobblech GmbH
voestalpine-Straße 3, 4020 Linz, Austria

Office: Vienna

Clients Order Number: 6501364

Date: 15-02-2017

Order Status: incomplete

Inspection Dates
First: 10-02-2017

final: 17-02-2017

This certificate is issued to voestalpine Grobblech GmbH, Linz/Austria, to certify that the undersigned Surveyor attended their works Linz for the purpose of testing and inspecting the undernoted material with satisfactory results as stated below.

Purchaser: Rosetti Marino Spa
Via Trieste 230
I-48122 RAVENNA

Order No.: 1716002502 116B20A

Description:

48 piece(s) of steel plate(s) 384580 kg , as per attached inspection Certificate no.: A0357565

Specification

S460G2+M Z35 EN 10225 : 2009

Heat treatment/Delivery Condition: thermomechanical rolled + accelerated cooled

Scope of inspection:

witness mechanical testing: yes ☑
review manufacturer's declared analysis: yes ☑
witness / verify ultrasonic examination: yes ☑ n/a ☐
witness / verify microstructure examination: yes ☐ n/a ☑
witness /verify corrosion testing: yes ☐ n/a ☑
random visual and dimensional control and check of hard stamping: yes ☑

Identification:

Makers Brand voestalpine
Material Quality
Heat No.
Plate No.
Brand of LR

Lloyd's Register EMEA
Vienna Office
Lloyd's Register

24 FEB 2017

Kurt Huber
Surveyor to Lloyd's Register EMEA

A subsidiary of Lloyd's Register Group Limited

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Form 1123 (2015.08)

voestalpine Grobblech GmbH

A02
Inspection certificate
EN 10204 - 3.2

VNA1700015-9

Z02 Date 23-02-2017

voestalpine-Straße 3
4020 Linz, Austria
www.voestalpine.com/grobblech

A03 Document number	A0357565	A08 Order-No.:	6501364	A07 OrderDat.	13-12-2016 4F

A06 Customer	Rosetti Marino Spa Via Trieste 230 I-48122 RAVENNA	B01 Product	Plate		
		B02 Material	S460G2+M Z35	B03 Standard	EN 10225 : 2009
A07 OrderNo.	1716002502 116B20A	Supplementary requirements	Z35 - EN 10164		
A06 Consignee	Rosetti Marino Spa Via Trieste 230 I-48122 RAVENNA	B04 Delivery condition	thermomechanical rolled + accelerated cooled		

A10 - Supplementary Information

SOUTH PARS 13 - PILES

B03 - Supplementary requirements

MATERIAL IS FINE GRAINED, VACUUM DEGASSED AND FULLY KILLED, PRODUCED BY BOF.
MATERIAL IS ACCORDING TO SPECIFICATION SP13-P2-ST-SP-8028.
MATERIAL IS ACCORDING TO EN 10225, OPTIONS 2,6,7,9,10,12 AND 13.

Z01 - Visual Examination and dimensional checking: satisfactory. The results of tests performed are in compliance with the requirements.

Detail of supply

B07 Heat No.	B06 Plate No	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	Ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
882852	186892/1	30 80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
882852	186892/2	30 80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
882852	186894/2	30 80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186894/1	30 80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186895/1	30 80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186895/2	30 80,00	2640,0	4800	1		8.010	56321	15-02-2017	1PLATCS80007
882852	186896/2	30 80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186896/1	30 80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186897/1	30 80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186897/2	30 80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186898/1	30 80,00	2640,0	4800	1		8.020	56268	15-02-2017	1PLATCS80007
882852	186898/2	30 80,00	2640,0	4800	1		8.020	56268	15-02-2017	1PLATCS80007
882852	186899/2	30 80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007

A04
Symbol of the manufacturer's work

voestalpine

Z03
Stamp of the inspection representative

LR
Lloyd's Register EMEA
Vienna Office
Initials: KH
24 FEB 2017

Z02
Inspection representative voestalpine Grobblech
Quality Department Heavy Plates
BERGER Alfred

voestalpine
ONE STEP AHEAD.

Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	Ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
882852	186899/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
882852	186900/2	30	80,00	2640,0	4800	1		8.020	56058	15-02-2017	1PLATCS80007
882852	186900/1	30	80,00	2640,0	4800	1		8.020	56058	15-02-2017	1PLATCS80007
882852	186901/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
882852	186901/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972090	186721/2	30	80,00	2640,0	4800	1		8.018	56010	10-02-2017	1PLATCS80007
972090	186723/2	30	80,00	2640,0	4800	1		8.012	56058	14-02-2017	1PLATCS80007
972090	186723/1	30	80,00	2640,0	4800	1		8.012	56058	14-02-2017	1PLATCS80007
972090	186724/1	30	80,00	2640,0	4800	1		8.010	56058	13-02-2017	1PLATCS80007
972090	186724/2	30	80,00	2640,0	4800	1		8.010	56321	13-02-2017	1PLATCS80007
972090	186725/1	30	80,00	2640,0	4800	1		8.010	56010	11-02-2017	1PLATCS80007
972090	186725/2	30	80,00	2640,0	4800	1		8.010	56010	11-02-2017	1PLATCS80007
972090	186726/2	30	80,00	2640,0	4800	1		8.022	56058	10-02-2017	1PLATCS80007
972090	186726/1	30	80,00	2640,0	4800	1		8.022	56010	10-02-2017	1PLATCS80007
972093	181846/2	30	80,00	2640,0	4800	1		8.005	56268	15-02-2017	1PLATCS80007
972093	181846/1	30	80,00	2640,0	4800	1		8.005	56268	15-02-2017	1PLATCS80007
972093	186842/1	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
972093	186842/2	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
972093	186843/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186843/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186844/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186844/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186846/2	30	80,00	2640,0	4800	1		8.007	56058	17-02-2017	1PLATCS80007
972093	186846/1	30	80,00	2640,0	4800	1		8.007	56058	17-02-2017	1PLATCS80007
972093	186902/2	30	80,00	2640,0	4800	1		8.010	56272	15-02-2017	1PLATCS80007
972093	186902/1	30	80,00	2640,0	4800	1		8.010	56272	15-02-2017	1PLATCS80007
972093	186903/2	30	80,00	2640,0	4800	1		8.010	56010	15-02-2017	1PLATCS80007
972093	186903/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186905/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186905/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972096	186841/1	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
972096	186841/2	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
972096	186845/1	30	80,00	2640,0	4800	1		8.010	56272	16-02-2017	1PLATCS80007
972096	186906/2	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007

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Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	Ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
972096	186906/1	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
		Sum				48		384.580			

C70 - Method of steelmaking: strand casted material: pure oxygen blown with vacuum treatment; steel is fully killed.

B14 - Supplementary information
Flatness acc. EN 10029/10 class N
Dimensional tolerances acc. EN 10029/10
EN10163-2: Class A3 - Repair-welding not permitted.
Thicknesstolerance acc. EN 10029/10 tab. 1 class A

Chemical composition (Heat analysis) - part 1 of 2

B07 Heat No.	C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %	Pb %	Cae %	Pcm %
>=		.150				.015																
Set values <=	.140	.550	1.650	.020	.0050	.055	.250	.700	.250	.300	.080	.040	.025	.0100	.0005	.0200	.0050	.0300	.0100	.010	.43	.22
882852	.052	.182	1.550	.009	.0009	.030	.182	.520	.123	.073	.004	.030	.012	.0051	.0002	.0020	.0003	.0020	.0020	.002	.41	.17
972090	.060	.176	1.520	.007	.0010	.022	.174	.520	.125	.046	.004	.027	.012	.0061	.0002	.0020	.0003	.0020	.0020	.002	.41	.17
972093	.052	.184	1.530	.008	.0011	.027	.172	.530	.125	.068	.004	.029	.012	.0042	.0003	.0020	.0003	.0030	.0020	.002	.41	.17
972096	.054	.177	1.530	.007	.0007	.026	.173	.530	.117	.054	.004	.027	.013	.0040	.0002	.0020	.0003	.0020	.0030	.002	.41	.17

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Chemical composition (Heat analysis) - part 2 of 2

B07

Heat. No.	LF01 %	LF02 %	LF03 %
Set values >= <=	.090	.110	.900
882852	.034	.046	.898
972090	.031	.043	.865
972093	.033	.045	.895
972096	.031	.044	.874

C99 - Supplementary information
BI <= 0,01%
C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF03: Cr+Ni+Cu+Mo
LF02: Nb+V+Ti
LF01: Nb+V

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Test results: C10-C29 Tensile Test acc. EN ISO 6892-1

B07 Heat No.	B06 Plate No	C41 Width	SpThickn mm	C01 loc.	PosTh.	C02 Dir	C11 Reh MPa	C11 Rp0,2 MPa	C12 Rm MPa	L0	C13 E %	C11 Reh/Rm %	C11 Rp0,2/Rm %	Sim.htm	WBH
>=							405	405	505		17.0				
Set values <=									665			90.00	90.00		
882852	186892	Ø	9.98	F	V	T	445	445	535	A5	32.0	83.07	83.09		
	186896	Ø	9.98	F	V	T	447	443	535	A5	30.9	83.47	82.69		
	186898	Ø	9.99	F	V	T	441	438	538	A5	31.2	81.97	81.41		
	186900	Ø	9.98	F	V	T	457	440	533	A5	30.3	85.65	82.52		
	186892	Ø	9.99	F	V	T		436	527	A5	30.0		82.78	001	1
	186896	Ø	9.99	F	V	T	468	443	524	A5	32.3	89.30	84.50	001	1
	186898	Ø	9.98	F	V	T	465	445	527	A5	32.4	88.24	84.44	001	1
	186900	Ø	9.99	F	V	T		437	524	A5	31.6		83.43	001	1
972090	184827	Ø	10.00	F	V	T	456	449	541	A5	29.3	84.28	82.93		
	184828	Ø	10.00	F	V	T	442	440	536	A5	30.8	82.41	82.00		
	186723	Ø	9.98	F	V	T		429	545	A5	27.5		78.81		
	184827	Ø	9.99	F	V	T		432	520	A5	28.5		83.09	001	1
	184828	Ø	9.99	F	V	T		440	529	A5	31.2		83.32	001	1
	186723	Ø	9.96	F	V	T	487	474	563	A5	28.1	86.53	84.17	001	1
972093	181846	Ø	9.95	F	V	T		415	564	A5	32.1		73.58		
	186842	Ø	9.98	F	V	T	456	449	540	A5	32.5	84.45	83.24		
	186843	Ø	9.99	F	V	T	461	452	544	A5	32.6	84.74	83.09		
	186902	Ø	9.98	F	V	T	456	448	532	A5	32.5	85.67	84.18		
	181846	Ø	9.98	F	V	T	460	424	524	A5	32.6	87.79	80.92	001	1
	186842	Ø	9.99	F	V	T	471	440	526	A5	32.4	89.49	83.56	001	1
	186843	Ø	9.98	F	V	T	470	443	532	A5	32.6	88.35	83.27	001	1
	186902	Ø	9.99	F	V	T	463	436	518	A5	32.9	89.37	84.16	001	1
972095	186841	Ø	9.98	F	V	T	459	429	529	A5	30.9	86.77	81.10		
	186906	Ø	9.98	F	V	T	466	436	524	A5	31.2	88.86	83.05		
	186841	Ø	9.98	F	V	T	470	441	525	A5	32.1	89.52	84.00	001	1
	186906	Ø	9.97	F	V	T		439	523	A5	32.7		83.96	001	1

SpThickn: specimen thickness
C01;loc.:
F: Bottom
PosTh.: Pos Thickness
V: ¼

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Test results: C10-C29 Tensile Test acc. EN ISO 6892-1

B07 Heat No.	B06 Plate No	C41 Width	SpThickn mm	C01 loc.	PosTh.	C02 Dir	C11 Reh MPa	C11 Rp0,2 MPa	C12 Rm MPa	L0	C13 E %	C11 Reh/Rm %	C11 Rp0,2/Rm %	Sim.htm	WBH

C02;Dir:
T: transverse
C12; Rm: Tensile Strength
L0: gauge
A5: Length = 5.65 * sqr (area) mm
C13;E: elongation
Sim.htm: sim. heat treatment
001: Sim.htm group #1
WBH: sim. heat treatment

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07	B06	C40	C01			C02	C03	C42	C42	C42	C43		
Heat No. samp.cond.	Plate No	shape	loc.	Pos.	PosTh.	Dir	temp	SV	SV	SV	AV	Sim.htm	WBH
							°C	J	J	J	J		
>=							-40	42	42	42	60		
Set values <=													

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No, samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	42	42	42	60		
882852	186892	CV 10x10	F		O	T	-40	340	328	325	331		
	186896	CV 10x10	F		O	T	-40	345	328	327	333		
	186898	CV 10x10	F		O	T	-40	352	332	322	335		
	186900	CV 10x10	F		O	T	-40	345	348	344	346		
	186892	CV 10x10	F		O	T	-40	307	310	303	307	001	1
	186896	CV 10x10	F		O	T	-40	314	321	315	317	001	1
	186898	CV 10x10	F		O	T	-40	323	311	317	317	001	1
	186900	CV 10x10	F		O	T	-40	334	324	325	328	001	1
	186892	CV 10x10	F		K	T	-40	348	364	385	366		
	186896	CV 10x10	F		K	T	-40	365	356	353	358		
	186898	CV 10x10	F		K	T	-40	352	365	345	354		
	186900	CV 10x10	F		K	T	-40	372	347	354	357		
	186892	CV 10x10	F		K	T	-40	345	329	324	333	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
Set values >=							-40	42	42	42	60		
Set values <=													
882852	186896	CV 10x10	F		K	T	-40	344	328	284	319	001	1
	186898	CV 10x10	F		K	T	-40	310	337	320	322	001	1
	186900	CV 10x10	F		K	T	-40	357	349	347	351	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	42	42	42	60		
972090	184827	CV 10x10	F	O		T	-40	321	320	314	318		
	184828	CV 10x10	F	O		T	-40	320	303	303	309		
	186723	CV 10x10	F	O		T	-40	323	327	322	324		
	184827	CV 10x10	F	O		T	-40	332	319	327	326	001	1
	184828	CV 10x10	F	O		T	-40	318	323	321	321	001	1
	186723	CV 10x10	F	O		T	-40	295	263	303	287	001	1
	184827	CV 10x10	F	K		T	-40	340	328	251	306		
	184828	CV 10x10	F	K		T	-40	346	336	317	333		
	186723	CV 10x10	F	K		T	-40	268	289	311	289		
	184827	CV 10x10	F	K		T	-40	321	331	357	336	001	1
	184828	CV 10x10	F	K		T	-40	326	353	89	256	001	1
	186723	CV 10x10	F	K		T	-40	284	266	276	275	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	42	42	42	60		
972093	181846	CV 10x10	F		O	T	-40	319	324	322	322		
	186842	CV 10x10	F		O	T	-40	345	347	334	342		
	186843	CV 10x10	F		O	T	-40	343	339	342	341		
	186902	CV 10x10	F		O	T	-40	349	344	335	342		
	181846	CV 10x10	F		O	T	-40	329	302	323	318	001	1
	186842	CV 10x10	F		O	T	-40	312	310	308	310	001	1
	186843	CV 10x10	F		O	T	-40	305	315	311	310	001	1
	186902	CV 10x10	F		O	T	-40	323	322	318	321	001	1
	181846	CV 10x10	F		K	T	-40	304	366	370	347		
	186842	CV 10x10	F		K	T	-40	362	369	351	361		
	186843	CV 10x10	F		K	T	-40	358	366	356	360		
	186902	CV 10x10	F		K	T	-40	357	366	377	366		
	181846	CV 10x10	F		K	T	-40	359	364	355	359	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	42	42	42	60		
972093	186842	CV 10x10	F		K	T	-40	323	298	331	317	001	1
	186843	CV 10x10	F		K	T	-40	313	304	301	306	001	1
	186902	CV 10x10	F		K	T	-40	361	363	364	362	001	1
972096	186841	CV 10x10	F		O	T	-40	345	333	341	339		
	186906	CV 10x10	F		O	T	-40	338	340	346	341		
	186841	CV 10x10	F		O	T	-40	324	316	313	318	001	1
	186906	CV 10x10	F		O	T	-40	317	321	323	320	001	1
	186841	CV 10x10	F		K	T	-40	337	342	353	344		
	186906	CV 10x10	F		K	T	-40	348	357	334	346		
	186841	CV 10x10	F		K	T	-40	309	332	343	328	001	1
	186906	CV 10x10	F		K	T	-40	347	338	278	321	001	1
>= Set values <=							-40	29	29	29	46		

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
	>=						-40	29	29	29	46		
Set values <=													
882852	186892	CV 10x10	F		ZB2	T	-40	320	310	312	314		strain aged 5%, 60 min. at 250°C
	186896	CV 10x10	F		ZB2	T	-40	305	297	314	305		strain aged 5%, 60 min. at 250°C
	186898	CV 10x10	F		ZB2	T	-40	311	303	309	307		strain aged 5%, 60 min. at 250°C
	186900	CV 10x10	F		ZB2	T	-40	305	317	306	309		strain aged 5%, 60 min. at 250°C
972090	184827	CV 10x10	F		ZB2	T	-40	341	317	326	328		strain aged 5%, 60 min. at 250°C
	186723	CV 10x10	F		ZB2	T	-40	259	299	299	286		strain aged 5%, 60 min. at 250°C
972093	181846	CV 10x10	F		ZB2	T	-40	306	302	323	310		strain aged 5%, 60 min. at 250°C
	186842	CV 10x10	F		ZB2	T	-40	316	299	319	311		strain aged 5%, 60 min. at 250°C
	186843	CV 10x10	F		ZB2	T	-40	322	309	315	315		strain aged 5%, 60 min. at 250°C
	186902	CV 10x10	F		ZB2	T	-40	306	302	323	310		strain aged 5%, 60 min. at 250°C
972096	186841	CV 10x10	F		ZB2	T	-40	311	302	314	309		strain aged 5%, 60 min. at 250°C
	186906	CV 10x10	F		ZB2	T	-40	305	310	313	309		strain aged 5%, 60 min. at 250°C

C40;shape:
CV 10x10: Test shape , Dimensions

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07	B06	C40	C01			C02	C03	C42	C42	C42	C43			
Heat No. samp.cond.	Plate No	shape	loc.	Pos.	PosTh.	Dir	temp °C	SV J	SV J	SV J	AV J		Sim.htm	WBH

C01;loc.:
F: Bottom
Pos.: test specimen position
PosTh.: Pos Thickness
K: ½
O: surface
ZB2: 2mm below surface
C02;Dir:
T: transverse
C42;SV: single value
C43;AV: average value
Sim.htm: sim. heat treatment
001: Sim.htm group #1
WBH: sim. heat treatment
samp.cond.: sample condition

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Test results: C10-C29 through Thickness Test acc. DIN / EN

B07 Heat No.	B06 Plate No	C40 Shape	SpThickn mm	C01 loc.	C02 Dir	C12 Rm MPa	C12 Rm MPa	C12 Rm MPa	Z (SV) %	Z (SV) %	Z (SV) %	Z (AV) %
Set values >=						404	404	404	25	25	25	35
882852	186892	Ø	10.01	F	S	531	531	531	72	78	60	70
	186896	Ø	10.00	F	S	539	530	532	78	78	70	75
	186900	Ø	10.00	F	S	526	521	530	77	79	78	78
972090	184827	Ø	10.03	F	S	528	528	525	60	67	58	62
	186723	Ø	9.96	F	S	539	544	525	73	74	79	75
972093	181846	Ø	10.00	F	S	522	520	520	75	74	77	75
	186842	Ø	10.00	F	S	535	533	536	78	75	72	75
	186902	Ø	10.01	F	S	515	520	517	77	71	74	74
972096	186906	Ø	9.87	F	S	527	525	539	77	79	70	75

SpThickn: specimen thickness
C01;loc.:
F: Bottom
C02;Dir:
S: through thickness direction
C12; Rm: Tensile Strength
Z(SV): reduction of area (single value)
Z(AV): reduction of area (average value)

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Chemical composition (Product analysis) - part 1 of 2

B07 Heat No.	B06 Plate No	C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %
	>=		.150				.015													
Set values	<=	.140	.550	1.650	.020	.0050	.055	.250	.700	.250	.300	.080	.040	.025	.0100	.0005	.0200	.0050	.0300	.0100
882852	186892	.052	.184	1.520	.008	.0010	.028	.181	.520	.123	.067	.004	.029	.012	.0058	.0002	.0020	.0002	.0030	.0020
	186896	.052	.185	1.530	.008	.0009	.030	.179	.520	.122	.071	.004	.029	.012	.0053	.0002	.0020	.0003	.0030	.0020
	186898	.052	.175	1.530	.007	.0009	.029	.180	.521	.123	.071	.003	.030	.012	.0051	.0001	.0020	.0002	.0010	.0010
	186900	.052	.184	1.530	.009	.0010	.029	.178	.520	.122	.072	.004	.030	.012	.0050	.0002	.0020	.0003	.0020	.0020
972090	184827	.054	.178	1.530	.007	.0007	.024	.176	.520	.127	.046	.004	.027	.013	.0056	.0002	.0020	.0002	.0030	.0020
	184828	.054	.176	1.530	.007	.0007	.024	.174	.520	.127	.045	.004	.027	.013	.0059	.0002	.0020	.0002	.0020	.0020
	186723	.055	.179	1.540	.007	.0010	.024	.174	.510	.126	.046	.004	.027	.013	.0061	.0002	.0020	.0002	.0030	.0020
972093	181846	.051	.180	1.520	.007	.0010	.029	.170	.520	.122	.060	.004	.029	.012	.0044	.0002	.0020	.0003	.0020	.0020
	186842	.052	.185	1.510	.007	.0012	.028	.168	.510	.124	.061	.004	.029	.013	.0042	.0002	.0020	.0003	.0020	.0020
	186843	.052	.177	1.500	.008	.0010	.027	.173	.531	.125	.066	.004	.029	.011	.0042	.0002	.0030	.0003	.0030	.0020
	186902	.048	.183	1.500	.007	.0010	.028	.168	.510	.122	.060	.004	.028	.012	.0045	.0002	.0020	.0003	.0020	.0020
972096	186841	.054	.175	1.530	.006	.0007	.024	.170	.527	.117	.055	.003	.027	.013	.0040	.0002	.0020	.0003	.0020	.0030
	186906	.053	.179	1.530	.007	.0010	.027	.174	.520	.121	.050	.004	.027	.013	.0040	.0002	.0020	.0002	.0020	.0020

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Chemical composition (Product analysis) - part 2 of 2

B07 Heat No.	B06 Plate No	Pb %	Cae %	Pcm %	LF01 %	LF02 %	LF03 %
Set values >= / <=		.010	.43	.22	.090	.110	.900
882852	186892	.002	.41	.16	.033	.045	.891
	186896	.002	.41	.17	.033	.045	.892
	186898	.002	.41	.16	.033	.045	.895
	186900	.002	.41	.17	.034	.046	.892
972090	184827	.002	.41	.17	.031	.044	.869
	184828	.002	.41	.17	.031	.044	.866
	186723	.002	.41	.17	.031	.044	.856
972093	181846	.002	.40	.16	.033	.045	.872
	186842	.002	.40	.16	.033	.046	.863
	186843	.002	.40	.16	.033	.044	.895
	186902	.002	.39	.16	.032	.044	.860
972096	186841	.002	.41	.17	.030	.043	.869
	186906	.002	.41	.16	.031	.044	.865

C99 - Supplementary information
BI <= 0,01%
C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF03: Cr+Ni+Cu+Mo
LF02: Nb+V+Ti
LF01: Nb+V

Remarks

Simulated heat treatment of test coupons:

Pos 30:
001/1: 1 cycle(s) sim. PWHT: furnace charge temperature at max. 400 °C, heating with max. 55 °C/h up to 580 °C, +20 °C/-20 °C, holding time 240 minutes, cooling with max. 55 °C/h down to 400 °C, final cooling in calm air.

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Remarks

We confirm that the above-mentioned delivery corresponds to the order (and standard).

Reduction of area on tensile test specimens in the through-thickness direction in accordance with EN 10164:2004, class Z35.

The signature of the inspection representative from voestalpine Grobblech GmbH is substituted by a electronic Signature, because the certificates of voestalpine Grobblech GmbH are prepared by a suitable data processing system (EN 10204, Pt.5).

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ULTRASONIC EXAMINATION

SPECIFICATION
Ultrasonic examination acc. to EN 10160, EN 10160 class S1/Body, Grid 200 mm, EN 10160 class E2/Edge Zone, Edge zone 75 mm

VALID TEST EQUIPMENT
mechanized ultrasonic "In-Line testing system" (Manufacturer: NDT-Systems & Services) and
mechanized ultrasonic "off-Line - testing system" (manufacturer: Windhoff Bahn- und Anlagentechnik GmbH) and
MUT (optional): Sonatest D20 no. 90006523 or Sonatest D20 no. 90007346 or Sonatest Masterscan 380 no. 90007347 or Sonatest Masterscan 380 no. 90006522 or Sonatest D50 no. 90010231 or GE - USM 36 no. 90010775

PROBE
(in-line AUT): 3STSE 18.3/8 P5, SEZ5R10RS, SE3 18.3/10 5A, (5MHz)
(off-line AUT): S140 (4MHz) 3T/1R
(MUT): SEB4E (4MHz), SEB4E0° (4MHz), MSEB4E (4MHz), B2SO (2MHz)
watergapcoupling

RESULT
Plate(s) comply with the specification.

INSPECTION OPERATOR
Operators Level 1 or 2: qualified and certified according ÖNORM EN 473 or EN ISO 9712 (since 01.01.2013) respectively according the Written Practice „NDT-WP" (in accordance to Recommended Practice SNT-TC-1A). Operators Level 2 for ASME/ASTM.

INSPECTION SUPERVISOR
Responsible Level 3: Bindreiter Erich

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ROSETTI MARINO

PQR 40/18

Shielding gas certificate



Attenzione

SEZIONE 1: identificazione della sostanza/miscela e della società/impresa

1.1. Identificatore del prodotto

Nome commerciale : Arcal™ 5

Scheda Nr. : AL.5.8.17

1.2. Usi identificati pertinenti della sostanza o della miscela e usi sconsigliati

Usi pertinenti identificati : Impiego industriale e professionale. Fare un'analisi di rischio prima dell'uso.
Gas di protezione nei processi di saldatura.
Contattare il fornitore per ulteriori informazioni sull'utilizzo.

Usi sconsigliati : Uso di consumo.

1.3. Informazioni sul fornitore della scheda di dati di sicurezza

Identificazione della società : Air Liquide Italia Service Srl
Via Calabria, 31
20158 Milano Italia
+39 02 4026.1
https://industria.airliquide.it

Indirizzo e-mail (persona competente): : info_schedesicurezza@airliquide.com

1.4. Numero telefonico di emergenza

Numero telefonico di emergenza : 800.452661 (24h/24h, 365 giorni/anno)

SEZIONE 2: identificazione dei pericoli

2.1. Classificazione della sostanza o della miscela

Classificazione secondo il regolamento (CE) n. 1272/2008 [CLP]

Pericoli fisici Gas sotto pressione: Gas compresso H280

2.2. Elementi dell'etichetta

Etichettatura secondo la regolamento CE n. 1272/2008 [CLP]

Pittogrammi di pericoli (CLP) :



GHS04

Avvertenza (CLP) : Attenzione

Indicazioni di pericolo (CLP) : H280 - Contiene gas sotto pressione; può esplodere se riscaldato.

Consigli di prudenza (CLP)

- Conservazione : P403 - Conservare in luogo ben ventilato.

2.3. Altri pericoli

: Asfissiante in alte concentrazioni.
In alta concentrazione il diossido di carbonio causa rapidamente insufficienza respiratoria. I

sintomi sono mal di testa, nausea e vomito che possono portare alla perdita di conoscenza.

SEZIONE 3: composizione/informazioni sugli ingredienti

3.1. Sostanze : Non applicabile.

3.2. Miscele

Nome	Identificatore del prodotto	%	Classificazione secondo il regolamento (CE) n. 1272/2008 [CLP]
Argon	(Numero CAS) 7440-37-1 (Numero CE) 231-147-0 (Numero indice EU) (no. REACH) *1	resto	Press. Gas (Comp.), H280
Diossido di carbonio	(Numero CAS) 124-38-9 (Numero CE) 204-696-9 (Numero indice EU) (no. REACH) *1	18	Press. Gas (Liq.), H280

Testo integrale delle indicazioni di pericolo H: vedere la sezione 16.

Non contiene altri prodotti e/o impurezze che influenzano la classificazione del prodotto.

**1: Indicata nella lista di sostanze dell'Allegato IV/V del REACH, esente dall'obbligo di registrazione.*

**2: Scadenza di registrazione non superata.*

**3: Registrazione non richiesta: sostanza fabbricata o importata in quantità <1t/anno.*

SEZIONE 4: misure di primo soccorso

4.1. Descrizione delle misure di primo soccorso

- Inalazione : Spostare la vittima in zona non contaminata indossando l'autorespiratore. Mantenere il paziente disteso e al caldo. Chiamare un medico. Procedere alla rianimazione cardiopolmonare in caso di arresto della respirazione.
- Contatto con la pelle : Non si attendono effetti avversi derivanti da questo prodotto.
- Contatto con gli occhi : Non si attendono effetti avversi derivanti da questo prodotto.
- Ingestione : L'ingestione è considerata una via di esposizione poco probabile.

4.2. Principali sintomi ed effetti, sia acuti che ritardati

: In alta concentrazione può causare asfissia. I sintomi possono includere perdita di mobilità e/o conoscenza. Le vittime possono non rendersi conto dell'asfissia.

Fare riferimento alla sezione 11.

4.3. Indicazione dell'eventuale necessità di consultare immediatamente un medico e di trattamenti speciali

: Nessuno(a).

SEZIONE 5: misure antincendio

5.1. Mezzi di estinzione

- Mezzi di estinzione idonei : Acqua nebulizzata.
- Mezzi di estinzione non idonei : Non usare getti d'acqua per estinguere l'incendio.

5.2. Pericoli speciali derivanti dalla sostanza o dalla miscela

Pericoli specifici : L'esposizione alle fiamme può causare la rottura o l'esplosione del recipiente.

Prodotti di combustione pericolosi : Nessuno(a).

5.3. Raccomandazioni per gli addetti all'estinzione degli incendi

Metodi specifici	: Utilizzare misure antincendio adeguate all'incendio circostante. L'esposizione alle fiamme e al calore può causare la rottura del recipiente. Raffreddare i contenitori esposti al rischio con getti d'acqua a doccia da una posizione protetta. Non riversare l'acqua contaminata dell'incendio negli scarichi fognari. Se possibile arrestare la fuoriuscita di prodotto. Se possibile utilizzare acqua nebulizzata per abbattere i fumi. Spostare i recipienti lontano dall'area dell'incendio se questo può essere fatto senza rischi.
Dispositivi di protezione speciali per addetti antincendio	: Usare l'autorespiratore in spazi confinati. Indumenti di protezione e dispositivi di protezione (autorespiratori) standard per vigili del fuoco. Norma UNI EN 137 - Dispositivi di protezione delle vie respiratorie - Autorespiratori a circuito aperto ad aria compressa con maschera intera. Norma UNI EN 469 - Indumenti di protezione per vigili del fuoco. Norma UNI EN 659 - Guanti di protezione per vigili del fuoco.

SEZIONE 6: misure in caso di rilascio accidentale

6.1. Precauzioni personali, dispositivi di protezione e procedure in caso di emergenza

: Tentare di arrestare la fuoriuscita.
Evacuare l'area.
Usare l'autorespiratore per entrare nella zona interessata se non è provato che l'atmosfera sia respirabile.
Assicurare una adeguata ventilazione.
Evitarne l'ingresso in fognature, scantinati, scavi e zone dove l'accumulo può essere pericoloso.
Operare in accordo al piano di emergenza locale.
Rimanere sopravvento.
Quando è possibile il rilascio di gas asfissianti, devono essere utilizzati dei rilevatori di ossigeno.

6.2. Precauzioni ambientali

: Tentare di arrestare la fuoriuscita.

6.3. Metodi e materiali per il contenimento e la bonifica

: Ventilare la zona.

6.4. Riferimento ad altre sezioni

: Vedere anche le sezioni 8 e 13.

SEZIONE 7: manipolazione e immagazzinamento

7.1. Precauzioni per la manipolazione sicura

Uso sicuro del prodotto	: Non respirare il gas. Evitare il rilascio del prodotto in atmosfera. Il prodotto deve essere manipolato in accordo alle buone prassi di sicurezza e di igiene industriale. Soltanto il personale con esperienza e opportunamente addestrato può manipolare i gas sotto pressione. Prendere in considerazione le valvole di sicurezza nelle installazioni per gas. Assicurarsi che l'intero sistema di distribuzione del gas sia stato (o sia regolarmente) verificato contro le fughe prima dell'uso. Non fumare mentre si manipola il prodotto. Utilizzare solo apparecchiature specifiche adatte per il prodotto, la pressione e la temperatura di impiego. In caso di dubbi contattare il fornitore del gas. Evitare il risucchio di acqua, acidi ed alcali.
Manipolazione sicura del contenitore del gas	: Non permettere il riflusso del gas nel contenitore. Proteggere le bombole da danni fisici; non trascinare, far rotolare, far scivolare o far cadere. Quando si spostano le bombole, anche se per brevi distanze, utilizzare gli opportuni mezzi di

movimentazione (carrelli, carrelli a mano, etc...) progettati per il trasporto delle bombole.

Lasciare i cappellotti di protezione delle valvole in posizione fino a quando il contenitore non è stato fissato a un muro o a un banco di lavoro o posizionato in un opportuno sostegno ed è pronto per l'uso.

Se l'operatore incontra una qualsiasi difficoltà durante il funzionamento della valvola interrompere l'uso e contattare il fornitore.

Mai tentare di riparare o modificare le valvole dei contenitori o i dispositivi di sicurezza.

Le valvole danneggiate devono essere immediatamente segnalate al fornitore.

Mantenere le valvole dei contenitori pulite e libere da contaminanti, in particolare olio e acqua.

Rimontare i tappi e/o i cappellotti delle valvole e dei contenitori, ove forniti, non appena il contenitore è disconnesso dall'apparecchiatura.

Chiudere la valvola del contenitore dopo ogni utilizzo anche se vuoto, anche se ancora connesso all'apparecchiatura.

Mai tentare di trasferire i gas da una bombola/contenitore a un altro.

Non utilizzare fiamme dirette o riscaldamento elettrico per aumentare la pressione interna del contenitore.

Non rimuovere né rendere illeggibili le etichette apposte dal fornitore per l'identificazione del contenuto della bombola.

Evitare il risucchio di acqua nel contenitore.

Aprire lentamente la valvola per evitare colpi di pressione.

7.2. Condizioni per lo stoccaggio sicuro, comprese eventuali incompatibilità

: Osservare le normative e i requisiti legislativi locali relativi allo stoccaggio dei recipienti.

I recipienti non devono essere immagazzinati in condizioni tali da favorire fenomeni corrosivi.

I cappellotti e/o i tappi devono essere montati.

I recipienti devono essere immagazzinati in posizione verticale e ancorati in modo da prevenirne la caduta.

I contenitori in stoccaggio dovrebbero essere controllati periodicamente per verificarne le condizioni generali ed eventuali perdite.

Mantenere il contenitore sotto i 50°C in zona ben ventilata.

Immagazzinare i recipienti in aree dove non vi è rischio di incendio, lontano da sorgenti di calore e da fonti di ignizione.

Tenere lontano da sostanze combustibili.

7.3. Usi finali particolari

: Nessuno(a).

SEZIONE 8: controllo dell'esposizione/protezione individuale

8.1. Parametri di controllo

Diossido di carbonio (124-38-9)		
OEL : Limiti di esposizione professionale		
UE	ILV (EU) - 8 H - [mg/m³]	9000 mg/m³
	ILV (EU) - 8 H - [ppm]	5000 ppm
ACGIH	ACGIH TWA (ppm)	5000 ppm
	ACGIH STEL (ppm)	30000 ppm
	Commento (ACGIH)	Asphyxia
Italia	Valori Limite di Esposizione Professionale (Italia) 8 ore [mg/m3]	9000 mg/m³
	Valori Limite di Esposizione Professionale (Italia) 8 ore [ppm]	5000 ppm

DNEL (Livello derivato senza effetto) : Nessun dato disponibile.

PNEC (Prevedibili concentrazioni prive di effetti) : Nessun dato disponibile.

8.2. Controlli dell'esposizione

8.2.1. Controlli tecnici idonei

: Fornire adeguata ventilazione degli scarichi a livello generale e locale.

I sistemi sotto pressione devono essere controllati periodicamente per verificare l'assenza di perdite.

Assicurare che l'esposizione sia ben al di sotto dei limiti di esposizione professionale (ove disponibili).

Quando è possibile il rilascio di gas asfissianti, devono essere utilizzati dei rilevatori di ossigeno.

Considerare l'uso di un sistema di permessi di lavoro, per esempio per le attività di manutenzione.

8.2.2. Misure di protezione individuale, ad es, dispositivi di protezione individuale

: Dovrebbe essere condotta e documentata un'analisi del rischio in ogni area di lavoro, per valutare il rischio correlato all'utilizzo del prodotto e per individuare i DPI appropriati ai rischi identificati. Devono essere considerate le seguenti raccomandazioni.
Devono essere selezionati DPI conformi agli standard UNI/EN/ISO raccomandati.

• Protezione per occhi/volto : Indossare occhiali di sicurezza con protezione laterale.
Norma UNI EN 166 - Protezione personale degli occhi - Specifiche.

• Protezione per la pelle

- Protezione per le mani : Indossare guanti da lavoro quando si movimentano i contenitori di gas.
Norma UNI EN 388 - Guanti di protezione contro rischi meccanici.
- Altri : Indossare scarpe di sicurezza durante la movimentazione dei contenitori.
Norma UNI EN ISO 20345 - Dispositivi di protezione individuale - Calzature di sicurezza.

• Protezione per le vie respiratorie : Le maschere a filtro possono essere utilizzate se sono note tutte le condizioni dell'ambiente circostante (per es. tipo e concentrazione del/i contaminante/i) e la durata di utilizzo.
Utilizzare maschere a filtro e maschere a pieno facciale quando i limiti di esposizione possono essere superati per un breve periodo, per esempio durante la connessione o la disconnessione dei recipienti.
Le maschere a filtro non proteggono dalle atmosfere sottossigenate.
In ambienti sottossigenati deve essere utilizzato un autorespiratore o un sistema di fornitura di aria respirabile con maschera.
Norma UNI EN 14387 - Apparecchi di protezione delle vie respiratorie - Filtri antigas e filtri combinati. Norma UNI EN 136 - Apparecchi di protezione delle vie respiratorie. Maschere intere.
Norma UNI EN 137 - Dispositivi di protezione delle vie respiratorie - Autorespiratori a circuito aperto ad aria compressa con maschera intera.

• Pericoli termici : Nessuno oltre a quelli indicati nelle sezioni precedenti.

8.2.3. Controlli dell'esposizione ambientale

: Nessuna necessaria.

SEZIONE 9: proprietà fisiche e chimiche

9.1. Informazioni sulle proprietà fisiche e chimiche fondamentali

Aspetto

- Stato fisico a 20°C / 101.3kPa : Gas
- Colore : La miscela contiene uno o più componenti che hanno i seguenti colori:
Incolore.

Odore : Inodore.

Soglia olfattiva : La soglia olfattiva è soggettiva e inadeguata per avvertire di una sovraesposizione.

pH : Non applicabile per i gas e le miscele di gas.

Punto di fusione / Punto di congelamento : Non applicabile per le miscele di gas.

Punto di ebollizione : Non applicabile per le miscele di gas.

Punto di infiammabilità : Non applicabile per i gas e le miscele di gas.

Velocità di evaporazione : Non applicabile per i gas e le miscele di gas.

Infiammabilità (solidi, gas) : Non infiammabile.

Limiti di infiammabilità o esplosività	: Non infiammabile.
Tensione di vapore [20°C]	: Non applicabile.
Tensione di vapore [50°C]	: Non applicabile.
Densità di vapore	: Non applicabile.
Densità relativa, gas (aria=1)	: Più pesante dell'aria.
Idrosolubilità	: Solubilità in acqua dei componenti della miscela: • Argon: 67,3 mg/l • Diossido di carbonio: 2000 mg/l Completamente solubile.
Coefficiente di ripartizione n-ottanolo/acqua (Log Kow)	: Non conosciuto(a).
Temperatura di autoaccensione	: Non infiammabile.
Temperatura di decomposizione	: Non applicabile.
Viscosità	: Non conosciuto(a).
Proprietà esplosive	: Non applicabile.
Proprietà ossidanti	: Non applicabile.

9.2. Altre informazioni

Massa molecolare	: Non applicabile per le miscele di gas.
Altri dati	: Gas/vapore più pesante dell'aria. Può accumularsi in spazi chiusi particolarmente al livello del suolo o al di sotto di esso.

SEZIONE 10: stabilità e reattività

10.1. Reattività

: Non ci sono ulteriori pericoli di reattività oltre a quelli descritti nei paragrafi sottostanti.

10.2. Stabilità chimica

: Stabile in condizioni normali.

10.3. Possibilità di reazioni pericolose

: Nessuno(a).

10.4. Condizioni da evitare

: Evitare l'umidità negli impianti.

10.5. Materiali incompatibili

: Nessuno(a).
Consultare la norma ISO 11114 per informazioni addizionali sulla compatibilità dei materiali.

10.6. Prodotti di decomposizione pericolosi

: In condizioni normali di stoccaggio e utilizzo, non dovrebbero generarsi prodotti di decomposizione pericolosi.

SEZIONE 11: informazioni tossicologiche

11.1. Informazioni sugli effetti tossicologici

Tossicità acuta : Non si aspettano effetti tossicologici da questo prodotto se sono rispettati i valori limite di esposizione.

A differenza degli asfissianti semplici, il diossido di carbonio ha la capacità di provocare la morte anche quando sono mantenuti livelli di ossigeno normale (20-21%). È stato riscontrato che il 5% di CO_2 contribuisce in modo sinergico all'incremento di tossicità di altri gas (CO, NO_2). Il CO_2 ha dimostrato di aumentare la produzione di carbossi oppure meta emoglobina, probabilmente a causa dei suoi effetti stimolatori sull'apparato respiratorio e circolatorio.

Per maggiori informazioni fare riferimento al documento 'EIGA Safety Info 24: Carbon Dioxide, Physiological Hazards' disponibile all'indirizzo www.eiga.eu.

Corrosione/irritazione cutanea	: Nessun effetto conosciuto da parte di questo prodotto.
Lesioni/irritazioni oculari gravi	: Nessun effetto conosciuto da parte di questo prodotto.
Sensibilizzazione respiratoria o cutanea	: Nessun effetto conosciuto da parte di questo prodotto.
Mutagenicità	: Nessun effetto conosciuto da parte di questo prodotto.
Cancerogenicità	: Nessun effetto conosciuto da parte di questo prodotto.

Tossico per la riproduzione: fertilità	: Nessun effetto conosciuto da parte di questo prodotto.
Tossico per la riproduzione: feto	: Nessun effetto conosciuto da parte di questo prodotto.
Tossicità specifica per organi bersaglio (STOT) — esposizione singola	: Nessun effetto conosciuto da parte di questo prodotto.
Tossicità specifica per organi bersaglio (STOT) — esposizione ripetuta	: Nessun effetto conosciuto da parte di questo prodotto.
Pericolo in caso di aspirazione	: Non applicabile per i gas e le miscele di gas.

SEZIONE 12: informazioni ecologiche

12.1. Tossicità

Valutazione	: Questo prodotto non causa alcun danno ecologico.
EC50 48h - Daphnia magna [mg/l]	: Dati non disponibili.
EC50 72h - Algae [mg/l]	: Dati non disponibili.
CL50 96h - Pesce [mg/l]	: Dati non disponibili.

12.2. Persistenza e degradabilità

Valutazione	: Questo prodotto non causa alcun danno ecologico.

12.3. Potenziale di bioaccumulo

Valutazione	: Questo prodotto non causa alcun danno ecologico.

12.4. Mobilità nel suolo

Valutazione	: Questo prodotto non causa alcun danno ecologico.

12.5. Risultati della valutazione PBT e vPvB

Valutazione	: Non classificato come PBT o vPvB.

12.6. Altri effetti avversi

Altri effetti avversi	: Nessun effetto conosciuto da parte di questo prodotto.
Effetto sullo strato d'ozono	: Nessuno(a).
Effetti sul riscaldamento globale	: Contiene gas a effetto serra.

SEZIONE 13: considerazioni sullo smaltimento

13.1. Metodi di trattamento dei rifiuti

Può essere scaricato all'atmosfera in zona ben ventilata.

Non scaricare dove l'accumulo può essere pericoloso.

Restituire al fornitore il prodotto non utilizzato nel recipiente originale.

Elenco dei rifiuti pericolosi : 16 05 05: gas in contenitori a pressione, diversi da quelli di cui alla voce 16 05 04*.

13.2. Informazioni supplementari

: Il trattamento e lo smaltimento dei rifiuti da parte di imprese esterne deve essere effettuato in conformità alla normativa vigente.

SEZIONE 14: informazioni sul trasporto

14.1. Numero ONU

Numero ONU : 1956

14.2. Nome di spedizione dell'ONU

Trasporto su strada/ferrovia (ADR/RID)	:	GAS COMPRESSO N.A.S. (Argon, Diossido di carbonio)
Trasporto per via aerea (ICAO-TI / IATA-DGR)	:	Compressed gas, n.o.s. (Argon, Carbon dioxide)
Trasporto per mare (IMDG)	:	COMPRESSED GAS, N.O.S. (Argon, Carbon dioxide)

14.3. Classi di pericolo connesso al trasporto

Etichettatura :



2.2 : Gas non infiammabili, non tossici.

Trasporto su strada/ferrovia (ADR/RID)

Classe	:	2
Codice classificazione	:	1A
N° di identificazione del pericolo	:	20
Codice di restrizione in galleria	:	E - Passaggio vietato nelle gallerie di categoria E

Trasporto per via aerea (ICAO-TI / IATA-DGR)

Classe/ Divisione(rischio(i) accessorio(i))	:	2.2

Trasporto per mare (IMDG)

Classe/ Divisione(rischio(i) accessorio(i))	:	2.2
Scheda di Emergenza (EmS) - Fuoco	:	F-C
Scheda di Emergenza (EmS) - Sversamento	:	S-V

14.4. Gruppo di imballaggio

Trasporto su strada/ferrovia (ADR/RID)	:	Non applicabile.
Trasporto per via aerea (ICAO-TI / IATA-DGR)	:	Non applicabile.
Trasporto per mare (IMDG)	:	Non applicabile.

14.5. Pericoli per l'ambiente

Trasporto su strada/ferrovia (ADR/RID)	:	Nessuno(a).
Trasporto per via aerea (ICAO-TI / IATA-DGR)	:	Nessuno(a).
Trasporto per mare (IMDG)	:	Nessuno(a).

14.6. Precauzioni speciali per gli utilizzatori

Istruzioni di imballaggio

Trasporto su strada/ferrovia (ADR/RID)	:	P200
Trasporto per via aerea (ICAO-TI / IATA-DGR)		
Aerei passeggeri e cargo	:	200
Solo aerei cargo	:	200
Trasporto per mare (IMDG)	:	P200

Misure di precauzione per il trasporto : Evitare il trasporto su veicoli dove la zona di carico non è separata dall'abitacolo.

Assicurarsi che il conducente sia informato del rischio potenziale del carico e sappia cosa fare in caso di incidente o di emergenza.

Prima di iniziare il trasporto:

- Assicurarsi che vi sia adeguata ventilazione.
- Accertarsi che il carico sia ben assicurato.
- Assicurarsi che la valvola della bombola sia chiusa e che non perda.
- Assicurarsi che il tappo cieco della valvola, ove fornito, sia correttamente montato.
- Assicurarsi che il cappellotto, ove fornito, sia correttamente montato.

Numero telefonico di emergenza nel trasporto: 800.452661 (operativo 24h/24h, 365 giorni all'anno, presso il centro di Risposta Nazionale del Servizio Emergenze Trasporti S.E.T.).

14.7. Trasporto di rinfuse secondo l'allegato II di MARPOL ed il codice IBC

: Non applicabile.

SEZIONE 15: informazioni sulla regolamentazione

15.1. Disposizioni legislative e regolamentari su salute, sicurezza e ambiente specifiche per la sostanza o la miscela

Normative UE

Restrizioni consigliate : Nessuno(a).

Direttiva Seveso: 2012/18/UE (Seveso III) : Non incluso.

Norme nazionali

Legislazione nazionale : Assicurare l'osservanza di tutte le norme nazionali e locali.

15.2. Valutazione della sicurezza chimica

: Per questo prodotto non è necessario effettuare una valutazione della sicurezza chimica (CSA).

SEZIONE 16: altre informazioni

Indicazioni di modifiche : Scheda di dati di sicurezza revisionata in accordo con il Regolamento (UE) 2015/830.

Ridenominazione di alcune sezioni in accordo con il Regolamento (EU) 2015/830. Modifiche editoriali, inclusa la ricollocazione di frasi, ove opportuna, per migliorare leggibilità e coerenza del documento.

Aggiornamento degli usi identificati in sezione 1.

Aggiornamento delle misure di protezione individuale in sezione 8.

Aggiornamento sezione 11.

Aggiornamento sezione 12.

Aggiornamento sezione 13.

Aggiunta di "Abbreviazioni e acronimi" in sezione 16.

Abbreviazioni ed acronimi : ATE - Acute Toxicity Estimate - Stima della tossicità acuta

CLP - Classification Labelling Packaging - Regolamento (CE) N. 1272/2008 relativo alla classificazione, all'etichettatura e all'imballaggio delle sostanze e delle miscele

REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals - Regolamento (CE) N. 1907/2006 concernente la registrazione, la valutazione, l'autorizzazione e la restrizione delle sostanze chimiche

EINECS - European Inventory of Existing Commercial Chemical Substances - Registro europeo delle sostanze chimiche in commercio

n. CAS - Chemical Abstract Service number - Identificativo numerico attribuito dal Chemical Abstract Service alle sostanze chimiche

DPI - Dispositivi di Protezione Individuale

LC50 - Lethal Concentration 50 - Concentrazione letale per il 50% della popolazione sottoposta a test

RMM - Risk Management Measures - Misure di gestione dei rischi

PBT - Persistent, Bioaccumulative and Toxic - Persistente, bioaccumulabile e tossico

vPvB - very Persistent and very Bioaccumulative - Molto persistente e molto bioaccumulabile

STOT-SE: Specific Target Organ Toxicity-Single Exposure - Tossicità specifica per organi bersaglio-esposizione singola

CSA - Chemical Safety Assessment - Valutazione della sicurezza chimica

EN - European Standard - Norma europea

ONU - Organizzazione delle Nazioni Unite

ADR - Accord européen relatif au transport international des marchandises Dangereuses par Route - Accordo europeo relativo al trasporto internazionale di merci pericolose su strada

IATA - International Air Transport Association - Associazione internazionale del trasporto aereo

IMDG code - International Maritime Dangerous Goods code - Codice per il trasporto via mare di merci pericolose

RID - Règlement concernant le trasport International ferroviaire des merchandises Dangereuses - Regolamento concernente il trasporto internazionale di merci pericolose per

ferrovia

WGK - Wassergefährdungsklassen - Classi di pericolo per l'acqua

STOT-RE: Specific Target Organ Toxicity-Repeated Exposure - Tossicità specifica per organi bersaglio-esposizione ripetuta

Consigli per la formazione : Il rischio di asfissia è spesso sottovalutato e deve essere ben evidenziato durante l'addestramento dell'operatore.

Dati supplementari : Classificazione effettuata in base alle informazioni contenute nei database di EIGA (European Industrial Gases Association).

Classificazione in conformità con i metodi di calcolo del Regolamento (CE) n. 1272/2008 (CLP).

Per ulteriori informazioni contattare la Linea Verde: 800.452661 (operativa 24h/24h, 365 giorni all'anno, presso il centro di Risposta Nazionale del Servizio Emergenze Trasporti S.E.T.).

Testo integrale delle indicazioni di pericolo H ed EUH

Press. Gas (Comp.) : Gas sotto pressione: Gas compresso

Press. Gas (Liq.) : Gas sotto pressione: Gas liquefatto

H280 : Contiene gas sotto pressione; può esplodere se riscaldato.

RINUNCIA ALLA RESPONSABILITÀ : Prima di utilizzare questo prodotto in qualsiasi nuovo processo o esperimento, deve essere condotto uno studio approfondito sulla sicurezza e sulla compatibilità del prodotto stesso con i materiali.

Le informazioni contenute in questo documento sono da ritenersi valide al momento della stampa.

Sebbene sia stata posta la massima cura nella redazione di questo documento, la Società non deve essere ritenuta responsabile per eventuali danni o infortuni derivanti dal suo utilizzo.

Fine del documento

ROSETTI MARINO

PQR 40/18

Consumables certificate

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2018-07-27

Numero certificato/Cert no: EC25251151 rev. 0

Nostro ordine/Our order:	2013780	Vostro ordine/Your order:	1718000897
Nostro riferimento/Our ref:	Web user - Movex CMP020 ITB	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB00060	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20180727	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address

ESAB SALDATURA S.P.A. (6155)
STRADA PROVINCIALE 34, N. 7
IT-20010 OSSONA MI
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address

ROSETTI MARINO SPA
.
VIA TRIESTE 230
48100 RAVENNA RA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PNS24006 Quantità/Quantity: 20 CT

PRODOTTO/PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK Tubrod 15.17 1.2mm 16kg
Codice/Item no:	**1517127730**

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.36: E81T1-M21A4-Ni1
EN ISO 17632-A: T 46 3 1Ni P C1 2 H5
EN ISO 17632-A: T 46 4 1Ni P M21 2 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:	M21 (EN ISO 14175)
C	0.05%
Si	0.39%
Mn	1.15%
P	0.01%
S	0.02%
Cr	0.03%
Ni	1.0%
Mo	0.03%
Nb	0.02%
Cu	0.06%
V	0.02%

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:	EN
Altro/Auxiliary:	M21 (EN ISO 14175)
Condizione/Condition:	As welded

TRAZIONE/TENSILE

ReL	Rm	A5
544 MPa	613 MPa	26 %

RESILIENZA/IMPACT

Temp	-40 °C
KV	124 J

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis		Validazione - altro/Validation - Others	
Piotr Grela	Quality Assurance Manager	Neil Farrow	Product Manager

ROSETTI MARINO

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preliminary WPS

PQR ref.:	40/18 TBQ	WPS (EN 15614-1 Ed.2017+MOTS 12 Rev. 4.0)	40/18	REV.:	0	Data /date	30/08/2018

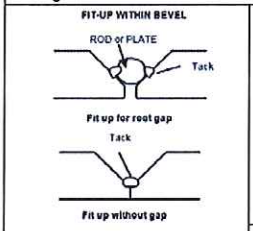
Procedimento di saldatura / Welding process: 136-FCAW — Tipo / Type: SEMIAUTOMATIC

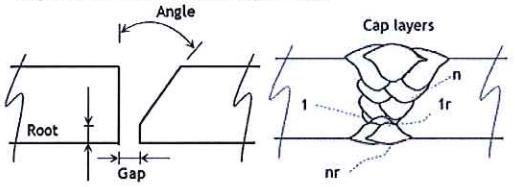
GIUNTO - JOINT

Tipo di giunto / Joint Design: 1/2V — Supporto / Backing: ☐ Si / Yes ☒ No

Materiale di supporto (tipo) / Backing material (type): ☐ Metallico / Metal ☐ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:





Note:
1. Surfaces cleaned from moisture, oil, grease, paint before welding (by grinding)/ *Pulire le superfici da liquidi, oli, grasso e vernici con molatura prima di saldare.*
2. Minimum tack weld lengths shall be 4 times the thk or 50 mm, whichever is less/ I tacchetti devono essere lunghi almeno 50 mm o 4 volte lo spessore (il più piccolo dei due);
3. Welding shall not be discontinued before 25% of the weld thickness or 3 passes are completed, whichever gives adequate cross section to prevent craking/ *La saldatura non può essere interrotta prima di aver completato almeno 3 passate o il 25% dello spessore da saldare*
4. Preheat shall be performed by electrical resistance, induction equipment or with gas burners. Cutting torches shall not be permitted. *Il preriscaldo può essere eseguito con resitenze, induzione o torcia. Non può essere utilizzato l'ossitaglio.*

MATERIALE BASE - BASE MATERIAL

Da / from P-N°: /	Group N° S4	A / to P-N°: /	Group N° S4

DA Tipo e grado / From type and grade: S460 G2+M

A Tipo e grado / To type and grade: S460 G2+M

Gamma spessori / Thickness range: ▶ Materiale base / Base material: Piena penetrazione / Groove 40 mm

▶ Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove N.A.

METALLO D'APPORTO - FILLER METAL

	GS FCAW	
Spec. N° (SFA)	5.29/5.36	
AWS N° (CLASS)	E81T1-1/E81T1-Ni1	
F-N°	6	
A-N°	1	
Diametro mat. D'apporto / Size of filler metal	1,2	
Gamma spessori /Thick. Range (mm)	Up to filling	
Accoppiamento filo-flusso / Electrode-flux (CLASS)	NA	
Denom. Comm. Flusso / FLUX trade name	NA	
Inserto consumabile / Consumable insert	NA	
Altro / other	OK Tubrod 15.17	

POSIZIONI - POSITION

giunto / Joint: Cianfrino / groove — Posizione / position 2G-3G — Progressione / weld progression: Ascendente / UP hill

PRERISCALDO - PRE-HEAT

Temp.preriscaldo minima / Min. pre-heat temp: 50 °C — Max temp. Di interpass / Max interpass temp.: 250 °C — Mantenimento interpass / Interpass maintenance: N.A. — Tempo di mantenimento prerisc. / Maintenance timing: N.A.

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs): N.A. — Temperatura di stasi / Holding temperature °C: N.A. — Tempo di stasi / Holding time (min.): N.A. — Velocità di raffreddamento / Cooling rate (°C/Hrs): N.A.

GAS DI PROTEZIONE - GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar+CO2	80%+20%	16-24 lt/min
Protezione al seguito / Trailing:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current: DC — Polarità / Polarity: RP

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: N.A.

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: N.A.

Velocità alimentazione filo / Electr. Wire feed speed range: Self regulated

TECNICA - TECHNIQUE

Passata / Bead: Tirata/String — Dimensione bocchello gas / Orifice of gas cup size: 1/2" — Pulizia iniziale e fra le passate / Initial and interpass cleaning: Spazzolatura/Brushing

Metodo di solcatura a rovescio / Method of back gouging: Scriccatura + molatura/ Arcair + grinding — Oscillazione / Oscillation: N.A. — Distanza zona di contatto e pezzo / Contact zone to work distance: N.A.

N°Passate / Passes nr.: Multipla/Multiple — Elettrodo multiplo o singolo / Multiple or single electrodes: Singolo/Single — Martellatura / Peening: N.A.

Altro / Other: All arc/air gouged surface shall be dressed to bright clean metal by grinding at an additional depth of minimum 2 mm/ *Molare per una profondità minima di 2 mm dopo scriccatura.*

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current			Voltaggio / Volt range		Vel. Avanzamento / Travel speed range (mm/min)		Apporto termic / Heat input (KJ/mm)	
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. Range							
Tack-1	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	180	195	27	29	160	235	1,24	2,12
2	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	230	250	27	29	210	285	1,31	2,07
3-n; Cap layers	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	240	270	27	29	220	350	1,11	2,14
Back gouging (minimum back gouging layers shall be 2 /Le passate di ripresa devono essere minimo 2)												
1r	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	230	250	27	29	210	285	1,31	2,07
2r-3r	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	240	270	27	29	220	350	1,11	2,14

Preparato da / prepared by:	Client/Third part signature:	Client/Third part signature:
D.Cenacchi	*Maersk*	*DNV*

ROSETTI MARINO

PQR 40/18

NDE certificate

ROSETTI MARINO	**VERBALE DI CONTROLLO VISIVO/DIMENSIONALE** **visual/dimensional inspection report**	VDR N° **40-18** data: **04-09-2018**

progetto project	**TYRA REDEVELOPMENT PROJECT**	cliente **TOTAL** client	ordine **/** PO	commessa **118A10** job

disegno dwg	**/**	ITP N°	fase step	**/**

SI CERTIFICA CHE :

gli item di seguito indicati sono stati sottoposti a controllo dimensionale ed accettati in accordo alla procedura / specifica sotto indicata ed ai criteri di accettabilita' in essa definiti.

WE CERTIFY THAT:

items below indicated have undergone a dimensional inspection and have been accepted according to the specific / procedure mentioned hereunder and to acceptance criteria defined in it.

oggetto – item

COUPON	STAMP	POS	THK	LENGHT	WPS	Date of examination
40/18 2G	AX61	2G	40mm	800mm	pWPS 40/18	04/09/2018
40/18 3G	AX82	3G	40mm	800mm	pWPS 40/18	04/09/2018

note - remarks

Acceptance criteria: EN-ISO 5817-2014 LEV. B

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

UNI EN ISO 17637 REV. 2017

Operatore - Operator	Controllo Qualita' - Quality Control	(Cliente - Client) THIRD PARTY
CSWIP D.CENACCHI 306250 WI 3.1		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 04/09/2018 File Signature Cinatti Davide

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 05/09/2018	FOGLIO – Sheet
RAPPORTO D'ESAME MAGNETOSCOPICO ***MAGNETIC PARTICLE TEST***		MT N° : 01	Ns. Rif./Our Ref. 18205

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	TYRA FUTURE	118A10	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
MAERSK OIL	PQR	/	/	/

CODICE / code	PROCEDURA/Procedure	ACCETTABILITA - Acceptance level	
/	DK-TEHY-MET-PRO-000-10006	Quality Level ISO 5817 Acceptance level ISO 23278	☑ B ☐ C ☐ D ☑ 2x ☐ 2x ☐ 3x
MATERIALE Material	TEMPERATURA DELLE SUPERFICI Surface temperature	INTENSITA' LUMINOSA / Light intensity LUCE BIANCA	 LUCE NERA
S460 G2 + M	RANGE 5÷52°C	☑ > 500 LUX	☐ 500 µW/cm².

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined
☐ MOLATO – Ground	☐ LAMINATO – Rolled	☐ GREZZO – Forged

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☐ PUNTALI/Prods	☑ GIOGO/Yoke	☐ SOLENOIDE/Solenoid	☐ CONDUTTORE CENTRALE/Central conduttor

TIPO APPARECCHIO/Type of equipment	SILVER YOKE/S.No.04 230-15	DISTANZA PUNTALI/Pole spacing mm	180mm
TIPO DI CORRENTE/Type current	C.A	INTENSITÀ/Intesity (Amp)	4,5 kg

MEZZO DI ISPEZIONE / Examination medium		☑ UMIDO/Wet	☐ ASCIUTTO/Dry
PARTICELLE UTILIZZATE/Particle Type			
POLVERE NERA/Black powder	☑	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	NDT BW2	MARCA TIPO/Mark Type	NDT FW1
LOTTO / Batck No.	7241s	LOTTO / Batck No.	
VERNICE DI CONTRASTO/Contrast Paint		☑ NDT WBL5	☐ CGM VECOPLAST
LOTTO / Batck No.		U171010c	

SALDATURE CONTROLLATE / Welds Verified

PQR 40/18 2G AX61
PQR 40/18 3G AX82

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Stefano Zauli 3° Livello CSQ - IC - IAI ISO 9712	ROSETTI MARINO SpA Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 10/09/2018 File Signature Cimatti Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items esamine*

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 05/09/2018	FOGLIO – Sheet 1
RAPPORTO D'ESAME CON ULTRASUONI ***Ultrasonic examination report***		UT N° : 01	Ns. Rif./Our Ref. 18205

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	TYRA FUTURE	118A10	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
MAERSK OIL			-	-

CODICE / Code	PROCEDURA / Procedure	ACCETTABILITA' / Acceptance level			
/	DK-TEHY-MET-PRO-000-10004	Quality Level ISO 5817	☑ B	☐ C	☐ D
		Acceptance level ISO 11666	☑ 2	☐ 3	☐ 3b

MATERIALE Material	DIMENSIONI Dimension	SPESSORE NOMINALE / Thk
S460 G2 + M	Plate L=800 mm	Butt weld 1\2V 40 mm

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO - Brushed	☐ LAVORATO DI MACCHINA - Machined
☐ MOLATO - Ground	☐ LAMINATO - Rolled	☐ GREZZO - Forged

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG	No. SERIE Serial Number	II03483

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	ONDE Waves
PANAMETRICS	PF4MR	4	10	0°	LONG.
PANAMETRICS	AMR	4	8X9	45°-60°	SHEAR
KRAUTKRAMER	SWB	2	14X14	45°-60°-70°	SHEAR

BLOCCO DI CALIBRAZIONE Calibration block	IIW V2	BLOCCO DI RIFERIMENTO Reference block	QT-REF-BLOCK 5
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity	DAC ON SDH 3 mm

SALDATURE CONTROLLATE / Welds Verified	PIANO DI SCANSIONE / Scanning plan
PQR 40/18 2G AX61 PQR 40/18 3G AX82	The Scanning plan used is in accordance with the requirements of IDL-QCI-UT-0216

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Stefano Zauli 3° Livello SNT-TC-1A / ISO 9712	ROSETTI MARINO SpA Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 10/09/2018 File Signature Cimatti Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items examine*

ROSETTI MARINO

PQR 40/18

Mechanical test report

INSPECTA S.R.L.	**TEST REPORT** ***RAPPORTO DI PROVA*** **N° 0319-00850-18** **Data: 12/09/2018**	ilac-MRA ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO	**LAB N°1607**

Object: *Oggetto:*	**MECHANICAL TEST ON PQR 40/2018**		Pag. 1 di 9
Specimen: *Saggio:* **387/18**	**Base Material:** *Materiale Base:*	**Plate THK. 40,00 mm.**	**EN 10225:2009; S460 G2+M**
Customer: ROSETTI MARINO SPA *Committente:* **Address: Via Trieste, 230 - 48122 Ravenna (RA)** *Indirizzo:*		**Witnessed by:** *Presenziato da:*	**ROSETTI S.p.A.** **RINA SERVICES S.p.A** **TOTAL**
Final customer:. *Cliente finale:*	**N.A.**		
Reference Yours bill of landing: *Vs. DDT di consegn* **n°** // *n°* //	**Date:** *Data:* //	**MD52** *MD 52* **88/18**	**Date:** *Data:* **06/09/2018**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **12/09/2018**	**End of activities:** *Fine prove:*	**Date:** *Data:* **12/09/2018**

PROVE RICHIESTE

☒ **TENSILE TEST/***Trazione*	☒ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*	
☒ **BEND TEST/***Piega*	☒ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root /*Dritto/Rovescio* ☒ Side/ *Laterale*	
☒ **IMPACT TEST/***Resilienza*	☒ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*	
☒ **MACROEXAMINATION TEST /** *Macrografia*			
☒ **HARDNESS TEST/** *Durezza*	☐ HV 5	☒ HV 10	
☐ **FRACTURE TEST/** *Frattura*	☐ Plate on Plate/ *Piastra su Piastra*	☐ Pipe on Plate/*Tubo su Piastra*	
☐ **CHEMICAL ANALYSIS/***Analisi Chimica*			
☐ **MICROEXAMINATION TEST /** *Micrografia*			
☐ **OTHER (Specify)/***Altro/(Specificare)*			

Allegati /Attachments: NONE

NOTE/ Remarks:

REFERENCE CODE FROM CUSTOMER REQUEST:MOG-FP-MET-STD-0012 Rev.04 + UNI EN ISO 15614-1:2017

WELDING POSITION: 2G

Tom
Victor Wilson

*** Prova non accreditata da ACCREDIA**

Laboratory Responsible *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - Francesca Tassi Service Responsible 12/09/18	ROSETTI MARINO SpA Welding Dept. D. Conacchi	RINA Services S.p.A. No. Bo. 0319 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 12/09/2018 File Signature Cimatti Davide

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova.. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I campionamenti sono eseguiti dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%
The results in this test report refers only to the specimen that has been tested.The customer undertakes to print out /reproduce the test report. Any partial reproduction is prohibited.Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory.Sampling shall be performed by the custode.Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku = 2 equivalent to a level of confidence of 95 % .

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

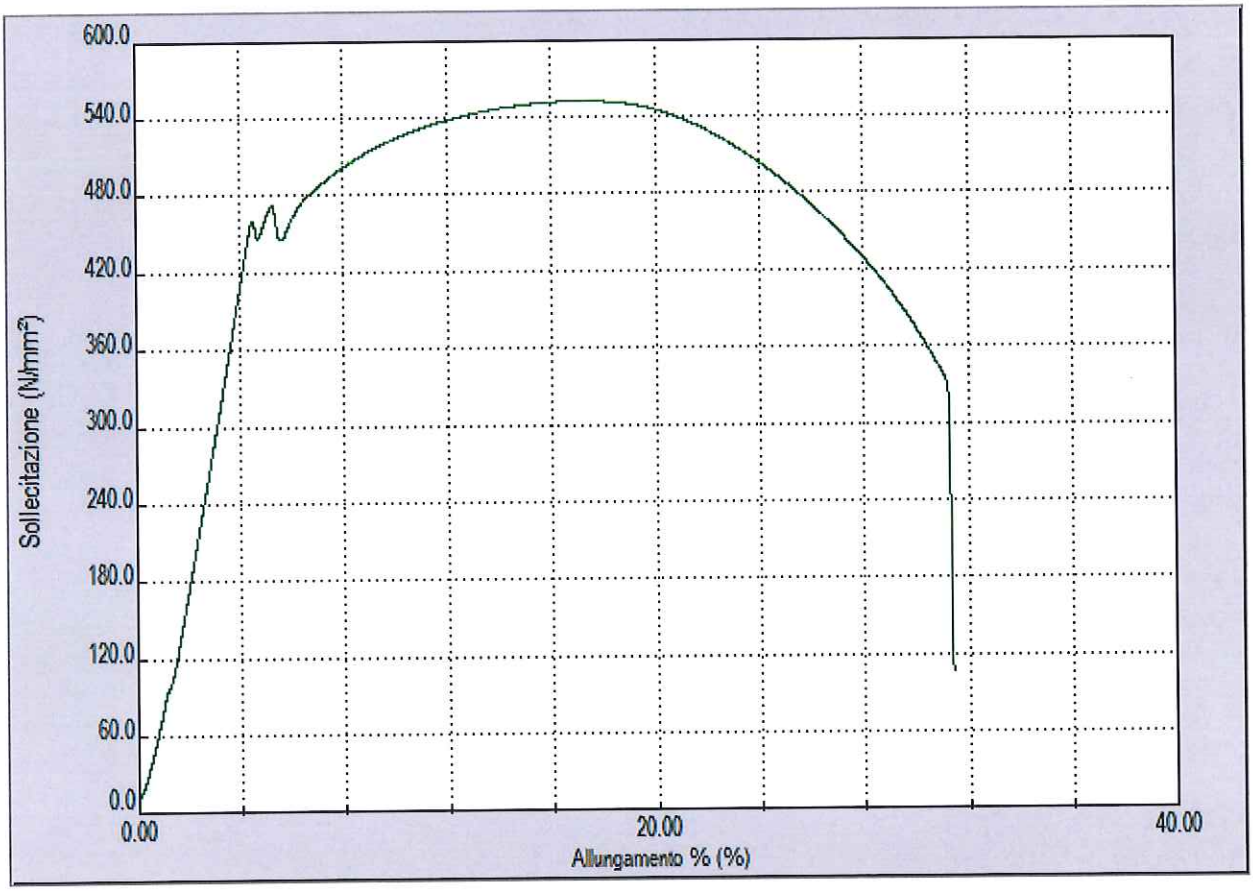
Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-17*
☐ *ASME IX QW-150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

Internal procedure *Procedura interna :* ***PP08 rev.03***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.							≥420			520÷680				
387/18 A TWT	**23,00x25,01**	**575,23**	**25°C**	//	//	/	**449**	/	**317'562**	**552**	/	//	//	**FOW**



Remarks / *Note:*

* **Prova non accreditata da ACCREDIA**

Legend / *Legenda*

TT = Transverse Tension*/Trazione.trasversale;*
TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;*
FOW = Failure Out of Weld*/Rottura fuori dalla saldatura*
FIW = Failure in Weld*/Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore terza parte*
- INSPECTA srl - Sig. Davide Chegia Laboratory Technician 12/09/18	- INSPECTA srl - Francesca Tesei Service Responsible 12/09/18	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Cinotti Davide 12/09/2018

TOTAL VICTOR WILSON Uniformbon

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

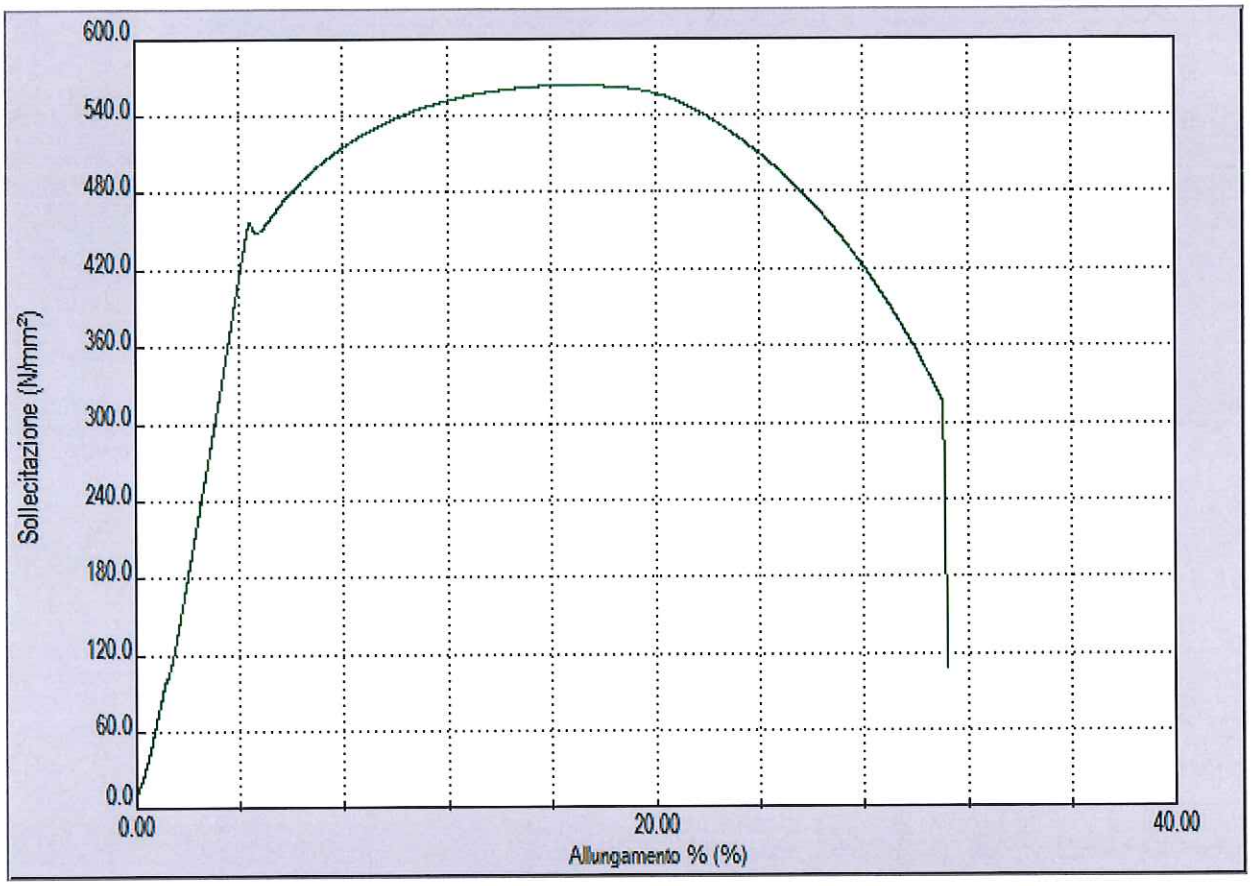
Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-17*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

Internal procedure *Procedura interna :* ***PP08 rev.03***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.							≥420			520÷680				
387/18 B TWT	**22,95x25,00**	**573,75**	**25°C**	//	//	/	**449**	/	**323'223**	**563**	/	//	//	**FOW**



Remarks */ Note:*

* Prova non accreditata da ACCREDIA

Legend / *Legenda*

TT = Transverse Tension*/Trazione.trasversale;* **FOW = Failure Out of Weld***/Rottura fuori dalla saldatura*

TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;* **FIW = Failure in Weld***/Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig.Davide Cinetti - TASK LOTTESI - Laboratory Technician 12/09/18	- INSPECTA srl - Francesca Tesei Service Responsible 12/09/18	ROSETTI MARINO SpA Welding Dept D. Cinacchi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 12/09/2018 File Signature Cinetti Davide

TOTAL
VICTOR WILSON

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

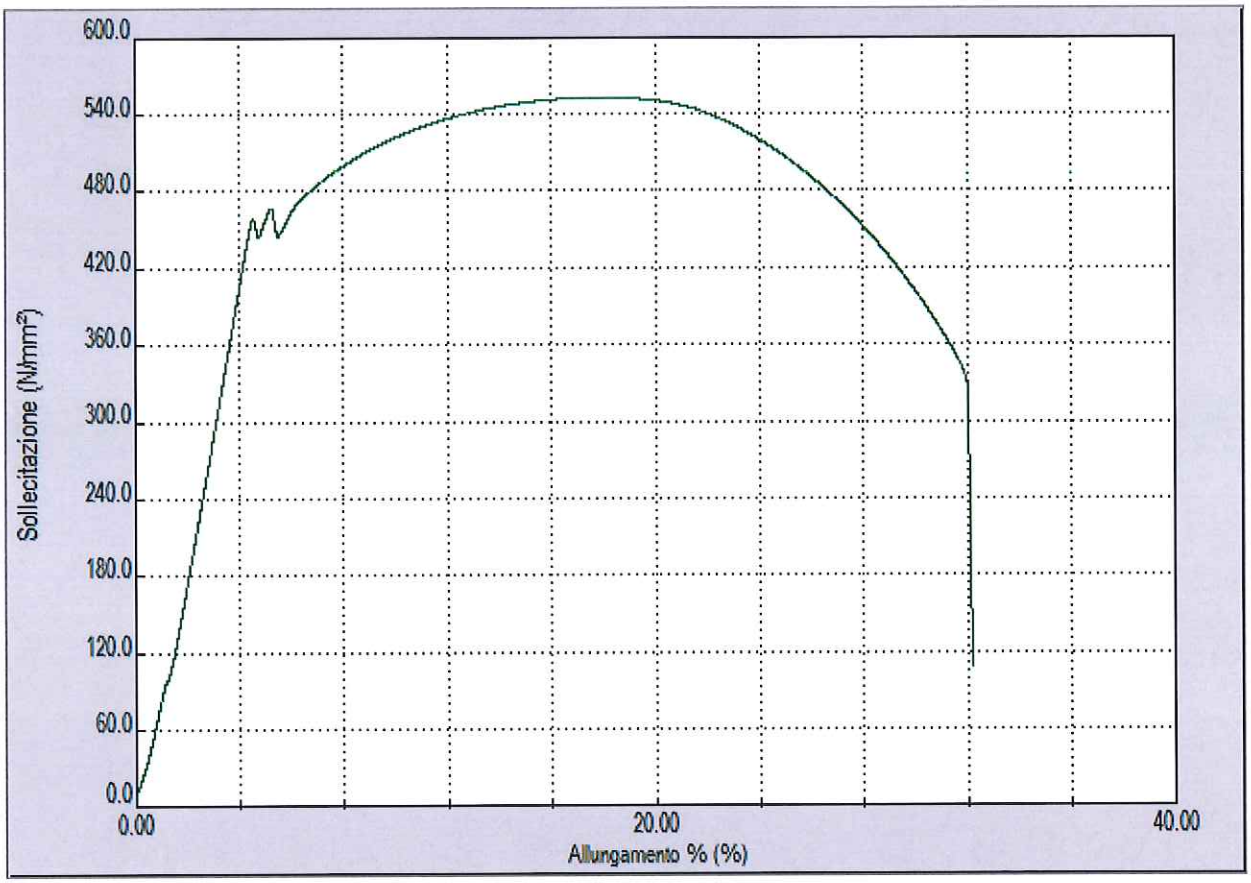
Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-17*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

Internal procedure *Procedura interna :* ***PP08 rev.03***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.							≥420			520÷680				
387/18 C TWT	**22,96x25,01**	**574,23**	**25°C**	//	//	/	**448**	/	**317'386**	**553**	/	//	//	**FOW**



Remarks */ Note:*

* **Prova non accreditata da ACCREDIA**

Legend */ Legenda*

TT = Transverse Tension*/Trazione.trasversale;* **FOW = Failure Out of Weld***/Rottura fuori dalla saldatura*

TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;* **FIW = Failure in Weld***/Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
- INSPECTA srl - Sig. Davide Grisgia Laboratory Technician 12/09/18	- INSPECTA srl - Francesca Tassi Service Responsible 12/09/18	ROSETTI MARINO SpA Welding Dept. D. Benacchi	RINA Services SpA Date 12/09/2018 No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File _____ Signature Cimatti Davide

Tonal Victor Wilson Hernandez

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

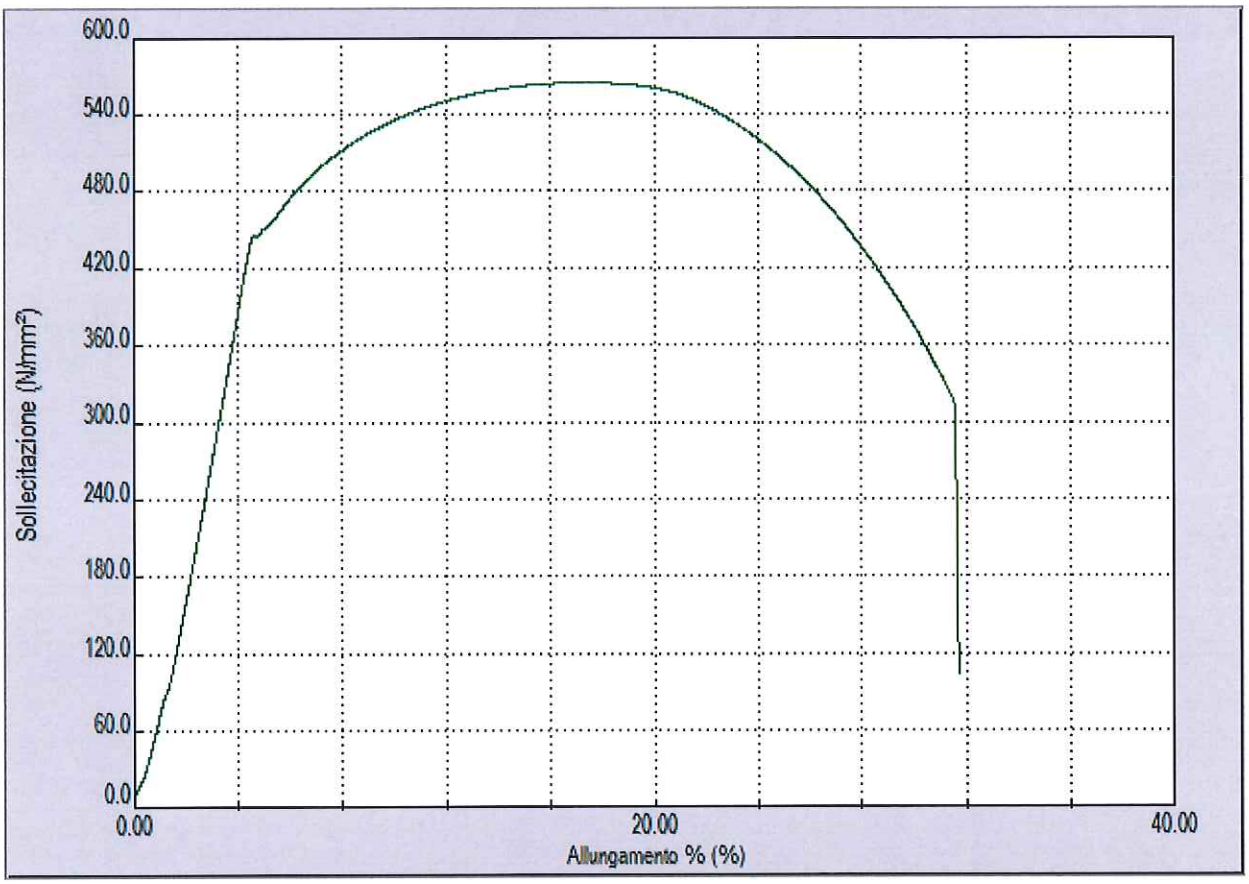
Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-17*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

Internal procedure *Procedura interna :* ***PP08 rev.03***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.							≥420			520÷680				
387/18 D TWT	**22,90x25,01**	**572,73**	**25°C**	//	//	/	**447**	/	**323'385**	**565**	/	//	//	**FOW**



Remarks / *Note:*

*** Prova non accreditata da ACCREDIA**

Legend / *Legenda*

TT = Transverse Tension/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura*

TWT = Transverse Weld Tension/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore terza parte*
INSPECTA Sig Davide Chegia' Laboratory Technician 12/09/18	INSPECTA srl Francesca Tesei Service Responsible 12/09/18	ROSETTI MARINO SpA Welding Dept. D. Genocchi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 12/09/2018 File Signature Cimatti Davide

TOTAL. VICAR WILSON Lautomation

BEND TEST
Prova di piega

Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 5173: 2012* ☐ *ASME IX QW-160: 2017* ☐ _____

Serial N. VAUP / 01

Internal procedure *Procedura interna* : ***PP11 rev.02***

Specimen id. *Identificazione provino*		**Dimension** *Dimensioni (mm)*	**Test Temp.** *Temp.test °C*	**Bend Angle** *Angolo di piega*	**Ø Former** *Ø Mandrino (mm)*	**Distance between rollers** *Distanza appoggi (mm)*	**Remarks** *Note*
387/18 SBB	**A**	**40,00x10,00**	**25°C**	**180°**	**40**	**70**	**No open discontinuities have been found in weld metal and heat affected zone**
387/18 SBB	**B**	**40,00x10,00**	**25°C**	**180°**	**40**	**70**	**No open discontinuities have been found in weld metal and heat affected zone**
387/18 SBB	**C**	**40,00x10,00**	**25°C**	**180°**	**40**	**70**	**No open discontinuities have been found in weld metal and heat affected zone**
387/18 SBB	**D**	**40,00x10,00**	**25°C**	**180°**	**40**	**70**	**No open discontinuities have been found in weld metal and heat affected zone**

Remarks *Note:* //

*** Prova non accreditata da ACCREDIA**

Legend *Legenda*

SBB. = Transverse Side Bend/*Piega Trasversale laterale*
TRB. = Transverse Root Bend/*Piega Trasversale al rovescio*
TFB. = Transverse Face Bend/*Piega Trasversale al dritto*
LRB = Longitudinal Root Bend */ Piega Longitudinale al rovescio*
LFB. = Longitudinal Face Bend */ Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio* *Sig Davide Ciregia*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - Laboratory Technician 12/09/18	- INSPECTA srl - Francesca Tesei Service Responsible 12/09/18	ROSETTI MARINO SpA Welding Dept. D.Genacchi	RINA Services SpA No. Bo. 0474 Date 12/09/2018 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Cimatti Davide

TOTAL . VICTOR WILSON

IMPACT TEST
Prova di resilienza

Date of Testing:12/09/2018
Data esecuzione prova:

☐ *UNI EN ISO 148-1: 2016* ☒ *UNI EN ISO 9016: 2012* ☐ *ASTM E23: 16b* ☐ *ASME IX QW-170: 2017* ☐ *ASTM A923-14 Method B*

Serial N. VAUP / 02

Internal procedure *Procedura interna* :***PP09 rev.04***

Specimen id. *Identificazione provino*	**Direction** *Direzione*	**Dimension** *Dimensioni (mm)*	**Test Temp.** *Temp .test*	**Notch Type** *Inta glio*	**Knife /** *coltello*	**Requirement** / Requisiti											**Remarks** *Note*
						Energy absorbed/ / Energia assorbita				**U**	**Lateral Expansion** *Espansione laterale (mm)*			**Shear Area** *Area fragile %*			
						Individual *Individuale Joule ≥35J*			**Average** *Media Joule ≥50j*								
						1	2	3			1	2	3	1	2	3	
387/18 VWT 0/2	**T**	**10x10x55**	**-40°C**	**V**	**2**	**78**	**79**	**76**	**78**	//	//	//	//	//	//	//	**CAP**
387/18 VHT 0/2	**T**	**10x10x55**	**-40°C**	**V**	**2**	**48**	**59**	**177**	**95**	//	//	//	//	//	//	//	**CAP**
387/18 VHT 1/2	**T**	**10x10x55**	**-40°C**	**V**	**2**	**256**	**261**	**269**	**262**	//	//	//	//	//	//	//	**CAP**
387/18 VHT 2/2	**T**	**10x10x55**	**-40°C**	**V**	**2**	**270**	**260**	**269**	**266**	//	//	//	//	//	//	//	**CAP**
387/18 VHT 5/2	**T**	**10x10x55**	**-40°C**	**V**	**2**	**266**	**288**	**229**	**261**	//	//	//	//	//	//	//	**CAP**
387/18 VWT 0/28	**T**	**10x10x55**	**-40°C**	**V**	**2**	**89**	**105**	**108**	**101**	//	//	//	//	//	//	//	**ROOT**
387/18 VHT 0/28	**T**	**10x10x55**	**-40°C**	**V**	**2**	**95**	**92**	**35**	**74**	//	//	//	//	//	//	//	**ROOT**
387/18 VHT 1/28	**T**	**10x10x55**	**-40°C**	**V**	**2**	**258**	**227**	**232**	**239**	//	//	//	//	//	//	//	**ROOT**
387/18 VHT 2/28	**T**	**10x10x55**	**-40°C**	**V**	**2**	**216**	**204**	**203**	**208**	//	//	//	//	//	//	//	**ROOT**
387/18 VHT 5/28	**T**	**10x10x55**	**-40°C**	**V**	**2**	**295**	**260**	**224**	**260**	//	//	//	//	//	//	//	**ROOT**

Remarks *Note:*

*** Prova non accreditata da ACCREDIA**

Legend *Legenda*

L= Longitudinal / Longitudinale
T= Trasversal / Trasversale
VWT 0/2 = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
VHT 0/2 = Impact Test on Fusion Line */ Resilienza Trasversale in linea di fusione*
VHT 1/2 = Impact Test at 1mm from Fusion Line */ Resilienza trasversale a 1 mm dalla linea di fusione*
VHT 2/2 = Impact Test at 2 mm from Fusion Line */ Resilienza trasversale a 2 mm dalla linea di fusione*
VHT 5/2 = Impact Test at 5 mm from Fusion Line */ Resilienza trasversale a 5 mm dalla linea di fusione*
WM = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
HAZ = Impact Test on Heat Affected Zone */ Resilienza Trasversale in zona termicamente alterata*
BM = Impact Test on Base Metal */ Resilienza Trasversale in materiale base*

FL = Fusion Line/ *Linea di fusione*
FL+1 = Fusion Line + 1mm/ *Linea di fusione+1mm*
FL+2 = Fusion Line + 2mm/ *Linea di fusione+2mm*
FL +5= Fusion Line + 5mm/ *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig Matteo Galdieri			RINA Services SpA No. Bo. 0474
- INSPECTA srl -	- INSPECTA srl -	ROSETTI MARINO S.p.A. Welding Dept. D. Cenacchi	Date 12/09/18
12/09/18	Francesca Tesei		Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐
Laboratory Technician	Service Responsible 12/09/18		File Signature Cimatti Davide

TOTAL
VICTOR WILSON

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing: *12/09/2018*
Data esecuzione prova:

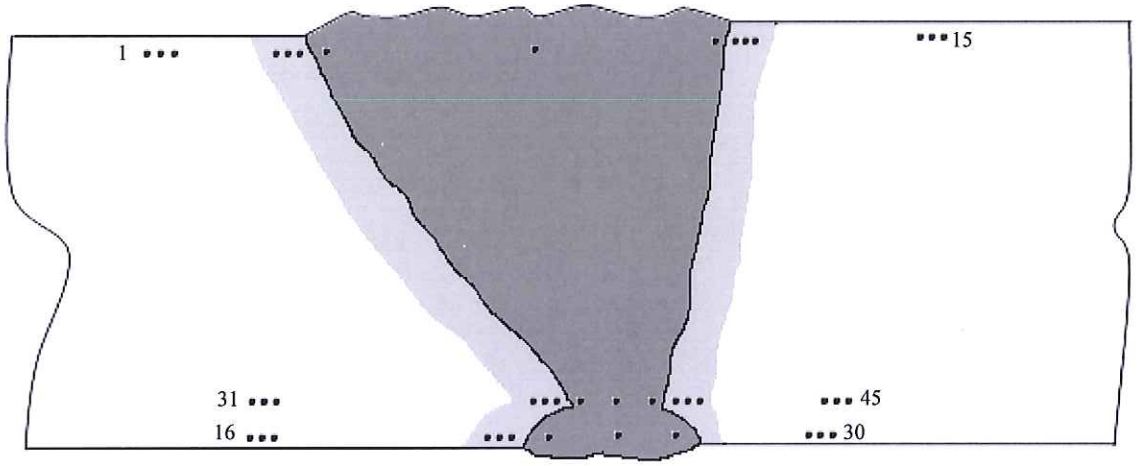
☐ *UNI EN ISO 6507-1: 2018* ☒ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

Serial N. 43030614C

Internal procedure *Procedura interna*	PP10 rev.02	Sample Identification *Identificazione provino*	387/18	Hardness test type *Tipo di durezza*	≤325 HV 10	Test Temp. *Temp.test*	25°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A:			Base Material Side B:	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
31 - 32 - 33	34 - 35 - 36	37 - 38 - 39	40 - 41 - 42	43 - 44 - 45
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**193-196-193**	//	16 – 17 - 18	**189-187-189**	//	31 – 32 - 33	**187-186-180**	//
4 - 5 - 6	**233-246-266**	//	19 - 20 - 21	**253-265-295**	//	34 - 35 - 36	**208-212-208**	//
7 – 8 - 9	**226-236-287**	//	22 – 23 - 24	**226-220-239**	//	37 – 38 - 39	**220-226-220**	//
10 - 11 - 12	**274-267-237**	//	25 - 26 - 27	**249-250-229**	//	40 - 41 - 42	**261-241-236**	//
13 – 14 - 15	**198-195-194**	//	28 – 29 - 30	**189-188-190**	//	43 – 44 - 45	**188-187-186**	//

Remarks/ *Note:* //
*** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third-part Inspector *Ispettore terza parte*
- INSPECTA srl - Ing. Davide Cimatti - Laboratory Technician 12/09/18	- INSPECTA srl - Francesca Tesei Service Responsible 12/09/18	ROSETTI MARINO SpA Welding Dept. D. Conacchi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 12/09/2018 File Signature Cimatti Davide

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

Internal procedure *PP12 rev.00* *Procedura internal*		**Test temperatura** *Temperature Test*	**25°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**387/18**	**Magnification:** *Ingrandimento:*	**Photo at 1.6X** **Examination at 10X**
Designation: *Designazione:*	**ISO 17639-A-E-1.2-1.2/1.2/1.2 NITAL**		



Remarks / *Note:*	*//* *** Prova non accreditata da ACCREDIA**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio *Sig Matteo Galdieri* - INSPECTA srl - 12/09/18 Laboratory Technician	Responsabile Laboratorio - INSPECTA srl - Francesca Tesei Service Responsible 12/09/18	*Ispettore del cliente* ROSETTI MARINO S.p.A. Welding Dept. D. Cenacchi	*Ispettore Terza parte* RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ Date 12/09/2018 File Signature Cimatti Davide

TUNA
VICTOR WILSON
Uttonubon.

INSPECTA S.R.L.	**TEST REPORT** ***RAPPORTO DI PROVA*** **N° 0320-00850-18** **Data: 12/09/2018**	ilac-MRA ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO **LAB N°1607**

Object: *Oggetto:*	**MECHANICAL TEST ON PQR 40/2018**			Pag. 1 di 9
Specimen: *Saggio:* **388/18**	**Base Material:** *Materiale Base:*	**Plate THK. 40,00 mm.**	**EN 10225:2009; S460 G2+M**	
Customer: ROSETTI MARINO SPA *Committente:* **Address: Via Trieste, 230 - 48122 Ravenna (RA)** *Indirizzo:*		**Witnessed by:** *Presenziato da:*	**ROSETTI S.p.A.** **RINA SERVICES S.p.A.** **TOTAL**	
Final customer:. *Cliente finale:*	**N.A.**			
Reference Yours bill of landing: *Vs. DDT di consegn*	**n°** // *n°*	**Date:** *Data:* //	**MD52** *MD 52* **88/18**	**Date:** *Data:* **06/09/2018**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **12/09/2018**	**End of activities:** *Fine prove:*	**Date:** *Data:* **12/09/2018**	

PROVE RICHIESTE

☒ **TENSILE TEST**/*Trazione*	☒ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*	
☒ **BEND TEST**/*Piega*	☒ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root */Dritto/Rovescio* ☒ Side/ *Laterale*	
☒ **IMPACT TEST**/*Resilienza*	☒ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*	
☒ **MACROEXAMINATION TEST /** *Macrografia*			
☒ **HARDNESS TEST**/ *Durezza*	☐ HV 5	☒ HV 10	
☐ **FRACTURE TEST**/ *Frattura*	☐ Plate on Plate/ *Piastra su Piastra*	☐ Pipe on Plate/*Tubo su Piastra*	
☐ **CHEMICAL ANALYSIS**/*Analisi Chimica*			
☐ **MICROEXAMINATION TEST /** *Micrografia*			
☐ **OTHER (Specify)**/*Altro/(Specificare)*			

Allegati /Attachments: *NONE*

NOTE/ Remarks:

REFERENCE CODE FROM CUSTOMER REQUEST:MOG-FP-MET-STD-0012 Rev.04 + UNI EN ISO 15614-1:2017

WELDING POSITION: 3G

*** Prova non accreditata da ACCREDIA**

Laboratory Responsible *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - Francesca Tesei Service Responsible 12/09/18	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RINA S.p.A. No. 0179 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 12/09/2018 File Signature Cimatti Davide

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova.. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I campionamenti sono eseguiti dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%
The results in this test report refers only to the specimen that has been tested.The customer undertakes to print out /reproduce the test report. Any partial reproduction is prohibited.Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory.Sampling shall be performed by the custode.Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku = 2 equivalent to a level of confidence of 95 % .

TOTAL
VICTOR WILSON

Headquarter: Via Giolitti 10 – 48123 Ravenna (RA) Italy – Phone /Fax + 39 0544 451424
Registered Office: Via Ravegnana 379/A - 47122 Forlì (FC) Italy - Phone +39 0543 806128 - Phone/Fax +39 0543 724366
Mobile +39 393 9374013 - e-mail: inspectasrl@inspectasrl.com - www.inspectasrl.com - P.iva 03944480403
Capital Stock € 10.000 - Chamber of Commerce registration Forlì/Cesena No. 03944480403 - R.E.A. No. 323199

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

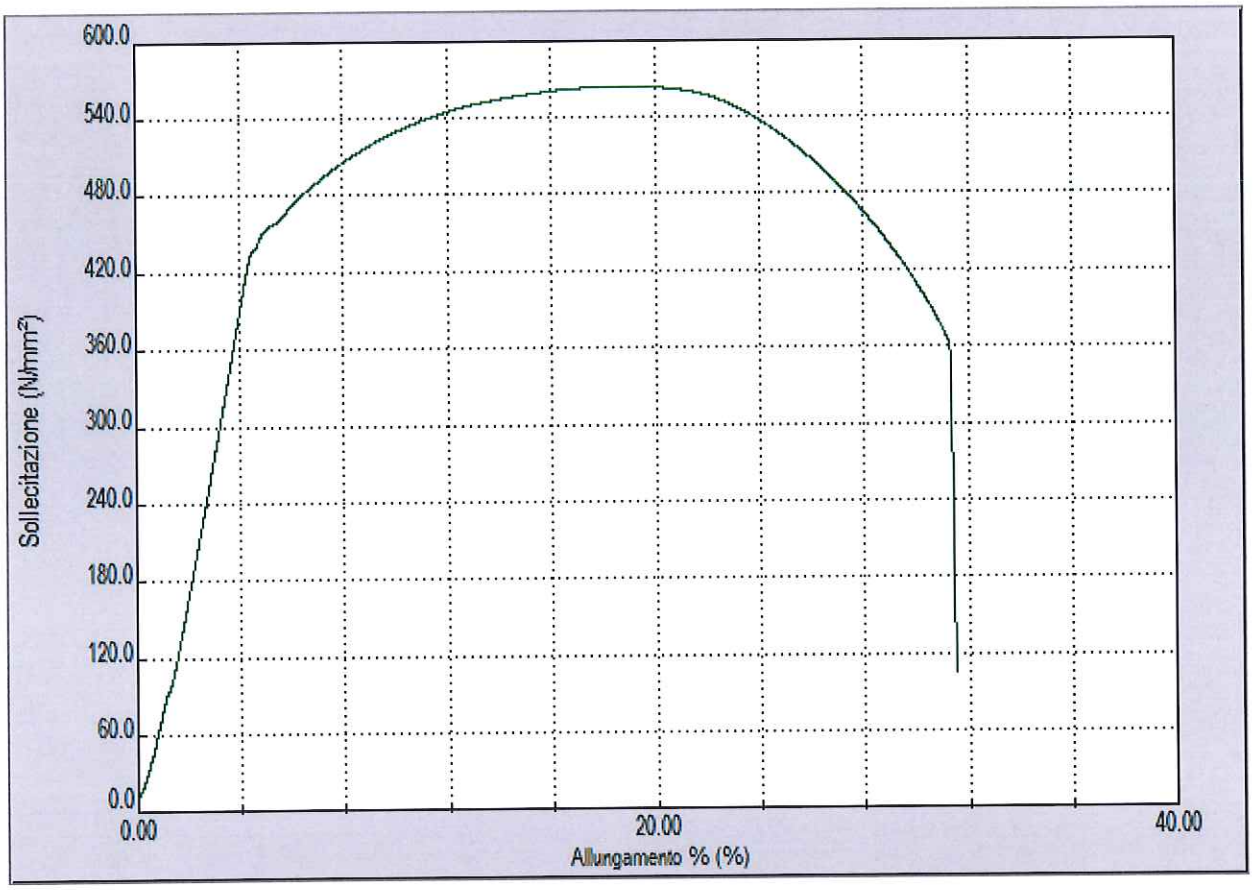
Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-17*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

Internal procedure *Procedura interna :* ***PP08 rev.03***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.							≥420			520÷680				
388/18 A TWT	**23,00x25,00**	**575,00**	**25°C**	//	//	/	**448**	/	**324'065**	**564**	/	//	//	**FOW**



Remarks */ Note:*

* **Prova non accreditata da ACCREDIA**

Legend */ Legenda*

TT = Transverse Tension*/Trazione.trasversale;* **FOW = Failure Out of Weld***/Rottura fuori dalla saldatura*

TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;* **FIW = Failure in Weld***/Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
INSPECTA srl Sig Matteo Galimberti 12/09/18 Laboratory Technician	- INSPECTA srl - Francesca Tesei Service Responsible 12/09/18	ROSETTI MARINO SpA Welding Dept. D. Genaschi	RINA Services S.p.A. No. BO 1274 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 12/09/2018 File Signature Cimatti Davide

TOTAL.
VICTOR WILSON.
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TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

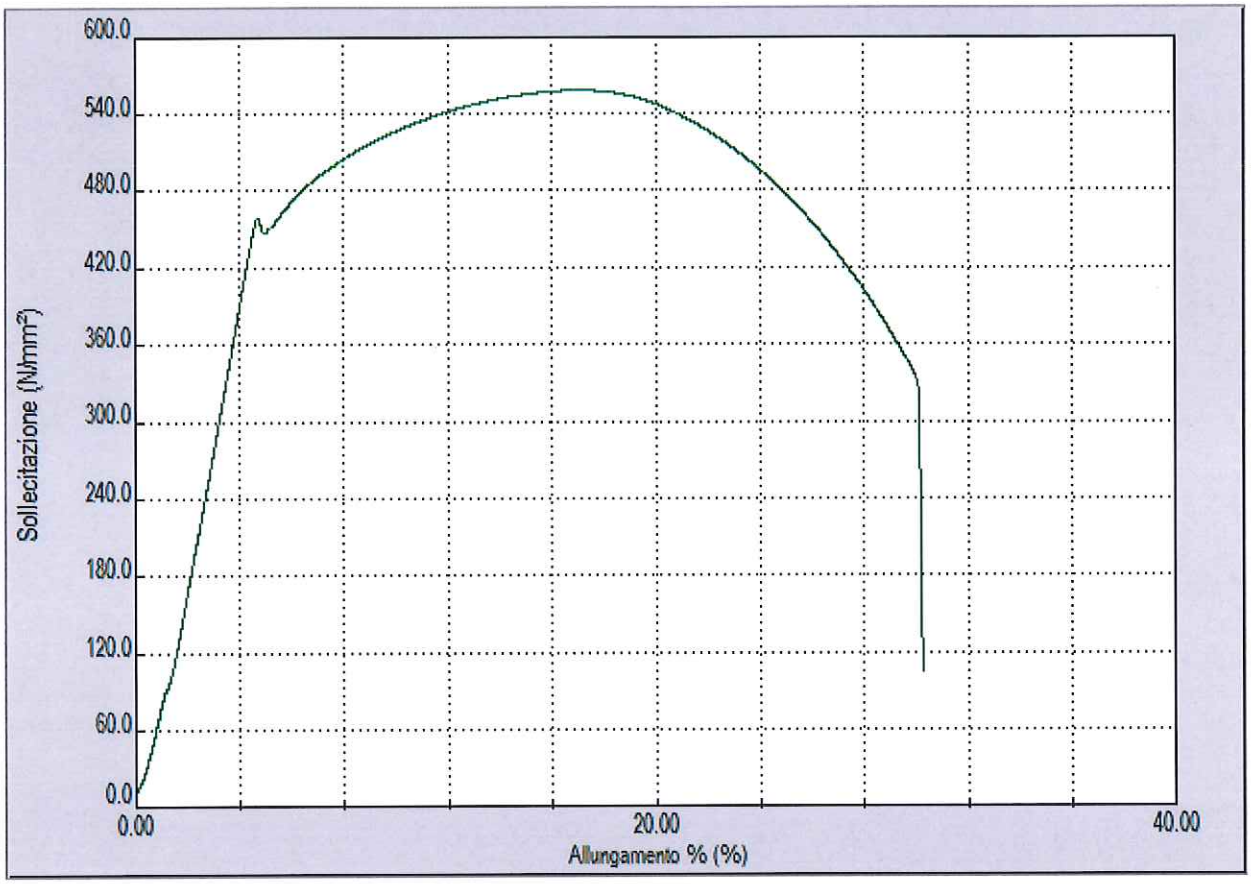
Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-17*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

Internal procedure *Procedura interna* : ***PP08 rev.03***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.							≥420			520÷680				
388/18 B TWT	**22,95x25,01**	**573,98**	**25°C**	//	//	/	**452**	/	**320'352**	**558**	/	//	//	**FOW**



Remarks / *Note:*

* **Prova non accreditata da ACCREDIA**

Legend / *Legenda*

TT = Transverse Tension/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura*

TWT = Transverse Weld Tension/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Stazza parte*
Sig.Matteo Caldieri - INSPECTA srl - 12/09/18 Laboratory Technician	- INSPECTA srl - Francesca Tesei Service Responsible 12/09/18	ROSETTI MARINO S.p.A. Welding Dept. D. Ceracchi	RINA Services S.p.A. No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ Date 12/09/2018 File Signature Cimatti Davide

TEAM
VICTOR WILSON
Ultrasom

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-17*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

Internal procedure *Procedura interna :* ***PP08 rev.03***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.							≥420			520÷680				
388/18 C TWT	**22,96x25,00**	**574,00**	**25°C**	//	//	/	**445**	/	**322'436**	**562**	/	//	//	**FOW**



Remarks */ Note:*

* **Prova non accreditata da ACCREDIA**

Legend / *Legenda*

TT = Transverse Tension*/Trazione.trasversale;* **FOW = Failure Out of Weld***/Rottura fuori dalla saldatura*

TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;* **FIW = Failure in Weld***/Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig Matteo Galdieri - INSPECTA srl - 12/09/18 Laboratory Technician	- INSPECTA srl - Francesca Tesei 12/09/18 Service Responsible	ROSETTI MARINO SpA Welding Dept D. Geraschi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 12/09/2018 File _____ Signature Cimatti Davide

TESTA VICTOR WILSON Ultrasuono

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

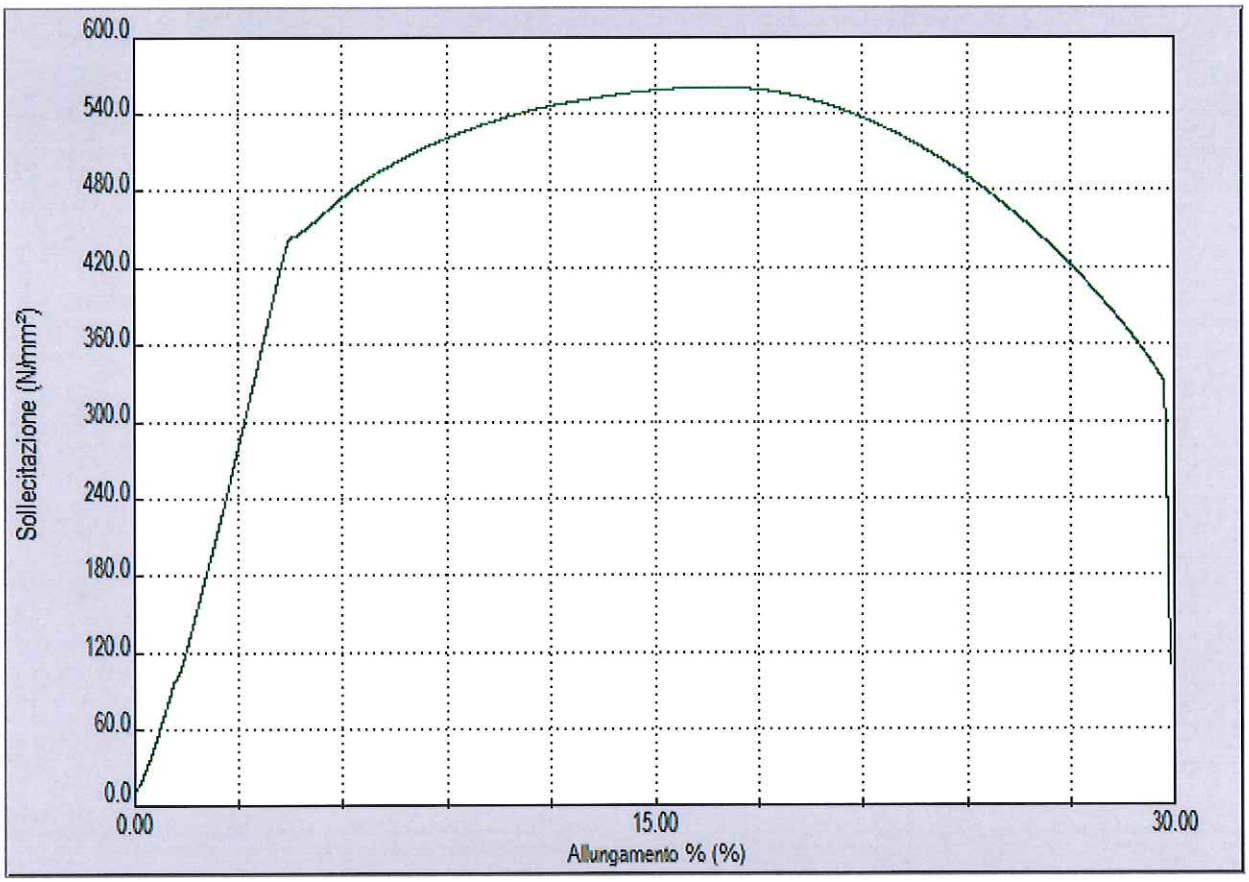
Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-17*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

Internal procedure *Procedura interna :* ***PP08 rev.03***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.							≥420			520÷680				
388/18 D TWT	**22,93x25,01**	**573,48**	**25°C**	//	//	/	**448**	/	**321÷449**	**561**	/	//	//	**FOW**



Remarks / *Note:*

* **Prova non accreditata da ACCREDIA**

Legend / *Legenda*

TT = Transverse Tension/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura*

TWT = Transverse Weld Tension/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore di parte*
- INSPECTA srl - Ing. Matteo Caldieri 12/09/18 *Laboratory Technician*	- INSPECTA srl - Francesca Tesei *Service Responsible* 12/09/18	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 12/09/2018 File Signature Ciriaco Davide

Victor Wilson Quintanilla

BEND TEST
Prova di piega

☒ *UNI EN ISO 5173: 2012* ☐ *ASME IX QW-160: 2017* ☐ _____

Date of Testing: *12/09/2018*
Data esecuzione prova:

Serial N. VAUP / 01

Internal procedure *Procedura interna* : ***PP11 rev.02***

Specimen id. *Identificazione provino*		Dimension *Dimensioni (mm)*	Test Temp. *Temp.test °C*	Bend Angle *Angolo di piega*	Ø Former *Ø Mandrino (mm)*	Distance between rollers *Distanza appoggi (mm)*	Remarks *Note*
388/18 SBB	A	40,00x10,00	25°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone
388/18 SBB	B	40,00x10,00	25°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone
388/18 SBB	C	40,00x10,00	25°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone
388/18 SBB	D	40,00x10,00	25°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone

Remarks *Note:*	//
	*** Prova non accreditata da ACCREDIA**

Legend *Legenda*

SBB. = Transverse Side Bend/*Piega Trasversale laterale*
TRB. = Transverse Root Bend/*Piega Trasversale al rovescio*
TFB. = Transverse Face Bend/*Piega Trasversale al dritto*
LRB = Longitudinal Root Bend */ Piega Longitudinale al rovescio*
LFB. = Longitudinal Face Bend */ Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig Matteo Galdieri			RINA Services SpA No. Bo. 0474
« INSPECTA srl » 12/09/18 Laboratory Technician	« INSPECTA srl » Francesca Tesei Service Responsible 12/09/18	ROSETTI MARINO SPA Welding Dept. D. Cenacchi	Date 12/09/2018
			Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐
			File _____ Signature Cimatti Davide

IMPACT TEST
Prova di resilienza

Date of Testing:12/09/2018
Data esecuzione prova:

☐ *UNI EN ISO 148-1: 2016* ☒ *UNI EN ISO 9016: 2012* ☐ *ASTM E23: 16b* ☐ *ASME IX QW-170: 2017* ☐ *ASTM A923-14 Method B*

Serial N. VAUP / 02

Internal procedure *Procedura interna* :***PP09 rev.04***

Specimen id. *Identificazione provino*	Direction *Direzione*	Dimension *Dimensioni (mm)*	Test Temp. *Temp .test*	Notch Type *Intaglio*	Knife / *coltello*	Requirement / Requisiti: Energy absorbed/ / Energia assorbita – Individual *Individuale Joule ≥35J* 1	2	3	Average *Media Joule ≥50j*	U	Lateral Expansion *Espansione laterale (mm)* 1	2	3	Shear Area *Area fragile %* 1	2	3	Remarks *Note*
388/18 VWT 0/2	T	10x10x55	-40°C	V	2	68	97	85	83	//	//	//	//	//	//	//	CAP
388/18 VHT 0/2	T	10x10x55	-40°C	V	2	107	71	30	69	//	//	//	//	//	//	//	CAP
388/18 VHT 1/2	T	10x10x55	-40°C	V	2	290	250	260	267	//	//	//	//	//	//	//	CAP
388/18 VHT 2/2	T	10x10x55	-40°C	V	2	300	294	304	299	//	//	//	//	//	//	//	CAP
388/18 VHT 5/2	T	10x10x55	-40°C	V	2	280	268	290	279	//	//	//	//	//	//	//	CAP
388/18 VWT 0/28	T	10x10x55	-40°C	V	2	75	88	94	86	//	//	//	//	//	//	//	ROOT
388/18 VHT 0/28	T	10x10x55	-40°C	V	2	171	16	72	87	//	//	//	//	//	//	//	ROOT
388/18 VHT 1/28	T	10x10x55	-40°C	V	2	307	287	241	278	//	//	//	//	//	//	//	ROOT
388/18 VHT 2/28	T	10x10x55	-40°C	V	2	255	270	265	263	//	//	//	//	//	//	//	ROOT
388/18 VHT 5/28	T	10x10x55	-40°C	V	2	285	292	280	286	//	//	//	//	//	//	//	ROOT

Remarks *Note:*

*** Prova non accreditata da ACCREDIA**

Legend *Legenda*

L= Longitudinal / Longitudinale
T= Trasversal / Trasversale
VWT 0/2 = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
VHT 0/2 = Impact Test on Fusion Line */ Resilienza Trasversale in linea di fusione*
VHT 1/2 = Impact Test at 1mm from Fusion Line */ Resilienza trasversale a 1 mm dalla linea di fusione*
VHT 2/2 = Impact Test at 2 mm from Fusion Line */ Resilienza trasversale a 2 mm dalla linea di fusione*
VHT 5/2 = Impact Test at 5 mm from Fusion Line */ Resilienza trasversale a 5 mm dalla linea di fusione*
WM = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
HAZ = Impact Test on Heat Affected Zone */ Resilienza Trasversale in zona termicamente alterata*
BM = Impact Test on Base Metal */ Resilienza Trasversale in materiale base*
FL = Fusion Line/ *Linea di fusione*
FL+1 = Fusion Line + 1mm/ *Linea di fusione+1mm*
FL+2 = Fusion Line + 2mm/ *Linea di fusione+2mm*
FL +5= Fusion Line + 5mm/ *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Sig Matteo Galdieri	- INSPECTA srl - Francesca Tesei Service Responsible 12/09/18	ROSETTI MARINO SPA Welding Dept	RINA Services SpA No. Bo. 0474 Date 12/09/2018
- INSPECTA srl - 12/09/18 Laboratory Technician			Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ File Signature Cinotti Davide

TOTAL VICTOR WILSON

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing: *12/09/2018*
Data esecuzione prova:

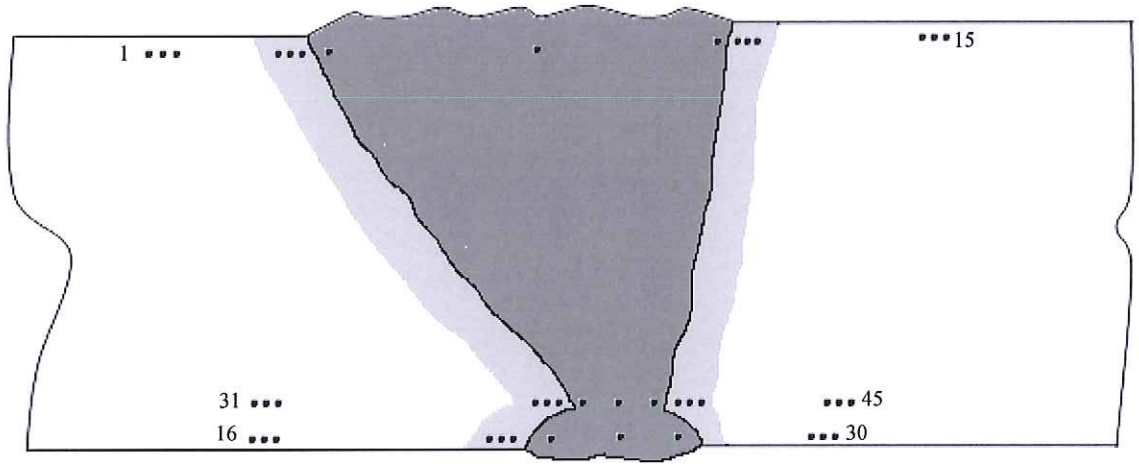
☐ *UNI EN ISO 6507-1: 2018* ☒ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

Serial N. 43030614C

Internal procedure *Procedura interna*	**PP10 rev.02**	**Sample Identification** *Identificazione provino*	**388/18**	**Hardness test type** *Tipo di durezza*	**≤325 HV 10**	**Test Temp.** *Temp.test*	**25°C**

Sketch for reference points
Schema punti di riferimento

Base Material Side A:				**Base Material Side B:**
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
31 - 32 - 33	34 - 35 - 36	37 - 38 - 39	40 - 41 - 42	43 - 44 - 45
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30



Reference points *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U
1 – 2 - 3	**185-189-190**	//	16 – 17 - 18	**182-184-191**	//	31 – 32 - 33	**183-183-190**	//
4 - 5 - 6	**213-247-250**	//	19 - 20 - 21	**245-258-269**	//	34 - 35 - 36	**231-238-230**	//
7 – 8 - 9	**250-228-241**	//	22 – 23 - 24	**230-233-228**	//	37 – 38 - 39	**213-216-223**	//
10 - 11 - 12	**269-247-224**	//	25 - 26 - 27	**274-265-251**	//	40 - 41 - 42	**209-204-217**	//
13 – 14 - 15	**192-194-197**	//	28 – 29 - 30	**186-186-182**	//	43 – 44 - 45	**186-195-188**	//

Remarks/ *Note:* //

*** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza Parte*
- INSPECTA srl - Stefano Galdieri 12/09/18 Laboratory Technician	- INSPECTA srl - Francesca Tesei Service Responsible 12/09/18	ROSETTI MARINO SpA Welding Dept D. Conicchi	RINA Services SpA Date 12/09/2018 No. Bo. 0474 Noted ☐ File Reviewed ☐ Witnessed ☒ Signature Approved ☐ Cimatti Davide

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

Internal procedure *PP12 rev.00* *Procedura internal*		**Test temperatura** *Temperature Test*	**25°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**388/18**	**Magnification:** *Ingrandimento:*	**Photo at 1.6X** **Examination at 10X**
Designation: *Designazione:*	**ISO 17639-A-E-1.2-1.2/1.2/1.2 NITAL**		



Remarks / *Note:*	*//* *** Prova non accreditata da ACCREDIA**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio *Sig Matteo Galdieri* - INSPECTA srl - 12/09/18 *Laboratory Technician*	Responsabile Laboratorio - INSPECTA srl - Francesca Tesei *Service Responsible* 12/09/18	*Ispettore del cliente* ROSETTI MARINO SpA Welding Dept D. Cenacchi	*Ispettore Terza parte* RINA Services SpA No. Bo. 0474 Date 12/09/2018 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Cimato Davide

INSPECTA S.R.L.	**TEST REPORT** ***RAPPORTO DI PROVA*** **N° 0330-00850-18** **Rev.00** **Data: 19/09/2018**	ilac-MRA ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO **LAB N°1607**

Object: *Oggetto:*	**INTEGRATION IMPACT TEST ON PQR 40/2018**			Pag. 1 di 2
Specimen: **388/18** *Saggio:*	**Base Material:** *Materiale Base:*	**Plate THK. 40,00 mm.**	**EN 10225:2009; S460 G2+M**	
Customer: ROSETTI MARINO SPA *Committente:* **Address: Via Trieste, 230 - 48122 Ravenna (RA)** *Indirizzo:*		**Witnessed by:** *Presenziato da:*	**ROSETTI S.p.A.** **RINA SERVICES S.p.A**	
Final customer:. *Cliente finale:*	**N.A.**			
Reference Yours bill of landing: **n°** // *Vs. DDT di consegn* *n°*	**Date:** // *Data:*	**MD52** **88/18** *MD 52*	**Date:** **06/09/2018** *Data:*	
Start of activities:: *Inizio prove :*	**Date:** **19/09/2018** *Data:*	**End of activities:** *Fine prove:*	**Date:** **19/09/2018** *Data:*	

PROVE RICHIESTE

☒ **TENSILE TEST/***Trazione*	☒ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*	
☒ **BEND TEST/***Piega*	☒ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root */Dritto/Rovescio* ☒ Side/ *Laterale*	
☒ **IMPACT TEST/***Resilienza*	☒ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*	
☒ **MACROEXAMINATION TEST /** *Macrografia*			
☒ **HARDNESS TEST/** *Durezza*	☐ HV 5	☒ HV 10	
☐ **FRACTURE TEST/** *Frattura*	☐ Plate on Plate/ *Piastra su Piastra*	☐ Pipe on Plate/*Tubo su Piastra*	
☐ **CHEMICAL ANALYSIS/***Analisi Chimica*			
☐ **MICROEXAMINATION TEST /** *Micrografia*			
☐ **OTHER (Specify)/***Altro/(Specificare)*			

Allegati /Attachments: NONE

NOTE/ Remarks:

REFERENCE CODE FROM CUSTOMER REQUEST:MOG-FP-MET-STD-0012 Rev.04 + UNI EN ISO 15614-1:2017

WELDING POSITION: 3G

*** Prova non accreditata da ACCREDIA**

Laboratory Responsible *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - Francesca Tosi Service Responsible 19/09/18	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RINA Services S.p.A. No. B 0170 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 19/09/2018 File Signature Cimatti Davide

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova.. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I campionamenti sono eseguiti dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%
The results in this test report refers only to the specimen that has been tested.The customer undertakes to print out /reproduce the test report. Any partial reproduction is prohibited.Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory.Sampling shall be performed by the custode.Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku = 2 equivalent to a level of confidence of 95 %.

IMPACT TEST
Prova di resilienza

Date of Testing:19/09/2018
Data esecuzione prova:

☐ *UNI EN ISO 148-1: 2016* ☒ *UNI EN ISO 9016: 2012* ☐ *ASTM E23: 16b* ☐ *ASME IX QW-170: 2017* ☐ *ASTM A923-14 Method B*

Serial N. VAUP / 02

Internal procedure *Procedura interna* **:PP09 rev.04**

Specimen id. *Identificazione provino*	Direction *Direzione*	Dimension *Dimensioni (mm)*	Test Temp. *Temp .test*	Notch Type *Intaglio*	Knife / *coltello*	Requirement / Requisiti: Energy absorbed/ / Energia assorbita — Individual *Individuale Joule ≥35J*			Average *Media Joule ≥50j*	U	Lateral Expansion *Espansione laterale (mm)*			Shear Area *Area fragile %*			Remarks *Note*
						1	2	3			1	2	3	1	2	3	
388/18 VHT 0/2	T	10x10x55	-40°C	V	2	280	262	201	248	//	//	//	//	//	//	//	CAP
388/18 VHT 0/2	T	10x10x55	-40°C	V	2	185	89	118	131	//	//	//	//	//	//	//	CAP
388/18 VHT 0/28	T	10x10x55	-40°C	V	2	52	65	73	63	//	//	//	//	//	//	//	ROOT
388/18 VHT 0/28	T	10x10x55	-40°C	V	2	136	59	48	81	//	//	//	//	//	//	//	ROOT

Remarks *Note:*

*** Prova non accreditata da ACCREDIA**

Legend *Legenda*

L= Longitudinal / Longitudinale
T= Trasversal / Trasversale
VWT 0/2 = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
VHT 0/2 = Impact Test on Fusion Line */ Resilienza Trasversale in linea di fusione*
VHT 1/2 = Impact Test at 1mm from Fusion Line */ Resilienza trasversale a 1 mm dalla linea di fusione*
VHT 2/2 = Impact Test at 2 mm from Fusion Line */ Resilienza trasversale a 2 mm dalla linea di fusione*
VHT 5/2 = Impact Test at 5 mm from Fusion Line */ Resilienza trasversale a 5 mm dalla linea di fusione*
WM = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
HAZ = Impact Test on Heat Affected Zone */ Resilienza Trasversale in zona termicamente alterata*
BM = Impact Test on Base Metal */ Resilienza Trasversale in materiale base*

FL = Fusion Line/ *Linea di fusione*
FL+1 = Fusion Line + 1mm/ *Linea di fusione+1mm*
FL+2 = Fusion Line + 2mm/ *Linea di fusione+2mm*
FL +5= Fusion Line + 5mm/ *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Sig Matteo Galdieri - INSPECTA srl - 19/09/18 Laboratory Technician	- INSPECTA srl - Francesca Tesei Service Responsible 19/09/18	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 19/09/2018 File Signature Cimatti Davide

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 54/18	Sheet/Foglio 1/2

Manufacturer's Welding Procedure. Ref. no.	54/18 REV. 1		
Manufacturer	ROSETTI MARINO S.p.A.		
Address	VIA TRIESTE 230 - 48121 RAVENNA		
Code, Testing Standard	PremierOil Spec. AB-TO-WGP-TO-ST-BD-0001 Rev. B02 and AB-TO-WGP-TO-ST-SP-0002 Rev. B01; EEMUA 158:2014 (Third Edition)		
	Location of test specimen according to EEMUA 158:2014 (Third Edition) Section 4.4.4, Fig. 7 to 11 Essential variables according to EEMUA 158:2014, Section 4.5		
Date of welding	Start: December 19th , 2018 Complete: December 19th, 2018		
Examiner of examining body	Rina Services S.p.A.		
RANGE OF QUALIFICATION			
Welding process	135- GMAW	121 - Saw Single	121 - Saw Tandem
Type(s)	Semiautomatic	Fully Mechanized	Fully Mechanized
Welding Equipment Type	HF inverter type		
Actual parent Material side A	Plate: EN 10225: S460G2+M Z35 (Heat: 882852)		
Actual parent Material side B	Plate: EN 10225: S460G2+M Z35 (Heat: 882852)		
Parent Material grade	Carbon steel with maximum strength of 520 MPa		
Supply condition	Thermomechanical rolled and accelerated cooled		
Carbon equivalent/Pcm/C	Heat Values: 0,41/0,17/ 0,052		
Groove design/configuration	Half Vee Butt Joint (both sides welding with back gouging), for groove dimension and details see page 4 of 5		
Parent material thickness (mm)	30 mm (obtained from parent material of 80 mm thk.)		
Weld metal thickness (mm)	135 - GMAW 3 mm	121 - SAW Single 12 mm	121 - SAW Tandem 15 mm
Single or Multi-pass	135 - GMAW (SINGLE)	121 - SAW Single (Multi-pass)	121 - SAW Tandem (Multi-pass)
Outside diameter	/		
Filler material Designation	**135 GMAW** EN ISO 14341-A: G 46 4 M21 3Si1 (AWS 5.18: ER70S-6) **121 SAW** Wire EN ISO 14171-A: S3Si (AWS A5.17: EH12K) ;		
Filler material Maker	135 - Lincoln Supramig	121 Single- Esab OK Autod 12.32 Flux : Esab OK 10.62	121 Tandem- Esab OK Autod 12.32
Filler material Size	135 - GMAW ∅ 1,2 mm ; 121 - SAW ∅ 3,2 mm and ∅ 4,0 mm		
Shielding gas/Flux	ISO 14175 :2008 M21 (80% Ar + 20% CO_2) for GMAW Flux: EN ISO 14174: S A FB 1 55 AC H5 ; Flux wire combination: SFA 5.17: F7A8-EH12K		
Shielding gas flow rate	20 l/min.		
Backing gas (purging)	None		

Type of welding current & polarity		Heat input / Apporto termico (kJ/mm) ± 10%		Welding process	Diameter mm	
			Pass			
DC - RP (FCAW, SAW Single, 1st wire of SAW Tandem); AC (2nd wire of SAW Tandem)			Root	GMAW	∅ 1,2	0,75 to 0,91
			Hot	SAW-Single	∅ 3,2	1,43 to 1,75
			Filll	SAW-Single	∅ 3,2	1,10 to 2,35
			Fill	SAW-Tandem	∅ 3,2/4,0	2,33 to 3,01
			Cap	SAW-Tandem	∅ 3,2/4,0	2,33 to 2,85
			R pass	SAW-Single	∅ 3,2	2,25 to 2,75

Welding position	PA		
Preheat (°C)	50	Interpass temperature / Temp. di interpass (°C)	250
Post-Weld Heat Treatment and/or ageing	NONE		
Weld bead width	Max. 8 mm (135-GMAW) ; Max. 15 mm (121-SAW Single) ; Max. 15 mm (135-SAW- Tandem)		
Welder's detail	Cascino Giancarlo R		
Time lapse between root and hot pass	N.A.		
Other information / Altre informazioni	- Preheat performed by propane torch -Accelerate weld cooling not permitted; -Base material origin: plate		

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 54/18	Sheet/Foglio 2/2

Manufacturer's Welding Procedure. Ref. no.	54/18 REV. 0		
Test result (WPQR) N°	54/18	Date/Data	16/01/2019
Manufacturer's WPS No.	pWPS 54/18 REV. 0	Date/Data	13/12/2018

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 54/18
Penetrant test	N.A.	/
Magnetic particle test	Acceptable	04-18307
Radiographic test	N.A.	/
Ultrasonic test	Acceptable	04-18307

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2] 420	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 520	A [%] ≥ 17,0	Z [%]	Fracture Location	Remarks
TRANSVERSE 1	463	/	568	/	/	Base metal	/
TRANSVERSE 2	463	/	565	/	/	Base metal	/
AWM 1, Cylindrical ∅ 10 mm	452	/	556	27,6	/	Weld metal	/

BEND TEST

Type & N.	Bend angle	Remarks	Results
4 Side bend	180°	Former Ø 40 mm	Satisfactory

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] ≥ 35J			Avarage value [J] ≥ 46J	Remarks
10x10x55	Weld metal 2mm from Cap	KV2	-40°C	195	193	207	198	/
10x10x55	Weld metal 2mm from Root	KV2	-40°C	181	192	192	188	/
10x10x55	FL 2mm from Cap	KV2	-40°C	235	239	153	209	/
10x10x55	FL 2mm from Root	KV2	-40°C	193	189	169	184	/
10x10x55	FL+2 2mm from Cap	KV2	-40°C	340	300	284	308	/
10x10x55	FL+2 2mm from Root	KV2	-40°C	333	315	241	296	/
10x10x55	FL+5 2mm from Cap	KV2	-40°C	354	348	353	352	/
10x10x55	FL+5 2mm from Root	KV2	-40°C	338	316	327	327	/

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
1 Macro examination+Hardness test	Satisfactory-See Element Materials Technology Milan Certificate No. RPR1550-5E1R0A18
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Element Materials Technology Milan S.r.l. - Crema (CR)
Laboratory report reference N.	Report No. RPR1550-5E1R0A18 dated JANUARY 16th 2018
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of PremierOil Spec. AB-TO-WGP-TO-ST-BD-0001 Rev. B02 and AB-TO-WGP-TO-ST-SP-0002 Rev. B01; EEMUA 158:2014 (Third Edition)

Date/Data
16-01-2019
ROSETTI MARINO SpA
Welding Dept
D.Cenacchi
ROSETTI MARINO S.p.A.

Examiner or Examination Body
RINA Services S.p.A.
RINA
Name and signature / Nome e firma
RINA Services S.p.A.

PremierOil | ROSETTI MARINO

PQR - AS- RUN PARAMETER SHEET

pWPS 54/18

PQR 54/18

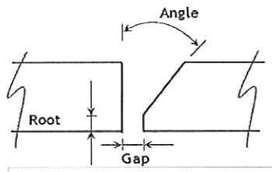
Coupon Nr. 54/18

Date: 19/12/2018 | Page: 1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: **EEMUA 158 Third Edition (2014) and PremierOil Spec. AB-TO-WGP-TO-ST-BD-0001 Rev. B02 and AB-TO-WGP-TO-ST-SP-0002 Rev. B01**

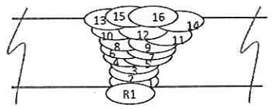
Welder Name(s):	CASCINO GIANCARLO	Welder Id No(s):	R
Welding Process(es):	135-FCAW ; 121-SAW single ; 121-SAW Tandem	Type(s):	SEMIAUTOMATIC (135) ; FULLY MECHANIZED (121)
Welding Position:	PA (1G)	Progression:	N.A.
Base Materials:	EN 10225: S460 G2+M	Wall Thickness:	30 (*) — Diameter: /
Heat No(s):	882852	Joint Type:	HALF VEE BUTT JOINT; BOTH SIDES WELDED

WELD PREPARATION:



Root: 1-2 mm ; Gap : 0-1 mm ; Angle : 45° - 50°

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	C1MG1181452	LINCOLN SupraMig
Hot Pass	3,2	PVR16395218	ESAB OK AUTROD 12.32
Filing Runs	3,2	PVR16395218	ESAB OK AUTROD 12.32
Filing Runs	3,2 & 4,0	PVR16395218 PVS28015153	ESAB OK AUTROD 12.32
Cap	3,2 & 4,0	PVR16395218 PVS28015153	ESAB OK AUTROD 12.32
R pass	3,2	PVR16395218	ESAB OK AUTROD 12.32

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar+ 20%CO2
Flow:	20 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/8" (135) ; 1/2" (121)
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
8 mm (GMAW); 15 mm (SAW SIngle) 15 mm (SAW Tandem)	String		Single (135) Multiple (121) (Single reverse pass)	Single (135); Single and multiple (121)

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required		Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
50°C	PROPANE TORCH	250	CONTACT DIGITAL THERMOMETHER	NA		NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficiency Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
NA	1	GMAW	1	-	ER70S-6 G46 4 M21 3Si1	1,2	DC EP	165	175	170,0	23	24	23,5	-	-	23	0,83	0,80	50	Welding unit: ISOSALD KMP460 (135); LINCOLN IDEALARC DC1500 (121)
NA	2	SAW single	2	-	F7A8-EH12K S3Si; S A FB 1 55 AC H5	3,2	DC EP	490	510	500,0	25	27	26,0	-	-	49	1,59	1,00	100	Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635
NA	3	SAW single	3	-	F7A8-EH12K S3Si; S A FB 1 55 AC H5	3,2	DC EP	490	510	500,0	27	30	28,5	-	-	40	2,14	1,00	120	(*) machined from base metal thickness : 80 mm
NA	4	SAW single	4	-	F7A8-EH12K S3Si; S A FB 1 55 AC H5	3,2	DC EP	490	510	500,0	25	27	26,0	-	-	60	1,30	1,00	140	Both side welded : side A passes from 1 to 16 (cap passes 13,14,15,16 ; last bead pass in the center of the weld) Side B pass R1
NA	4	SAW single	5	-	F7A8-EH12K S3Si; S A FB 1 55 AC H5	3,2	DC EP	490	510	500,0	25	27	26,0	-	-	64	1,22	1,00	200	
NA	4	SAW single	6	-	F7A8-EH12K S3Si; S A FB 1 55 AC H5	3,2	DC EP	490	510	500,0	25	27	26,0	-	-	60	1,30	1,00	250	Grinding to sound metal before performing reverse pass
NA	5	SAW tandem	7	-	F7A8-EH12K S3Si; S A FB 1 55 AC H5	3,2 4,0	DC EP AC	600 530	620 550	610 540	27 35	29 37	28 36	-	-	80	2,74	1,00	200	
NA	6	SAW tandem	8	-	F7A8-EH12K S3Si; S A FB 1 55 AC H5	3,2 4,0	DC EP AC	590 530	610 550	600 540	27 35	29 37	28 36	-	-	84	2,59	1,00	140	
NA	6	SAW tandem	9	-	F7A8-EH12K S3Si; S A FB 1 55 AC H5	3,2 4,0	DC EP AC	590 530	610 550	600 540	27 35	29 37	28 36	-	-	80	2,72	1,00	150	
NA	6	SAW tandem	10	-	F7A8-EH12K S3Si; S A FB 1 55 AC H5	3,2 4,0	DC EP AC	590 530	610 550	600 540	27 35	29 37	28 36	-	-	80	2,72	1,00	200	
NA	7	SAW tandem	11	-	F7A8-EH12K S3Si; S A FB 1 55 AC H5	3,2 4,0	DC EP AC	590 530	610 550	600 540	27 35	29 37	28 36	-	-	82	2,65	1,00	180	
NA	7	SAW tandem	12	-	F7A8-EH12K S3Si; S A FB 1 55 AC H5	3,2 4,0	DC EP AC	590 530	610 550	600 540	27 35	29 37	28 36	-	-	82	2,65	1,00	250	
NA	7	SAW tandem	13	-	F7A8-EH12K S3Si; S A FB 1 55 AC H5	3,2 4,0	DC EP AC	590 530	610 550	600 540	27 35	29 37	28 36	-	-	84	2,59	1,00	200	
NA	8	SAW tandem	14	-	F7A8-EH12K S3Si; S A FB 1 55 AC H5	3,2 4,0	DC EP AC	590 530	610 550	600 540	27 35	29 37	28 36	-	-	84	2,59	1,00	210	
NA	8	SAW tandem	15	-	F7A8-EH12K S3Si; S A FB 1 55 AC H5	3,2 4,0	DC EP AC	590 530	610 550	600 540	27 35	29 37	28 36	-	-	84	2,59	1,00	180	
NA	8	SAW tandem	16	-	F7A8-EH12K S3Si; S A FB 1 55 AC H5	3,2 4,0	DC EP AC	590 530	610 550	600 540	27 35	29 37	28 36	-	-	84	2,59	1,00	210	
NA	R1	SAW single	R1	-	F7A8-EH12K S3Si; S A FB 1 55 AC H5	3,2	DCEP	550	600	575,0	27	28	27,5	-	-	38	2,50	1,00	150	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SPA Welding Dept. D. Cenacchi	Signature:	Signature: RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	Signature:
Date: 19/12/18	Date:	Date: 19/12/2018 File Signature Cimatti Davide	Date:

ROSETTI MARINO

PQR 54/18

PQR attachments index:

Base material certificate (Plate EN 10225: S460 G2+M)

Consumables certificate

preliminary WPS

NDE certificate

Mechanical test report

ROSETTI MARINO

PQR 54/18

Base material certificate
(Plate EN 10225: S460 G2+M)

Certificate Number:**VNA 1700015 / 9**
Page: 1 of 1

Inspection Certificate

Project: ————
Client: **voestalpine Grobblech GmbH**
voestalpine-Straße 3, 4020 Linz, Austria
Office: **Vienna**

Clients Order Number: **6501364**
Date: **15-02-2017**

Order Status: **incomplete**

Inspection Dates
First: **10-02-2017**
final: **17-02-2017**

This certificate is issued to voestalpine Grobblech GmbH, Linz/Austria, to certify that the undersigned Surveyor attended their works Linz for the purpose of testing and inspecting the undemoted material with satisfactory results as stated below.

Purchaser: **Rosetti Marino Spa**
Via Trieste 230
I-48122 RAVENNA

Order No.: **1716002502 116B20A**

Description:

48 piece(s) of steel plate(s) 384580 kg , as per attached inspection Certificate no.: **A0357565**

Specification

S460G2+M Z35 EN 10225 : 2009

Heat treatment/Delivery Condition: thermomechanical rolled + accelerated cooled

Scope of inspection:

witness mechanical testing: yes ☑
review manufacturer's declared analysis: yes ☑
witness / verify ultrasonic examination: yes ☑ n/a ☐
witness / verify microstructure examination: yes ☐ n/a ☑
witness /verify corrosion testing: yes ☐ n/a ☑
random visual and dimensional control and check of hard stamping: yes ☑

Identification:

Makers Brand voestalpine
Material Quality
Heat No.
Plate No.
Brand of LR

Lloyd's Register EMEA
Vienna Office
Lloyd's Register

24 FEB 2017

Kurt Huber
Surveyor to Lloyd's Register EMEA

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Form 1123 (2015.08)

voestalpine Grobblech GmbH

A02
Inspection certificate

EN 10204 - 3.2

VNA1700015-9

Z02 Date 23-02-2017

voestalpine-Straße 3
4020 Linz, Austria
www.voestalpine.com/grobblech

A03 Document number	A0357565	A08 Order-No.:	6501364	A07 OrderDat.	13-12-2016

4F

A06 Customer	Rosetti Marino Spa Via Trieste 230 I-48122 RAVENNA	B01 Product	Plate		
		B02 Material	S460G2+M Z35	B03 Standard	EN 10225 : 2009
A07 OrderNo.	1716002502 116B20A	Supplementary requirements	Z35 - EN 10164		
A06 Consignee	Rosetti Marino Spa Via Trieste 230 I-48122 RAVENNA	B04 Delivery condition	thermomechanical rolled + accelerated cooled		

A10 - Supplementary Information

SOUTH PARS 13 - PILES

B03 - Supplementary requirements

MATERIAL IS FINE GRAINED, VACUUM DEGASSED AND FULLY KILLED, PRODUCED BY BOF.
MATERIAL IS ACCORDING TO SPECIFICATION SP13-P2-ST-SP-8028.
MATERIAL IS ACCORDING TO EN 10225, OPTIONS 2,6,7,9,10,12 AND 13.

Z01 - Visual Examination and dimensional checking: satisfactory. The results of tests performed are in compliance with the requirements.

Detail of supply

	B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	Ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
a	882852	186892/1	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
b	882852	186892/2	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
b	882852	186894/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
c	882852	186894/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
c	882852	186895/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
	882852	186895/2	30	80,00	2640,0	4800	1		8.010	56321	15-02-2017	1PLATCS80007
d	882852	186896/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
d	882852	186896/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
e	882852	186897/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
e	882852	186897/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
	882852	186898/1	30	80,00	2640,0	4800	1		8.020	56268	15-02-2017	1PLATCS80007
	882852	186898/2	30	80,00	2640,0	4800	1		8.020	56268	15-02-2017	1PLATCS80007
a	882852	186899/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007

A04
Symbol of the manufacturer's work

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Inspection representative voestalpine Grobblech
Quality Department Heavy Plates
BERGER Alfred

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Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	Ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
882852	186899/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
882852	186900/2	30	80,00	2640,0	4800	1		8.020	56058	15-02-2017	1PLATCS80007
882852	186900/1	30	80,00	2640,0	4800	1		8.020	56058	15-02-2017	1PLATCS80007
882852	186901/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
882852	186901/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972090	186721/2	30	80,00	2640,0	4800	1		8.018	56010	10-02-2017	1PLATCS80007
972090	186723/2	30	80,00	2640,0	4800	1		8.012	56058	14-02-2017	1PLATCS80007
972090	186723/1	30	80,00	2640,0	4800	1		8.012	56058	14-02-2017	1PLATCS80007
972090	186724/1	30	80,00	2640,0	4800	1		8.010	56058	13-02-2017	1PLATCS80007
972090	186724/2	30	80,00	2640,0	4800	1		8.010	56321	13-02-2017	1PLATCS80007
972090	186725/1	30	80,00	2640,0	4800	1		8.010	56010	11-02-2017	1PLATCS80007
972090	186725/2	30	80,00	2640,0	4800	1		8.010	56010	11-02-2017	1PLATCS80007
972090	186726/2	30	80,00	2640,0	4800	1		8.022	56058	10-02-2017	1PLATCS80007
972090	186726/1	30	80,00	2640,0	4800	1		8.022	56010	10-02-2017	1PLATCS80007
972093	181846/2	30	80,00	2640,0	4800	1		8.005	56268	15-02-2017	1PLATCS80007
972093	181846/1	30	80,00	2640,0	4800	1		8.005	56268	15-02-2017	1PLATCS80007
972093	186842/1	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
972093	186842/2	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
972093	186843/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186843/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186844/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186844/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186846/2	30	80,00	2640,0	4800	1		8.007	56058	17-02-2017	1PLATCS80007
972093	186846/1	30	80,00	2640,0	4800	1		8.007	56058	17-02-2017	1PLATCS80007
972093	186902/2	30	80,00	2640,0	4800	1		8.010	56272	15-02-2017	1PLATCS80007
972093	186902/1	30	80,00	2640,0	4800	1		8.010	56272	15-02-2017	1PLATCS80007
972093	186903/2	30	80,00	2640,0	4800	1		8.010	56010	15-02-2017	1PLATCS80007
972093	186903/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186905/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186905/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972096	186841/1	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
972096	186841/2	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
972096	186845/1	30	80,00	2640,0	4800	1		8.010	56272	16-02-2017	1PLATCS80007
972096	186906/2	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007

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BERGER Alfred

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Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	Ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
972096	186906/1	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
	Sum					48		384.580			

C70 - Method of steelmaking: strand casted material: pure oxygen blown with vacuum treatment; steel is fully killed.

B14 - Supplementary information

Flatness acc. EN 10029/10 class N
Dimensional tolerances acc. EN 10029/10
EN10163-2: Class A3 - Repair-welding not permitted.
Thicknesstolerance acc. EN 10029/10 tab. 1 class A

Chemical composition (Heat analysis) - part 1 of 2

B07 Heat No.	C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %	Pb %	Cae %	Pcm %
>=		.150				.015																
Set values <=	.140	.550	1.650	.020	.0050	.055	.250	.700	.250	.300	.080	.040	.025	.0100	.0005	.0200	.0050	.0300	.0100	.010	.43	.22
882852	.052	.182	1.550	.009	.0009	.030	.182	.520	.123	.073	.004	.030	.012	.0051	.0002	.0020	.0003	.0020	.0020	.002	.41	.17
972090	.060	.176	1.520	.007	.0010	.022	.174	.520	.125	.046	.004	.027	.012	.0061	.0002	.0020	.0003	.0020	.0020	.002	.41	.17
972093	.052	.184	1.530	.008	.0011	.027	.172	.530	.125	.068	.004	.029	.012	.0042	.0003	.0020	.0003	.0030	.0020	.002	.41	.17
972096	.054	.177	1.530	.007	.0007	.026	.173	.530	.117	.054	.004	.027	.013	.0040	.0002	.0020	.0003	.0020	.0030	.002	.41	.17

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Chemical composition (Heat analysis) - part 2 of 2

B07 Heat No.	LF01 %	LF02 %	LF03 %
Set values >= <=	.090	.110	.900
882852	.034	.046	.898
972090	.031	.043	.865
972093	.033	.045	.895
972096	.031	.044	.874

C99 - Supplementary information
BI <= 0,01%
C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF03: Cr+Ni+Cu+Mo
LF02: Nb+V+Ti
LF01: Nb+V

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Test results: C10-C29 Tensile Test acc. EN ISO 6892-1

B07 Heat No.	B06 Plate No	C41 Width	SpThickn mm	C01 loc.	PosTh.	C02 Dir	C11 Reh MPa	C11 Rp0,2 MPa	C12 Rm MPa	L0	C13 E %	C11 Reh/Rm %	C11 Rp0,2/Rm %	Sim.htm	WBH
>=							405	405	505		17.0				
Set values <=									665			90.00	90.00		
882852	186892	Ø	9.98	F	V	T	445	445	535	A5	32.0	83.07	83.09		
	186896	Ø	9.98	F	V	T	447	443	535	A5	30.9	83.47	82.69		
	186898	Ø	9.99	F	V	T	441	438	538	A5	31.2	81.97	81.41		
	186900	Ø	9.98	F	V	T	457	440	533	A5	30.3	85.65	82.52		
	186892	Ø	9.99	F	V	T		436	527	A5	30.0		82.78	001	1
	186896	Ø	9.99	F	V	T	468	443	524	A5	32.3	89.30	84.50	001	1
	186898	Ø	9.98	F	V	T	465	445	527	A5	32.4	88.24	84.44	001	1
	186900	Ø	9.99	F	V	T		437	524	A5	31.6		83.43	001	1
972090	184827	Ø	10.00	F	V	T	456	449	541	A5	29.3	84.28	82.93		
	184828	Ø	10.00	F	V	T	442	440	536	A5	30.8	82.41	82.00		
	186723	Ø	9.98	F	V	T		429	545	A5	27.5		78.81		
	184827	Ø	9.99	F	V	T		432	520	A5	28.5		83.09	001	1
	184828	Ø	9.99	F	V	T		440	529	A5	31.2		83.32	001	1
	186723	Ø	9.96	F	V	T	487	474	563	A5	28.1	86.53	84.17	001	1
972093	181846	Ø	9.95	F	V	T		415	564	A5	32.1		73.58		
	186842	Ø	9.98	F	V	T	456	449	540	A5	32.5	84.45	83.24		
	186843	Ø	9.99	F	V	T	461	452	544	A5	32.6	84.74	83.09		
	186902	Ø	9.98	F	V	T	456	448	532	A5	32.5	85.67	84.18		
	181846	Ø	9.98	F	V	T	460	424	524	A5	32.6	87.79	80.92	001	1
	186842	Ø	9.99	F	V	T	471	440	526	A5	32.4	89.49	83.56	001	1
	186843	Ø	9.98	F	V	T	470	443	532	A5	32.6	88.35	83.27	001	1
	186902	Ø	9.99	F	V	T	463	436	518	A5	32.9	89.37	84.16	001	1
972096	186841	Ø	9.98	F	V	T	459	429	529	A5	30.9	86.77	81.10		
	186906	Ø	9.98	F	V	T	466	436	524	A5	31.2	88.86	83.05		
	186841	Ø	9.98	F	V	T	470	441	525	A5	32.1	89.52	84.00	001	1
	186906	Ø	9.97	F	V	T		439	523	A5	32.7		83.96	001	1

SpThickn: specimen thickness
C01;loc.:
F: Bottom
PosTh.: Pos Thickness
V: ¼

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Z02
Inspection representative voestalpine Grobblech
Quality Department Heavy Plates
BERGER Alfred

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Test results: C10-C29 Tensile Test acc. EN ISO 6892-1

B07 Heat No.	B06 Plate No	C41 Width mm	SpThickn	C01 loc.	PosTh.	C02 Dir	C11 Reh MPa	C11 Rp0,2 MPa	C12 Rm MPa	L0	C13 E %	C11 Reh/Rm %	C11 Rp0,2/Rm %	Sim.htm	WBH

C02;Dir:
  T: transverse
C12; Rm: Tensile Strength
L0: gauge
  A5: Length = 5.65 * sqr (area) mm
C13;E: elongation
Sim.htm: sim. heat treatment
  001: Sim.htm group #1
WBH: sim. heat treatment

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Z02
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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07	B06	C40	C01			C02	C03	C42	C42	C42	C43		
Heat No. samp.cond.	Plate No	shape	loc.	Pos.	PosTh.	Dir	temp	SV	SV	SV	AV	Sim.htm	WBH
							°C	J	J	J	J		
>=							-40	42	42	42	60		
Set values <=													

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No, samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>=							-40	42	42	42	60		
Set values <=													
882852	186892	CV 10x10	F	O		T	-40	340	328	325	331		
	186896	CV 10x10	F	O		T	-40	345	328	327	333		
	186898	CV 10x10	F	O		T	-40	352	332	322	335		
	186900	CV 10x10	F	O		T	-40	345	348	344	346		
	186892	CV 10x10	F	O		T	-40	307	310	303	307	001	1
	186896	CV 10x10	F	O		T	-40	314	321	315	317	001	1
	186898	CV 10x10	F	O		T	-40	323	311	317	317	001	1
	186900	CV 10x10	F	O		T	-40	334	324	325	328	001	1
	186892	CV 10x10	F	K		T	-40	348	364	385	366		
	186896	CV 10x10	F	K		T	-40	365	356	353	358		
	186898	CV 10x10	F	K		T	-40	352	365	345	354		
	186900	CV 10x10	F	K		T	-40	372	347	354	357		
	186892	CV 10x10	F	K		T	-40	345	329	324	333	001	1

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Z03
Stamp of the inspection representative

LR
Lloyd's Register EMEA
Vienna Office
Initials: KH
24 FEB 2017

Z02
Inspection representative voestalpine Grobblech
Quality Department Heavy Plates
BERGER Alfred

voestalpine
ONE STEP AHEAD.

Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>=							-40	42	42	42	60		
Set values <=													
882852	186896	CV 10x10	F		K	T	-40	344	328	284	319	001	1
	186898	CV 10x10	F		K	T	-40	310	337	320	322	001	1
	186900	CV 10x10	F		K	T	-40	357	349	347	351	001	1

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Z02
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Quality Department Heavy Plates
BERGER Alfred

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ONE STEP AHEAD.

Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>=							-40	42	42	42	60		
Set values <=													
972090	184827	CV 10x10	F		O	T	-40	321	320	314	318		
	184828	CV 10x10	F		O	T	-40	320	303	303	309		
	186723	CV 10x10	F		O	T	-40	323	327	322	324		
	184827	CV 10x10	F		O	T	-40	332	319	327	326	001	1
	184828	CV 10x10	F		O	T	-40	318	323	321	321	001	1
	186723	CV 10x10	F		O	T	-40	295	263	303	287	001	1
	184827	CV 10x10	F		K	T	-40	340	328	251	306		
	184828	CV 10x10	F		K	T	-40	346	336	317	333		
	186723	CV 10x10	F		K	T	-40	268	289	311	289		
	184827	CV 10x10	F		K	T	-40	321	331	357	336	001	1
	184828	CV 10x10	F		K	T	-40	326	353	89	256	001	1
	186723	CV 10x10	F		K	T	-40	284	266	276	275	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	42	42	42	60		
972093	181846	CV 10x10	F		O	T	-40	319	324	322	322		
	186842	CV 10x10	F		O	T	-40	345	347	334	342		
	186843	CV 10x10	F		O	T	-40	343	339	342	341		
	186902	CV 10x10	F		O	T	-40	349	344	335	342		
	181846	CV 10x10	F		O	T	-40	329	302	323	318	001	1
	186842	CV 10x10	F		O	T	-40	312	310	308	310	001	1
	186843	CV 10x10	F		O	T	-40	305	315	311	310	001	1
	186902	CV 10x10	F		O	T	-40	323	322	318	321	001	1
	181846	CV 10x10	F		K	T	-40	304	366	370	347		
	186842	CV 10x10	F		K	T	-40	362	369	351	361		
	186843	CV 10x10	F		K	T	-40	358	366	356	360		
	186902	CV 10x10	F		K	T	-40	357	366	377	366		
	181846	CV 10x10	F		K	T	-40	359	364	355	359	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	42	42	42	60		
972093	186842	CV 10x10	F	K		T	-40	323	298	331	317	001	1
	186843	CV 10x10	F	K		T	-40	313	304	301	306	001	1
	186902	CV 10x10	F	K		T	-40	361	363	364	362	001	1
972096	186841	CV 10x10	F	O		T	-40	345	333	341	339		
	186906	CV 10x10	F	O		T	-40	338	340	346	341		
	186841	CV 10x10	F	O		T	-40	324	316	313	318	001	1
	186906	CV 10x10	F	O		T	-40	317	321	323	320	001	1
	186841	CV 10x10	F	K		T	-40	337	342	353	344		
	186906	CV 10x10	F	K		T	-40	348	357	334	346		
	186841	CV 10x10	F	K		T	-40	309	332	343	328	001	1
	186906	CV 10x10	F	K		T	-40	347	338	278	321	001	1
>= Set values <=							-40	29	29	29	46		

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Grobtech
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BERGER Alfred

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	C02 PosTh.	C03 Dir	temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>=							-40	29	29	29	46		
Set values <=													
882852	186892	CV 10x10	F		ZB2	T	-40	320	310	312	314		strain aged 5%, 60 min. at 250°C
	186896	CV 10x10	F		ZB2	T	-40	305	297	314	305		strain aged 5%, 60 min. at 250°C
	186898	CV 10x10	F		ZB2	T	-40	311	303	309	307		strain aged 5%, 60 min. at 250°C
	186900	CV 10x10	F		ZB2	T	-40	305	317	306	309		strain aged 5%, 60 min. at 250°C
972090	184827	CV 10x10	F		ZB2	T	-40	341	317	326	328		strain aged 5%, 60 min. at 250°C
	186723	CV 10x10	F		ZB2	T	-40	259	299	299	286		strain aged 5%, 60 min. at 250°C
972093	181846	CV 10x10	F		ZB2	T	-40	306	302	323	310		strain aged 5%, 60 min. at 250°C
	186842	CV 10x10	F		ZB2	T	-40	316	299	319	311		strain aged 5%, 60 min. at 250°C
	186843	CV 10x10	F		ZB2	T	-40	322	309	315	315		strain aged 5%, 60 min. at 250°C
	186902	CV 10x10	F		ZB2	T	-40	306	302	323	310		strain aged 5%, 60 min. at 250°C
972096	186841	CV 10x10	F		ZB2	T	-40	311	302	314	309		strain aged 5%, 60 min. at 250°C
	186906	CV 10x10	F		ZB2	T	-40	305	310	313	309		strain aged 5%, 60 min. at 250°C

C40;shape:
CV 10x10: Test shape , Dimensions

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07	B06	C40	C01			C02	C03	C42	C42	C42	C43			
Heat No. samp.cond.	Plate No	shape	loc.	Pos.	PosTh.	Dir	temp	SV	SV	SV	AV		Sim.htm	WBH
							°C	J	J	J	J			

C01;loc.:
F: Bottom
Pos.: test specimen position
PosTh.: Pos Thickness
K: ½
O: surface
ZB2: 2mm below surface
C02;Dir:
T: transverse
C42;SV: single value
C43;AV: average value
Sim.htm: sim. heat treatment
001: Sim.htm group #1
WBH: sim. heat treatment
samp.cond.: sample condition

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Test results: C10-C29 through Thickness Test acc. DIN / EN

B07 Heat No.	B06 Plate No	C40 Shape	SpThickn mm	C01 loc.	C02 Dir	C12 Rm MPa	C12 Rm MPa	C12 Rm MPa	Z(SV) %	Z(SV) %	Z(SV) %	Z(AV) %
Set values >=						404	404	404	25	25	25	35
882852	186892	Ø	10.01	F	S	531	531	531	72	78	60	70
	186896	Ø	10.00	F	S	539	530	532	78	78	70	75
	186900	Ø	10.00	F	S	526	521	530	77	79	78	78
972090	184827	Ø	10.03	F	S	528	528	525	60	67	58	62
	186723	Ø	9.96	F	S	539	544	525	73	74	79	75
972093	181846	Ø	10.00	F	S	522	520	520	75	74	77	75
	186842	Ø	10.00	F	S	535	533	536	78	75	72	75
	186902	Ø	10.01	F	S	515	520	517	77	71	74	74
972096	186906	Ø	9.87	F	S	527	525	539	77	79	70	75

SpThickn: specimen thickness
C01;loc.:
F: Bottom
C02;Dir:
S: through thickness direction
C12; Rm: Tensile Strength
Z(SV): reduction of area (single value)
Z(AV): reduction of area (average value)

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Chemical composition (Product analysis) - part 1 of 2

B07 Heat No.	B06 Plate No	C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %
	>=		.150				.015													
Set values	<=	.140	.550	1.650	.020	.0050	.055	.250	.700	.250	.300	.080	.040	.025	.0100	.0005	.0200	.0050	.0300	.0100
882852	186892	.052	.184	1.520	.008	.0010	.028	.181	.520	.123	.067	.004	.029	.012	.0058	.0002	.0020	.0002	.0030	.0020
	186896	.052	.185	1.530	.008	.0009	.030	.179	.520	.122	.071	.004	.029	.012	.0053	.0002	.0020	.0003	.0030	.0020
	186898	.052	.175	1.530	.007	.0009	.029	.180	.521	.123	.071	.003	.030	.012	.0051	.0001	.0020	.0002	.0010	.0010
	186900	.052	.184	1.530	.009	.0010	.029	.178	.520	.122	.072	.004	.030	.012	.0050	.0002	.0020	.0003	.0020	.0020
972090	184827	.054	.178	1.530	.007	.0007	.024	.176	.520	.127	.046	.004	.027	.013	.0056	.0002	.0020	.0002	.0030	.0020
	184828	.054	.176	1.530	.007	.0007	.024	.174	.520	.127	.045	.004	.027	.013	.0059	.0002	.0020	.0002	.0020	.0020
	186723	.055	.179	1.540	.007	.0010	.024	.174	.510	.126	.046	.004	.027	.013	.0061	.0002	.0020	.0002	.0030	.0020
972093	181846	.051	.180	1.520	.007	.0010	.029	.170	.520	.122	.060	.004	.029	.012	.0044	.0002	.0020	.0003	.0020	.0020
	186842	.052	.185	1.510	.007	.0012	.028	.168	.510	.124	.061	.004	.029	.013	.0042	.0002	.0020	.0003	.0020	.0020
	186843	.052	.177	1.500	.008	.0010	.027	.173	.531	.125	.066	.004	.029	.011	.0042	.0002	.0030	.0003	.0030	.0020
	186902	.048	.183	1.500	.007	.0010	.028	.168	.510	.122	.060	.004	.028	.012	.0045	.0002	.0020	.0003	.0020	.0020
972096	186841	.054	.175	1.530	.006	.0007	.024	.170	.527	.117	.055	.003	.027	.013	.0040	.0002	.0020	.0003	.0020	.0030
	186906	.053	.179	1.530	.007	.0010	.027	.174	.520	.121	.050	.004	.027	.013	.0040	.0002	.0020	.0002	.0020	.0020

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Chemical composition (Product analysis) - part 2 of 2

B07 Heat No.	B06 Plate No	Pb %	Cae %	Pcm %	LF01 %	LF02 %	LF03 %
Set values >= / <=		.010	.43	.22	.090	.110	.900
882852	186892	.002	.41	.16	.033	.045	.891
	186896	.002	.41	.17	.033	.045	.892
	186898	.002	.41	.16	.033	.045	.895
	186900	.002	.41	.17	.034	.046	.892
972090	184827	.002	.41	.17	.031	.044	.869
	184828	.002	.41	.17	.031	.044	.866
	186723	.002	.41	.17	.031	.044	.856
972093	181846	.002	.40	.16	.033	.045	.872
	186842	.002	.40	.16	.033	.046	.863
	186843	.002	.40	.16	.033	.044	.895
	186902	.002	.39	.16	.032	.044	.860
972096	186841	.002	.41	.17	.030	.043	.869
	186906	.002	.41	.16	.031	.044	.865

C99 - Supplementary information
BI <= 0,01%

C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF03: Cr+Ni+Cu+Mo
LF02: Nb+V+Ti
LF01: Nb+V

Remarks

Simulated heat treatment of test coupons:

Pos 30:
001/1: 1 cycle(s) sim. PWHT: furnace charge temperature at max. 400 °C, heating with max. 55 °C/h up to 580 °C, +20 °C/-20 °C, holding time 240 minutes, cooling with max. 55 °C/h down to 400 °C, final cooling in calm air.

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Remarks

We confirm that the above-mentioned delivery corresponds to the order (and standard).

Reduction of area on tensile test specimens in the through-thickness direction in accordance with EN 10164:2004, class Z35.

The signature of the inspection representative from voestalpine Grobblech GmbH is substituted by a electronic Signature, because the certificates of voestalpine Grobblech GmbH are prepared by a suitable data processing system (EN 10204, Pt.5).

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ULTRASONIC EXAMINATION

SPECIFICATION
Ultrasonic examination acc. to EN 10160, EN 10160 class S1/Body, Grid 200 mm, EN 10160 class E2/Edge Zone, Edge zone 75 mm

VALID TEST EQUIPMENT
mechanized ultrasonic "In-Line testing system" (Manufacturer: NDT-Systems & Services) and
mechanized ultrasonic "off-line - testing system" (manufacturer: Windhoff Bahn- und Anlagentechnik GmbH) and
MUT (optional): Sonatest D20 no. 90006523 or Sonatest D20 no. 90007346 or Sonatest Masterscan 380 no. 90007347 or Sonatest Masterscan 380 no. 90006522 or Sonatest D50 no. 90010231 or GE - USM 36 no. 90010775

PROBE
(in-line AUT): 3STSE 18.3/8 P5, SEZ5R10RS, SE3 18.3/10 5A, (5MHz)
(off-line AUT): S140 (4MHz) 3T/1R
(MUT): SEB4E (4MHz), SEB4E0° (4MHz), MSEB4E (4MHz), B2SO (2MHz)
watergapcoupling

RESULT
Plate(s) comply with the specification.

INSPECTION OPERATOR
Operators Level 1 or 2: qualified and certified according ÖNORM EN 473 or EN ISO 9712 (since 01.01.2013) respectively according the Written Practice „NDT-WP" (in accordance to Recommended Practice SNT-TC-1A). Operators Level 2 for ASME/ASTM.

INSPECTION SUPERVISOR
Responsible Level 3: Bindreiter Erich

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Consumables certificate

Inspection Certificate 3.1

Product	**SupraMig**
Size(s) mm	**1.20 x 16 kg Basket RW**
Item No.	**S12K016R6F00**
Lot/Batch	**C1MG181452**
Product Line	**MIG Wire**
Class	**AWS A5.18/A5.18M : ER70S-6** **EN ISO 14341-A-G 46 4 M21 / G 42 3 C1 3Si1**

Chemical analysis (%) According to EN10204 3.1

C	Si	Mn	P	S	Cr	Ni	Mo	Cu	V	Al	Ti+Zr
0.073	**0.83**	**1.43**	**0.007**	**0.006**	**0.02**	**0.01**	**0.01**	**0.01**	**<0.01**	**<0.01**	**0.020**

Mechanical test, Wire. RM (MPa) According to EN10204 2.2

Tensile testing

ReL	Rm	A5
MPa	MPa	%
502	**574**	**28**

Impact testing

Cond.	Temp.	KV
	°C	J
M21	**-40**	**102**

Remarks

The product identified above has been manufactured, tested and supplied in compliance with a certified ISO 9001 Quality Assurance Programme.

Company
Lincoln Electric Italia srl
Via Fratelli Canepa 8
16010 Serra Riccò
Italy

Lincoln Electric Italia S.r.l.
MIG Wire Plant
Quality Assurance

Printed		Cert. No.
By	**Cristina Ghiglino**	**00533354**
Function	**Customer Service Center**	ZEU_CMN , 1
Date	**21/JUN/2018**	

CERTIFICATO DI COLLAUDO/ INSPECTION CERTIFICATE

in accordo a/acc to EN 10204 - 3.1

Data/Date: 2017-06-01

Numero certificato/Cert no: EC24758009 rev. 0

Nostro ordine/Our order:	1653138	Vostro ordine/Your order:	1717000928
Nostro riferimento/Our ref:	Web user - Movex CMP020 ITB	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB00060	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20170526	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address

ESAB SALDATURA SpA
.
VIA ROSA LUXEMBURG 49
20085 LOCATE DI TRIULZI (MI)
20085 ITALY
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address

ROSETTI MARINO SPA
.
VIA TRIESTE 230
48100 RAVENNA RA
Italy

PRODOTTO CONSEGNATO/DELIVERED PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK Autrod 12.32 3.2mm 30kg
Codice/Item no:	**1232322800**
Numero di lotto/Lot no:	**PVR16395218**
Quantità/Quantity:	900 KG

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.17: EH12K
EN ISO 14171-A: S3Si

ANALISI CHIMICA/ CHEMICAL ANALYSIS

Wire/strip

Altro/Auxiliary:

C		0.14%
Si		0.32%
Mn		1.79%
P		0.013%
S		0.009%
Cr		0.02%
Ni		0.01%
Mo	<	0.01%
Cu		0.05%

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione/Validation

Josef Moravek Quality Manager

CERTIFICATO DI COLLAUDO/ INSPECTION CERTIFICATE

in accordo a/acc to EN 10204 - 3.1

Data/Date: 2018-07-18

Numero certificato/Cert no: EC25239657 rev. 0

Nostro ordine/Our order:	1980269	Vostro ordine/Your order:	1718000772
Nostro riferimento/Our ref:	Alessandro Campanato ESAB Ktf	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB00060	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20180618	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address
ESAB SALDATURA SpA
.
STRADA PROVINCIALE 34, N.7
20010 OSSONA (MI)
20010 ITALY
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
ROSETTI MARINO SPA
.
VIA TRIESTE 230
48100 RAVENNA RA
Italy

PRODOTTO CONSEGNATO/DELIVERED PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK Autrod 12.32 4.0mm 280kg
Codice/Item no:	**1232400400**
Numero di lotto/Lot no:	**PVS28015153**
Quantità/Quantity:	2800 KG

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.17: EH12K
EN ISO 14171-A: S3Si

ANALISI CHIMICA/ CHEMICAL ANALYSIS

Wire/strip

Altro/Auxiliary:

C	0.13%
Si	0.29%
Mn	1.75%
P	0.012%
S	0.006%
Cr	0.04%
Ni	0.03%
Mo	0.01%
Cu	0.08%

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione/Validation

Josef Moravek Quality Manager

ROSETTI MARINO

PQR 54/18

preliminary WPS

PQR ref.:	54/18	WPS (EEMUA 158)	pWPS 54/18	REV.:	0	Data /date	13/09/2018

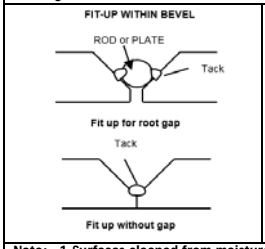
Procedimento di saldatura / Welding process: **135 GMAW +121 SAW** — Tipo / Type: **SEMIAUTOMATIC+ FULLY MECHANIZED**

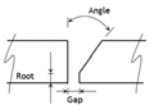
GIUNTO - JOINT

Tipo di giunto / Joint Design: **1/2V** — Supporto / Backing: ☐ Si / Yes ☒ No

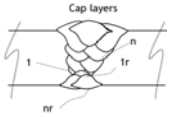
Materiale di supporto (tipo) / Backing material (type). ☐ Metallico / Metal ☐ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:





Angle: 45°
Root: 2 mm
Gap: 0-1 mm



Note: **1.Surfaces cleaned from moisture, oil, grease, paint before welding (by grinding)/** *Pulire le superfici da liquidi, oli, grasso e vernici con molatura prima di saldare.*
2.Minimum tack weld lengths shall be 4 times the thk or 50 mm, whichever is less/ I tacchetti devono essere lunghi almeno 50 mm o 4 volte lo spessore (il più piccolo dei due);
3.Welding shall not be discontinued before 25% of the weld thickness or 3 passes are completed, whichever gives adequate cross section to prevent craking/ *La saldatura non può essere interrotta prima di aver completato almeno 3 passate o il 25% dello spessore da saldare*
4.The whole length of the joint to be welded, and 75 mm each side, shall be preheated to the required temperature. Preheat shall be performed by electrical resistance, induction equipment or with gas burners. Hand held oxy-propane torches shall only be used for weld shorter than 300 mm. Cutting torches shall not be permitted. *L'intera lunghezza del giunto e 75 mm su ogni lato deve essere preriscaldata alla temperatura richiesta. Il preriscaldo può essere eseguito con resitenze, induzione o torcia. La torcia a mano può essere usata solo per saldature fino a 300 mm . Non può essere utilizzato l'ossitaglio.*

MATERIALE BASE - BASE MATERIAL

Da / from P-N°: **/** — Group N° **5** — A / to P-N°: **/** — Group N° **5**

DA Tipo e grado / From type and grade: **S460 G2+M (CEV 0,41; Pcm 0,17)**

A Tipo e grado / To type and grade: **S460 G2+M (CEV 0,41; Pcm 0,17)**

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove **30 mm**

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove **N.A.**

METALLO D'APPORTO - FILLER METAL

	GMAW	SAW
Spec. N° (SFA)	5.18	A5.17
AWS N° (CLASS)	ER 70 S6	EH12K
F-N°	6	6
A-N°	1	1
Diametro mat. D'apporto / Size of filler metal	1,2	3,2/4,0
Gamma spessori /Thick. Range (mm)	Only root	Up to filling
Accoppiamento filo-flusso / Electrode-flux (CLASS)	NA	F7A8-EH12K
Denom. Comm. Flusso / FLUX trade name	NA	OK FLUX 10.62
Inserto consumabile / Consumable insert	NA	NA
Altro / other	LINCOLN SUPRAMIG	OK Autrod 12.32

Note for weld repair/ *Note per riparazioni*:
-Weld parameters shall be in accordance to original weld/*Parametri in accord a sald originale*
-The minimum preheat temperature shall be 50 °C above the preheat temperature used for the original weld/ *Aumetare preriscaldo di 50°C rispetto a sald. originale;*
-The removal of defective areas shall be by grinding or arc/air gouging followed by grinding (min 2 mm depth)/ *Rimuore il difetto tramite molatura o scriccatura seguita da molatura (minimo 2 mm);*
-Defect removal shall be assured by MPI; *Controllare area difetto con MPI dopo rimozione*;
-The resulting exacavation shall be clean, free from scale and have a contour to permit easy repair/ *Raccordare l'area dopo la rimozione del difetto.*

POSIZIONI - POSITION

giunto / Joint: **Cianfrino / groove** — Posizione / position **PA** — Progressione / weld progression: **N.A.**

PRERISCALDO - PRE-HEAT

Temp.preriscaldo minima / Min. pre-heat temp: **50°C** — Max temp. Di interpass / Max interpass temp.: **250 °C** — Mantenimento interpass / Interpass maintenance: **N.A.** — Tempo di mantenimento prerisc. / Maintenance timing: **N.A.**

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs): **N.A.** — Temperatura di stasi / Holding temperature °C: **N.A.** — Tempo di stasi / Holding time (min.): **N.A.** — Velocità di raffreddamento / Cooling rate (°C/Hrs): **N.A.**

GAS DI PROTEZIONE - GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar+CO2	80%+20%	16-20 lt/min
Protezione al seguito / Trailing:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current: **DC** — Polarità / Polarity: **RP**

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: **N.A.**

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: **N.A.**

Velocità alimentazione filo / Electr. Wire feed speed range: **Self regulated**

TECNICA - TECHNIQUE

Passata / Bead: **Tirata/String** — Dimensione bocchello gas / Orifice of gas cup size: **1/2"** — Pulizia iniziale e fra le passate / Initial and interpass cleaning: **Spazzolatura/Brushing**

Metodo di solcatura a rovescio / Method of back gouging: **Scriccatura + molatura/ Arcair + grinding** — Oscillazione / Oscillation: **N.A.** — Distanza zona di contatto e pezzo / Contact zone to work distance: **N.A.**

N°Passate / Passes nr.: **Multipla/Multiple** — Elettrodo multiplo o singolo / Multiple or single electrodes: **Singolo/Single** — Martellatura / Peening: **N.A.**

Altro / Other: **All arc/air gouged surface shall be dressed to bright clean metal by grinding at an additional depth of minimum 2 mm/** *Molare per una profondità minima di 2 mm dopo scriccatura.*

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range	Vel. Avanzamento / Travel speed range (mm/min)	Apporto termico / Heat input (KJ/mm)
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. Range			
Tack-1	GMAW	ER 70S-6	1,2	RP	250 260	27 29	245 270	1,5 1,84
2	SAW single	EH12K	3,2	DC-RP	500 520	24 26	435 470	1,53 1,86
3	SAW single	EH12K	3,2	DC-RP	570 590	26 28	395 420	2,1 2,5
4-n	SAW Tander	EH12K	3,2/4,0	DC-RP/AC	550-580/590-630	26-28//35-37	700 800	2,62 3,39
Cap layers	SAW Tander	EH12K	3,2/4,0	DC-RP/AC	550-570/590-610	26-28//35-36	790 860	2,43 2,88
Arcair+grinding								
1r	SAW single	EH12K	3,2	DC-RP	580 620	26 28	380 390	2,3 2,7

Preparato da / prepared by:	Client/Third part signature:	Client/Third part signature:
M.Del Prete	*Premier oil*	*DNV*

NDE certificate

ROSETTI MARINO	**VERBALE DI CONTROLLO VISIVO/DIMENSIONALE** **visual/dimensional inspection report**	VDR N° 54-18 data: 19-12-2018

progetto project	TOLMOUNT REDEVELOPMENT PROJECT	cliente client	PREMIER OIL
ordine PO	/	commessa job	118A50
disegno dwg	/	ITP N°	AB-TO-ROS-PM-QA-PL-0002 REV.C01
fase step	8.1		

SI CERTIFICA CHE :

gli item di seguito indicati sono stati sottoposti a controllo dimensionale ed accettati in accordo alla procedura / specifica sotto indicata ed ai criteri di accettabilita' in essa definiti.

WE CERTIFY THAT:

items below indicated have undergone a dimensional inspection and have been accepted according to the specific / procedure mentioned hereunder and to acceptance criteria defined in it.

oggetto – item

COUPON	STAMP	POS	THK	LENGHT	WPS	Date of examination
54/18 PA	R	PA	30mm	600mm	pWPS 54/18	19/12/2018

RINA Services SpA No. Bo. 0474	Date 20/12/2018
Noted ☐ Reviewed ☑ Witnessed ☑ Approved ☐	File Signature Cinotti Davide

note - remarks

Acceptance criteria: EEMUA 158 TABLE 14

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

AB-TO-ROS-PM-QA-PR-0006 Rev.01

Operatore - Operator	Controllo Qualita' - Quality Control	Cliente - Client
CSWIP D.CENACCHI 305250 WI 3.1		

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 19-12-2018	FOGLIO – Sheet 1/1
RAPPORTO D'ESAME CON ULTRASUONI ***Ultrasonic examination report***		UT N° : 04	Ns. Rif./Our Ref. 18307

CLIENTE – Client	ORDINE – Order	PROGETTO – Project		COMMESSA – Job
ROSETTI MARINO	/	TULMONT DEVELOPMENT PROJECT		118A50
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
PremierOil / TULMOUNT	PQR	/	/	8.1

CODICE / Code	PROCEDURA / Procedure	ACCETTABILITA' / Acceptance level
UNI EN 17640	AB-TO-ROS-PM-QA-PR-0011_C01	AB-TO-ROS-PM-QA-PR-0011_C01
MATERIALE Material	DIMENSIONI Dimension	SPESSORE NOMINALE / Thk
S460 G2+M	SEE TABLE	SEE TABLE

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO - Brushed	☐ LAVORATO DI MACCHINA - Machined
☐ MOLATO - Ground	☐ LAMINATO - Rolled	☐ GREZZO - Forged

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG 700	No. SERIE Serial Number	1003937

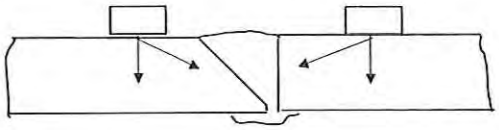
TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	AMPLIFICAZIONE dB value	ONDE Waves
OLYMPUS PF4R	4	10	0	40	L
DOPPLER A2P	2	10x14	45	42	T
DOPPLER A2P	2	10x14	60	44	T
DOPPLER A2P	2	10x14	70	45	T

BLOCCO DI CALIBRAZIONE Calibration block	IIW V1	BLOCCO DI RIFERIMENTO Reference block	QT BLOCK No. 02
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity	DAC ON SDH O 3mm

MATERIALE CONTROLLATE / Material Verified

ITEM	THICKNESS	STAMP	LENGHT	PROCESS
PQR 54/18 PF	30	R	600	SAW + SAW

PIANO DI SCANSIONE / Scanning Plan



RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Nico Tomasi II° Livello SNT-TC-1A N° 9712	ROSETTI MARINO SpA Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 20/12/2018 File Signature Cinotti Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items esamine*

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 19/12/2018	FOGLIO – Sheet 1
RAPPORTO D'ESAME MAGNETOSCOPICO ***MAGNETIC PARTICLE TEST***		MT N° : 04	Ns. Rif./Our Ref. 18307

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	TOULMONT DEVELOPMENT	118A50	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
PremierOil / TOULMOUNT	PQR	/	/	8.1

CODICE / code	PROCEDURA/Procedure	ACCETTABILITA - Acceptance level
UNI EN ISO 23278	AB-TO-ROS-PM-QA-PR-0007_C01	AB-TO-ROS-PM-QA-PR-0007_C01

MATERIALE Material	TEMPERATURA DELLE SUPERFICI Surface temperature	INTENSITA' LUMINOSA / Light intensity	
		LUCE BIANCA	LUCE NERA
S460 G2+M	INTERVALLO 5÷52°C	☑ > 1000 LUX	☐ 1000 µW/cm².

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined
☐ MOLATO – Ground	☐ LAMINATO – Rolled	☐ GREZZO – Forged

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☐ PUNTALI/Prods	☑ GIOGO/Yoke	☐ SOLENOIDE/Solenoid	☐ CONDUTTORE CENTRALE/Central conduttor

TIPO APPARECCHIO/Type of equipment	SILVER YOKE HR230 S.No. 03.230-16	DISTANZA PUNTALI/Pole spacing mm	180mm
TIPO DI CORRENTE/Type current	C.A	INTENSITÀ/Intesity (Amp)	4,5 kg

MEZZO DI ISPEZIONE / Examination medium		☑ UMIDO/Wet	☐ SECCO/Dry
PARTICELLE UTILIZZATE/Particle Type			
POLVERE NERA/Black powder	☑	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	NDT BW2	MARCA TIPO/Mark Type	NDT FW1
LOTTO/BACH	7241s	LOTTO/BACH	
VERNICE DI CONTRASTO/Contrast Paint		☑ NDT WBL5	☐ CGM VECOPLAST
LOTTO/BACH		U180327s	X

SALDATURE CONTROLLATE / Welds Verified

THE CONTROL HAS BEEN CARRIED OUT ON 100% OF FOLLOWING WELDS:

ITEM	THICKNESS	STAMP	LENGHT	PROCESS
PQR 54/18 PF	30	R	600	GMAW + SAW

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Nico Tomasi II° Livello SNT-TC-1A-[illegible]9712	ROSETTI MARINO SpA Welding Dept D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 20/12/2018 File Signature Cimatti Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items esamine*

ROSETTI MARINO

PQR 54/18

Mechanical test report

Element Materials Technology Milan S.r.l.
Via della Pierina 9/11
26013 Crema (CR)
Italy

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F: +39 0373 897200
info.milan@element.com
element.com

TEST REPORT

Client
Cod. 1737

ROSETTI MARINO S.P.A
VIA TRIESTE, 230
48122 RAVENNA (RA)
Italia

	Your ref. :	Document :	Ddt n. 1VTS180585	Date:	21/12/2018
	Our ref. :	Report :	RPR1550-5E1R0A18	Date:	16/01/2019
		Job :	ADC1550-1E1R0A18	Date:	27/12/2018

Remarks: PQR 54/18
PLATE DIMENSION : 30mm
CLIENT : PREMIER OIL

Project: TOULMONT DEVELOPMENT PROJECT

Doc. reference: EEMUA 158 ed.2014

Test standard: UNI EN ISO 17639:2013 - UNI EN ISO 6507-1:2006 - EEMUA 158 ed.2014 - UNI EN ISO 5173:2012 - UNI EN ISO 148-1:2016 - UNI EN ISO 4136:2012 - UNI EN ISO 6892-1:2016 - ASTM E8/E8M-16a

This Report (RPR) contains tests results on the following materials

Ref:	Identification	Material	Dn (mm)	Thk (mm)	Remarks
4984A18	PQR 54/18 PA	EN 10225 S460G2+M			

Report signatories and approval

☐ Third party	☐ Third party	☐ Third party	Client
☐ Witness	☐ Witness	☐ Witness	

Digitally signed by Cantoni Luca
Element Materials Technology Milan S.r.l.

Issue approved

ROSETTI MARINO S.p.A.
Matteo Dal Prete
Welding Dept.

RINA Services SpA No. Bo. 0474	Date 16/01/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimatti Davide
Approved ☐	

General conditions:
1. The Customer accepts general conditions and prices fixed by the laboratory to perform the tests.
2. Test results will be communicated only by means of test report except for different contractual agreement.
3. Tests sample will be destroyed 30 days after test except for different written Client request.
4. The spare will be destroyed 90 days after date of receipt for different written Client request.
5. The test results described in the following test report are referring only to the sample mentioned in it.
6. The date of material receivement is the same as the date of job opening. The date of testing is the same as the date of test report, except for different info.
7. The laboratory has examined the material sampled an supplied by the Client in compliance with standard request.
8. This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.
9. Unless otherwise agreed, sales terms and conditions (MOD20-1E1R0) will be apply.

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TEST REPORT

Test	Page	Technician
Macrographic examination	Pag. 3	**Cristian Piloni**
Hardness test	Pag. 4	**Cristian Piloni**
Bend test	Pag. 5	**Luigi Vailati**
Charpy impact test	Pag. 6	**Luigi Vailati**
Tensile test	Pag. 7..9	**Luigi Vailati**

ROSETTI MARINO S.p.A.
Matteo Del Prete
Welding Dept.

RINA Services SpA
No. Bo. 0474
Date 16/01/2019
File
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
Signature
Cimatti Davide

Technician signatories

Digitally signed by Cristian Piloni
Element Materials Technology Milan S.r.l.

Digitally signed by Luigi Vailati
Element Materials Technology Milan S.r.l.

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TEST REPORT

MACROGRAPHIC EXAMINATION

General info

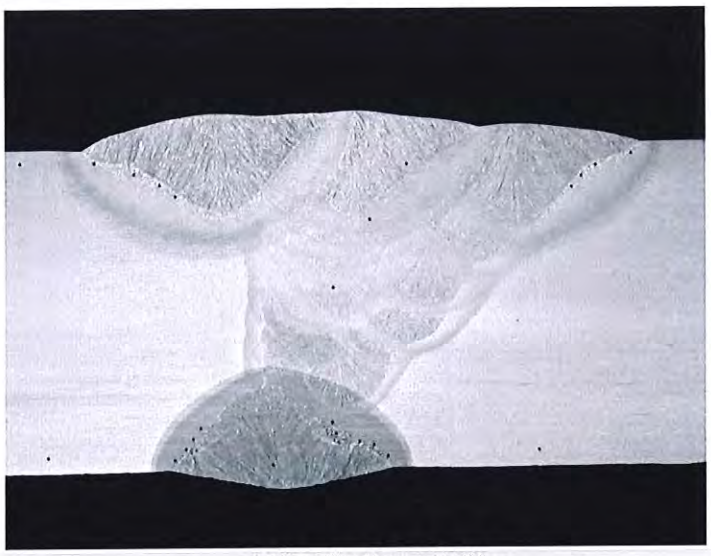
Test start - Test finish	16/01/2019 - 16/01/2019
MIF reference (Lab)	4984A18
Client reference	PQR 54/18 PA
Identification of specimen (Lab)	984 MC 1
Material	EN 10225 S460G2+M
Position	T WM Full thk
Test standard	UNI EN ISO 17639:2013

Equipments

(Inv.N°1961) PHOTOCAMERA

Test properties

Etching: Nital 3%



Magnification: ~1.4X

Result

Test specimen has been examined at low magnification (25x) with and without etching.
According to UNI EN ISO 5817:2014, level B and C, the results of this exam didn't show the presence of imperfections or defects in weld metal.

ROSETTI MARINO S.p.A.
Matteo Dell'Preta
Welding Dept.

RINA Services SpA No. Bo. 0474	Date 16/01/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimatti Davide
Approved ☐	

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TEST REPORT

HARDNESS TEST

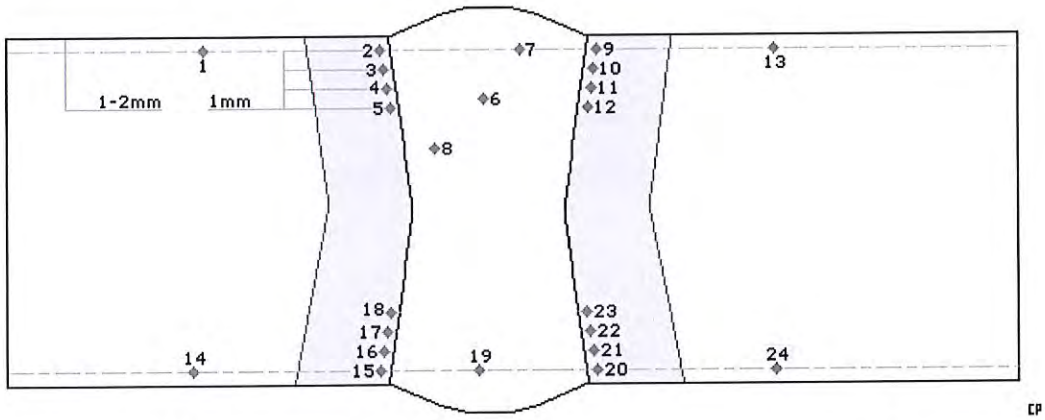
General info

Test start - Test finish	16/01/2019 - 16/01/2019
MIF reference (Lab)	4984A18
Client reference	PQR 54/18 PA
Identification of specimen (Lab)	984 MC 1
Material	EN 10225 S460G2+M
Position	T WM Full thk
Test standard	UNI EN ISO 6507-1:2006 + EEMUA 158 ed.2014

Equipments

(Inv.N°9) HARDNESS TESTING MACHINE

Results



Cap

N°	Value HV10
1	**184.0**
2	**178.0**
3	**171.0**
4	**178.0**
5	**169.0**
6	**157.0**
7	**153.0**
8	**146.0**
9	**193.0**
10	**183.0**
11	**186.0**
12	**189.0**
13	**185.0**

Root

N°	Value HV10
14	**152.0**
15	**203.0**
16	**207.0**
17	**203.0**
18	**194.0**
19	**210.0**
20	**198.0**
21	**212.0**
22	**221.0**
23	**215.0**
24	**178.0**

Min: **146.0** Max: **221.0** **Required:** : ≤325 HV10

ROSETTI MARINO S.p.A.
Matteo Del Prete
Welding Dept.

RINA Services SpA
No. Bo. 0474
Date 16/01/2019
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
File
Signature
Cimarti Davide

Element Materials Technology Milan S.r.l.
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element.com

TEST REPORT

BEND TEST

General info

Test start - Test finish	16/01/2019 - 16/01/2019
MIF reference (Lab)	4984A18
Client reference	PQR 54/18 PA
Material	EN 10225 S460G2+M
Test standard	UNI EN ISO 5173:2012 + EEMUA 158 ed.2014

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1123) BEND MACHINE

Test parameters

Jig (mm)	40
Rollers distance (mm)	66
Angle (°)	180
Method	FORMER

Results

Ref.Lab.	T (°C)	Type	Position	Dimensions (mm)	L0 (mm)	Elongation (%)	Results
984 PI 1	20	SBB (Transverse side bend)	T Side Bend	10.01 x 30.17			No defect
984 PI 2	20	SBB (Transverse side bend)	T Side Bend	10.02 x 30.18			No defect
984 PI 3	20	SBB (Transverse side bend)	T Side Bend	10.01 x 30.13			No defect
984 PI 4	20	SBB (Transverse side bend)	T Side Bend	10.02 x 30.15			No defect

ROSETTI MARINO S.p.A.
Matteo Del Prete
Welding Dept

RINA Services SpA
No. Bo. 0474
Date 16/01/2019
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
File
Signature
Cimatti Davide

Element Materials Technology Milan S.r.l.
Via della Pierina 9/11
26013 Crema (CR)
Italy

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F: +39 0373 897200
info.milan@element.com
element.com

TEST REPORT

CHARPY IMPACT TEST

General Info

Test start - Test finish	16/01/2019 - 16/01/2019
MIF reference (Lab)	4984A18
Client reference	PQR 54/18 PA
Material	EN 10225 S460G2+M
Test standard	UNI EN ISO 148-1:2016

Equipments

(Inv.N°814) CHARPY IMPACT 450 - (Inv.N°1102) CALIPER - (Inv.N°1806) CRYOSTAT

Specimen informations

Notch: KV2

Test parameters

Nominal energy of test machine (J): 450

Results

Lab Id.	T (°C)	Position	Dimensions (mm)	A	B	C	Average
				Value (J)	Value (J)	Value (J)	Value (J)
984 RE 1	-40	T WM 2mm from Cap	10.0 x 10.0	195	193	207	198
984 RE 2	-40	T WM 2mm from Root	10.0 x 10.0	181	192	192	188
984 RE 3	-40	T FL 2mm from Cap	10.0 x 10.0	235	239	153	209
984 RE 4	-40	T FL Root	10.0 x 10.0	193	189	169	184
984 RE 5	-40	T FL +2 2mm from Cap	10.0 x 10.0	340	300	284	308
984 RE 6	-40	T FL +2 2mm from Root	10.0 x 10.0	333	315	241	296
984 RE 7	-40	T FL +5 2mm from Cap	10.0 x 10.0	354	348	353	352
984 RE 8	-40	T FL +5 2mm from Root	10.0 x 10.0	338	316	327	327

Required

Single value (J)	≥35.0
AVG (J)	≥46.0

ROSETTI MARINO S.p.A.
Matteo Del Prete
Welding Dept.

RINA Services SpA No. Bo. 0474	Date 16/01/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimarelli Davide

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TEST REPORT

TENSILE TEST

General info

Test start - Test finish	16/01/2019 - 16/01/2019
MIF reference (Lab)	4984A18
Client reference	PQR 54/18 PA
Identification of specimen (Lab)	984 TR 1
Material	EN 10225 S460G2+M
Position	T WM Full thk
Test standard	UNI EN ISO 4136:2012 + UNI EN ISO 6892-1:2016

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1153) UNIVERSAL MACHINE QUASAR 600

Specimen informations

Type	Prismatic
Width (mm)	25.02
Thickness (mm)	29.13
Section (mm²)	728.83

Test parameters

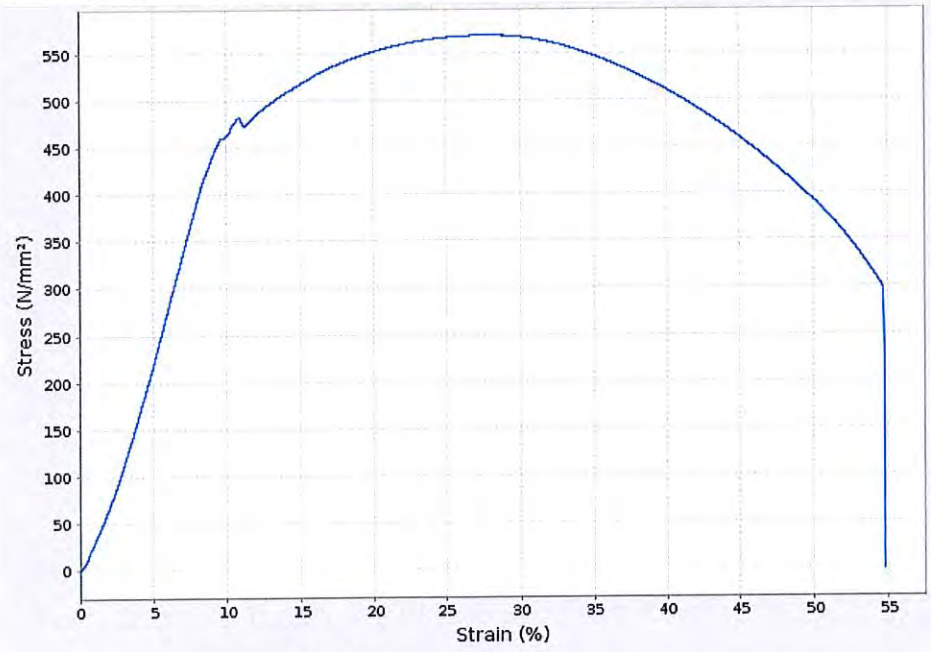
Temperature (°C)	20.0

Results

		Required
Rp0.2% (N/mm²)	463.0	≥420
Rm (N/mm²)	568.0	≥520

Note

Broken out of weld
Speed of testing during yielding ref. method B PAR.10.3.3.2.1 - after yielding according to PAR.10.3.3.3



ROSETTI MARINO S.p.A.
Matteo Del Prete
Welding Dept.

RINA Services SpA No. Bo. 0474	Date 16/01/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimatti Davide
Approved ☐	

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TEST REPORT

TENSILE TEST

General info

Test start - Test finish	16/01/2019 - 16/01/2019
MIF reference (Lab)	4984A18
Client reference	PQR 54/18 PA
Identification of specimen (Lab)	984 TR 2
Material	EN 10225 S460G2+M
Position	T WM Full thk
Test standard	UNI EN ISO 4136:2012 + UNI EN ISO 6892-1:2016

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1153) UNIVERSAL MACHINE QUASAR 600

Specimen informations

Type	Prismatic
Width (mm)	25.00
Thickness (mm)	28.78
Section (mm²)	719.50

Test parameters

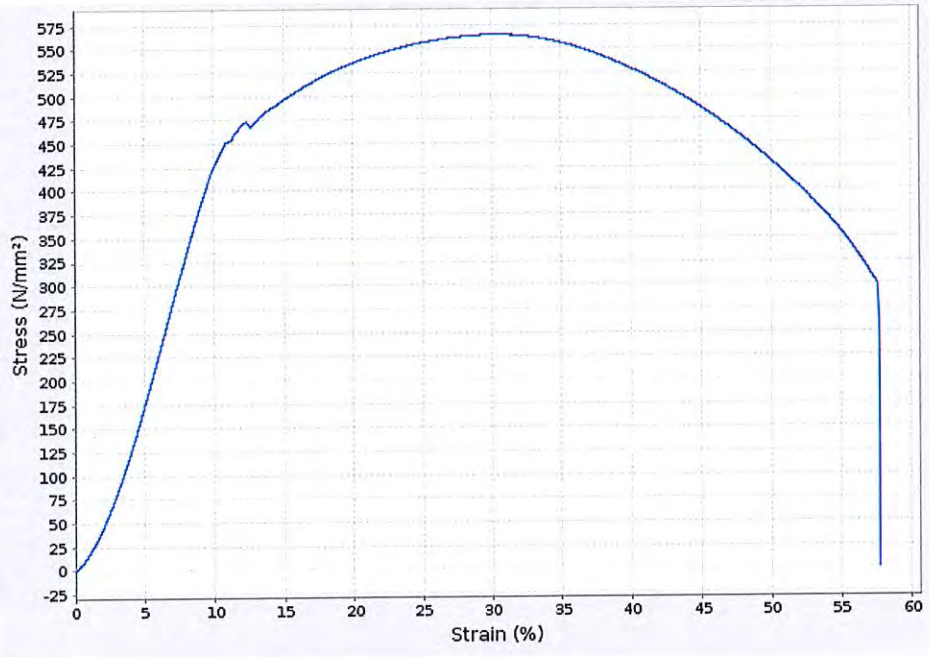
Temperature (°C)	20.0

Results

		Required
Rp0.2% (N/mm²)	463.0	≥420
Rm (N/mm²)	565.0	≥520

Note

Broken out of weld
Speed of testing during yielding ref. method B PAR.10.3.3.2.1 - after yielding according to PAR.10.3.3.3



ROSETTI MARINO S.p.A.
Matteo Del Prete
Welding Dept.

RINA Services SpA
No. Bo. 0474
Noted ☐
Reviewed ☐
Witnessed ☑
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Date 16/01/2019
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Signature
Cimatti Davide

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TEST REPORT

TENSILE TEST

General info

Test start - Test finish	16/01/2019 - 16/01/2019
MIF reference (Lab)	4984A18
Client reference	PQR 54/18 PA
Identification of specimen (Lab)	984 TR 3
Material	EN 10225 S460G2+M
Position	L AWM ½ thk
Test standard	ASTM E8/E8M-16a

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1153) UNIVERSAL MACHINE QUASAR 600 - (Inv.N°1161) EXTENSOMETER

Specimen informations

Type	Cylindrical
Diameter (mm)	10.00
Section (mm²)	78.54

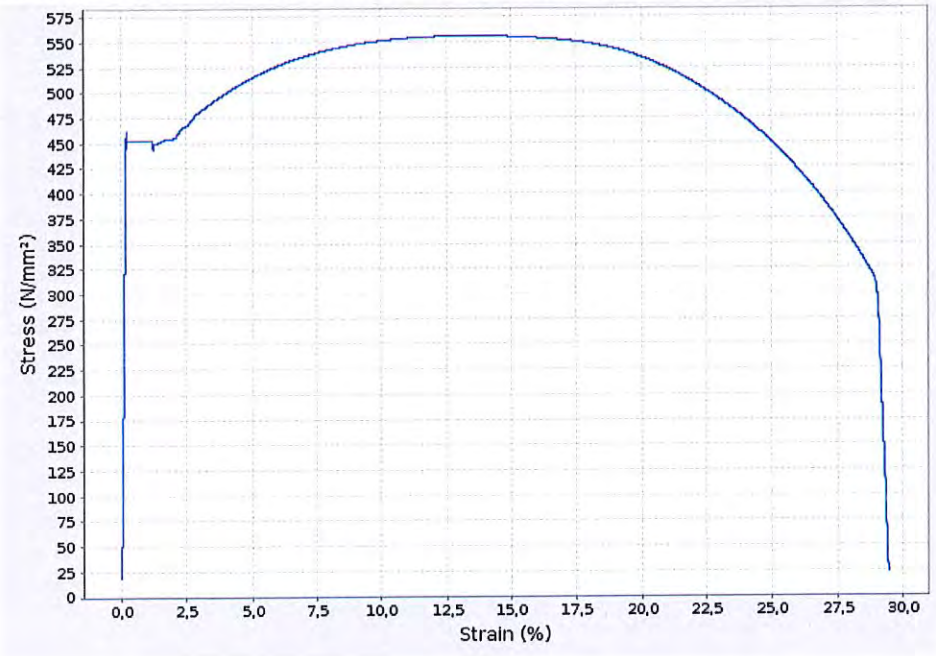
Test parameters

Temperature (°C)	20.0

Results		**Required**
Rp0.2% (N/mm²)	452.0	≥420
Rm (N/mm²)	556.0	≥520
A%	27.6	≥17

Note

Speed of testing during yielding ref. method B PAR.10.3.3.2.1 - after yielding according to PAR.10.3.3.3



ROSETTI MARINO S.p.A.
Matteo Del Prete
Welding Dept.

RINA Services SpA No. Bo. 0474	Date 16/01/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimatti Davide
Approved ☐	

ROSETTI MARINO SPA	Welding Procedure Approval Record form (WPAR) Certificato Approvazione Procedura di Saldatura	Sheet/Foglio 1/4

Welding Procedure Approval Certificate
Approvazione Procedura di Saldatura Certificato N. 03/03

Manufacturer's Welding / Procedure Reference No **Procedura di saldatura del costruttore. / N. di riferimento**	03/03 REV. 0			
Manufacturer / Costruttore	**ROSETTI MARINO S.p.A.**			
Address / Indirizzo	**VIA TRIESTE 230 - 48100 RAVENNA**			
Code, Testing Standard / Codice, Normativa	EN 288 – 3:1993/A1 May 1999			
Date of welding / Data esecuzione saggio	10.03.2003			
EXTENT OF APPROVAL / VALIDITA' DELL'APPROVAZIONE				
Welding process / Processo di saldatura	**a)** GTAW (141)	**b)** /	**c)** /	
Type(s) / Tipo	**a)** Manuale	**b)** /	**c)** /	
Joint type / Tipo di giunto	BW on plate and pipe: SS (mb, nb): BS (gg, mg); TW (ss, bs); FW (p, t)			
Parent metal(s) / Materiale di base	EM Gruppo 9 con gruppo 1			
Metal thickness / Spessore (mm)	3,0 ÷ 7,82 Throat ≥ 2,93 ÷ 5,86			
Outside diameter / Diametro esterno (mm)	30,15 ÷ 120,6			
Filler metal type / Tipo materiale d'apporto	DIN 8556:UPX2 CrNi 2412			
Shielding gas, flux / Gas di protezione, flusso	EN 439-I1 (ARGON 99,99%)			
Type of welding current / Corrente di saldatura	DC - EN	**Heat input / Apporto termico (kJ/mm)**	± 25% ogni passata	
Welding position / Posizione di saldatura	H-L045 Up			
Preheat / Preriscaldo (°C)	15	**Interpass temperature / Temp. di interpass (°C)**	200	
Post-Weld Heat Treatment and/or ageing / Trattamento Termico e/o Invecchiamento	N.A.			
Other information / Altre informazioni	NONE			
Welder's name / Nome del saldatore	Masacci Alberto (punzone n° 10)			
Welding test conducted by / Prove condotte da	Rosetti Marino S.p.A. – Ravenna			
Mechanical tes conducted by / Prove meccaniche condotte da	Control snc – Ravenna			
Laboratory report reference N. / Rapporto di prova N.	Report N° 193			

Test carried out in the presence of **Test condotti alla presenza di**	**BUREAU VERITAS**	**Test results are** **Risultato prove**	**Acceptable**

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of EN 288-3:1993/A1 May 1999

Si certifica che i dati riportati in questo rapporto sono corretti e che i saggi di saldatura sono preparati, saldati e testati in accordo con le richieste di EN 288-3:1993/A1 May 1999

Location / Luogo	**Date of issue / Data di emissione**	**Examiner or Examining Body / Esaminatore o Ente Certificante**
RAVENNA	**30-04-2003**	**BUREAU VERITAS**

ROSETTI MARINO S.p.A.

Name and signature / Nome e firma

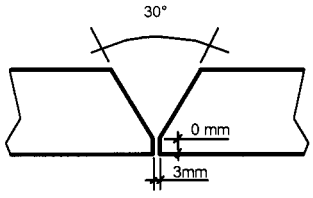
EWF S. SOLMI I EWT 30416 EUROPEAN WELDING TECHNOLOGIST

BUREAU VERITAS PADUA ITALY WITNESSED REVIEWED SURVEYOR MORASSI DATE 30 APR 2003

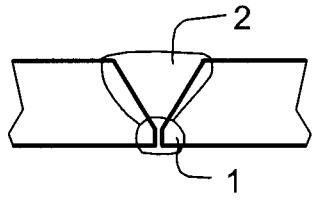
ROSETTI MARINO SPA	WELDING PROCEDURE APPROVAL RECORD QUALIFICA DI PROCEDIMENTO WPAR	WPAR N./PROC. N. 03/03	Sheet/Foglio 2/4

Manufacturer / Costruttore	ROSETTI MARINO S.p.A.					
Address / Indirizzo	VIA TRIESTE 230 - 48100 RAVENNA			Examiner or Examining body / Ente certificante		
Procedure approval record (WPAR) N° / Qualifica di procedimento N.	03/03	Date/Data	10.03.03	Ref. N./N. Rif.	BUREAU VERITAS	
WPS No. / Procedure N.	03/03	Rev.	0	Date/Data	28.02.2003	
Welding Process(es) / Processo(i) di saldatura	a) GTAW (141)	b) /		c) /		
Types / Tipi (Man., Autom., Semi-autom.)	a) Manual / Manuale	b) /		c) /		
JOINTS / GIUNTI Joint type / Tipo di giunto	Butt weld single "V" groove					
BACKING / Sostegno	ARGON 99,99%					

EDGE PREPARATION / PREPARAZIONE GIUNTO



WELDING SEQUENCE - PASS LOCATION / POSIZIONAM. PASSATE



Run or layers / Passate o strati	Proc.	Filler metal / Materiale d'apporto Size / Dim (mm)		Amp.		Volt.		Travel Speed / Veloc. Sald.	Heat Input / Apporto Termico
		1E	2E	1E	2E	1E	2E	mm/min	kJ/mm
1	141	2.4	/	105	/	11	/	35	1,98
2	141	2.4	/	98	/	12	/	50	1,41

PARENT MATERIAL / MATERIALE DI BASE

Spec. Type & Grade / Specif. Tipo e Grado		ASTM/ASME A/SA 333		Gr. 6	
to Spec. Type & Grade / Specif. Tipo e Grado		ASTM A 312		TP 304 L	
Group No. / Gruppo	1	To / al	Group No. / Gruppo	9	
Thickness of test coupon / Spessore del saggio (mm)		3.91	to / con	3.91	
Diameter of test coupon / Diametro del saggio (mm)		60.3	to / con	60.3	
Other / Altro	Certificate Pietra 77063 heat 11590 Changwon Specialty Steel 20926-3053 heat A57892				

BUREAU VERITAS PADUA ITALY WITNESSED REVIEWED SURVEYOR MORASSI DATE 30 APR 2003

FILLER METALS / MATERIALE D'APPORTO	a)	b)	c)
Specification No. DIN 8556	UP X2 CrNi 24 12		
En Class / Classificazione	/		
Size of filler metal / Dimensioni materiale d'apporto (mm)	2.4		
F.M. Trade name / Nome commerciale materiale d'apporto	SOUDOTIG 309L		
Manufacturer / Fabbricante	SOUDOMETAL		
Flux Trade name / Nome Commerciale Flusso	NA		
Manufacturer / Fabbricante	NA		
Deposited Weld Metal / Metallo depositato (mm)	3.91		
Other / Altro	Soudometal E110714 heat 3099		

EWF EUROPEAN WELDING FEDERATION S. SOLMI I.EWF.30416

ROSETTI MARINO SPA	WELDING PROCEDURE APPROVAL RECORD QUALIFICA DI PROCEDIMENTO WPAR	WPAR N./PROC. N. 03/03	Sheet/Foglio 3/4

ELECTRICAL CHARACTERISTICS / CARATTERISTICHE ELETTRICHE		
Current / Corrente		DC / CC
Polarity / Polarità		EN / PD
Ampere – Volt		See table page 2/4 / Vedi tabella pagina 2/4
Tungsten Electrode Type & Size / Tipo e Dimensioni Elettrodo W		UNI EN 26848 WT 20 Ø = 2,5 mm
Mode of Metal Transfer for GMAW / Modo di trasf. per MAG		N.A.
Other / Altro		None
TECHNIQUE / TECNICA		
Orifice or gas cup size / Diametro dell'ugello o ceramica		a) 3/8"
String or Weave Bead / Cordoni Stretti o Larghi		String/Stretti
Initial and interpass cleaning / Pulizia iniziale e tra le passate		Brushing end/or grinding - Molatura e/o spazzolatura
Method of back gouging / Metodo di solcatura		N.A.
Oscillation / Oscillazione:		
	Amplitude / Ampiezza	N.A.
	Frequency / Frequenza	N.A.
Distance contact tube-work piece / Distanza libera filo		/
Multiple, Single Pass (per Side) / Passata Singola o Mult. (per lato)		Multiple/Multipla
Single or Multiple Electrodes / Elettrodi Multipli o SIngoli		Singolo
Torche angle direction of welding / Angolo e direzione torcia		N.A.
Other / Altro		/
WELDING POSITIONS / POSIZIONI DI SALDATURA		
Position of groove or fillet/Posizione dello smusso o del cordone d'angolo		H L045
Welding Progression / Progressione di Saldatura		Up hill / Ascendente
Other / Altro		/
PREHEAT / PRERISCALDO		
Preheat Temperature / Temperatura di Preriscaldo (°C)		15
Interpass Temperature / Temperatura di Interpass (°C)		150
Other / Altro		/
POSTWELD HEAT TREATMENT / TRATTAMENTO TERMICO		
Temperature / Temperatura (°C)		/
Time / Tempo (h)		/
Other / Altro		/

EWF S. SOLMI I EWT 30416 EUROPEAN WELDING TECHNOLOGIST

GAS

	Percent Composition / Composizione %			
	Gas(es) / Gas	**(Mixture) / (Miscela)**	**Flow rate / Portata**	
Plasma	/	/	/	l/min
Shielding / Protezione	ARGON	99.99	10	l/min
Trailing /Aggiuntivo	/	/	/	l/min
Backing / Al rovescio	ARGON	99.99	4	l/min
Other / Altro	EN 439-I1	/	/	

BUREAU VERITAS PATERNO (ITALY) WITNESSED REVIEWED SURVEYOR MORASSI DATE 30 APR 2003

ROSETTI MARINO SPA	WELDING PROCEDURE APPROVAL RECORD QUALIFICA DI PROCEDIMENTO WPAR	WPAR N./PROC. N. 03/03	Sheet/Foglio 4/4

NON DESTRUCTIVE EXAMINATIONS / ESAMI NON DISTRUTTIVI

	Acceptable/Accettabile			Not performed / Non eseguito			Report No. / Rapporto N.
Visual examinations / Visivo		X					VRD 03/03
Penetrant test / Liquidi penetr.		X					CONTROL PT REPORT N° 03/03
Magnetic particle test / Magnet.							
Radiographic test / Radiografico		X					CONTROL RT REPORT N° 110
Ultrasonic test / Ultrasonoro							

TEST RESULT / RISULTATO DELLE PROVE

TENSILE TEST / PROVA DI TRAZIONE

Specimen type and No. / Provette tipo e N.	Re N/mm²	Rm N/mm²	A % on/su	Z %	Fracture Location Posizione Rottura	Remarks Note
Requirements / Richieste		≥ 415	/	/		
TRANSVERSE FACE		557			FAILURE OUT WELD	
TRANSVERSE FACE		556			FAILURE OUT WELD	
LONGITUDINAL T						

BEND TEST / PROVA DI PIEGAMENTO — Former diameter / Diametro Mandrino 15 mm

Type & N. / Tipo e N.	Bend angle / Angolo di piega	Elongation / Allungamento	Results / Risultati
N. 2 Root bend	180°	Not required	Satisfactory
N. 2 Root bend	180°	Not required	Satisfactory

IMPACT TEST / PROVA DI RESILIENZA — Requirements / Richieste Joule

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction Posiz. Intaglio / Direzione	Notch Type / Tipo Intaglio	Test Temp. Temp. Prova (°C)	Impact value/average Valori/media (joule)	Remarks / Note
2,5x10x55	VWT 0/2	Kv	-56°C	26-30-28	
2,5x10x55	ZTA SIDE SA 333 Gr 6	Kv	-56°C	36-10-16	

FILLET WELD TEST / PROVA SALDATURA D'ANGOLO

Result – Satisfactory Risultato - Soddisfacente	Yes -	/	No -	/		Penetration into Parent Metal Penetrazione nel Materiale Base	Yes -	/	No -	/
Macro Results / Risultati Macro: -	/									

OTHER TESTS / ALTRE PROVE

Location of measurement (Sketch) (if required) / Posizione delle impronte (quando richieste)

Type of test / Tipo di prova	
Macro results	satisfactory

Examiner or Examining Body / Esaminatore o Ente Certificante

Date / Data

30-04-2003

BUREAU VERITAS

ROSETTI MARINO S.p.A. EWF S. SOLMI EWT 30418 EUROPEAN WELDING TECHNOLOGIST

Name and signature / Nome e firma

BUREAU VERITAS PADUA ITALY WITNESSED REVIEWED SURVEYOR MORASSI DATE 30 APR 2003

Control Snc	***LABORATORIO DI CONTROLLI E PROVE***	**N° 193 Fg.1/2**
Sede Amministrativa - Laboratorio Via Attilio Monti, 15 - 48100 Ravenna Telefono - 0544 590597	***CERTIFICATO PROVE MATERIALI*** *TEST CERTIFICATE*	DATA / Date **30-apr-03**

COMMITTENTE / CUSTOMER **ROSETTI MARINO S.p.A.**

OBJECT **PQR 3/03 Mater.: 333 Gr.6 - 312 Tp 304**

NORME DI COLLAUDO / SPECIFICATIONS	**EN 288.3**	*ENTE COLLAUDO / INSPECTOR*	**BUREAU VERITAS**

PROVE MECCANICHE / MECHANICAL TESTS

CARATTERISTICHE RICHIESTE	*Snervamento*		*Massimo*		*Allung*	*Striz*	*Resilienza/Impact Test* Joule -56C°	
	Yeld stress	*Rs*	*Total Load*	*Rm*	*Elong.*	*Reduc.*	*Individual*	*Average*
REQUIREMENTS ---------->	*Fs(N)*	*N/mmq*	*Fm(N)*	*N/mmq*	*%*	*%*		
				>415			4	5

Pos.	*Prova Nr*	*Dimensioni*	*Area*			*RISULTATI / RESULT*							
Pos.	*Test N°*	*Size mm*	*So*	*L0*	*LU*								
			mmq	*mm*	*mm*	*Fs*	*Rs*	*Fm*	*Rm*	*A%*			
TWT	1	13,0 x 3,7	48,1					26800	557		FOW	SIDE 333 Gr. 6	
TWT	2	13,0 x 3,5	45,5					25300	556		FOW	SIDE 333 Gr. 6	
FBB	n° 2	20 X 4	ANGLE: 120° - DIAMETER OF THE FORMER: 15mm								Acceptable		
RBB	n° 2	20 X 4	ANGLE: 120° - DIAMETER OF THE FORMER: 15mm								Acceptable		
VWT0/2		10 X 2,5										26 30 28	28
VHT2/2		10 X 2,5	SIDE 333 Gr. 6									36 10 16	21

CRITERI DI ACCETTABILITA'/REFERENCE STANDARD: EN 288.3

NORME DI RIFERIMENTO/REFERENCE STANDARD:

PROVA DI TRAZIONE TRASVERSALE/TRANSVERSE TENSILE TEST: UNI EN 895

PROVA DI TRAZIONE LONGITUDINALE/LONGITUDINAL TENSILE TEST: UNI EN 876

PROVA DI PIEGA /BEND TEST: UNI EN 910

PROVA DI RESILIENZA/IMPACT TEST: UNI EN 875

TWT=TRAZIONE TRASVERSALE SALDATURA/TRANSVERSE WELD TENSILE TEST

TWL=TRAZIONE LONG. SALDATURA / ALL WELD LONG. TENSILE

FOW=ROTTURA DUTTILE FUORI SALDATURA/ DUCTILE FAILURE OUT OF WELD

RBB=PIEGA TRASVERSALE AL ROVESCIO/TRANSVERSE ROOT BEND TEST

FBB= PIEGA TRASVERSALE AL DIRITTO/TRANSVERSE FACE BEND TEST

OPERATORE / Operator	COMMITTENTE / Customer	ISPETTORE / Inspector
CONTROL S.N.C. Sez. Laboratorio Prove Materiali Il Tecnico Mercatali Alessio	ROSETTI MARINO S.p.A. Responsabile Controllo Qualità Quality Control Manager	BUREAU VERITAS PADUA ITALY WITNESSED REVIEWED SURVEYOR MORASSI DATE 30 APR 2003

Control Snc
Sede Amministrativa - Laboratorio
Via Attilio Monti, 15 - 48100 Ravenna
Telefono - 0544 590597

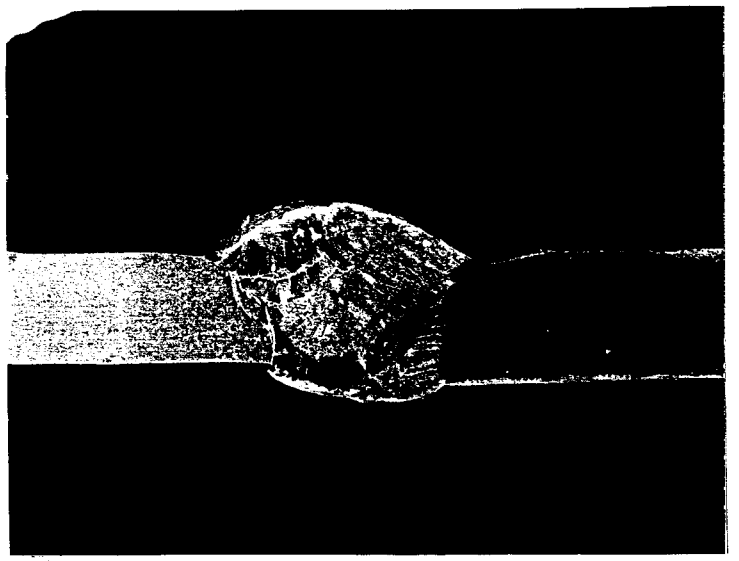
LABORATORIO DI CONTROLLI E PROVE

CERTIFICATO PROVE MATERIALI
TEST CERTIFICATE
MACRO EXAMINATION

N° 193 Fg. 2/2
DATA / Date
30-apr-03

COMMITTENTE
CUSTOMER **ROSETTI MARINO S.p.A.**

OGGETTO
OBJECT **PQR 3/03**



ROSETTI MARINO SPA
Ravenna Works

PROCEDURA DI SALDATURA (in accordo EN 288.3)
Welding Procedure Specification (according EN 288.3)

WPS N°:	03/03
PQR ref.:	03/03 to qualify
REV.:	0
Data /date	28.02.2003

Procedimento di saldatura / Welding process: **GTAW** + +
Tipo / Type: **MANUAL** + +

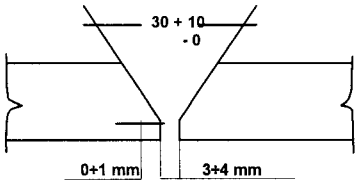
GIUNTO – JOINT

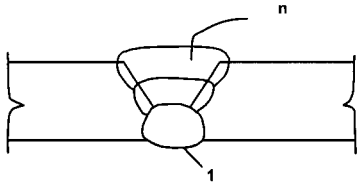
Tipo di giunto / Joint Design: **V**

Supporto / Backing: ☒ Si / Yes **Mat. d'apporto/Weld metal** ☒ No **Solo prima passata/Only for first pass**

Materiale di supporto (tipo) / Backing material (type): ☒ Metallico / Metal ☐ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other **Use SMAW or FCAW for tack welding**

Dettagli / Details: Groove preparation by machining





MATERIALE BASE – BASE MATERIAL

Da / from P-N°: / Group N°: **1** A / to P-N°: / Group N° **9**

Da Tipo e grado / From type and grade: **ASTM A333Gr.6**

A Tipo e grado / To type and grade: **ASTM A312Tp.304L**

Gamma spessori / Thickness range:
► Materiale base / Base material: Piena penetrazione / Groove **3,91 mm**
► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove **2"**

METALLO D'APPORTO – FILLER METAL (Procedures for filler metal management IL/MF-04, 05, 06)

	GTAW 141		
Spec. N° (SFA) DIN	**(5,9) 8556**		
AWS N° (CLASS) DIN	**(ER 309L) UP X2 CrNi 24 12**		
F-N°	**6**		
A-N°	**8**		
Diametro mat. d'apporto / Size of filler metal	**2,4**		
Metallo depositato / Deposit weld metal	**3,91**		
Gamma spessori /Thick. range	**3,91**		
Accoppiamento filo-flusso / Electrode-flux (CLASS)	**NA**		
Denom. Comm. flusso / FLUX trade name	**NA**		
Inserto consumabile / Consumable insert	**NA**		
Altro / other	**WIRE SOUDOTIG 309L**		

POSIZIONI – POSITION

Posizione del giunto / Joint position: **Cianfrino / groove**
Posizione / position **H-L0456G**
Progressione / weld progression: **UP HILL**

PRERISCALDO (misurazione con gessetti termoviranti o termometro) – PRE-HEAT (measuring with tempel sticks or thermometer)

Temp.preriscaldo minima / Min. pre-heat temp: **20°C**
Max temp. Di interpass / Max interpass temp.: **200**
Mantenimento interpass / Interpass maintenance: **N.A.**
Tempo di mantenimento interpass / Maintenance timing: **NA**

TRATTAMENTO TERMICO DOPO SALDATURA – POST WELD HEAT TREATMENT

Riscaldamento / Heating rate: (°C/Hrs) **NA**
Temperatura di stasi / Holding temperature (°C) **NA**
Tempo di stasi / Holding time: **NA**
Velocità di raffreddamento / Cooling rate: (°C/Hrs) **NA**

GAS DI PROTEZIONE – GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	**Ar**	**99,99**	**8-10 lt/1'**
Protezione al seguito / Trailing:	**N.A.**	**N.A.**	**N.A.**
Prot. Al rovescio / Backing:	**Ar**	**99,99**	**4 lt/1'**

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current: **DC** Polarità / Polarity **DP**
Dia e tipo elettr. Tungsteno / Tungsten electr. Size & type: **EN 26848WT20 ∅ 2,5 mm**
Metodo di trasferimento per GMAW / GMAW metal tranfer mode: **N.A.**
Velocità alimentazione filo / Electr. Wire feed speed range: **N.A.**

TECNICA – TECHNIQUE

Passata / Bead: **Tirata/String**
Dimensione bocchello gas / Orifice of gas cup size: **3/8"**
Pulizia iniziale e fra le passate / Initial and interpass cleaning: **Spazzolatura e Molatura/Brushing Grinding**
Metodo di solcatura a rovescio / Method of back gouging: **N.A.**
Oscillazione / Oscillation: **N.A.**
Sporgenza filo (distanza testa a pezzo) / Contact tube to work distance: **NA**
N°Passate / Passes nr.: **Multiple/Multiple**
Elettrodo multiplo o singolo / Multiple or single electrodes: **Singolo/Single**
Martellatura / Peening: **N.A.**
Altro / Other: **NA**

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range	Vel. avanzamento / Travel speed range (mm/min)	Apporto termico / Heat Input (KJ/mm)
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. range			
1	GTAW	ER 309L	2,4	DC-DP	90-110	10-12	30-50	1,08÷2,64
2-n	GTAW	ER 309L	2,4	DC-DP	90-110	10-12	30-50	1,08÷2,64

Preparato da / prepared by: EMANUELE CERONI

Approvato da / approved by: STEFANO SOLMI

BUREAU VERITAS PADUA ITALY WITNESSED REVIEW SURVEYOR MORASSI DATE 28 FEB 2003

ROSETTI MARINO SPA

TABELLA DI SALDATURA
Welding Table

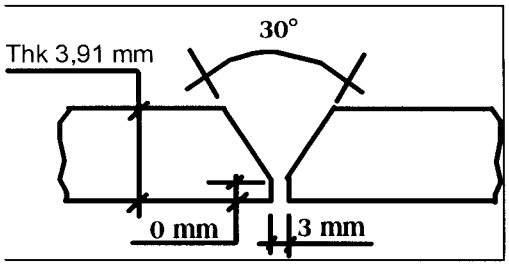
WPS N. **PQR 03-03 and 03A-03** | Posizione / Position **H-L045 (6G)**

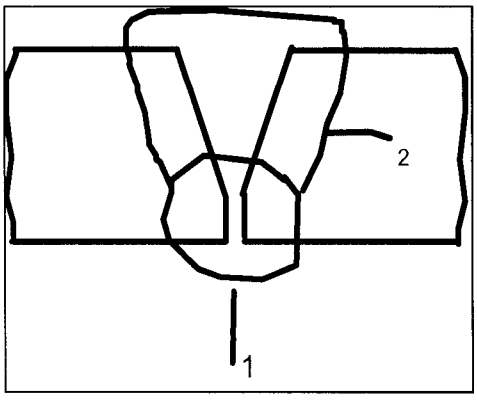
Tipo di saldatura / Welding Process	**GTAW (141)**
Filo / Wire	**SIDOTIG ER 309L HEAT 64502-001**
Flusso / Flux	
Cliente / Client	**AGIP-PETROLI SPA TARANTO**
Commessa / Job	**102D40**
Materiale base / Base material	**ASTM A333 Gr 6** / **A312 TP 304L HEAT A57892**
Saldatore/Operatore: Welder Name/Welding Operator	**MASACCI ALBERTO Sw 10**

	Gas / Gas (es)	Miscela / Mixture	Portata / Flow Rate
Protezione/Shielding	Ar	99,99%	10 lt/1'
Protezione/Shielding			
Aggiuntivo/Trailing			
Al rovescio/Backing	Ar	99,99%	4 lt/1'

Prerisc: / Preheat	**15°C**
Temp. max. di interpass:	**200°C**
Elettrodo / Electrode	**N.A.**
Ravenna,	10-mar-03
Officina Rosetti	**X**
Cantiere	
Corrente AC o DC / Current AC or DC	**DC**
Polarità / Polarity	**DP-SP**
Preparazione / Joint Design	See details

Pass. N. / Pass N.	Proced. / Process	Elettr. / Electr.	Ampere / Amps	Volts / Volts	Vel.mm/1' / Trav.Sp.	Altro / Other
1	141	2,4	105	11	35	1,98
2	141	2,4	98	12	50	1,41





EWF S. SOLMI I EWT 30416 EUROPEAN WELDING TECHNOLOGIST

Note / Notes: **TUNGSTEN ELECTRODE TYPE AND SIZE: UNI EN 26848 WTA 20; ∅ 25 mm.**

BUREAU VERITAS PADUA ITALY WITNESSED REVIEWED SURVEYOR MORASSI DATE 10 MAR 2003

ROSETTI MARINO SPA	**VERBALE DI CONTROLLO VISIVO/DIMENSIONALE** **visual/dimensional inspection report**	VDR N° 03/03 data: 10.03.2003

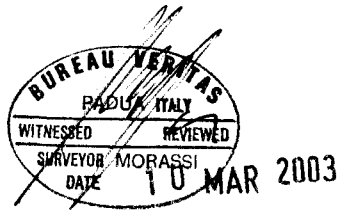
progetto COLONNE SNAM PROGETTI TARANTO project	cliente SNAM PROGETTI S.p.a. client	ordine / PO	commessa 102D40 job

disegno / dwg	ITP N° /	fase / step

oggetto – item

QUALIFICA PROCEDIMENTO PQR 03/03

SI CERTIFICA CHE LA SALDATURA DEL SAGGIO SOPRA CITATO E' STATA SOTTOPOSTA AD ESAME VISIVO AL 100%



note – remarks

Risultato dell'esame visivo : Accettato

risultato – result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

EN 970 Ed. ottobre 1997

Operatore - Operator	Controllo Qualita' - Quality Control	Cliente - Client

CONTROL snc
via Attilio Monti,15 48100 (RA)
tel. 0544 590597 - fax 590599

NDE ACTIVITIES - TEST SHEET

RAPPORTO CND - RADIOGRAFICO

NDE REPORT -RADIOGRAPHIC TEST

Data / Date **18/03/2003**

NDE-RT Report Nr **110**

foglio / sheet n° 1 of 1

COMMITTENTE / Customer	OGGETTO / Object	COMMESSA N° / Job No	ORDINE N° / Order No	PROGETTO / Project
ROSETTI MARINO SpA *(Ravenna - ITALIA)*	PQR	102D40	-	COLONNE AGIP TARANTO

LINEA N°/ Line No	DWG N° / DWG No	CODICE / PROCEDURA/In accordance with	ACCETTABILITA'/Acceptance levels
-	-	PRO-CND-AG-01 rev. 0	I.S.P.E.S.L. "Raccolta S"

ITP N° / ITP No	FASE ITP / Phase ITP		
-	-	● PRIMA ESECUZIONE/ First test	○ PRIMA DEL TT/ Before PWHT
		○ DOPO RIPARAZIONE/ After repair	○ DOPO IL TT/ After PWHT

TRACEABILITY		JOINT TYPE						
weld No - dwg - item	WPS	material	Φ	thickness	welder No	position film	defect	judgment
PQR 03/03 W1a			2"	3,91		0-1	Ex	A
						1-2		A
						2-0		A
PQR 03/03 W1A			"	"		0-1		A
						1-2	Aa	A
						2-0	Ex-Aa	A
PQR 03/03 W2			"	"		0-1	Aa	A
						1-2	Aa	A
						2-0		A
PQR 03/03 W2A			"	"		0-1	Be	A
						1-2	Ex-Aa	A
						2-0		A

NOTE / Remarks

CLASSIFICAZIONE DIFETTI

Classification defects ref. ISO 6520

(2011)	Aa	Soffiattura tondeggiante/Porosity < Φ 1mm
(2012)		Uniformly distributed porosity
(2013)		Localized porosity (Clustered)
(2014)		Linear porosity
(2017)		Surface pore
(2015)	Ab	Cavità allungata/Elongated cavity
(2016)	Ab	Tarli/Worm-hole
(300)		Inclusione solide/Solid inclusion
(301)	Ba	Inclusione di scoria/Slag inclusion
(3013)	Bb	Scoria d'orient. diverso/Of any shape in.
	Be	Difetto di ripresa/ 1st run irregular
(400)	C	Mancanza di fusione/Lack of fusion
(402)	D	Mancanza di penetrazione/Lack of penet.
(100)	E	Cricca o fessura/Crack
(101)	Ea	Cricca longitudinale/Longitudinal crack
(102)	Eb	Cricca trasversale/Transverse crack
(104)	Ec	Cricca di cratere/Crater crack
(502)		Sovrametallo in eccesso/Excess weld metal
(504)	Ex	Eccesso di penetrazione/Penetration excess.
(5041)		Sgocciolamento/Local protrusion
(5011)	F	Solco o incisione/Undercut
(514)	Fa	Irregolarità superficiale/Surface irregularity
(509)		Avvallamento/Sagging
(511)		Incom. riempimento/Incom. Filled groove
(515)	In	Insellamento/Root concavity
(517)		Ripresa difettosa/Poor restart
(2024)	K	Cavità di ritiro/Shrinkage cavity
(506)		Traboccamento/Overlap
(507)	Sl	Slivellamento/Misalignment
(3041)	W	Inclusione di tungsteno/Tungsten inclusion
(601)		Innesco d'arco/Arc strike

Giudizio / Judgment

NX-CF	To repeat to confirm defect
A	Accettabile/Acceptable
R	Riparare/To repair
NT	Tagliare/To cut
NX	Ripetere film/To repeat film
EX	Estendere il controllo/Extende test
DF	Difetto film/Film defect
TM	Taglio o modifica/Cut or modification

Pellicole (Nr) A-210	**Marca e tipo pellicola** T-231	**Indicatore Qualità Immagine** - Tipo T-233	
Films 12	Type film AGFA GEVAERT *Structurix D4*	Indicator Quality Image - Type DIN ■ ASTM □ altro/other □	
		wire minimum visible *11 0,32 mm*	
Unità X	**Pellicole per cassetta** (Nr)	**I.Q.I. - Posizione** T-233	**I.Q.I. - Sensibilità (%)**
Unit -	Films box 1	I.Q.I. - Location ■ Lato film/Film Side □ Lato sorgente/Source	I.Q.I. - Sensibility < 2
Sorgente γ T272.2	**Densità film**	**Schermi di rinforzo** (mm) T-232	**Penombra Ug** (mm) T-285
Source γ Iridio 192	Film density 2,5÷3,0	Intensifying screens Pb 0,10x0,15 Front-Back	Unsharpness geom. Ug < 0,5
Energia (keV)	**Sviluppo** T-231.2	**Tecnica radiografica** T-271.1	**Distanza sorgente-pellicola** (mm)
Energy 206÷612	Development ■ Automatic □ Manual	Radiographic techniques □ Panoramic □ Direct ■ Contact □ Ellipse	Distance Source-Film Φe
Macchia Focale (mm) T261.2	**Tempo di esposizione** (s)		**Distanza pezzo lato sorgente-pellicola** (mm)
Focal Spot 1,98*2,00	Exposure time 40/45		Distance Object (source side)-Film =Thk.

TECNICO II° livello CND - IMPRESA	CONTROLLO QUALITA'	ISPETTORE CLIENTE	ISPETTORE A.I.
Operator NDE-IR Level SNT-TC-1A EN473	O.C. Supervisor	Company Repr.	Inspection Agency
MASSIMO GUARDIGLI II° Level RT SNT-TC-1A RINA No 02DG00085PQ0001	ROSETTI MARINO S.p.A. Responsabile Controllo Qualità Quality Control Manager S. Solmi		
NDE Company - Date	Q.C. Supervisor - Date	Company Repr.- Date	I. A. - Date

file:110_ROSETTI_Ceroni

CONTROL S.N.C.
Via Attilio Monti 15 48100
RAVENNA

NDE ACTIVITIES - TEST SHEET

RAPPORTO CND - LIQUIDI PENETRANTI
NDT REPORT - DYE PENETRANT TEST

NDE-PT Report No

COMMITTENTE/Customer	**ORDINE N°**/Order No	**COMMESSA N°**/Job No	**PROGETTO**/Project
ROSETTI MARINO S.p.A.			
FILE NAME:	**LINEA N°**/ Line No	**OGGETTO** / Object	**DATA**/Date
		PQR 3 ; PQR 3A	

In accordance with specification and rule: EN 571.1

Stato della superficie / Surface Condition

COME SALDATO As Welded	■	SPAZZOLATO Brushed	■	LAV. DI MACCHINA Machined	☐	COME CALANDRATO As Bent	☐
MOLATO Ground	☐	COME LAMINATO As Rolled	☐	GREZZO As Forged	☐		☐

PRODOTTI UTILIZZATI / Products used	PROCEDURA DI ESECUZIONE / Execution of Procedure
PULITORE PRELIMINARE/ Cleaner **VELNET CGM**	**1** PULITURA PRELIMINARE / Preliminary Cleanign **SPRAY**
PENETRANTE / Penetrant **RED W - CGM**	**2** APPLICAZIONE PENETRANTE / Penetrant application **SPRAY**
PULITORE PENETRANTE/ Penetrant Remover **WATER**	**3** RIMOZIONE PENETRANTE / Removal penetrant ■ **WATER** ☐ ☐
RIVELATORE / Developer **WHITE W - CGM**	**4** ESSICAZIONE / Drying process **NATURAL**
NOTE / Remarks	**5** APPLICAZIONE RIVELATORE / Developer application **SPRAY**
	a (2) TEMPO PENETRAZIONE / Penetrating time (minuti / minutes) **15**
PULITORE POST-CONTROLLO / Cleaner after examination **Cloths and water**	**b** TEMPO DI LETTURA / Checking time (min.) (minuti / minutes) **5**
TEMPERATURA SUPERFICI / Surfaces temperature (°C) (standard range 16-52 °C) **ambient**	**c** ISPEZIONE VISIVA / Visual Inspection ☐ luce bianca min.1000 Lux ☐ luce U.V. min.1000 mW/cmq

NOTE / Remarks

Difetti / Discontinuities

a) Cricca a freddo / Crack	e) Cordone irregolare / Irreg. seam
b) Cricca da stress / Stress Crack	f) Incisione marginale / Undercutting
c) Difetto di ripresa / 1st run defect	g)
d) Porosità / Porosity	h)

Saldatura / Weld F spessore/thickness material/material

ROSETTI MARINO S.p.A.
Responsabile Controllo Qualità
Quality Control Manager
S. Solmi

RESULTS

NDE COMPANY - II° level NDE Operator	**CONFORME ALLA SPECIFICA (*)** conforming to specification	**NON CONFORME ALLA SPECIFICA (*)** not conforming to specification
MERCATALI ALESSIO II° liv. MT/PT CIC PND	■	☐

Q.C. Supervisor	**CUSTOMER INSPECTOR**
Date	Date

file:Pt nord

DALMINE DIV. TAD COM P.O. 02 AT 351 Pag. 1/2
JOB N. RS 095662 02 POS. 003 NR 28 MT 336,00 KG 1828,00 HEAT/COLATA N.11590

PIETRA
SOCIETÀ PER AZIONI
25125 BRESCIA - Via Orzinuovi, 2
telef.: 030 3540545 - fax: 030 3540204

CERTIFICATO DI COLLAUDO
Inspection certificate - Abnahmeprüfzeugnis - Certificat de Réception

EN 10204/3.1.B

N. 77063 FOGLIO 1 di 1 (Sheet - Blatt - Page)
DATA 27.09.01 (Date - Datum - Date)

CLIENTE EUROTUBE LIMITED (Customer - Kunde - Acheteur)
ORDINE RP28451 (Order - Bestellung - Commande) DATA 20.06.01 (Date - Datum - Date)
NS. COMMESSA 15373 (Our order - Uns auftrags - Cde usine) DATA 26.06.01 (Date - Datum - Date)
DESCRIZIONE: TUBI S.S. Hot Rolled (Description - Seamless tubes - Beschreibung - Nahtlose stahlrohre - Description - Tubes sans soudure)
STATO DI FORNITURA: (Condition of supply - Lieferzustand - Etat de fourniture)
X FINITI DI LAVORAZIONE A CALDO CON APPROPRIATA STRUTTURA
Hot-working finished with proper structure - Warmverarbeitet mit einwandfreiem Gefügezustand - Finis de travail a chaud avec convenable structure
NORME DI COLLAUDO ASTM/ASME A/SA 333/99-API5L/00 (Tests standards - Abnahmenormen - Spécification du produit)
TRATTAMENTO TERMICO 910 °C ___ MIN. (Heat treatment - Wärmebehandlung - Traitement thermique)
Raffreddamento: aria (Cooling - Abkühlung - Refroidissement: air) : Luft
PEZZI N. 258 (3084 M) (Quantity - Stückzahl - Nombre)
PESO KG. 17750 (Weight - Gewicht - Masse)
QUALITÀ ACCIAIO Gr.6-X 52 Fully killed (Quality of steel - Werkstoff - Nuance d'acier)
DIMENSIONI 60,30 X 3,91 X lg. 12000 mm (Sizes - Abmessungen - Dimensions)

VALORI RICHIESTI (Requirements - Anforderungen - Valeurs)	Ro 0,2	Rm	A 2"	5,65√So	H RB	KV = 56 °C	Rm x A ≥ 10500	MANDRINATURA (Ring expanding - Ringaufdornversuch - Mandrinage)	ALLARGAMENTO (Flaring test - Aufweitversuch - Evasement)	BORDATURA (Flaring test - Bördelversuch - Rabattement)	SCHIACCIAMENTO (Flattening test - Ringfaltversuch - Aplatissement)
PROVETTA (*) (Specimen - Probestab - Eprouvette)	SNERVAMENTO (Yeld point - Streckgrenze - Limite d'elast.)	ROTTURA (Tensil strenght - Zugfestigkeit - Rupture)	ALLUNGAMENTO (Elongation - Bruchdehnung - Allongement)		DUREZZA (Hardness - Härte - Duretes)	RESILIENZA (J) (Impact - Kerbschlagarbeit - Resiliance)					
	≥240	≥415	≥30,00								

RISULTATI OTTENUTI - Results - Ergebnisse - Resultats

N.	Sez. mm²	Lo mm	N / mm²	N / mm²	%		1'	2'	3'						
1	58,50	51	378	572	31	80	29J	32J	32J						G
2	58,65	51	380	572	30	80									G
3	58,65	51	380	577	30	81									G
4	58,65	51	380	572	30	80									G
5	58,50	51	375	568	31	79									G
6	58,65	51	380	572	30	80									G
7	58,50	51	376	571	31	79									G
8	58,50	51	376	565	31	79									G
9	58,65	51	380	577	30	81									G
10	58,65	51	380	576	30	81									G
11	58,50	51	377	571	31	79									G
12	58,65	51	380	577	30	81									G
13	58,50	51	375	567	31	79									G
14	58,65	51	380	572	30	80									G

AZIENDA CERTIFICATA UNI EN ISO 9002:94 IQD 9105 — CERTIFIED QUALITY SYSTEM IQNet

RECEIVED 25 OCT 2001

Notes : Heat 11590 Nr.150 Mt.1800 Kg.10310 Spec.1-8
Heat 11753 Nr.108 Mt.1296 Kg.7440 Spec.9-14
Heat 11590 Shear area = 60% Lateral expansion = 1,0 mm
Heat 11753 Shear area = 60% Lateral expansion = 1,2 mm

BUREAU VERITAS PADUA (IT) WITNESSED REVIEWED SURVEYOR MORASSI DATE 10 MAR 2003

(*) SENSO PROVINI (Specimen direction - Probenrichtung - Direction de l'éprouvette) : LONGITUDINALE (Longitudinal - Länge - Longitudinale)
X PROVA IDRAULICA ALLA PRESSIONE DI 3000 psi (Hydraulic test pressure - Wasserdruckversuch - Essai hydraulique)
X CORRENTI INDOTTE SECONDO NORMA ASTM E 309 (Eddy current according to - Zerstörungsfreie Prüfung - Courant de Foucaul)
RISULTATI DELL'ISPEZIONE E CONTROLLO DIMENSIONALE : OK (Results of inspection and dimensional control - Besichtigung und Ausmessung - Resultat de l'inspection et controle dimensions)
DIE ROHRE SIND DICHT UND HABEN FREIEN DURCHGANG

CERTIFICHIAMO CHE LA FORNITURA È CONFORME AGLI ACCORDI DELL'ORDINAZIONE
We here by certify that the material complies with the terms of the order - Es wird bestätigt daßdie Lieferung den Vereinbarungen bei der Bestellung entspricht - Nous certifions que la fourniture est conformeaux accords de la commande

COPY CONFORMING TO THE ORIGINAL

ANALISI CHIMICA (Chemical analysis - Chemische analyse - Analyse chimiques) PIETRA S.P.A.
TIPO DI FUSIONE : ELECTRIC FURNACE (Cast type - Erschmelzungsart - Type de fusion)

COLATA N. (Heat - Schmelze - Coulée)	C %	Mn %	Si %	P %	S %	Cr %	Mo %	Ni %	Cu %	Sn %	V %	Al %	N %	Ceq. %	CERTIFICATO DI COLATA (Heat Certificate - Vormaterialzeugnis - Cert. d'origine)
11590	0,133	1,250	0,192	0,012	0,008	0,108	0,042	0,180	0,226	0,015	0,000	0,027		0,406	GQ250701
CHECK	0,129	1,176	0,198	0,011	0,008	0,102	0,041	0,177	0,226	0,015	0,000	0,028			
11753	0,146	1,250	0,209	0,010	0,008	0,063	0,018	0,077	0,140	0,014	0,000	0,027		0,393	GQ060901
CHECK	0,142	1,256	0,194	0,009	0,008	0,063	0,017	0,073	0,139	0,013	0,000	0,027			

NOTE - Notes - Bemerkungen - Notes
G = GOOD
I TUBI HANNO SUBITO UN TRATTAMENTO COMPLETO DI DEMAGNETIZZAZIONE.
The tubes have been subjected to a complete demagnetization treatment.

MARCATURA marking - Kennzeichnung - Marquage

Il Collaudatore d'Officina (Internal authorized inspector - Der Beauftragte der Werksabnahme - Contrôleur autorisé)
QUALITY CONTROL (A. Zacchi)

Eurotube Limited

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ROSETTI M. S.p.A.
controllo qualità
quality control
F. Ragazzini

PIETRA S.p.A.

ENCLOSED TO CERTIFICATE NO. 77063 *DATE* 27/09/01

- ACCORDING TO TAD GROUP SPECIFICATION **TG 029 Rev.1**
- ACCORDING TO **ASME SECT. II PART A ED. 1998 Add. 2000**
- ACCORDING TO **NACE MR 01.75 REV. 2000**
- ACCORDING TO **ASTM A 333 ED. 2000 (VOL. 01.01)**
- ACCORDING TO **ASME SA 333 ED 1998 ADD. 2000**
- ACCORDING TO **API 5L ED. 2000**
- EDDY CURRENT TESTS ACCORDING TO **ASTM E 309**
- YELD/TENSILE STRENGHT RAZIO **0,85 MAX**
- **Nb** max 0,020% - **B** max 0,0005% - **Ti** max 0,02%
- **Nb + V + Ti + Cu + Mo + Cr 0,60% max**

ROSETTI MARINO S.p.A.
Conforme alla spec
According to the spec. REVIEW
Date
Date
11 GEN. 2003

DECLARATION

We hereby guarantee that the Yeld strength values of the above mentioned pipes are in accordance with ASME II part D table Y - 1 for Sec. VIII - " Application.

La société PIETRA S.p.A. garantit que les produits objet du présent certificat respectent en leur totalité les prescriptions de l'Article 15 de l'Arrete Ministériel du 24 Mars 1978 modifié:

C<=0,25%, P<=0,050%, S<=0,050%, R<=700 N/mm2, E<=0,9 x R, A% (Lo=5,65VSo) min. 16% en lon. R(A-2)>=10500, A% (Lo=5,65VSo) min. 14% en transv. RxA>=10500.

COPY CONFORMING TO THE ORIGINAL

PIETRA S.p.A.
QUALITY CONTROL
(A. Zacchi)

BUREAU VERITAS
PADUA ITALY
WITNESSED REVIEWED
SURVEYOR MORASSI
DATE
10 MAR 2003

Eurotube Limited

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Dalmine S.p.A.
Sede Legale, Direzione Generale,
Amministrativa e Commerciale
Piazza Caduti 6 Luglio 1944, 1 - 24044 Dalmine (BG)
Tel. + 39 035 560 111 - Fax + 39 035 560 4001

~~MILL TEST CERTIFICATE~~
~~INSPECTION CERTIFICATE~~

CHANGWON SPECIALTY STEEL

65 Shinchon-dong, Changwon, Kyongnam, Korea

MILL TEST CERTIFICATE

CUSTOMER: TAD METALS SPA

SUPPLIER: SAM SUN CORP.

PURCHASE ORDER NO.: TAD-020725.

REF.CD:715561-01

MANUFACTURE NO.: KPGEE03DB 060

CERT. NO.: 20926-3053

STEEL GRADE : TP304/304L

S I Z E : OD 2 NPS X WT SCH80S

ARTICLE : SEAMLESS AUSTENITIC STAINLESS STEEL PIPES

SPECIFICATION : ASTM A312

EDITION/ADDENDA : 99

STATE OF DELIVERY: SOLUTION TREATMENT
HOT FINISHED, PLAIN END

MELTING PROCESS: E.A.F.
V.O.D.
STRAND CASTING

Heat No.		Chemical Composition (wt.%)															Non-Metallic Inclusion Test
		C	Si	Mn	P	S	Ni	Cr	Mo	Cu							
Spec.	MIN.						8.000	18.000									
	MAX.	.035	.750	2.000	.0400	.0300	11.000	20.000									
A57892 L		.017	.356	1.674	.0310	.0010	9.182	18.108	.282	.406							
A57892 P		.015	.361	1.696	.0282	.0010	9.183	18.245	.282	.401							

Test No. (Lot No.)		Tensile Properties				Hardness		Impact Test			Decarburized Depth (mm)		Grain Size No.	Additional Tests
		Y.S.(KSI) 0.2%		T.S. (KSI)	EL. (%)	Body HRB					TOTAL	FERR.		
Spec.	MIN.	30.0		75.0	35.0									Flattening test: GOOD Hydrostatic test: GOOD (2500PSI)
	MAX.					90								
9000-1		35.0		84.0	53.0	78								
9000-2		36.0		84.0	52.0	79								

TAD METALS S.r.l.
COPIA CONFORME
ALL'ORIGINALE
Pos.: 6
Bolla: 6742

COPY CONFORMING
TO THE ORIGINAL

Lot No.	Bundle No.	Length (M)	Number of Qt.	Total Length(M)	Weight Kg	Case No.
2P12939000	2P129390001	6	29	174	1,319	290237
		TOTAL	29		1,319	

Additional Tests / Remarks

TOLERANCES: ASTM A530/530M-99. HARDNESS TEST: NACE MR-0175(00ED.)
TECH. CONDITION ACC. TO ASTM A312-99/ASME SA312-98ED.(00ADD.) TP304/304L
EQUIVALENT TO DIN WNR1.4301, 1.4306 & AFNOR Z6CN18-09, Z2CN18-10
INSPECTION CERTIFICATE DIN 50049 3.1B/EN 10204 3.1B

ROSETTI MARINO S.p.A
Conforme alla spec.
According to the spec. REVIEW
C.F. Firma
C.F. Signature
Data
Date
27 GEN 2003

BUREAU VERITAS
PADUA ITALY
WITNESSED REVIEWED
SURVEYOR MORASSI
DATE 10 MAR 2003

ORIGINAL

Our quality system is certified in accordance with ISO 9002 by kfq.

We here certify, that the material described above has been tested and complies with the terms of the order contract. Pz. 1 unt. 6

Quality Technology Team Manager
DATE : SEP. 26, 2002

S.A. SOUDOMETAL N.V.
Bld. M. Herbettelaan 24
1070 Brussels (Belgium)
Tel.: 32 2 522 98 00 Fax: 32 2 520 08 07 Tlx: 23 361 Soudo B
TVA/BTW: BE 401.918.312

Message for FAX number : I3959343297
PLEASE USE OUR REF: CT_01384

FAX : I3959343297
ATTN : SIG. BORTOLACELLI

CERTIFICAT - TESTRAPPORT- TEST REPORT - WERKZEUGNIS - CERTIFICATO - CERTIFICADO

Cliente : E110714
Qualità : SOUDOR 309 L

SFA 5.9:ER 309 L
TALSUDO S.R.L.
Classificazione
DIN 8556:UP X2 CrNi 24 12

V/o Ordine : 501 DEL 050195

Dimensioni (mm)

N/o Rif : 105069
2,4

Prodotto : Filo per saldatura auto

N° Produzione(colata,lotto,ecc) 3099

1. Analisi chimica(%) metallo depositato * Valori rilevati

2. Proprieta meccaniche Valori tipici

N°	Rs0,2	Rm	A %	Z %	KV-J	Tratt.termico Durata(O)
3099	+20					

3. Varie Valori tipici Osservazioni

	Cont.Radio.	Sald.d'angolo	FN	Durezza HB	HRC	HRC(WH)
3099						

4. Composizione chimica del filo(%) Valori tipici

N°	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	N
3099	0,015	1,6	0,41	0,013	0,015	23,33	13,51	0,08	0,082	0,078

BUREAU VERITAS PADUA, ITALY WITNESSED REVIEWED SURVEYOR MORASSI DATE 10 MAR 2003

Data :13/01/95

Noi certifichiamo che il prodotto sopradescritto risponde alle caratteristiche richieste della sua classific.(Ultima edizione)

T, I & QA Mgr

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 03/19	Sheet/Foglio 1/2

Manufacturer's Welding Procedure. Ref. no.	03/19 REV. 0					
Manufacturer	ROSETTI MARINO S.p.A.					
Address	VIA TRIESTE 230 - 48121 RAVENNA					
Code, Testing Standard	MAERSK OIL Specification MOG-FP-MET-STD-0012 Rev. 5.0; EN ISO 15614-1:2017, Lev.2					
	Location of test specimen according to EN ISO 15614-2:2017 Par. 7.2. Essential variables according to EN ISO 15614-1:2017 Chapter 8 and MAERSK OIL Specification MOG-FP-MET-STD-0012 Rev. 5.0 par. 6.4					
Date of welding	Start: February 18th , 2019 Complete: February 18th , 2019					
Examiner of examining body	Rina Services S.p.A.					
RANGE OF QUALIFICATION						
Welding process	111 - SMAW					
Type(s)	Manual					
Welding Equipment Type	HF inverter type					
Actual parent Material side A	Pipe: ASTM A312 Tp. 316L (Heat: 47517)					
Actual parent Material side B	Plate: EN 10225: S460G2+M (Heat: 362290)					
Parent Material grade	Stainless steel with maximum strength of 485 MPa (Pipe); Carbon steel with maximum strength of 540 MPa (Plate)					
Supply condition	Heat treated, pickled, pickled-passivated (Pipe) Thermomechanical rolled (Plate)					
Carbon equivalent/Pcm/C	Pipe : Not applicable, stainless steel; Heat Values: 0,386/0,207/ 0,106 (Plate)					
Groove design/configuration	Fillet Joint Pipe to Plate in Single Pass and Multi-pass					
Parent material thickness (mm)	5,54 mm (Pipe); 10 mm (Plate)					
Weld metal thickness (mm)	111 - SMAW	Throat thickness (mm)		2F (PB)	4F (PD)	5F (PH)
Single or Multi-pass	111 - SMAW SINGLE AND MULTIPLE		Single	5 mm (3,75 to 7,5)	4,5 mm (3,375 to 6,75)	5,5 mm (4,125 to 8,25)
			Multi-pass	8 mm (No restriction)	9,5 mm (No restriction)	7,5 mm (No restriction)
Outside diameter	≥30,15 mm (60,3 mm Test Coupon)					
Filler material Designation	111 SMAW EN ISO 3581-A: E 23 12 L R 3 2 (AWS 5.4: E309L-17)					
Filler material Maker	111 - Esab OK 67.60					
Filler material Size	111 - SMAW ∅ 2,5 mm ; 3,2mm					
Shielding gas/Flux	N.A.					
Shielding gas flow rate	N.A.					
Backing gas (purging)	None					
Type of welding current & polarity	DC - RP	Heat input / Apporto termico (kJ/mm) ± 25%		Diameter mm	2F (PB)	4F (PD)	5F (PH)
			Pass				
			Root	∅ 2,5 ∅ 3,2	- 0,56 to 0,93	0,46 to 0,76 -	0,52 to 0,86 -
			Fill/Cap	∅ 2,5 ∅ 3,2	- 0,45 to 0,79	- 0,47 to 0,79	0,56 to 0,94 -
Welding position	All, vertical down progression excluded (Test Coupon performed in PB, PD and PH positions)						
Preheat (°C)	20	Interpass temperature / Temp. di interpass (°C)		150			
Post-Weld Heat Treatment and/or ageing	NONE						
Weld bead width	Max. 10 mm for PB & PD position ; Max. 12 mm for PH position						
Welder's detail	Crispino Antonio NC272						
Time lapse between root and hot pass	N.A.						
Other information / Altre informazioni	- Preheat performed by propane torch -Accelerate weld cooling not permitted; -Base material origin: Seamless pipe and plate						

Manufacturer's Welding Procedure. Ref. no.	03/19 REV. 0		
Test result (WPQR) N°	03/19	Date/Data	05/03/2019
Manufacturer's WPS No.	pWPS 03/19 REV. 0	Date/Data	11/02/2019

TESTS CARRIED OUT ON SAMPLES 03/19 WELDED IN 2F POSITION (PB, single and multi-pass), IN 4F POSITION (PD, single and multi-pass) & IN 5F POSITION (PH, single and multi-pass)

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 03/19
Penetrant test	Acceptable	01-18205
Magnetic particle test	N.A.	/
Radiographic test	N.A.	/
Ultrasonic test	N.A.	/

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2]	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2]	A [%]	Z [%]	Fracture Location	Remarks
/	/	/	/	/	/	/	/

BEND TEST

Type & N.	Bend angle	Remarks	Results
/	/	/	/

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J]			Avarage value [J]	Remarks
/	/	/	/	/	/	/	/	/

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
2 Macro examination+Hardness test (HV10) (PB, multipass)	Satisfactory-See Element certificate No. RPR212-6E1R0A19, max. Hardness: 225 HV10
Fracure test - Nick Break, (PB, multipass)	Satisfactory, See Element certificate No. RPR212-6E1R0A19
2 Macro examination+Hardness test (HV10) (PD, multipass)	Satisfactory-See Element certificate No. RPR212-7E1R0A19, max. Hardness: 217 HV10
Fracure test - Nick Break, (PD, multipass)	Satisfactory, See Element certificate No. RPR212-7E1R0A19
2 Macro examination+Hardness test (HV10) (PH, multipass)	Satisfactory-See Element certificate No. RPR212-3E1R0A19, max. Hardness: 282 HV10
Fracure test - Nick Break, (PH, multipass)	Satisfactory, See Element certificate No. RPR212-3E1R0A19
2 Macro examination+Hardness test (HV10) (PB, single pass)	Satisfactory-See Element certificate No. RPR212-1E1R0A19, max. Hardness: 188 HV10
Fracure test - Nick Break, (PB, single pass)	Satisfactory, See Element certificate No. RPR212-1E1R0A19
2 Macro examination+Hardness test (HV10) (PD, single pass)	Satisfactory-See Element certificate No. RPR212-2E1R0A19, max. Hardness: 259 HV10
Fracure test - Nick Break, (PD, single pass)	Satisfactory, See Element certificate No. RPR212-2E1R0A19
2 Macro examination+Hardness test (HV10) (PH, single pass)	Satisfactory-See Element certificate No. RPR212-8E1R0A19, max. Hardness: 238 HV10
Fracure test - Nick Break, (PH, single pass)	Satisfactory, See Element certificate No. RPR212-8E1R0A19
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Element Materials Technology Milan S.r.l. - Crema (CR)
Laboratory report reference N.	Report No. RPR212-1E1R0A19, RPR212-2E1R0A19, RPR212-3E1R0A19, RPR212-6E1R0A19, RPR212-7E1R0A19, RPR212-8E1R0A19 dated MARCH 5th 2019
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of MOG-FP-MET-STD-0012 Rev. 5.0 Specification; EN ISO 15614-1:2017 Lev. 2

Date/Data
05-03-2019

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

ROSETTI MARINO S.p.A.

Examiner or Examination Body
RINA Services S.p.A.

RINA
F. Lago
RINA Services S.p.A.

Name and signature / Nome e firma

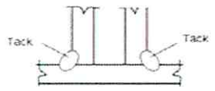
PQR - AS- RUN PARAMETER SHEET

pWPS 03/19	
PQR 03/19	
Coupon Nr. 03/19 PB SI	
Date: 18/02/2019	Page: 1_ of _1

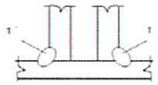
REFERENCE CODE AND PROJECT SPECIFICATIONS: **EN ISO 15614-1:2017 Liv.2 & Spec. MOG-EP-MET-STD-0012 (MOTS-12) 5.0**

Welder Name(s):	CRISPINO ANTONIO	Welder Id No(s):	NC272		
Welding Process(es):	111-SMAW	Type(s):	MANUAL		
Welding Position:	PB (2F)	Progression:	N.A.		
Base Materials:	ASTM A312 Tp. 316L to EN 10225: S460G2+M	Wall Thickness:	5,54 (Pipe) to 10 (Plate)	Diameter:	60,3 mm (2")
Heat No(s):	47517 to 362290	Joint Type:	FILLET		

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	3,2	SB612214	ESAB OK 67.60
Hot Pass	/		
Filling Runs	/		
Filling Runs	/		
Cap	/		

GAS:

Shielding Gas:	N.A.
Composition:	-
Flow:	-
Gas Backing:	N.A.
Flow:	-
Gas Size Nozzle:	-
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
10 mm	String		Single	Single

	Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required		Holding Temperature °C	Holding Time °C	Heating Rate °C	Cooling Rate °C
20°C	PROPANE TORCH	N.A.	CONTACT DIGITAL THERMOMETHER	NA		NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
NA	1	SMAW	1	-	E 23 12 L R 3 2 E309L-17	3,2	DC EP	100	110	105,0	22	25	23,5	-	-	16	0,74	0,80	20	Welding unit: HELVI SE.0236
																				Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA Welding Dept. D. Cenacchi	Signature:	Signature:	Signature:
Date:	Date:	Date:	Date:

RINA Services S.p.A. No. Bo. 0474
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
Date 18/02/2019
File
Signature

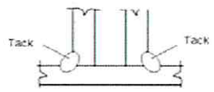
PQR - AS- RUN PARAMETER SHEET

pWPS 03/19			
PQR 03/19			
Coupon Nr. 03/19 PB MI			
Date:	18/02/2019	Page:	1_ of _1

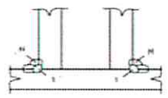
REFERENCE CODE AND PROJECT SPECIFICATIONS: **EN ISO 15614-1:2017 Liv.2 & Spec. MOG-EP-MET-STD-0012 (MOTS-12) 5.0**

Welder Name(s):	CRISPINO ANTONIO	Welder Id No(s):	NC272		
Welding Process(es):	111-SMAW	Type(s):	MANUAL		
Welding Position:	PB (2F)	Progression:	N.A.		
Base Materials:	ASTM A312 Tp. 316L to EN 10225: S460G2+M	Wall Thickness:	5,54 (Pipe) to 10 (Plate)	Diameter:	60,3 mm (2")
Heat No(s):	47517 to 362290	Joint Type:	FILLET		

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	3,2	SB612214	ESAB OK 67.60
Fill/Cap	3,2	SB612214	ESAB OK 67.60

GAS:	
Shielding Gas:	N.A.
Composition:	-
Flow:	-
Gas Backing:	N.A.
Flow:	-
Gas Size Nozzle:	-
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
10 mm	String	Multiple	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature °C	Holding Time °C	Heating Rate °C	Cooling Rate °C
20°C	PROPANE TORCH	150°C	CONTACT DIGITAL THERMOMETHER	NA	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
NA	1	SMAW	1	-	E 23 12 L R 3 2 E309L-17	3,2	DC EP	100	110	105,0	22	25	23,5	-	-	16	0,74	0,80	20	Welding unit: HELVI SE.0236
NA	2	SMAW	2	-	E 23 12 L R 3 2 E309L-17	3,2	DC EP	105	120	112,5	22	25	23,5	-	-	21	0,60	0,80	120	Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635
NA	2	SMAW	3	-	E 23 12 L R 3 2 E309L-17	3,2	DC EP	105	120	112,5	22	25	23,5	-	-	20	0,63	0,80	150	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA Welding Dept. D. Cenacchi	Signature:	Signature:	Signature:
Date:	Date:	Date:	Date:

RINA Services SpA No. Bo. 0474
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
Date 18/02/2019
File
Signature
Cimatti Davide

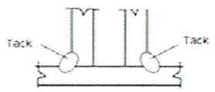
PQR - AS- RUN PARAMETER SHEET

pWPS 03/19			
PQR 03/19			
Coupon Nr. 03/19 PD SI			
Date:	18/02/2019	Page:	1_ of _1

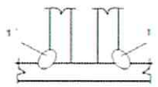
REFERENCE CODE AND PROJECT SPECIFICATIONS: **EN ISO 15614-1:2017 Liv.2 & Spec. MOG-EP-MET-STD-0012 (MOTS-12) 5.0**

Welder Name(s):	CRISPINO ANTONIO	Welder Id No(s):	NC272		
Welding Process(es):	111-SMAW	Type(s):	MANUAL		
Welding Position:	PD (4F)	Progression:	N.A.		
Base Materials:	ASTM A312 Tp. 316L to EN 10225: S460G2+M	Wall Thickness:	5,54 (Pipe) to 10 (Plate)	Diameter:	60,3 mm (2")
Heat No(s):	47517 to 362290	Joint Type:	FILLET		

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	2,5	SBS31043	ESAB OK 67.60
Hot Pass	/		
Filling Runs	/		
Filling Runs	/		
Cap	/		

GAS:

Shielding Gas:	N.A.
Composition:	-
Flow:	-
Gas Backing:	N.A.
Flow:	-
Gas Size Nozzle:	-
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
10 mm	String	Single	Single

	Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required		Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
20°C	PROPANE TORCH	N.A.	CONTACT DIGITAL THERMOMETHER	NA		NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
NA	1	SMAW	1	-	E 23 12 L R 3 2 E309L-17	2,5	DC EP	77	84	80,5	21	23	22,0	-	-	14	0,61	0,80	20	Welding unit: HELVI SE.0236
																				Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA Welding Dept D. Cenacchi	Signature:	Signature:	Signature:
Date:	Date:	Date:	Date:

RINA Services SpA No. Bo 0474 — Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ — Date 18/02/2019 — File — Signature Cipolli Davide

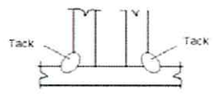
PQR - AS- RUN PARAMETER SHEET

pWPS 03/19			
PQR 03/19			
Coupon Nr. 03/19 PD MI			
Date:	18/02/2019	Page:	1_ of _1

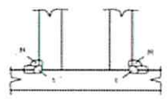
REFERENCE CODE AND PROJECT SPECIFICATIONS: **EN ISO 15614-1:2017 Liv.2 & Spec. MOG-EP-MET-STD-0012 (MOTS-12) 5.0**

Welder Name(s):	CRISPINO ANTONIO	Welder Id No(s):	NC272		
Welding Process(es):	111-SMAW	Type(s):	MANUAL		
Welding Position:	PD (4F)	Progression:	N.A.		
Base Materials:	ASTM A312 Tp. 316L to EN 10225: S460G2+M	Wall Thickness:	5,54 (Pipe) to 10 (Plate)	Diameter:	60,3 mm (2")
Heat No(s):	47517 to 362290	Joint Type:	FILLET		

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	2,5	SBS31043	ESAB OK 67.60
Fill/Cap	3,2	SB612214	ESAB OK 67.60

GAS:

Shielding Gas:	N.A.
Composition:	-
Flow:	-
Gas Backing:	N.A.
Flow:	-
Gas Size Nozzle:	-
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
10 mm	String	Multiple	Single

	Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required		Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
20°C	PROPANE TORCH	150°C	CONTACT DIGITAL THERMOMETHER	NA		NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
NA	1	SMAW	1	-	E 23 12 L R 3 2 E309L-17	2,5	DC EP	77	84	80,5	21	23	22,0	-	-	14	0,61	0,80	20	Welding unit: HELVI SE.0236
NA	2	SMAW	2	-	E 23 12 L R 3 2 E309L-17	3,2	DC EP	95	105	100,0	22	25	23,5	-	-	18	0,63	0,80	110	Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635
NA	2	SMAW	3	-	E 23 12 L R 3 2 E309L-17	3,2	DC EP	95	105	100,0	22	25	23,5	-	-	18	0,63	0,80	150	

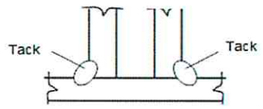
PQR - AS- RUN PARAMETER SHEET

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Coupon Nr. 03/19 PH SI			
Date:	18/02/2019	Page:	1_ of _1

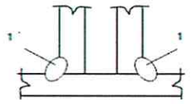
REFERENCE CODE AND PROJECT SPECIFICATIONS: **EN ISO 15614-1:2017 Liv.2 & Spec. MOG-EP-MET-STD-0012 (MOTS-12) 5.0**

Welder Name(s):	CRISPINO ANTONIO	Welder Id No(s):	NC272		
Welding Process(es):	111-SMAW	Type(s):	MANUAL		
Welding Position:	PH (5F)	Progression:	Uphill		
Base Materials:	ASTM A312 Tp. 316L to EN 10225: S460G2+M	Wall Thickness:	5,54 (Pipe) to 10 (Plate)	Diameter:	60,3 mm (2")
Heat No(s):	47517 to 362290	Joint Type:	FILLET		

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	2,5	SBS31043	ESAB OK 67.60
Hot Pass	/		
Filling Runs	/		
Filling Runs	/		
Cap	/		

GAS:

Shielding Gas:	N.A.
Composition:	-
Flow:	-
Gas Backing:	N.A.
Flow:	-
Gas Size Nozzle:	-
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
12 mm	String		Single	Single

	Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required		Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
20°C	PROPANE TORCH	N.A.	CONTACT DIGITAL THERMOMETHER	NA		NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
NA	1	SMAW	1	-	E 23 12 L R 3 2 E309L-17	2,5	DC EP	60	70	65,0	21	23	22,0	-	-	10	0,69	0,80	20	Welding unit: HELVI SE.0236
																				Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:		SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	RINA Services SpA No. Bo. 0474 Date 18/07/2019	Name:
Signature: ROSETTI MARINO SpA Welding Dept D. Cenacchi	Signature:	Signature:	Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Cimato Davide	Signature:
Date:	Date:	Date:		Date:

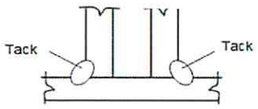
PQR - AS- RUN PARAMETER SHEET

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Coupon Nr. 03/19 PH MI			
Date:	01/02/2019	Page:	1_ of _1

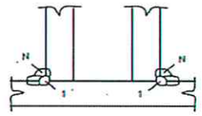
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Heat No(s):	47517 to 362290	Joint Type:	FILLET		

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	2,5	SBS31043	ESAB OK 67.60
Fill/Cap	2,5	SBS31043	ESAB OK 67.60

GAS:

Shielding Gas:	N.A.
Composition:	-
Flow.	-
Gas Backing:	N.A.
Flow.	-
Gas Size Nozzle:	-
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
12 mm	String		Multiple	Single

	Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required		Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
20°C	PROPANE TORCH	150°C	CONTACT DIGITAL THERMOMETHER	NA		NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
NA	1	SMAW	1	-	E 23 12 L R 3 2 E309L-17	2,5	DC EP	60	70	65,0	21	23	22,0	-	-	10	0,69	0,80	20	Welding unit: HELVI SE.0236
NA	2	SMAW	2	-	E 23 12 L R 3 2 E309L-17	2,5	DC EP	70	80	75,0	22	24	23,0	-	-	11	0,75	0,80	100	Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635
NA	2	SMAW	3	-	E 23 12 L R 3 2 E309L-17	2,5	DC EP	70	80	75,0	22	24	23,0	-	-	11	0,75	0,80	150	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA Welding Dept. D. Cenacchi	Signature:	Signature: RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 18/02/2019 File Signature Cimatti Davide	Signature:
Date:	Date:	Date:	Date:

PQR attachments index:

Base material certificate (Pipe ASTM A312 Tp. 316L)

Base material certificate (Plate EN 10225: S460G2+M)

Consumables certificate

preliminary WPS

NDE certificate

Mechanical test report

ROSETTI MARINO

PQR 03/19

Base material certificate
(Pipe ASTM A 312 Tp. 316L)

ROSETTI MARINO

MATERIAL CERTIFICATES BOOK

Supplier	Purchase Order nr.	job	Barcode
RACCORTUBI SPA	1713004007	112A70B	Q011301238

ROSETTI MARINO

ROSETTI MARINO

Conforme alla SPEC. + PO

According to the spc.

TMUGF Firma / MTSMD Signature

Data / Date

02/12/2013

Sonia Emiliani

[X] REVIEW

[ ] WITNESS

CUSTOMER

NOTE

RACCORTUBI
Viale De Gasperi, 194
20010 MARCALLO Con CASONE (MI) - Italia
Tel. 02/976300.1 - Fax 02/976300252

Marcallo (MI), 31/10/2013

ROSETTI MARINO S.p.A.
Via Trieste, 230
48122 - RAVENNA

Uff. Collaudi

OGGETTO /Subject:

- TRASMISSIONE CERTIFICATI di analisi chimica e prove meccaniche
- Test certificates transmittal

Vi inviamo in allegato la certificazione relativa al seguente ordine:
Please find here attached material test certificates for the above mentioned P.Order:

Type	EN 10204:2005 3.1
Prot. N.	00021537
Ns. Rif.	00004516
Vs. Rif.	1713004007 112A70B - 28.10.2013 112A70B - DECK MARLIN FOXTROT

DISTINTI SALUTI
Best regards

N. 00021537
PAG. N. Sheet N. 1 / 1
DATA Date 31/10/2013

ALLEGATO RIASSUNTIVO
Summary of test certificates

Cliente Customer: ROSETTI MARINO S.p.A.

Commessa Job N. 00004516

Ordine N. P.O. number: 1713004007 112A70B - 28.10.2013
112A70B - DECK MARLIN FOXTROT

Pos. Item	Descrizione Description	Q.ta' Q.ty	N°Colata o Marcatura Pz. Heat N° or PCS. Marking	Immagine Image
10	60.33x3.91	182,66	47195	CTCERT201300162083_ 1
				CTCERT201300162083_ 2
				CTCERT201300162083_ 3
20	33.40x4.55	49,08	46760	CTCERT201300160292_ 1
				CTCERT201300160292_ 2
				CTCERT201300160292_ 3
30	21.34x3.73	6,00	46702	CTCERT201300164534_ 1
				CTCERT201300164534_ 2
				CTCERT201300164534_ 3
40	60.33x5.54	96,47	47517	CTCERT201300163861_ 1
				CTCERT201300163861_ 2
				CTCERT201300163861_ 3
50	26.67x3.91	6,00	QP635	CTCERT201300161418_ 1
				CTCERT201300161418_ 2
				CTCERT201300161418_ 3
				CTCERT201300161418_ 4
60	88.90x7.62	27,50	370049	CTCERT201300162541_ 1
				CTCERT201300162541_ 2
				CTCERT201300162541_ 3
				CTCERT201300162541_ 4
70	114.30x8.56	48,30	47628	CTCERT201300163918_ 1
				CTCERT201300163918_ 2
				CTCERT201300163918_ 3
80	48.26x5.08	6,16	47163	CTCERT201300161258_ 1
				CTCERT201300161258_ 2
				CTCERT201300161258_ 3

raccortubi

N. 00021537
PAG. N. Sheet N. 1 / 1
DATA Date 31/10/2013

POSITIVE MATERIAL IDENTIFICATION

Cliente Customer: ROSETTI MARINO S.p.A.
Commessa Job N. 00004516

Ordine N. P.O. number: 1713004007 112A70B - 28.10.2013
112A70B - DECK MARLIN FOXTROT

Il materiale sottoelencato e' stato sottoposto con esito favorevole al controllo P.M.I tramite apparecchiatura NITON XLT898 secondo specifica PO 40.

The under listed material have been satisfactory passed the P.M.I. test carried out with instruments NITON XLT898 in accordance with specification PO 40.

Note:
Notes: P.M.I. extension 10%

Pos. *Item*	**Q.ta'** *Q.ty*	**U.M.**	**Descrizione** *Description*	N° Colata o Marcatura Pz. *Heat N° or PCS. Marking*
			TUBI S.S. ASME/ASTM SA/A-312 TP.316/316L, DIM. SEC.ANSI B36.19	
10	182,66	MT	60.33x3.91	47195
20	49,08	MT	33.40x4.55	46760
30	6,00	MT	21.34x3.73	46702
40	96,47	MT	60.33x5.54	47517
50	6,00	MT	26.67x3.91	QP635
60	27,50	MT	88.90x7.62	370049
70	48,30	MT	114.30x8.56	47628
80	6,16	MT	48.26x5.08	47163

Operatore Qualificato
Qualified Operator

Raccortubi Q.A./Q.C.

Ente Terzo
Third Party Agency

Cliente
Customer

raccortubi

INSPECTION CERTIFICATE
EN 10204:2004 / 3.1

Number: 580741 Page: 1 / 3	Rev: 00
Created on: Date: 29.05.2013	Modified on:

TTI - TUBACEX TUBOS INOXIDABLES
Registro Mercantil de Alava, Tomo 587, Folio 189, Hoja VI-2885 - N.I.F. A-01140227
Tres cruces, 8
01400 Llodio (Alava)
SPAIN
TL: +34 946719300
FAX: +34 946725062
E-MAIL: qualitytti@tubacex.es

CUSTOMER DESCRIPTION 162083

CLIENT SOLD TO	CLIENT SHIP TO
RACCORTUBI S.P.A. VIALE DE GASPERI 194 20010 MARCALLO CON CASONE MI ITALY	RACCORTUBI S.P.A. VIA FRATELLI KENNEDY 59 20010 MARCALLO CON CASONE MI ITALY

CLIENT ORDER: OS000265'S
SALES ORDER: 130744

MATERIAL: SEAML. STAINL. STEEL TUBES/PIPES
HEAT-TREATED, PICKLED, PICKLED-PASSIVATED
GRADE: TP316,TP316L,1.4401,1.4404,
STANDARD: ASME SECT.II PART.A SA312/SA312M-2010 ED. 2011 ADD.
ASTM A312/A312M-12
EN 10216-5:2004 TC1
NACE MR0175/ISO 15156-3:2009
RACCORTUBI PURCHASING SPECIFICATION RTX_S01S REV.1
NACE MR0103-2010
TOLERANCES: ASME SECT.II PART.A SA999/SA999M-2010 ED. 2011 ADD.
ASTM A999/A999M-12
EN ISO 1127/03.97 D3/T3
RANDOM LENGTHS 5.000/6.500 MM
PLAIN ENDS,
DIMENSIONS: 60,33 X 3,91 MM
COLD FINISHED

Sales Item	Client Item	Delivery No	Lot No.	Heat No	Pieces	Weight	Tot Lgth	Un Lgth
220		8110026426	200101891	47194	99	3.030 KG	544,27 M	5000-6500 MM
220		8110026426	200101892	47195	250	8.172 KG	1.462,22 M	5000-6500 MM

RAW MATERIAL

Heat Nr:	Method
47194	Electric furnace+AOD
47195	Electric furnace+AOD

REVIEWED

CHEMICAL COMPOSITION (%) *L: Ladle C:Products

*	Heat	Seq	C	Mn	Si	P	S	Ni	Cr	Mo	N
L	47194	1	0,018	1,37	0,450	0,025	0,0010	11,15	17,00	2,21	0,0685
L	47195	1	0,016	1,34	0,440	0,025	0,0010	11,10	16,95	2,15	0,0675
C	47194	5	0,019	1,41	0,450	0,024	0,0010	11,10	16,95	2,20	0,0685
C	47195	3	0,020	1,39	0,430	0,023	0,0010	11,00	16,75	2,13	0,0675

AENOR ER Empresa Registrada ER-0141/2000/001
AENOR GA Gestión Ambiental GA-2000/0001

TUBACEX TUBOS INOXIDABLES S.A.
INGENIERIA DE CALIDAD
Iñigo Arriola Iturbe

We hereby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and satisfies order's requirements. This certificate is issued by a computerized system and it is valid without original signature. In case the owner of the certificate would release as a copy of it, he must attest its conformity to the issued, assuming the responsibility for any unlawful of TUBACEX, not allowed use. Any forgery or falsification of this certificate shall legally prosecuted.

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 60.33x3.91
Heat n° or Pcs. marking : 47195 Qtà/Qty:182,66 Posiz./Item n.: 10
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

TUBACEX

INSPECTION CERTIFICATE EN 10204:2004 / 3.1

Number: 580741 Page: 2 / 3	Rev: 00
Created on: Date: 29.05.2013	Modified on:

HEAT TREATMENT

SOLUTION ANNEALED AT 1100 °C , 7 min , WATER

TENSILE TEST

Lot No.	Sample	T	Rp0,2	Rp1,0	Rm	A2"	A5	Type
		°C	MPa	MPa	MPa	%	%	
200101891	1	20	311	353	602	68	59	L
200101892	1	20	300	344	599	71	62	L
	2	20	307	353	613	61	53	L

HARDNESS TEST

Lot No.	Sample	HRB1	HRB2
200101891	1	82	83
200101892	1	79	80
	2	79	80

METALURGICAL TESTS

INTERGRANULAR CORROSION TEST ACC. TO ASTM A262 PRACT."E": SATISFACTORY

NON-DESTRUCTIVE TESTS

POSITIVE MATERIAL IDENTIFICATION TEST ON EACH TUBE/PIPE BY "X-RAY-FLUORESCENCE-ANALYZER": SATISFACTORY

HYDROSTATIC PRESSURE TESTED AT 130 bar, 1900 PSI DURING 5 SEC ON EACH TUBE/PIPE: SATISFACTORY

DIMENSIONAL CHECKING ON EACH TUBE: SATISFACTORY

VISUAL INSPECTION ON EACH TUBE: SATISFACTORY

TECHNOLOGICAL TESTS

FLARING TEST: SATISFACTORY

FLATTENING TEST: SATISFACTORY

MARKING

TX2 TUBACEX 60,33 X 3,91 MM ASME SA312 ASTM A312 EN 10216-5 TC1 TP316 TP316L 1.4401 1.4404 CFD CD SMLS HEAT/ PMI-AV LOT NO/SPAIN

REMARKS

NO MERCURY, MERCURY COMPOUNDS OR MERCURY BEARING INSTRUMENTS AND/OR EQUIPMENT HAVE BEEN USED ALONG MANUFACTURING AND INSPECTION PROCESS.

AENOR ER Empresa Registrada ER-0023/2001

AENOR Gestión Ambiental GA-2001/0001

We hereby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and satisfies order's requirements. This certificate is issued by a computerized system and it is valid without original signature. In case the owner of the certificate would release as a copy of it, he must check its conformity to the issued, assuming the responsibility for any untrue of it. TUBACEX, not allowed use. Any forgery or falsification of this certificate shall legally prosecuted

TUBACEX TUBOS INOXIDABLES S.A.
INGENIERIA DE CALIDAD

Iñigo Arriola Alzuaga

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 60.33x3.91
Heat n° or Pcs. marking : 47195 Qtà/Qty:182,66 Posiz./Item n.: 10
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

TUBACEX

INSPECTION CERTIFICATE
EN 10204:2004 / 3.1

Number: 580741 Page: 3 / 3	Rev: 00
Created on: Date: 29.05.2013	Modified on:

REMARKS

NO WELDING OR WELD REPAIRS WERE MADE

MATERIAL MANUFACTURER APPROVED BY TÜV SÜD Industrie Service GmbH (NOTIFIED BODY 036)TO ISSUE CERTIFICATES OF SPECIFIC PRODUCT CONTROL IN ACCORDING TO PRESSURE EQUIPMENT DIRECTIVE 97/23/EC ANNEX I POINT 4.3.

MATERIAL CHARACTERISTICS COMPLY WITH POINT 7.5 OF ANNEX I TO PED BY HAVING AN ELONGATION AFTER RUPTURE AT TENSILE TEST NO LESS THAN 14% AND A BENDING RUPTURE ENERGY AT IMPACT TEST NO LESS THAN 27J AT 20°C.

MATERIAL IS FREE OF RADIATION CONTAMINATION

AENOR ER Empresa Registrada

AENOR Gestión Ambiental

We hereby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and satisfies order's requirements. This certificate is issued by a computerized system and it is valid without original signature. In case the owner of this certificate would release as a copy of it, he must attest its conformity to the issued, assuming the responsibility for any unlawful or TUBACEX not allowed use. Any forgery or falsification of this certificate shall legally prosecuted.

TUBACEX TUBOS INOXIDABLES S.A.
INGENIERIA DE CALIDAD

Iñigo Arriola Aloñar

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 60.33x3.91
Heat n° or Pcs. marking : 47195 Qtà/Qty:182,66 Posiz./Item n.: 10
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

TUBACEX

INSPECTION CERTIFICATE
EN 10204:2004 / 3.1

Number: 571304 Page: 1 / 3	Rev: 00
Created on: Date: 18.02.2013	Modified on:

TTI - TUBACEX TUBOS INOXIDABLES
Registro Mercantil de Alava, Tomo 587, Folio 189, Hoja VI 2885 - N.I.F. A-01140227
Tres cruces, 8
01400 Llodio (Alava)
SPAIN
TL: +34 946719300
FAX: +34 946725062
E-MAIL: qualityttl@tubacex.es

160292

CUSTOMER DESCRIPTION

CLIENT SOLD TO	CLIENT SHIP TO
RACCORTUBI S.P.A. VIALE DE GASPERI 194 20010 MARCALLO CON CASONE MI ITALY	RACCORTUBI S.P.A. VIA FRATELLI KENNEDY 59 20010 MARCALLO CON CASONE MI ITALY

REVIEWED

CLIENT ORDER: OS000209 S.
SALES ORDER: 128153

MATERIAL: SEAML. STAINL. STEEL TUBES/PIPES
HEAT-TREATED, PICKLED, PICKLED-PASSIVATED
GRADE: 1.4401,1.4404,TP316,TP316L,
STANDARD: EN 10216-5:2004 TC1
ASTM A312/A312M-12
ASME SECT.II PART.A SA312/SA312M-2010 ED. 2011 ADD.
NACE MR0103-10
NACE MR0175/ISO 15156-3:2009
RACCORTUBI PURCHASING SPECIFICATION RTX_S01S REV.0
TOLERANCES: ASME SECT.II PART.A SA999/SA999M-2010 ED. 2011 ADD.
ASTM A999/A999M-11
EN ISO 1127/03.97 D3/T3
RANDOM LENGTHS 5.000/6.500 MM
PLAIN ENDS,
DIMENSIONS: 33,40 X 4,55 MM
COLD FINISHED

Sales Item	Client Item	Delivery No	Lot No.	Heat No	Pieces	Weight	Tot Lgth	Un Lgth
130		8110023569	200091245	46760	259	4.802 KG	1.465,34 M	5000-6500 MM

RAW MATERIAL

Heat Nr:	Method
46760	Electric furnace+AOD

CHEMICAL COMPOSITION (%) *L: Ladle C:Products

*	Heat	Seq	C	Mn	Si	P	S	Ni	Cr	Mo	N
L	46760	1	0,021	1,43	0,530	0,027	0,0010	11,20	17,00	2,11	0,0560
C	46760	3	0,022	1,44	0,520	0,024	0,0010	11,20	16,95	2,14	0,0560

AENOR ER Empresa Registrada ER-0692/2001
AENOR GA Gestión Ambiental GA-2001/0003

We hereby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and satisfies order's requirements. This certificate is issued by a computerized system and it is valid without original signature; in case the owner of the certificate would release as a copy of it, he must attest its conformity to the issued, assuming the responsibility for any unlawful or TUBACEX, not allowed use. Any forgery or falsification of this certificate shall legally prosecuted.

TUBACEX TUBOS INOXIDABLES S.A.
INGENIERIA DE CALIDAD

Iñigo Arrizabalaga Alcibar

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 33.40x4.55
Heat n° or Pcs. marking : 46760 Qtà/Qty:49,08 Posiz./Item n.: 20
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

TUBACEX

INSPECTION CERTIFICATE
EN 10204:2004 / 3.1

Number: 571304 Page: 2 / 3	Rev: 00
Created on: Date: 18.02.2013	Modified on:

HEAT TREATMENT

SOLUTION ANNEALED AT 1100 °C , 7,00 min , WATER

TENSILE TEST

Lot No.	Sample	T	Rp0.2	Rpt.0	Rm	A2"	A5	Type
		°C	MPa	MPa	MPa	%	%	
200091245	1	20	320	368	633	64	57	L
	2	20	316	359	628	64	58	L

HARDNESS TEST

Lot No.	Sample	HRB1	HRB2
200091245	1	79	80

METALURGICAL TESTS

INTERGRANULAR CORROSION TEST ACC. TO ASTM A262 PRACT."E": SATISFACTORY

NON-DESTRUCTIVE TESTS

100 % HYDROSTATIC PRESSURE TESTED AT 175 BAR, DURING 5 SEC, GOOD.

POSITIVE MATERIAL IDENTIFICATION TEST ON EACH TUBE/PIPE BY "X-RAY-FLUORESCENCE-ANALYZER": SATISFACTORY

DIMENSIONAL CHECKING ON EACH TUBE: SATISFACTORY

VISUAL INSPECTION ON EACH TUBE: SATISFACTORY

TECHNOLOGICAL TESTS

FLARING TEST: SATISFACTORY

FLATTENING TEST: SATISFACTORY

MARKING

TX2 TUBACEX 33,40 X 4,55 MM ASME SA312 ASTM A312 EN 10216-5 TC1 1.4401 1.4404 TP316 TP316L CFD CD SMLS HEAT/ PM1-AV LOT NO/SPAIN

REMARKS

NO MERCURY, MERCURY COMPOUNDS OR MERCURY BEARING INSTRUMENTS AND/OR EQUIPMENT HAVE BEEN USED ALONG MANUFACTURING AND INSPECTION PROCESS.

NO WELD REPAIR WAS PERFORMED

MATERIAL MANUFACTURER APPROVED BY TÜV SÜD Industrie Service GmbH (NOTIFIED BODY 036)TO ISSUE CERTIFICATES OF SPECIFIC PRODUCT CONTROL IN ACCORDING TO PRESSURE EQUIPMENT DIRECTIVE 97/23/EC ANNEX 1 POINT 4.3

AENOR ER Empresa Registrada

AENOR Gestión Ambiental

TUBACEX TUBOS INOXIDABLES S.A.
INGENIERIA DE CALIDAD

Firma Asociada Alcalde

We hereby certify that the material hereby described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and satisfies order's requirements. This certificate is issued by a computerized system and it is valid without original signature. In case the owner of this certificate would release as a copy of it, he must attest its conformity to the issued, assuming the responsibility for any unlawful or TUBACEX, not allowed use. Any forgery or falsification of this certificate shall legally prosecuted.

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 33.40x4.55
Heat n° or Pcs. marking : 46760 Qtà/Qty:49,08 Posiz./Item n.: 20
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

TUBACEX

INSPECTION CERTIFICATE
EN 10204:2004 / 3.1

Number: 571304 Page: 3 / 3	Rev: 00
Created on: Date: 18.02.2013	Modified on:

REMARKS

MATERIAL CHARACTERISTICS COMPLY WITH POINT 7.5 OF ANNEX I TO PED BY HAVING AN ELONGATION AFTER RUPTURE AT TENSILE TEST NO LESS THAN 14% AND A BENDING RUPTURE ENERGY AT IMPACT TEST NO LESS THAN 27J AT 20ºC.

MATERIAL IS FREE OF RADIATION CONTAMINATION

AENOR ER Empresa Registrada

AENOR Gestión Ambiental

We hereby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and satisfies order's requirements. This certificate is issued by a computerized system and it is valid without original signature. In case the owner of the certificate would release as a copy of it, he must annex its conformity to the issued, assuming the responsibility for any unlawful or TUBACEX, not allowed use. Any forgery or falsification of this certificate shall legally prosecuted.

TUBACEX TUBOS INOXIDABLES S.A.
INGENIERIA DE CALIDAD

Iñigo Arriola Alonso

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 33.40x4.55
Heat n° or Pcs. marking : 46760 Qtà/Qty:49,08 Posiz./Item n.: 20
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

TUBACEX

INSPECTION CERTIFICATE EN 10204:2004 / 3.1

Number: 591142 Page: 1 / 3	Rev: 00
Created on: Date: 15.10.2013	Modified on: 15.10.2013

TTI - TUBACEX TUBOS INOXIDABLES
Registro Mercantil de Alava, Tomo 587, Folio 189, Hoja VI 2885 - N.I.F. A-01140227
Tres cruces, 8
01400 Llodio (Alava)
SPAIN
TL: +34 946719300
FAX: +34 946725062
E-MAIL: qualityttl@tubacex.es

164534

CUSTOMER DESCRIPTION

CLIENT SOLD TO	CLIENT SHIP TO
RACCORTUBI S.P.A. VIALE DE GASPERI 194 20010 MARCALLO CON CASONE MI ITALY	RACCORTUBI S.P.A. VIA FRATELLI KENNEDY 59 20010 MARCALLO CON CASONE MI ITALY

CLIENT ORDER: OS000048 S REV.1
SALES ORDER: 135865

REVIEWED

MATERIAL: SEAML. STAINL. STEEL TUBES/PIPES
HEAT-TREATED, PICKLED, PICKLED-PASSIVATED
GRADE: TP316,TP316L,1.4401,1.4404,
STANDARD: ASME SECT.II PART.A SA312/SA312M-2010 ED. 2011 ADD.
ASTM A312/A312M-12a
EN 10216-5:2004 TC1
NACE MR0175/ISO 15156-3:2009
RACCORTUBI PURCHASING SPECIFICATION RTX_S01S REV.1
NACE MR0103-2010
TOLERANCES: ASME SECT.II PART.A SA999/SA999M-2010 ED. 2011 ADD.
ASTM A999/A999M-12
EN ISO 1127/03.97 D3/T3
RANDOM LENGTHS 5.000/6.500 MM
PLAIN ENDS,
DIMENSIONS: 21,34 X 3,73 MM / 1/2" SCH 80S
COLD FINISHED

Sales Item	Client Item	Delivery No	Lot No.	Heat No	Pieces	Weight	Tot Lgth	Un Lgth
60	ITEM NO: 6	8110029785	200104168	47417	3	28 KG	16,21 M	5000-6500 MM
60	ITEM NO: 6	8110029785	200112685	46702	34	322 KG	203,00 M	5000-6500 MM

RAW MATERIAL

Heat Nr:	Method
46702	Electric furnace+AOD
47417	Electric furnace+AOD

CHEMICAL COMPOSITION (%) *L: Ladle C:Products

*	Heat	Seq	C	Mn	Si	P	S	Ni	Cr	Mo	N
L	46702	1	0,020	1,36	0,420	0,026	0,0010	11,30	16,75	2,11	0,0565
L	47417	1	0,017	1,41	0,460	0,027	0,0010	11,20	16,80	2,12	0,0635
C	46702	2	0,017	1,43	0,460	0,026	0,0010	11,05	16,50	2,09	0,0565
C	47417	14	0,020	1,44	0,450	0,025	0,0010	11,20	16,67	2,30	0,0635

AENOR ER Empresa Registrada
AENOR Gestión Ambiental

TUBACEX TUBOS INOXIDABLES S.A.
INGENIERIA DE CALIDAD
Iñigo Arrieta Alcibar

We hereby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and satisfies order's requirements. This certificate is issued by a computerized system and is valid without original signature. In case the owner of the certificate would release as a copy of it, he must attest its conformity to the issued, assuming the responsibility for any unlawful or TUBACEX, not allowed use. Any forgery or falsification of this certificate shall legally prosecuted.

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 21.34x3.73
Heat n° or Pcs. marking : 46702 Qtà/Qty:6 Posiz./Item n.: 30
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

TUBACEX

INSPECTION CERTIFICATE
EN 10204:2004 / 3.1

Number: 591142 Page: 2 / 3	Rev: 00
Created on: Date: 15.10.2013	Modified on: 15.10.2013

HEAT TREATMENT

SOLUTION ANNEALED AT 1100 °C , 5 min , WATER

TENSILE TEST

Lot No.	Sample	T °C	Rp0,2 MPa	Rp1,0 MPa	Rm MPa	A2" %	A5 %	Type
200104168	1	20	367	409	649	56	53	L
200112685	1	20	375	418	675	54	51	L
	2	20	383	425	682	54	50	L

HARDNESS TEST

Lot No.	Sample	HRB1	HRB2
200104168	1	86	87
200112685	1	88	87
	2	89	88
	3	89	86

METALURGICAL TESTS

INTERGRANULAR CORROSION TEST ACC. TO ASTM A262 PRACT."E": SATISFACTORY

NON-DESTRUCTIVE TESTS

POSITIVE MATERIAL IDENTIFICATION TEST ON EACH TUBE/PIPE BY "X-RAY-FLUORESCENCE-ANALYZER": SATISFACTORY

HYDROSTATIC PRESSURE TESTED AT 170 bar, 2500 PSI DURING 5 SEC ON EACH TUBE/PIPE: SATISFACTORY

DIMENSIONAL CHECKING ON EACH TUBE: SATISFACTORY

VISUAL INSPECTION ON EACH TUBE: SATISFACTORY

TECHNOLOGICAL TESTS

FLARING TEST: SATISFACTORY

FLATTENING TEST: SATISFACTORY

MARKING

TX2 TUBACEX 21,34 X 3,73 MM / 1/2" SCH 80S ASME SA312 ASTM A312 EN 10216-5 TC1 TP316 TP316L 1.4401 1.4404 SMLS HEAT/ PMI-AV LOT NO/ SPAIN

REMARKS

NO MERCURY, MERCURY COMPOUNDS OR MERCURY BEARING INSTRUMENTS AND/OR EQUIPMENT HAVE BEEN USED ALONG

AENOR ER Empresa Registrada UNE-EN ISO 9001

AENOR Gestión Ambiental UNE-EN ISO 14001

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TUBACEX TUBOS INOXIDABLES S.A.
INGENIERIA DE CALIDAD

Iñigo Arriola Alcibar.

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 21.34x3.73
Heat n° or Pcs. marking : 46702 Qtà/Qty:6 Posiz./Item n.: 30
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

TUBACEX

INSPECTION CERTIFICATE
EN 10204:2004 / 3.1

Number: 591142 Page: 3 / 3	Rev: 00
Created on: Date: 15.10.2013	Modified on: 15.10.2013

REMARKS

MANUFACTURING AND INSPECTION PROCESS.

NO WELDING OR WELD REPAIRS WERE MADE

MATERIAL MANUFACTURER APPROVED BY TÜV SÜD Industrie Service GmbH (NOTIFIED BODY 0036)TO ISSUE CERTIFICATES OF SPECIFIC PRODUCT CONTROL IN ACCORDING TO PRESSURE EQUIPMENT DIRECTIVE 97/23/EC ANNEX I POINT 4.3.

MATERIAL CHARACTERISTICS COMPLY WITH POINT 7.5 OF ANNEX I TO PED BY HAVING AN ELONGATION AFTER RUPTURE AT TENSILE TEST NO LESS THAN 14% AND A BENDING RUPTURE ENERGY AT IMPACT TEST NO LESS THAN 27J AT 20°C.

MATERIAL IS FREE OF RADIATION CONTAMINATION

AENOR ER Empresa Registrada

AENOR Gestión Ambiental

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TUBACEX TUBOS INOXIDABLES S.A.
INGENIERIA DE CALIDAD

Iñigo Arrieta Alcibar

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 21.34x3.73
Heat n° or Pcs. marking : 46702 Qtà/Qty:6 Posiz./Item n.: 30
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

TUBACEX

INSPECTION CERTIFICATE
EN 10204:2004 / 3.1

Number: 588477 Page: 1 / 3	Rev: 00
Created on: Date: 16.09.2013	Modified on:

TTI - TUBACEX TUBOS INOXIDABLES
Registro Mercantil de Alava, Tomo 587, Folio 189, Hoja VI 2885 - N.I.F. A-01140227
Tres cruces, 8
01400 Llodio (Alava)
SPAIN
TL: +34 946719300
FAX: +34 946725062
E-MAIL: qualityttl@tubacex.es

CUSTOMER DESCRIPTION 163861

CLIENT SOLD TO	CLIENT SHIP TO
RACCORTUBI S.P.A. VIALE DE GASPERI 194 20010 MARCALLO CON CASONE MI ITALY	RACCORTUBI S.P.A. VIA FRATELLI KENNEDY 59 20010 MARCALLO CON CASONE MI ITALY

CLIENT ORDER: OS000110 S Rev.1
SALES ORDER: 138795

MATERIAL:SEAML. STAINL. STEEL TUBES/PIPES
HEAT-TREATED, PICKLED, PICKLED-PASSIVATED
GRADE: TP316,TP316L,1.4401,1.4404,
STANDARD: ASME SECT.II PART.A SA312/SA312M-2010 ED. 2011 ADD.
ASTM A312/A312M-12a
EN 10216-5:2004 TC1
NACE MR0175/ISO 15156-3:2009
RACCORTUBI PURCHASING SPECIFICATION RTX_S01S REV.1
NACE MR0103-2010
TOLERANCES: ASME SECT.II PART.A SA999/SA999M-2010 ED. 2011 ADD.
ASTM A999/A999M-12
EN ISO 1127/03.97 D3/T3
RANDOM LENGTHS 5.000/6.500 MM
PLAIN ENDS,
DIMENSIONS: 60,33 X 5,54 MM - 2" SCH 80S
COLD FINISHED

Sales Item	Client Item	Delivery No	Lot No.	Heat No	Pieces	Weight	Tot Lgth	Un Lgth
30		8110029018	200107829	47517	96	4.304 KG	564,93 M	5000-6500 MM

RAW MATERIAL

Heat Nr:	Method
47517	Electric furnace+AOD

REVIEWED

CHEMICAL COMPOSITION (%) *L: Ladle C:Product

*	Heat	Seq	C	Mn	Si	P	S	Ni	Cr	Mo	N
L	47517	1	0,020	1,45	0,430	0,027	0,0010	11,25	16,70	2,14	0,0620
C	47517	3	0,022	1,46	0,430	0,027	0,0010	11,20	16,60	2,15	0,0620
C	47517	4	0,022	1,46	0,430	0,028	0,0010	11,25	16,60	2,15	0,0620

AENOR ER Empresa Registrada ER-0139/2001
AENOR Gestión Ambiental GA-2001/0401

TUBACEX TUBOS INOXIDABLES S.A.
INGENIERIA DE CALIDAD
Iñigo Arriola Alcibar

We hereby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and satisfies order's requirements. This certificate is issued by a computerized system and it is valid without original signature. In case the owner of the certificate would release as a copy of it, he must attest its conformity to the issued, assuming the responsibility for any unlawful or TUBACEX, not allowed use. Any forgery or falsification of this certificate shall legally prosecuted.

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 60.33x5.54
Heat n° or Pcs. marking : 47517 Qtà/Qty:96,47 Posiz./Item n.: 40
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

TUBACEX

INSPECTION CERTIFICATE
EN 10204:2004 / 3.1

Number: 588477 Page: 2 / 3	Rev: 00
Created on: Date: 16.09.2013	Modified on:

HEAT TREATMENT

SOLUTION ANNEALED AT 1100 °C , 10 min , WATER

TENSILE TEST

Lot No.	Sample	T	Rp0.2	Rp1.0	Rm	A2"	A5	Type
		°C	*MPa*	*MPa*	*MPa*	*%*	*%*	
200107829	1	20	282	337	563	49	48	L

HARDNESS TEST

Lot No.	Sample	HRB1	HRB2
200107829	1	83	85

METALURGICAL TESTS

INTERGRANULAR CORROSION TEST ACC. TO ASTM A262 PRACT."E": SATISFACTORY

NON-DESTRUCTIVE TESTS

POSITIVE MATERIAL IDENTIFICATION TEST ON EACH TUBE/PIPE BY "X-RAY-FLUORESCENCE-ANALYZER": SATISFACTORY

HYDROSTATIC PRESSURE TESTED AT 170 bar, 2500 PSI DURING 5 SEC ON EACH TUBE/PIPE: SATISFACTORY

DIMENSIONAL CHECKING ON EACH TUBE: SATISFACTORY

VISUAL INSPECTION ON EACH TUBE: SATISFACTORY

TECHNOLOGICAL TESTS

FLARING TEST: SATISFACTORY

FLATTENING TEST: SATISFACTORY

MARKING

TX2 TUBACEX 60,33 X 5,54 MM - 2" SCH 80S ASME SA312 ASTM A312 EN 10216-5 TC1 TP316 TP316L 1.4401 1.4404 CFD CD SMLS HEAT/ PMI-AV LOT NO/SPAIN

REMARKS

NO MERCURY, MERCURY COMPOUNDS OR MERCURY BEARING INSTRUMENTS AND/OR EQUIPMENT HAVE BEEN USED ALONG MANUFACTURING AND INSPECTION PROCESS.

NO WELDING OR WELD REPAIRS WERE MADE

MATERIAL MANUFACTURER APPROVED BY TÜV SÜD Industrie Service GmbH (NOTIFIED BODY 036)TO ISSUE CERTIFICATES OF

AENOR ER Empresa Registrada UNE-EN ISO 9001

AENOR Gestión Ambiental UNE-EN ISO 14001

TUBACEX TUBOS INOXIDABLES S.A.
INGENIERIA DE CALIDAD

Iñigo Arrieta Alcibar

We hereby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and satisfies order's requirements. This certificate is issued by a computerized system and it is valid without original signature. In case the owner of the certificate would release as a copy of it, he must attach its conformity to the issued, assuming the responsibility for any unlawful or TUBACEX, not allowed use. Any forgery or falsification of this certificate shall legally prosecuted.

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 60.33x5.54
Heat n° or Pcs. marking : 47517 Qtà/Qty:96,47 Posiz./Item n.: 40
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

TUBACEX

INSPECTION CERTIFICATE
EN 10204:2004 / 3.1

Number: 588477 Page: 3 / 3	Rev: 00
Created on: Date: 16.09.2013	Modified on:

REMARKS

SPECIFIC PRODUCT CONTROL IN ACCORDING TO PRESSURE EQUIPMENT DIRECTIVE 97/23/EC ANNEX I POINT 4.3.

MATERIAL CHARACTERISTICS COMPLY WITH POINT 7.5 OF ANNEX I TO PED BY HAVING AN ELONGATION AFTER RUPTURE AT TENSILE TEST NO LESS THAN 14% AND A BENDING RUPTURE ENERGY AT IMPACT TEST NO LESS THAN 27J AT 20°C.

MATERIAL IS FREE OF RADIATION CONTAMINATION

AENOR ER Empresa Registrada ER-0430/2000/AQ01

AENOR GA Gestión Ambiental GA-2000/0150/AQ01

We hereby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and satisfies order's requirements. This certificate is issued by a computerized system and it is valid without original signature. In case the owner of the certificate would release as a copy of it, he must attest its conformity to the issued, assuming the responsibility for any unlawful of TUBACEX, not allowed use. Any forgery or falsification of this certificate shall legally prosecuted.

TUBACEX TUBOS INOXIDABLES S.A.
INGENIERIA DE CALIDAD

Iñigo Arpiola Alcibar

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 60.33x5.54
Heat n° or Pcs. marking : 47517 Qtà/Qty:96,47 Posiz./Item n.: 40
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

(A01) Salzgitter Mannesmann Stainless Tubes Italia Srl
(A05) Via Pio 30 - 24062 Costa Volpino (BG) - ITALY
www.smst-tubes.com

SALZGITTER MANNESMANN STAINLESS TUBES

INSPECTION CERTIFICATE

(A02) EN 10204: 2004 TYPE 3.1

(A03) No **4-13-18472-rev.01**

(A06) **Purchaser**	(A07) **Customer Order No**
RACCORTUBI Spa	OS27 #N#
Viale De Gasperi	(A08) **SMST-Tubes Order No**
20010 MARCALLO	0000250457
Milano	**SMST-Item** (A09) **Part No**
Italia	0000250457-000003

161418

(B01)(B02)(B04) **Product Description**

Seamless Stainless Steel Cold Finished Pipes Solution Annealed Free From Scale Plain Ends Square Cut Deburred

Specifications	ASME SA 312M 11 a;ASTM A 312M 12;EN 10216-5 09.2004 AC:2008 TC1;NACE MR0103 2007;NACE MR0175/ISO 15156-3 2009;RACCORTUBI RTX_S01S Rev.1
Grade	1.4401;1.4404;TP 316;TP 316L
Tolerances	A 312M;EN 10216-5

(B03) **Supplementary Requirements**

None

(B06)(D01) **Marking of the Product**

Technical marking	DMV-I EN 10216-5 TC1 ASTM A 312 ASME SA 312 DMV 316L TP 316L TP 316 1.4404 1.4401 - NPS 3/4 X SCH 80S 26,70 MM X 3,91 MM - ET SML CFD HEAT $HEAT_NBR$ $QUAL_LOT_NBR$ ITALY IF 250457-003
End marking	BUNDLE $BUNDLE_NBR$
Country of Origin of the tubes	Italy

Quantity						Dimensions			
(B07) Heat	Quality Lot	SMST-Item	(B08) Pieces	(B13) Weight	(B16) Length	(B09) OD	(B10) WT	(B11) Ordered Length min	(B11) Ordered Length max
QP633	QL40020798	000003	215	2776.00 kg	1246.800 m	26.70 mm	3.91 mm	5000 mm	6500 mm
				6120.03 lbs	4090.55 ft	NPS 3/4	SCH 80S	16.40 ft	21.33 ft
				6120.03 lbs	4090.55 ft	1.051 "	0.154 "	16.40 ft	21.33 ft
QP635	QL40020745	000003	151	1944.00 kg	857.000 m	26.70 mm	3.91 mm	5000 mm	6500 mm
				4285.79 lbs	2811.68 ft	NPS 3/4	SCH 80S	16.40 ft	21.33 ft
				4285.79 lbs	2811.68 ft	1.051 "	0.154 "	16.40 ft	21.33 ft

Heat Analysis

REVIEWED

		Request	C	Si	Mn	P	S	Cr	Ni	Mo	N
		Min	0.00	0.00	0.00	0.00	0.0000	16.5	11.00	2.0	0.00
		Max	0.030	1.0	2.0	0.040	0.0150	18.00	13.0	2.5	0.11
(B07) Heat	Heat Origin	(C70) Melting Process	%	%	%	%	%	%	%	%	%
QP633	Germany	E+AOD/VOD	0.011	0.27	1.89	0.016	0.008	16.73	11.04	2.10	0.070
QP635	Germany	E+AOD/VOD	0.013	0.29	1.88	0.018	0.009	16.77	11.14	2.14	0.071

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 26.67x3.91
Heat n° or Pcs. marking : QP635 Qtà/Qty:6 Posiz./Item n.: 50
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

(A01) Salzgitter Mannesmann Stainless Tubes Italia Srl
(A05) Via Pio 30 - 24062 Costa Volpino (BG) - ITALY
www.smst-tubes.com

SALZGITTER MANNESMANN STAINLESS TUBES

INSPECTION CERTIFICATE

(A02) EN 10204: 2004 TYPE 3.1

(A03) No **4-13-18472-rev.01**

Product Analysis

EN 10216-5 // ASTM A 312M // ASME SA 312M

	Request	C	Si	Mn	P	S	Cr	Ni	Mo	N
	Min	0.00	0.00	0.00	0.00	0.0000	16.3	11.00	2.00	0.00
	Max	0.030	1.00	2.00	0.045	0.0180	18.00	13.15	2.6	0.12
Quality Lot	(C00) Sample	%	%	%	%	%	%	%	%	%
QL40020745	40166647	0.013	0.29	1.81	0.016	0.0080	16.67	11.12	2.19	0.07
QL40020798	40167046	0.011	0.29	1.81	0.015	0.0080	16.60	11.03	2.12	0.07

Sampling done on tubes in manufacturing length

Tensile Test at Room Temperature

EN 10002-1 // ASTM A 370

(C02) Direction : LONGITUDINAL

		(C11) YS 0.2% Rp 0,2%	(C11) YS 1% Rp 1%	(C12) U.T.S. Rm	(C13) EL 50mm	(C13) EL 5,65√So
Request	Min	205	240	515	35	40
	Max			690		
Quality Lot	(C00) Sample	MPa	MPa	MPa	%	%
QL40020745	40166647	392	430	654	46	40,84
QL40020798	40167046	401	447	675	49	40,32
	40167178	428	465	663	49	40,00

Sampling done on tubes in manufacturing length

(C30) Hardness Test

NACE MR0175/ISO 15156-3 // NACE MR0103

(C30) HRC

		Request			22 max
Quality Lot	(C00) Sample	Result	(C31) Min	(C31) Max	(C32) Avg
QL40020745	40166647		8.0	9.0	9
QL40020798	40167046		9.0	10.0	10

Sampling done on tubes in manufacturing length

(C62) Drift Expanding Test

EN 10234

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 26.67x3.91
Heat n° or Pcs. marking : QP635 Qtà/Qty:6 Posiz./Item n.: 50
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

(A01) Salzgitter Mannesmann Stainless Tubes Italia Srl
(A05) Via Pio 30 - 24062 Costa Volpino (BG) - ITALY
www.smsl-tubes.com

SALZGITTER MANNESMANN STAINLESS TUBES

INSPECTION CERTIFICATE

(A02) EN 10204: 2004 TYPE 3.1

(A03) No: **4-13-18472-rev.01**

EN 10234

Quality Lot	(C00) Sample		Result
QL40020745	40166647		OK
QL40020798	40167046	40167178	OK

Sampling done on tubes in manufacturing length

(C50) Flattening Test

ASTM A 999

Quality Lot	(C00) Sample					Result
QL40020745	40166644	40166645	40166646	40166647		OK
QL40020798	40167044	40167045	40167046	40167176	40167177	40167178	OK

Sampling done on tubes in manufacturing length

Intergranular Corrosion Test

ASTM A 262 PRACTICE E

Quality Lot	Request Max Unit (C00) Sample	Result
QL40020745	40166647	Satisfactory
QL40020798	40167046	Satisfactory

Sampling done on tubes in manufacturing length

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 26.67x3.91
Heat n° or Pcs. marking : QP635 Qtà/Qty:6 Posiz./Item n.: 50
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

(A01) Salzgitter Mannesmann Stainless Tubes Italia Srl
(A05) Via Pio 30 - 24062 Costa Volpino (BG) - ITALY
www.smst-tubes.com

SALZGITTER MANNESMANN STAINLESS TUBES

INSPECTION CERTIFICATE

(A02) EN 10204: 2004 TYPE 3.1

(A03) No **4-13-18472-rev.01**

Other Tests and Declarations

QL40020745; QL40020798

Heat Treatment Solution Annealed 1070 C° Holding Time 2 Min / mm WT rapid cooling

(D01)	Visual and dimensional inspection (VT) on 100% of tubes according to the order	Satisfactory
(D51)	Antimixing Check (PMI) on 100% of tubes	Satisfactory
(D02)	Eddy Current Testing (ET) on 100% of tubes ASTM A 999; EN 10246-2	Satisfactory
(D52)	Hydro Pressure Test 5 Second at 17 MPA ASTM A 999; EN 10216-5	Satisfactory

The material is conforming to directive 2000/53/EC, 2002/95/EC and CD 2005/618/EC

No Weld Repair

(Z01) SMST declares that the product is in compliance with the order.

Tubes are free from mercury contamination and from radioactiv contamination

Confimation with reference to Pressure Equipment Directive 97/23/EC:
The works operates a quality management system that has undergone a specific assessment for materials for pressure equipment and is certified by a competent body (TUV-Cert. No: 70/2002/MUC)

(Z02) Mill's Inspector **Fausto Razzitti** Date of Edition **13/05/2013**

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Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 26.67x3.91
Heat n° or Pcs. marking : QP635 Qtà/Qty:6 Posiz./Item n.: 50
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

SALZGITTER MANNESMANN STAINLESS TUBES
A Member of the Salzgitter Group

SMST Deutschland GmbH (A01)
Postfach 16 01 20 - D-42830 Remscheid - DEUTSCHLAND
www.smst-tubes.com

Page/Seite 1/4

No/Nr/N° (A03)
250303-032646

INSPECTION CERTIFICATE
Abnahmeprüfzeugnis
Certificat de réception
EN 10204: 2004 TYPE 3.1 (A02)

SMST Deutschland GmbH - Postfach 16 01 20 - D-42830 Remscheid - DEUTSCHLAND
RACCORTUBI Spa
Viale De Gasperi
20010 MARCALLO
Italien

Purchaser/Besteller/Acheteur

Customer order no./Kunde Auftragsnr./N° Commande client (A07)
OS19

SMST-Tubes order no/Auftragsnr./N° Commande (A08)
0000250303

SMST-Tubes Item **Part number/Teilenummer/N° d'article (A09)**
0000250303-000008

Product Description/Produkt Beschreibung/Description du produit (B01) (B02) (B04)

162541

Seamless Stainless Steel Hot Finished Tubes Pickled Plain Ends Square Cut Deburred
Warmgefertigte, nahtlose Edelstahlrohre Gebeizt Enden Glatt Abgeschnitten
Tubes en Acier Inox Sans Soudure Finis à Chaud Pickled Coupés d'equerre, lisses, ébavuré

Specifications/Spezifikationen/Spécifications ASME SA 312M 11 a / ASTM A 312M 12 / EN 10216-5 09.2004 AC:2008 TC1 / NACE MR0175/ISO 15156-3 2009 / RACCORTUBI RTX_S01S Rev.1

Grade/Werkstoff/Nuance 1.4401 / 1.4404 / TP 316 / TP 316L

Tolerances/Toleranzen/Tolérances A 312M / EN 10216-5

Supplementary requirements/Zusatzanforderungen/Exigences supplémentaires (B03):

MARKING:
DMV-D – DMV 316L - TP 316 - TP 316L - 1.4401 - 1.4404 - HEAT - 88,9 x 7,62 - NPS 3 x SCH 80S - EN 10216-5-TC1 - HFD - ASTM A 312/M - ASME SA 312/M - SML - 250303/8 - WA

Quantity/Menge/Quantité						Dimensions / Abmessungen			
Heat no Schmelze Nr. N° de Coulée	Quality lot Qualitätslos Lot qualité	SMST Item	Pieces Stück Pièces (B08)	Total weight Gesamtgewicht Masse totale (B13)	Total length Gesamtlänge Longueur totale	OD (B09)	WT (B10)	Tube length Rohrlänge Longueur tube min (B11)	max
370049	QL20023288	000008	46	3810.00 Kg 8400 Lbs	252.780 m 829.33 Ft	88.90 mm 3.500 "	7.62 mm 0.300 "	6000 mm 19.40 Ft	6500 mm 21.33 Ft

Chemical Analysis / Chemische Zusammensetzung / Analyse chimique (C71 - C92)

Heat no/Schmelzen Nr./N° de coulée 370049

Melting Process/Erschmelzungsart/Élaboration (C70) E + AOD

Heat Origin/Ursp. der Schmelze/Origine de la Coulée Italy

Heat Analysis / Analyse de coulée

	C	Si	Mn	P	S	Cr	Ni	Mo	N
Min	0.00	0.00	0.00	0.00	0.0000	16.5	11.00	2.0	0.00
Max	0.030	1.0	2.0	0.040	0.0150	18.00	13.0	2.5	0.11
	0,017	0,46	1,66	0,025	0,008	17,00	11,18	2,05	0,070

Quality Lot : QL20023288

Product Analysis / Analyse du produit **EN 10216-5 ASTM A 312M ASME SA 312M**

	C	Si	Mn	P	S	Cr	Ni	Mo	N
Min	0,000	0,00	0,00	0,000	0,0000	16,30	11,00	2,00	0,00
Max	0,035	1,00	2,00	0,046	0,0180	18,00	13,15	2,60	0,12
20023004	0,017	0,44	1,65	0,021	0,0071	16,93	11,35	2,02	0,08
20023005	0,017	0,43	1,60	0,020	0,0064	16,91	11,06	2,04	0,08

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Dieses Zeugnis bzw. Diese Bescheinigung wurde mit Hilfe der EDV erstellt und ist ohne Unterschrift gültig. Veränderungen sowie Verwendung für andere Erzeugnisse werden als Urkundenfälschung und Betrug strafrechtlich verfolgt.

Ce certificat est rédigé à l'aide d'un traitement électronique de donnée et est applicable sans signature. Tout changement ou application pou d'autres produits seront considérés comme falsification de documents et fraude et seront sujet à la juridiction pénale.

REVIEWED

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 88.90x7.62
Heat n° or Pcs. marking : 370049 Qtà/Qty:27,5 Posiz./Item n.: 60
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

SALZGITTER MANNESMANN STAINLESS TUBES
A Member of the Salzgitter Group

SMST Deutschland GmbH (A01)
Postfach 16 01 20 - D-42830 Remscheid - DEUTSCHLAND
www.smst-tubes.com

No/Nr/N° (A03)

250303-032646

INSPECTION CERTIFICATE
Abnahmeprüfzeugnis
Certificat de réception

EN 10204: 2004 TYPE 3.1 (A02)

Mechanical testing

Quality Lot : QL20023288

Tensile test at room temperature/Zugversuch bei Raumtemperatur/Essai de traction à température ambiante (C10)

EN 10002-1 ASTM A 370

Test no Proben Nr. N° d'échantillon (C00)	Direction Probenrichtung Direction (C02)	Yield strength/Dehngrenze/Limite d'élasticité (C11)			Tensile strength / Zugfestigkeit / Résistance à la traction (C12)	Elongation/Bruchdehnung/Allongement (C13)					Reduction of area Z%
		0.2 %	0.5 %	1 %		2 "	50 mm	5D	5,65 √So	4D	
		MPa	/	MPa	MPa	/	%	/	%	/	/
	Min	205	/	240	515	/	35	/	40	/	/
	Max	/	/	/	690	/	/	/	/	/	/
20023005	LONGITUDINAL	291	/	344	624	/	47	/	47	/	/

Hardness test/Härteprüfung/Essai de dureté (C30)

NACE MR0175/ISO 15156-3 NACE MR0103

Load /

Test no Proben Nr. N° d'échantillon	HB			HRC			HV			HRB			HR 15-T			HR 30-T		
Min	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Max	/	/	/	22	22	22	/	/	/	/	/	/	/	/	/	/	/	/
	min	max	avg	min	max	avg	min	max	avg	min	max	avg	min	max	avg	min	max	avg
20023005	/	/	/	<22,0	<22,0	22	/	/	/	80,0	80,0	80,00	/	/	/	/	/	/

Flattening test/Faltversuch/Essai d'aplatissement (C50)

ASTM A 999

Test Number	Result
20023004	OK
20023005	OK

Drift expanding test/Dornaufweiteversuch/Essai d'évasement (C52)

EN 10234

Test Number	Result
20023006	OK

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Other testing

Quality Lot : QL20023288

Intergranular corrosion test/Prüfung Interkristallinen Korrosion/Essai de corrosion intergranulaire

ASTM A 262 PRACTICE E

Test Number	Result
20023005	Satisfactory

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Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 88.90x7.62
Heat n° or Pcs. marking : 370049 Qtà/Qty:27,5 Posiz./Item n.: 60
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

SALZGITTER MANNESMANN STAINLESS TUBES
A Member of the Salzgitter Group

SMST Deutschland GmbH (A01)
Postfach 16 01 20 - D-42830 Remscheid - DEUTSCHLAND
www.smst-tubes.com

INSPECTION CERTIFICATE
Abnahmeprüfzeugnis
Certificat de réception

No/Nr/N° (A03)

250303-032646

EN 10204: 2004 TYPE 3.1 (A02)

Other Tests and Declarations / Andere Prüfungen und Prüffeststellungen / Autres tests et déclarations

VISUAL AND DIMENSIONAL INSPECTION: SATISFACTORY / BESICHTIGUNG UND MASSKONTROLLE: BESTANDEN
MATERIAL IDENTIFICATION TEST OF ALL TUBES BY SPECTROGRAPHIC ANALYSIS: SATISFACTORY
VERWECHSLUNGSPRUEFUNG ALLER ROHRE DURCH SPECTRAL ANALYSE: BESTANDEN
HYDROSTATIC TEST, 170 BAR (1BAR=100KPA), HOLDING TIME 5 SEC.: SATISFACTORY
INNENDRUCKVERSUCH MIT WASSER 170 BAR (1BAR=100KPA), HALTEZEIT 5 SEC.: BESTANDEN
HEAT TREATMENT: HOT EXTRUDED (1200° C / AIR) / WAERMEBEHANDLUNG: WARM GEPRESST (1200° C / LUFT)

No Weld repair / Keine Reparaturschweissung / Aucune réparation par soudure

The material is conforming to directive 2000/53/EC, 2002/95/EC and CD 2005/618/EC. / Das Material entspricht den Anforderungen der Richtlinien 2000/53/EC, 2002/95/EC und CD 2005/618/EC. / Le matériau est conforme aux directives 2000/53/EC, 2002/95/EC et CD 2005/618/EC.

Tubes are free from mercury contamination and from radioactive contamination / Die Rohre sind frei von Quecksilberverunreinigungen und frei vom radioaktiver Verunreinigung / Les tubes sont exempts de contamination par le mercure et de contamination radioactive

Confirmation with reference to Pressure Equipment Directive 97/23/EC:
The works operates a quality management system that has undergone a specific assessment for materials for pressure equipment and is certified by a competent body (TÜV-Cert.No:01202811/Q-020025)
Bestätigung in Bezug auf Druckgeräterichtlinie 97/23/EC:
Das Werk wendet ein Qualitätsmanagementsystem an, das in Bezug auf Werkstoffe für Druckgeräte einer spezifischen Bewertung unterzogen wurde und von einer zuständigen Stelle (TÜV-Cert.No:01202811/Q-020025) zertifiziert ist.
Confirmation concernant la Directive Equipements sous Pression 97/23/EC : L'usine applique un système de management de la qualité qui a fait l'objet d'une évaluation spécifique pour les matériaux pour équipements sous pression et qui est certifié par un organisme compétent (TÜV-Cert.No:01202811/Q-020025)

SMST certify that the delivered products comply with the requirements stipulated in the order. / Die Erzeugnisse wurden bestellungsgemäß geprüft und für in Ordnung befunden. / SMST-Tubes atteste que les produits livrés sont conformes aux stipulations de la commande.

Validation by manufacturer's representative / Validierung durch Vertreter des Herstellers

Mill's Inspector Werksachverständiger Le contrôleur usine	D. Brozulat
Date of edition Ausgabedatum Date d'édition	24/06/2013

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Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 88.90x7.62
Heat n° or Pcs. marking : 370049 Qtà/Qty:27,5 Posiz./Item n.: 60
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

INSPECTION CERTIFICATE
EN 10204:2004 / 3.1

Number: 588435 Page: 1 / 3	Rev: 00
Created on: Date: 13.09.2013	Modified on:

TTI - TUBACEX TUBOS INOXIDABLES
Registro Mercantil de Alava, Tomo 587, Folio 189, Hoja VI 2885 - N.I.F. A-01140227
Tres cruces, 8
01400 Llodio (Alava)
SPAIN
TLS: +34 946719300
FAX: +34 946725062
E-MAIL: qualitytti@tubacex.es

163918

CUSTOMER DESCRIPTION

CLIENT SOLD TO	CLIENT SHIP TO
RACCORTUBI S.P.A. VIALE DE GASPERI 194 20010 MARCALLO CON CASONE MI ITALY	RACCORTUBI S.P.A. VIA FRATELLI KENNEDY 59 20010 MARCALLO CON CASONE MI ITALY

CLIENT ORDER: OS0000748 REV.1
SALES ORDER: 137107

MATERIAL:SEAML. STAINL. STEEL TUBES/PIPES
HEAT-TREATED, PICKLED, PICKLED-PASSIVATED
GRADE: TP316,TP316L,1.4401,1.4404,
STANDARD: ASME SECT.II PART.A SA312/SA312M-2010 ED. 2011 ADD.
ASTM A312/A312M-12a
EN 10216-5:2004 TC1
NACE MR0175/ISO 15156-3:2009
RACCORTUBI PURCHASING SPECIFICATION RTX_801S REV.1
NACE MR0103-2010
TOLERANCES: ASME SECT.II PART.A SA999/SA999M-2010 ED. 2011 ADD.
ASTM A999/A999M-12
EN ISO 1127/03.97 D2/T2
RANDOM LENGTHS 5.000/6.500 MM
PLAIN ENDS,
DIMENSIONS: 114,30 X 8,56 MM / 4" SCH 80S
HOT FINISHED

Sales Item	Client Item	Delivery No	Lot No.	Heat No	Pieces	Weight	Tot Lgth	Un Lgth
140		8110029016	200109390	47483	4	564 KG	23,92 M	5000-6500 MM
140		8110029016	200109391	47628	34	4.873 KG	206,45 M	5000-6500 MM

RAW MATERIAL

Heat Nr:	Method
47483	Electric furnace+AOD
47628	Electric furnace+AOD

CHEMICAL COMPOSITION (%) *L: Ladle C:Products

*	Heat	Seq	C	Mn	Si	P	S	Ni	Cr	Mo	N
L	47483	1	0,016	1,41	0,440	0,027	0,0010	11,15	16,65	2,09	0,0555
L	47628	1	0,017	1,38	0,480	0,028	0,0010	11,15	16,90	2,01	0,0625
C	47483	8	0,018	1,45	0,460	0,029	0,0010	11,10	16,70	2,10	0,0500
C	47628	1	0,019	1,40	0,460	0,030	0,0010	11,20	16,85	2,10	0,0600

AENOR ER Empresa Registrada ER-0030/2000
AENOR Gestión Ambiental GA-2001/0160

We hereby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and satisfies order's requirements. This certificate is issued by a computerized system and it is valid without original signature. In case the owner of the certificate would release as a copy of it, he must attest its conformity to the issued, assuming the responsibility for any unlawful or TUBACEX, not allowed use. Any forgery or falsification of this certificate shall legally prosecuted.

TUBACEX TUBOS INOXIDABLES S.A.
INGENIERIA DE CALIDAD
Iñigo Arriola Alcibar

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 114.30x8.56
Heat n° or Pcs. marking : 47628 Qtà/Qty:48,3 Posiz./Item n.: 70
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

TUBACEX

INSPECTION CERTIFICATE EN 10204:2004 / 3.1

Number: 588435 Page: 2 / 3	Rev: 00
Created on: Date: 13.09.2013	Modified on:

HEAT TREATMENT

SOLUTION ANNEALED AT 1040 °C , Rapidly cooled

TENSILE TEST

Lot No.	Sample	T	Rp0.2	Rp1.0	Rm	A2"	A5	Type
		°C	MPa	MPa	MPa	%	%	
200109390	1	20	383	425	620	44	40	L
200109391	1	20	415	455	645	46	42	L

HARDNESS TEST

Lot No.	Sample	HRB1	HRB2
200109390	1	84	85
200109391	1	86	87

METALURGICAL TESTS

INTERGRANULAR CORROSION TEST ACC. TO ASTM A262 PRACT."E": SATISFACTORY

NON-DESTRUCTIVE TESTS

POSITIVE MATERIAL IDENTIFICATION TEST ON EACH TUBE/PIPE BY "X-RAY-FLUORESCENCE-ANALYZER": SATISFACTORY

HYDROSTATIC PRESSURE TESTED AT 2200 PSI DURING 5 SEC ON EACH TUBE/PIPE: SATISFACTORY

DIMENSIONAL CHECKING ON EACH TUBE: SATISFACTORY

VISUAL INSPECTION ON EACH TUBE: SATISFACTORY

TECHNOLOGICAL TESTS

FLARING TEST: SATISFACTORY

FLATTENING TEST: SATISFACTORY

MARKING

TX3 TUBACEX 114,30 X 8,56 MM / 4" SCH 80S ASME SA312 ASTM A312 EN 10216-5 TC1 TP316 TP316L 1.4401 1.4404 HFD HF SMLS HEAT/ PMI-AV LOT NO/SPAIN

REMARKS

NO MERCURY, MERCURY COMPOUNDS OR MERCURY BEARING INSTRUMENTS AND/OR EQUIPMENT HAVE BEEN USED ALONG MANUFACTURING AND INSPECTION PROCESS.

NO WELDING OR WELD REPAIRS WERE MADE

AENOR ER Empresa Registrada

AENOR GA Gestión Ambiental

TUBACEX TUBOS INOXIDABLES S.A.
INGENIERIA DE CALIDAD

Iñigo Arriola Alcibar

We hereby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above stipulated specifications and satisfies order's requirements. This certificate is issued by a computerized system and it is valid without original signature. In case the owner of the certificate would release as a copy of it, he must attest its conformity to the issued, assuming the responsibility for any unlawful or TUBACEX, not allowed use. Any forgery or falsification of this certificate shall legally prosecuted.

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 114.30x8.56
Heat n° or Pcs. marking : 47628 Qtà/Qty:48,3 Posiz./Item n.: 70
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

TUBACEX

INSPECTION CERTIFICATE EN 10204:2004 / 3.1

Number: 588435 Page: 3 / 3	Rev: 00
Created on: Date: 13.09.2013	Modified on:

REMARKS

MATERIAL MANUFACTURER APPROVED BY TÜV SÜD Industrie Service GmbH (NOTIFIED BODY 036)TO ISSUE CERTIFICATES OF SPECIFIC PRODUCT CONTROL IN ACCORDING TO PRESSURE EQUIPMENT DIRECTIVE 97/23/EC ANNEX I POINT 4.3.

MATERIAL CHARACTERISTICS COMPLY WITH POINT 7.5 OF ANNEX I TO PED BY HAVING AN ELONGATION AFTER RUPTURE AT TENSILE TEST NO LESS THAN 14% AND A BENDING RUPTURE ENERGY AT IMPACT TEST NO LESS THAN 27J AT 20°C.

MATERIAL IS FREE OF RADIATION CONTAMINATION

AENOR ER Empresa Registrada

AENOR Gestión Ambiental

We hereby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and satisfies order's requirements. This certificate is issued by a computerized system and it is valid without original signature. In case the owner of the certificate would release as a copy of it, he must attest its conformity to the issued, assuming the responsibility for any unlawful or TUBACEX not allowed use. Any forgery or falsification of this certificate shall legally prosecuted.

TUBACEX TUBOS INOXIDABLES S.A.
INGENIERIA DE CALIDAD

Iñigo Arriola Ripiñar

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 114.30x8.56
Heat n° or Pcs. marking : 47628 Qtà/Qty:48,3 Posiz./Item n.: 70
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

TUBACEX

INSPECTION CERTIFICATE
EN 10204:2004 / 3.1

Number: 577747 Page: 1 / 3	Rev: 00
Created on: Date: 25.04.2013	Modified on:

TTI - TUBACEX TUBOS INOXIDABLES
Registro Mercantil de Alava, Tomo 587, Folio 189, Hoja VI 2885 - N.I.F. A-01140227
Tres cruces, 8
01400 Llodio (Alava)
SPAIN
TL: +34 946719300
FAX: +34 946725062
E-MAIL: qualitytti@tubacex.es

161258

CUSTOMER DESCRIPTION

CLIENT SOLD TO	CLIENT SHIP TO
RACCORTUBI S.P.A. VIALE DE GASPERI 194 20010 MARCALLO CON CASONE MI ITALY	RACCORTUBI S.P.A. VIA FRATELLI KENNEDY 59 20010 MARCALLO CON CASONE MI ITALY

CLIENT ORDER: OS000265 S
SALES ORDER: 130744

MATERIAL:SEAML. STAINL. STEEL TUBES/PIPES
HEAT-TREATED, PICKLED, PICKLED-PASSIVATED
GRADE: TP316,TP316L,1.4401,1.4404,
STANDARD: ASME SECT.II PART.A SA312/SA312M-2010 ED. 2011 ADD.
ASTM A312/A312M-12
EN 10216-5:2004 TC1
NACE MR0175/ISO 15156-3:2009
RACCORTUBI PURCHASING SPECIFICATION RTX_S013 REV.1
NACE MR0103-2010
TOLERANCES: ASME SECT.II PART.A SA999/SA999M-2010 ED. 2011 ADD.
ASTM A999/A999M-12
EN ISO 1127/03.97 D3/T3
RANDOM LENGTHS 5,000/6.500 MM
PLAIN ENDS,
DIMENSIONS: 48,26 X 5,08 MM
COLD FINISHED

Sales Item	Client Item	Delivery No	Lot No.	Heat No	Pieces	Weight	Tot Lgth	Un Lgth
190		8110025406	200098980	47163	95	3.142 KG	567,59 M	5000-6500 MM

RAW MATERIAL

Heat Nr:	Method
47163	Electric furnace+AOD

CHEMICAL COMPOSITION (%) *L: Ladle C:Products

*	Heat	Seq	C	Mn	Si	P	S	Ni	Cr	Mo	N
L	47163	1	0,012	1,39	0,430	0,027	0,0010	11,20	16,85	2,13	0,0585
C	47163	2	0,014	1,41	0,440	0,025	0,0010	11,15	16,75	2,11	0,0585

REVIEWED

AENOR ER Empresa Registrada ONE-EN ISO 9001
AENOR Gestión Ambiental ONE-EN ISO 14001

We hereby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and satisfies order's requirements. This certificate is issued by a computerized system and it is valid without original signature. In case the owner of this certificate would release as a copy of it, he must attest its conformity to the issued, assuming the responsibility for any unlawful or TUBACEX, not allowed use. Any forgery or falsification of this certificate shall legally prosecuted.

TUBACEX TUBOS INOXIDABLES S.A.
INGENIERIA DE CALIDAD
Iñigo Arzúola Alcibar

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 48.26x5.08
Heat n° or Pcs. marking : 47163 Qtà/Qty:6,16 Posiz./Item n.: 80
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

TUBACEX

INSPECTION CERTIFICATE
EN 10204:2004 / 3.1

Number: 577747 Page: 2 / 3	Rev: 00
Created on: Date: 25.04.2013	Modified on:

HEAT TREATMENT

SOLUTION ANNEALED AT 1100 °C , 7 min , WATER

TENSILE TEST

Lot No.	Sample	T	Rp0.2	Rp1.0	Rm	A2"	A5	Type
		°C	MPa	MPa	MPa	%	%	
200098980	1	20	309	354	588	59	51	L

HARDNESS TEST

Lot No.	Sample	HRB1	HRB2
200098980	1	83	84

METALURGICAL TESTS

INTERGRANULAR CORROSION TEST ACC. TO ASTM A262 PRACT."E": SATISFACTORY

NON-DESTRUCTIVE TESTS

POSITIVE MATERIAL IDENTIFICATION TEST ON EACH TUBE/PIPE BY "X-RAY-FLUORESCENCE-ANALYZER": SATISFACTORY

HYDROSTATIC PRESSURE TESTED AT 170 bar, 2500 PSI DURING 5 SEC ON EACH TUBE/PIPE: SATISFACTORY

DIMENSIONAL CHECKING ON EACH TUBE: SATISFACTORY

VISUAL INSPECTION ON EACH TUBE: SATISFACTORY

TECHNOLOGICAL TESTS

FLARING TEST: SATISFACTORY

FLATTENING TEST: SATISFACTORY

MARKING

TX2 TUBACEX 48,26 X 5,08 MM ASME SA312 ASTM A312 EN 10216-5 TC1 TP316 TP316L 1.4401 1.4404 CFD CD SML3 HEAT/ PMI-AV LOT NO/SPAIN

REMARKS

NO MERCURY, MERCURY COMPOUNDS OR MERCURY BEARING INSTRUMENTS AND/OR EQUIPMENT HAVE BEEN USED ALONG MANUFACTURING AND INSPECTION PROCESS.

NO WELDING OR WELD REPAIRS WERE MADE

MATERIAL MANUFACTURER APPROVED BY TÜV SÜD Industrie Service GmbH (NOTIFIED BODY 036)TO ISSUE CERTIFICATES OF

AENOR ER Empresa Registrada ER-0483/2001

AENOR GA Gestión Ambiental GA-2001/0009

TUBACEX TUBOS INOXIDABLES S.A.
INGENIERIA DE CALIDAD

Iñigo Arriola Aleiber

We hereby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and satisfies order's requirements. This certificate is issued by a computerized system and it is valid without original signature. In case the owner of the certificate would release as a copy of it, he must attest its conformity to the issued, assuming its responsibility for any unlawful or TUBACEX, not allowed use. Any forgery or falsification of this certificate shall legally prosecuted.

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 48.26x5.08
Heat n° or Pcs. marking : 47163 Qtà/Qty:6,16 Posiz./Item n.: 80
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

raccortubi

TUBACEX

INSPECTION CERTIFICATE
EN 10204:2004 / 3.1

Number: 577747 Page: 3 / 3	Rev: 00
Created on: Date: 25.04.2013	Modified on:

REMARKS

SPECIFIC PRODUCT CONTROL IN ACCORDING TO PRESSURE EQUIPMENT DIRECTIVE 97/23/EC ANNEX 1 POINT 4.3.

MATERIAL CHARACTERISTICS COMPLY WITH POINT 7.5 OF ANNEX I TO PED BY HAVING AN ELONGATION AFTER RUPTURE AT TENSILE TEST NO LESS THAN 14% AND A BENDING RUPTURE ENERGY AT IMPACT TEST NO LESS THAN 27J AT 20°C.

MATERIAL IS FREE OF RADIATION CONTAMINATION

AENOR ER Empresa Registrada

AENOR Gestión Ambiental

We hereby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and satisfies order's requirements. This certificate is issued by a computerized system and it is valid without original signature. In case the owner of the certificate would release as a copy of it, he must attest its conformity to the issued, assuming the responsibility for any unlawful of TUBACEX, not allowed use. Any forgery or falsification of this certificate shall legally prosecuted.

TUBACEX TUBOS INOXIDABLES S.A.
INGENIERIA DE CALIDAD

Iñigo Arriola Alcibar

Customer: ROSETTI MARINO S.p.A.
Order : 1713004007 112A70B - 28.10.2013 Project: 112A70B - DECK MARLIN FOXTROT
Descr. : 48.26x5.08
Heat n° or Pcs. marking : 47163 Qtà/Qty:6,16 Posiz./Item n.: 80
Protocollo : CTCERC201300021537 * CERTIFIED TRUE COPY * Issued 31/10/13

ROSETTI MARINO

PQR 03/19

Base material certificate
(Plate EN 10225: S460G2+M)

Q011201453

TOTAL

WEST FRANKLIN PROJECT

ROSETTI MARINO

ARCELORMITTAL PROJECTS INTERNAT.B.V.

ELGIN B TOPSIDE

PLATES - NODES

CERTIFICATION DOSSIER

ROSETTI P.O. NR. 1712004722

ROSETTI JOB NR. 111A61

ELB-1712004722-K01-00001

ROSETTI MARINO SpA
VERIFIED
VERIFICATO
DATE/data 14 FEB 2013
SIGNATURE/firma

Rev	Date	Reason for Revision
I01	15/02/2013	Issued for information

QM-System: Certification as per ISO 9001

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION REPORT 3.2 AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991

A10 Advice of dispatch No./ Date of dispatch: 2378593-08.09.11

A08/ Manufacturer's order/ A03 Certificate No.: 366376-010

Sheet: 5

A05 Established Inspecting body: NV

A06 Purchaser: AM PROJECTS,HEIJNING A07.1 No. 3200019767

Final receiver: AM PROJECTS,ROTTERDA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design. S460G2+M OPTION-12;13;18

B03 Any suppl. requirements: MDS-Y40:REV.5/EN-10225:01

C94 Product analysis Carbon equivalent / Alloying restrictions

B07.2 Heat	B07.1 Test No.	C01											
362026	728124	K40	FO-02=	0,38	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,09	FO-A1= 7,50
362026	730092	K40	FO-02=	0,38	FO-31=	0,21	FO-51=	0,03	FO-52=	0,03	FO-55=	0,09	FO-A1= 7,80

C94 Carbon equivalent formula / Alloying restrictions

FO-02 = C+(MN/6)+(CR+MO+V)/5+(NI+CU)/15
FO-31 = C+SI/30+(MN+CR+CU)/20+MO/15+V/10+NI/60+5B
FO-51 = V +NB
FO-52 = V +NB+TI
FO-55 = CU+MO+NI+CR
FO-A1 = AT/N

D01 Marking and identification, surface appearance, shape and dimensional properties

ITEM NO.: 02-04
RESULT OF MARKING, SURFACE, SHAPE AND DIMENSIONS: NO REMARKS
SURFACE AS PER EN-10163-A3
THICKNESS AS PER EN-10029:91-A
LENGTH AND WIDTH AS PER EN-10029:91
FLATNESS AS PER EN-10029:91-T4L

D02 Non-destructive tests - Ultrasonic testing

ITEM NO.: 02-04
UT-SPECIFICATION : EN-10160 CLASS S1 AND E2
SCANNING PLAN BODY : LONGITUDINALLY SCAN LINES SPACING 100 MM
EDGES : 100 MM
PERSONNEL QUALIFICATION : LEVEL 2 IN ACCORDANCE TO EN 473
THE TEST RESULTS MEET THE REQUIREMENTS OF THE ORDER.

A04 TFK Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV DUNKERQUE REVIEWED M. NIEDZWIEDZ Inspector

POISSONNET Test House Manager

A01 GTS Industries - Groupe Dillinger Hütte
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais

Date 21.10.11 AC 2

QM-System: Certification as per ISO 9001

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION REPORT 3.2 AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991

A10 Advice of dispatch No./ Date of dispatch: 2378414-06.09.11

A08/ Manufacturer's order/ A03 Certificate No.: 366518-001

Sheet: 1/...

A05 Established inspecting body: NV

A06 Purchaser: AM PROJECTS,HEIJUNING A07.1 No. 3200019767

Final receiver: AM PROJECTS,ROTTERDA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design: S460G2+M OPTION-12;18

B03 Any suppl. requirements: MDS-Y40:REV.5/EN-10225:01

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness	B10 Width	B11 Length	B12 Theoretical mass	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
			MM		KG				
01	1	10,00	x 2500	x 12000	2355	TM	362290	735033-01	
01	1	10,00	x 2500	x 12000	2355	TM	362290	735033-02	
01	1	10,00	x 2500	x 12000	2355	TM	362290	736240-01	
01	1	10,00	x 2500	x 12000	2355	TM	362290	736240-02	
01	1	10,00	x 2500	x 12000	2355	TM	362290	736241-01	
01	1	10,00	x 2500	x 12000	2355	TM	362290	736241-02	
01	1	10,00	x 2500	x 12000	2355	TM	362290	736242-01	
01	1	10,00	x 2500	x 12000	2355	TM	362290	736242-02	
01	1	10,00	x 2500	x 12000	2355	TM	362290	736243-01	
01	1	10,00	x 2500	x 12000	2355	TM	362290	736243-02	
**	10				23550				
***	10				23550				

DNV DUNKERQUE REVIEWED M. NIEDZWIEDZ

B06 Marking of the product

ITEM NO.: 01
STEEL DESIGNATION S460G2+M S460ML
HEAT NO. / TRADEMARK / ROLLED PLATE NO.-TEST NO. / INSPECTOR'S STAMP

C10-C29 Tensile test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C10 MPA RP02	C11 RM	C12 A % L0=5D	C13	C14-C15 RP02/RM
01	362290	736241		K4	QO	RT	531	607	23		0,87

DNV DUNKERQUE WITNESSED M. NIEDZWIEDZ

A04 TFK
Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

Inspector

POISSONNET
Test House Manager

GTS Industries - Groupe Dillinger Hütte
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais

A01

Date 07.09.11 AC 3

QM-System: Certification as per ISO 9001

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION REPORT 3.2 AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991

A10 Advice of dispatch No./ Date of dispatch: 2378414-06.09.11

A08/ Manufacturer's order/ A03 Certificate No.: 366518-001 Sheet: 2/...

A05 Established Inspecting body: NV

A06 Purchaser: AM PROJECTS,HEIJNING A07.1 No. 3200019767

Final receiver: AM PROJECTS,ROTTERDA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design.: S460G2+M OPTION-12;18

B03 Any suppl. requirements: MDS-Y40:REV.5/EN-10225:01

C30-C39 Hardness test

B14 Item. No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/C01	C03 Temp. GR.C	C30 Method of test	C35	C31 Individual values	C32 Mean value
01	362290	736241		K4	QO	RT	HV10	HV	192	

C40-C49 Impact test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C41 Width of test piece	C40 Type of test piece	C44 Testing method	C46 Energy Joule	C45	C42 Individual values AV=J			C43 Mean value
01	362290	736241		K4	LO	-50	7,5	CHP-V		600	AV	126	152	119	132
				K4	QO	-40	7,5	CHP-V		600	AV	112	115	111	113

C40-C49 Further information about impact test

ITEM NO.: 01

B07.2	B07.1	C01	C02 C01	C03	C40	C44	C46	C45	C42			C43
362290	736302 *	K4	QX	-40	CHP-V	5,0%-250C/60MN	600	AV	111	121	114	115

TEST FOR INFORMATION

C66-C68 Supplementary tests on test samples

ITEM NO.: 01

DEEP ETCH TESTING AS PER DH-STANDARD <=2B : SATISFACTORY

C70-C99 Chemical composition % - Heat analysis

B07.2 Heat	C70	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	AS	SN
362290	Y	0,106	0,467	1,55	0,013	0,0009	0,0038	0,044	0,012	0,059	0,059	0,001	027	0,005	0,003

B07.2 Heat	C70	TI	PB	B	SB	CA	BI	AL-T
362290	Y	0,002	0,001	0,0002	0,0020	0,0015	0,0001	0,034

DET NORSKE VERITAS DNV DUNKERQUE WITNESSED M.NIEDZWIEDZ

DET NORSKE VERITAS DNV DUNKERQUE REVIEWED M.NIEDZWIEDZ

A04 TFK Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

Inspector

POISSONNET Test House Manager

A01 GTS Industries - Groupe Dillinger Hütte
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais

Date 07.09.11 AC 3

QM-System: Certification as per ISO 9001

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION REPORT 3.2 AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991

A10 Advice of dispatch No./ Date of dispatch: 2378414-06.09.11

A08/ Manufacturer's order/ A03 Certificate No.: 366518-001 Sheet: 3/...

A05 Established Inspecting body: NV

A06 Purchaser: AM PROJECTS,HEIJNING A07.1 No. 3200019767

Final receiver: AM PROJECTS,ROTTERDA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design. S460G2+M OPTION-12;18

B03 Any suppl. requirements MDS-Y40:REV.5/EN-10225:01

C94 Heat analysis Carbon equivalent / Alloying restrictions

B07.2 Heat										
362290	FO-02= 0,39	FO-31= 0,21	FO-51= 0,03	FO-52= 0,03	FO-55= 0,17	FO-A1= 8,95				

C95 Ladle treatment

ITEM NO.: 01
HEAT OF THE INDICATED ITEM: VACUUM DEGASSED

C70-C99 Chemical composition % - Product analysis

B07.2 Heat	B07.1 Test No.	C01	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	TI	B
362290	736241	K4O	0,100	0,457	1,50	0,012	0,0006	0,0035	0,046	0,013	0,057	0,058	0,000	0,027	0,002	0,0002

B07.2 Heat	B07.1 Test No.	C01	AL-T
362290	736241	K4O	0,035

C94 Product analysis Carbon equivalent / Alloying restrictions

B07.2 Heat	B07.1 Test No.	C01									
362290	736241	K4O	FO-02= 0,37	FO-31= 0,20	FO-51= 0,03	FO-52= 0,03	FO-55= 0,17	FO-A1= 10,00			

C94 Carbon equivalent formula / Alloying restrictions

FO-02 = C+(MN/6)+(CR+MO+V)/5+(NI+CU)/15
FO-31 = C+SI/30+(MN+CR+CU)/20+MO/15+V/10+NI/60+5B
FO-51 = V +NB
FO-52 = V +NB+TI
FO-55 = CU+MO+NI+CR
FO-A1 = AT/N

DNV DUNKERQUE
REVIEWED
M.NIEDZWIEDZ

A04 TFK Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

Inspector

POISSONNET
Test House Manager

A01 GTS Industries - Groupe Dillinger Hütte
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais

Date 07.09.11 AC 3

QM-System: Certification as per ISO 9001

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION REPORT 3.2 AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991

A10 Advice of dispatch No./ Date of dispatch: 2378414-06.09.11

A08/ Manufacturer's order/ A03 Certificate No.: 366518-001

Sheet: 4

A05 Established inspecting body: NV

A06 Purchaser: AM PROJECTS,HEIJNING A07.1 No. 3200019767

Final receiver: AM PROJECTS,ROTTERDA A07.2 No.

B01 Product: HOT ROLLED PLATES

B02/ Steel design. S460G2+M OPTION-12;18

B03 Any suppl. requirements MDS-Y40:REV.5/EN-10225:01

D01 Marking and identification, surface appearance, shape and dimensional properties

ITEM NO.: 01
RESULT OF MARKING, SURFACE, SHAPE AND DIMENSIONS: NO REMARKS
SURFACE AS PER EN-10163-A3
THICKNESS AS PER EN-10029:91-A
LENGTH AND WIDTH AS PER EN-10029:91
FLATNESS AS PER EN-10029:91-T4L

D02 Non-destructive tests - Ultrasonic testing

ITEM NO.: 01
UT-SPECIFICATION : EN-10160 CLASS S1 AND E2
SCANNING PLAN BODY : LONGITUDINALLY SCAN LINES SPACING 100 MM
EDGES : 100 MM
PERSONNEL QUALIFICATION : LEVEL 2 IN ACCORDANCE TO EN 473
THE TEST RESULTS MEET THE REQUIREMENTS OF THE ORDER.

DNV DUNKERQUE
REVIEWED
M. NIEDZWIEDZ

A04 TFK Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

Inspector

POISSONNET
Test House Manager

GTS Industries - Groupe Dillinger Hütte
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais

A01

Date 07.09.11 AC 3

Consumables certificate

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2018-11-13

Numero certificato/Cert no: EC25377910 rev. 0

Nostro ordine/Our order:	2096663	Vostro ordine/Your order:	GS351/2018
Nostro riferimento/Our ref:	Web user - Movex CMP020 ITB	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB01056	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20181112	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address
ESAB SALDATURA SpA
.
STRADA PROVINCIALE 34, N.7
20010 OSSONA (MI)
20010 ITALY
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
TECHNO SERVICE S.R.L.
.
VIA DELLA MERENDA,32 FOR.ZARATTINI
48124 RAVENNA RA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: SBS31043 Quantità/Quantity: 10 CT

PRODOTTO/PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK 67.60 2.5x300mm 1/4 VP
Codice/Item no:	67602520L0

CLASSIFICAZIONE/CLASSIFICATIONS

EN ISO 3581-A: E 23 12 L R 3 2
SFA/AWS A5.4: E309L-17
CSA W48: E309L-17
Werkstoffnummer: 1.4332

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:	
C	0.03%
Si	0.58%
Mn	0.8%
P	0.013%
S	0.003%
Cr	23.9%
Ni	12.3%
Mo	0.03%
Cu	0.06%
N	0.08%
FN WRC-92	15

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:
Altro/Auxiliary:
Condizione/Condition:

TRAZIONE/TENSILE

Rp0.2	Rm	A5
470 MPa	580 MPa	32 %

RESILIENZA/IMPACT

Temp	+20 °C
KV	50 J

TECHNO SERVICE S.R.L.
QUESTO CERTIFICATO E' VALIDO PER
UNA QUANTITA' DI ~~KG~~/PZ 186
VEDI DDT N. 297 DEL 12/02/19

COPIA CONFORME
ALL'ORIGINALE

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:
ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis		Validazione - altro/Validation - Others	
Ellen Björgan	Quality Manager	Tapio Huhtala	Product Manager

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2016-07-14 Numero certificato/Cert no: EC24389442 rev. 0

Nostro ordine/Our order:	1394662	Vostro ordine/Your order:	1716001401
Nostro riferimento/Our ref:	Web user - Movex CMP020 ITB	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB00060	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20160714	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address
ESAB SALDATURA SpA
.
VIA ROSA LUXEMBURG 49
20085 LOCATE DI TRIULZI (MI)
20085 ITALY
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
ROSETTI MARINO SPA
DIVISIONE NAVALE
VIA 13 MARZO 1987 NO. 3
48100 PORTO S. VITALE RA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: SB612214 Quantità/Quantity: 54 KG

PRODOTTO/PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK 67.60 3.2x350mm 1/2 VP
Codice/Item no:	**67603230T0**

CLASSIFICAZIONE/CLASSIFICATIONS

EN ISO 3581-A: E 23 12 L R 3 2
SFA/AWS A5.4: E309L-17
CSA W48: E309L-17
Werkstoffnummer: 1.4332

CARATTERISTICHE MECCANICHE/MECHANICAL PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:
Altro/Auxiliary:
Condizione/Condition:

TRAZIONE/TENSILE

Rp0.2	Rm	A5
470 MPa	580 MPa	32 %

RESILIENZA/IMPACT

Temp	+20 °C
KV	50 J

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:

C	0.03%
Si	0.68%
Mn	0.7%
P	0.016%
S	0.004%
Cr	22.9%
Ni	12.1%
Mo	0.03%
Cu	0.04%
N	0.09%
FN WRC-92	10

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1

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This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis		Validazione - altro/Validation - Others	
Ellen Björgan	Quality Manager	Tapio Huhtala	Product Manager

ROSETTI MARINO

PQR 03/19

preliminary WPS

PQR ref.:	TBQ	pWPS (ISO 15614-1 ed. 2017+MOTS 12 Rev. 5.0)	03/19	REV.:	0	Data /date	11/02/2019

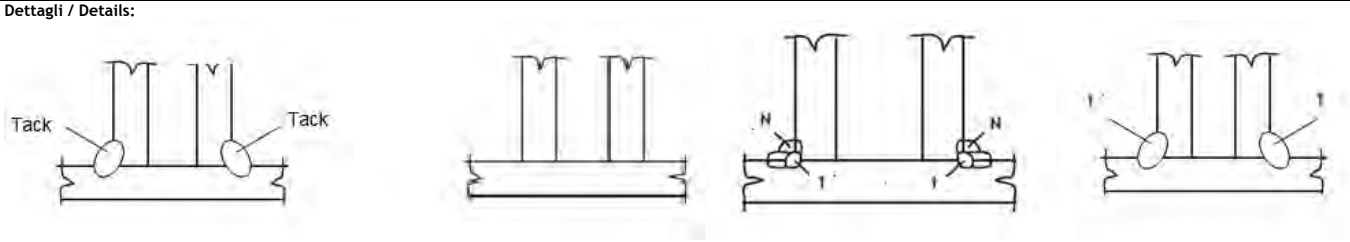
Procedimento di saldatura / Welding process: **111-SMAW** — Tipo / Type: **MANUAL**

GIUNTO - JOINT

Tipo di giunto / Joint Design: **FILLET** — Supporto / Backing: ☒ Si / Yes **(Base Material)** ☐ No

Materiale di supporto (tipo) / Backing material (type): ☒ Metallico / Metal ☐ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:



Note:

1. **Surfaces cleaned from moisture, oil, grease, paint before welding (by grinding)/** *Pulire le superfici da liquidi, oli, grasso e vernici con molatura prima di saldare.*
2. **Minimum tack weld lengths shall be 4 times the thk or 50 mm, whichever is less/** I tacchetti devono essere lunghi almeno 50 mm o 4 volte lo spessore (il più piccolo dei due);
3. **Preheat shall be performed by electrical reistance, induction equioment or with gas burners. Cutting torches shall not be permitted.** ***Il preriscaldo può essere eseguito con resitenze, induzione o torcia. Non può essere utilizzato l'ossitaglio.***

MATERIALE BASE - BASE MATERIAL (QW-403)

Da / from P-N°: **/** — Group N° **S2/S1 Toughness class NT** — A / to P-N°: **/** — Group N° **S2/S1 Toughness class NT**

DA Tipo e grado / From type and grade: **S460 S460 G2+M Plate 10 mm**

A Tipo e grado / To type and grade: **Pipe TP 316L 2" x 5,54mm**

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove **≥ 3 mm**

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove **1" - 2"**

METALLO D'APPORTO - FILLER METAL (QW-404)

	SMAW	
Spec. N° (SFA)	5.4	
AWS N° (CLASS)	E 309L-17	
F-N°	5	
A-N°	8	
Diametro mat. D'apporto / Size of filler metal	2,5-3,2	
Gamma spessori /Thick. Range (mm)	For single pass a=3 mm; no restriction for multipass	
Accoppiamento filo-flusso / Electrode-flux (CLASS)	NA	
Denom. Comm. Flusso / FLUX trade name	NA	
Inserto consumabile / Consumable insert	NA	
Altro / other	ELECTRODE: OK 67.60	

POSIZIONI - POSITION (QW 405)

giunto / Joint: **Cordone d'angolo / fillet** — Posizione / position **PD-PB-PH** — Progressione / weld progression: **Ascendente / UP hill**

PRERISCALDO - PRE-HEAT (QW406)

Temp.preriscaldo minima / Min. pre-heat temp: **20 °C** — Max temp. Di interpass / Max interpass temp.: **150 °C** — Mantenimento interpass / Interpass maintenance: **N.A.** — Tempo di mantenimento prerisc. / Maintenance timing: **N.A.**

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT(QW 407)

Riscaldamento / Heating rate (°C/Hrs): **N.A.** — Temperatura di stasi / Holding temperature °C: **N.A.** — Tempo di stasi / Holding time (min.): **N.A.** — Velocità di raffreddamento / Cooling rate (°C/Hrs): **N.A.**

GAS DI PROTEZIONE - GAS (QW 408)

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	N.A.	N.A.	N.A.
Protezione al seguito / Trailing:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS (QW -409)

Corrente / Current: **DC** — Polarità / Polarity **RP**

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: **N.A.**

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: **N.A.**

Velocità alimentazione filo / Electr. Wire feed speed range: **N.A.**

TECNICA - TECHNIQUE (QW-410)

Passata / Bead: **Tirata/String** — Dimensione bocchello gas / Orifice of gas cup size: **N.A.** — Pulizia iniziale e fra le passate / Initial and interpass cleaning: **Spazzolatura/Brushing**

Metodo di solcatura a rovescio / Method of back gouging: **N.A.** — Oscillazione / Oscillation: **N.A.** — Distanza zona di contatto e pezzo / Contact zone to work distance: **N.A.**

N°Passate / Passes nr.: **Multipla/Multiple** — Elettrodo multiplo o singolo / Multiple or single electrodes: **Singolo/Single** — Martellatura / Peening: **N.A.**

Altro / Other:

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range		Vel. Avanzamento / Travel speed range (mm/min)		Apporto termico / Heat input (KJ/mm)	
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. Range						
FOR SINGLE PASS											
Tack-1	SMAW	E 309L-17	2,5-3,2	RP	55 110	22	26	50	70	0,82	2,74
FOR MULTIPASS											
Tack-1	SMAW	E 309L-17	2,5-3,2	RP	55 110	22	26	50	70	0,82	2,74
2-N	SMAW	E 309L-17	2,5-3,2	RP	65 100	22	25	75	85	0.81	1,60

Preparato da / prepared by:	Client/Third part signature:	Client/Third part signature:
D.Cenacchi	***TOTAL***	

NDE certificate

ROSETTI MARINO	**VERBALE DI CONTROLLO VISIVO/DIMENSIONALE** **visual/dimensional inspection report**	VDR N° **03-19** data: **18-02-2019**

progetto project	TYRA REDEVELOPMENT PROJECT	cliente **TOTAL** client	ordine **/** PO	commessa **118A10** job

disegno dwg **/**	ITP N°	fase **/** step

SI CERTIFICA CHE :

gli item di seguito indicati sono stati sottoposti a controllo dimensionale ed accettati in accordo alla procedura / specifica sotto indicata ed ai criteri di accettabilita' in essa definiti.

WE CERTIFY THAT:

items below indicated have undergone a dimensional inspection and have been accepted according to the specific / procedure mentioned hereunder and to acceptance criteria defined in it.

oggetto – item

COUPON	STAMP	POS	THK	LENGHT	WPS	Date of examination
03/19 PB-SL	NC272	PB	5,54mm(PIPE)-10mm(PLATE)	190 mm	pWPS 03/19	18/02/2019
03/19 PB-ML	NC272	PB	5,54mm(PIPE)-10mm(PLATE)	190 mm	pWPS 03/19	18/02/2019
03/19 PH-SL	NC272	PH	5,54mm(PIPE)-10mm(PLATE)	190 mm	pWPS 03/19	18/02/2019
03/19 PH-ML	NC272	PH	5,54mm(PIPE)-10mm(PLATE)	190 mm	pWPS 03/19	18/02/2019
03/19 PD-SL	NC272	PD	5,54mm(PIPE)-10mm(PLATE)	190 mm	pWPS 03/19	18/02/2019
03/19 PD-ML	NC272	PD	5,54mm(PIPE)-10mm(PLATE)	190 mm	pWPS 03/19	18/02/2019

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐	File
Reviewed ☑	Signature
Witnessed ☐	Cimatti Davide
Approved ☐	

note - remarks

Acceptance criteria: EN-ISO 5817-2014 LEV. B

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

UNI EN ISO 17637 REV. 2017

Operatore - Operator	Controllo Qualita' - Quality Control	Cliente - Client
CSWIP D.CENACCHI 305250 WI 3.1		

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 20/02/2019	FOGLIO - Sheet 1
RAPPORTO D'ESAME LIQUIDI PENETRANTI ***NDT REPORT - DYE PENETRANT TEST***		PT N° : 01	Ns. Rif. 18205

COSTRUTTORE/Customer	ORDINE/Order	PROGETTO/Project	COMMESSA/Job	
ROSETTI MARINO	/	TYRA FUTURE	118A10	
CLIENTE FINALE/Final client	OGGETTO/Object	DISEGNO/Dwg	P.F.C./Q.C.P.	FASE/Step
MAERSK OIL	PQR	/	/	/

CODICE/Code	PROCEDURA/Procedure	ACCETTABILITA'/Acceptance level	
/	DK-TEHY-MET-PRO-000-10008	Quality Level ISO 5817 ☑ B ☐ C ☐ D Acceptance level ISO 23277 ☑2X ☐ 2X ☐ 3X	
MATERIALE/Material	TEMP. SUPERFICI/ Surface temperature	INTENSITA' LUMINOSA/ Light intensity	
S460 G2+M/TP316L	RANGE 10°÷50°	☑ LUCE BIANCA >500 Lux	☐ LUCE NERA 1000 µW/cm²

STATO DELLA SUPERFICIE – Surface condition			
☑ COME SALDATO/As welded	☑ SPAZZOLATO - Brushed		☐ LAVORATO DI MACCHINA - Machined
☐ MOLATO - Ground	☐ LAMINATO - Rolled		☐ GREZZO - Forged
MATERIALI UTILIZZATI - Material Used	NDT	TIPO/Type	LOTTO NUMERO/Back No.
PULITORE PRELIMINARE/Cleaner	BC1	CLASSE 2 TIPO II METODO A	171204 S
PENETRANTE - Penetrant SENSIBILITA' Sensitivity level	K71B2P	TIPO II METODO A 2	17100Ps
RIVELATORE/Developer	D112A	FORMA d	180718Ws

ISTRUZIONE DI LAVORO/Works instruction		
Step 1 PULITURA PRELIMINARE/Preliminary Cleaning	SPAZZOLATURA +BC1	
Step 2 ASCIUGATURA / Drying	STROFINACCI	
Step 3 APPLICAZIONE PENETRANT/ Penetrant application	SPRAY	
Step3a TEMPO PENETRAZIONE/Dwel time (min)	5÷60	
Step 4 RIMOZIONE PENETRANTE/Removal penetrant	☑ ACQUA + STROFINACCI	☐ SOLVENTE + STROFINACCI
Step 5 ASCIUGATURA/Drying process	STROFINATURA CON PANNO PULITO NON SFILACCIATO	
Step 6 INTERVALLO APP. RIVELATORE/time int. developer app.	/	
Step 7 APPLICAZIONE RIVELATORE/Developer application	SPRAY	
Step 8 TEMPO DI LETTURA/Checking time	RANGE 10÷30	
Step 8 PULIZIA DOPO CONTROLLO/Cleaner after examination	☑ NO/No	☐ SI/Yes

SALDATURE CONTROLLATE / Welds Verified

ITEM	POS.	STAMP	Ø	THK	PROCESS
PQR 03/19 PE-SL	PE	NC272	L=198	10(PLATE) 5,54(PIPE)	SMAW
PQR 03/19 PB-SL	PB	NC272	L=198	10(PLATE) 5,54(PIPE)	SMAW
PQR 03/19 PH-SL	PH	NC272	L=198	10(PLATE) 5,54(PIPE)	SMAW
PQR 03/19 PE-ML	PE	NC272	L=198	10(PLATE) 5,54(PIPE)	SMAW
PQR 03/19 PB-ML	PB	NC272	L=198	10(PLATE) 5,54(PIPE)	SMAW
PQR 03/19 PH-ML	PH	NC272	L=198	10(PLATE) 5,54(PIPE)	SMAW

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Salvatore Randazzo II° Livello SNT - TC - [illegible] ISO 9712	ROSETTI MARINO SPA Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 26/2/2019 File Signature Cimatti Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items esamine*
Z:\Temporanea\qualità\05 modulistica\validi\01 moduli cnd\validi\09 iso

ROSETTI MARINO

PQR 03/19

Mechanical test report

Element Materials Technology Milan S.r.l.
Via della Pierina 9/11
26013 Crema (CR)
Italy

P: +39 0373 89721
F: +39 0373 897200
info.milan@element.com
element.com

TEST REPORT

Client
Cod. 1737

ROSETTI MARINO S.P.A
VIA TRIESTE, 230
48122 RAVENNA (RA)
Italia

Your ref. :	Document :	Ddt n. 000087	Date:	21/02/2019
Our ref. :	Report :	RPR212-8E1R0A19	Date:	05/03/2019
	Job :	ADC212-1E1R0A19	Date:	22/02/2019

Remarks: PQR 03/19
PIPE DIMENSION : SIde A : Thk 10mm + Side B : 60.3mm x 5.54mm
CLIENT : TOTAL

Project: TYRA DEVELOPMENT PROJECT

Doc. reference: EN ISO 15614-1:2017 LEV. 2

Test standard: UNI EN ISO 17639:2013 - UNI EN ISO 6507-1:2018 - UNI EN ISO 9017:2013

This Report (RPR) contains tests results on the following materials

Ref:	Identification	Material	Dn (mm)	Thk (mm)	Remarks
614A19	PQR 03/19 PH SL	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L			

Report signatories and approval

☐ Third party	☐ Third party	☐ Third party	Client
☐ Witness	☐ Witness	☐ Witness	

ROSETTI MARINO S.P.A. Welding Dept. D. Cenacchi

D 460 GSO TOTAL
5/3/19

Digitally signed by
Luca Cantoni
Element Materials Technology Milan S.r.l.
Issue approved
(For and on behalf Element Materials Technology Milan S.r.l)

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimatti Davide
Approved ☐	

General conditions:
1. The Customer accepts general conditions and prices fixed by the laboratory to perform the tests.
2. Test results will be communicated only by means of test report except for different contractual agreement.
3. Tests sample will be destroyed 30 days after test except for different written Client request.
4. The spare will be destroyed 90 days after date of receipt for different written Client request.
5. The test results described in the following test report are referring only to the sample mentioned in it.
6. The date of material receivement is the same as the date of job opening. The date of testing is the same as the date of test report, except for different info.
7. The laboratory has examined the material sampled an supplied by the Client in compliance with standard request.
8. This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.
9. Unless otherwise agreed, sales terms and conditions (MOD20-1E1R0) will be apply.

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TEST REPORT

Test	Page	Technician	Department manager
Macrographic examination	Pag. 3..4	**Cristian Piloni**	**Cristian Piloni**
Hardness test	Pag. 5..6	**Cristian Piloni**	**Cristian Piloni**
Nick break test	Pag. 7	**Luigi Vailati**	**Mirko Piloni**

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

D. HODGSON TOTAL
5/3/19

RINA Services SpA
No. Bo. 0474
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
Date 05/03/2019
File
Signature
Cimatti Davide

Signatories

Digitally signed by Cristian Piloni
Element Materials Technology Milan S.r.l.

Digitally signed by Luigi Vailati
Element Materials Technology Milan S.r.l.

Digitally signed by Mirko Piloni
Element Materials Technology Milan S.r.l.

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TEST REPORT

MACROGRAPHIC EXAMINATION

General Info

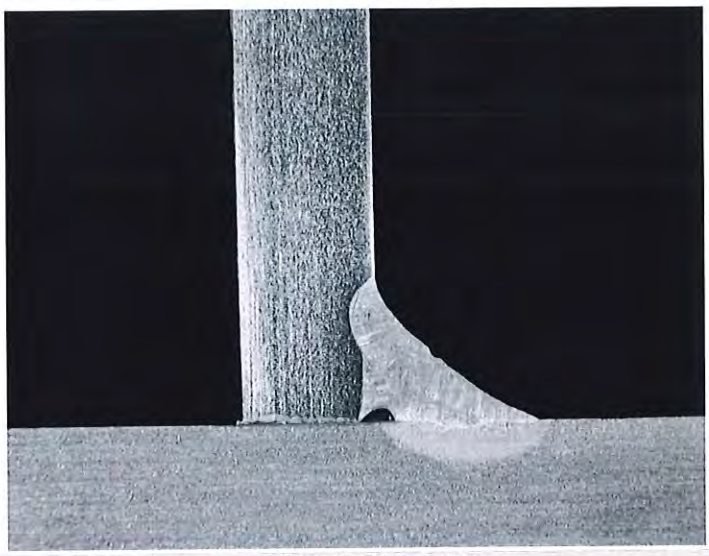
Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	614A19
Client reference	PQR 03/19 PH SL
Identification of specimen (Lab)	614 MC 1
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h12
Test standard	UNI EN ISO 17639:2013

Equipments

(Inv.N°1961) PHOTOCAMERA

Test properties

Etching	Alcoholic hydrochloric acid solution with hydrogen peroxide + Nital 3%



Magnification: ~3X

Result

Test specimen has been examined at low magnification (10x) with and without etching.
According to UNI EN ISO 5817:2014 level B, the result of this exam has show the presence of slag inclusion.

Throat thickness a = 4.23mm
Acceptance criteria h ≤ 0.2a = 0.85mm
Defect height h= 0.39mm

Result: Satisfactory

D HOOGSEN TOTAL
DP
5/3/19

ROSETTI MARINO SpA
D. Cenacchi

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Comotti Davide

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TEST REPORT

MACROGRAPHIC EXAMINATION

General info

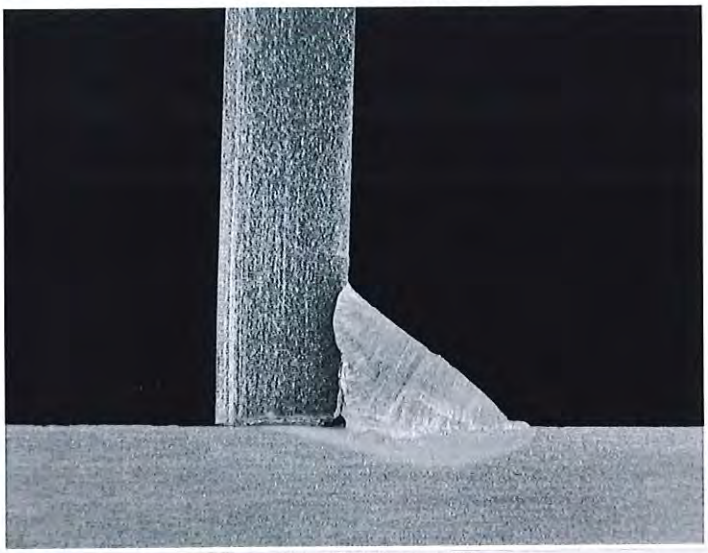
Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	614A19
Client reference	PQR 03/19 PH SL
Identification of specimen (Lab)	614 MC 2
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h3
Test standard	UNI EN ISO 17639:2013

Equipments

(Inv.N°1961) PHOTOCAMERA

Test properties

Etching	Alcoholic hydrochloric acid solution with hydrogen peroxide + Nital 3%



Magnification: ~3X

Result

Test specimen has been examined at low magnification (10x) with and without etching.
According to UNI EN ISO 5817:2014 level B, the result of this exam has show the presence of slag inclusion.

Throat thickness a = 4.58mm
Acceptance criteria h ≤ 0.2a = 0.92mm
Defect height h= 0.57mm

Result: Satisfactory

DIDGSON TOTAL
5/3/19

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA
No. Bo. 0474
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
Date 05/03/2019
File
Signature
Cinarelli Davide

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TEST REPORT

HARDNESS TEST

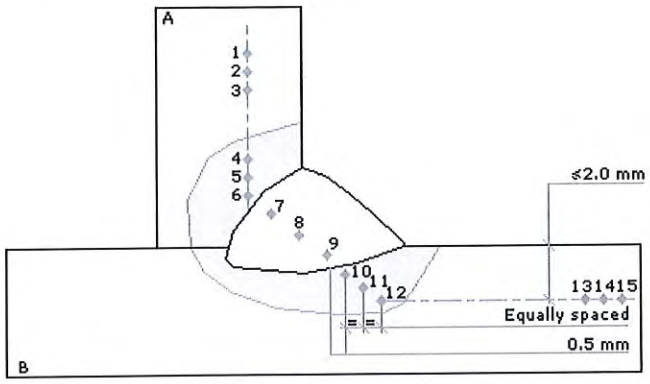
General info

Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	614A19
Client reference	PQR 03/19 PH SL
Identification of specimen (Lab)	614 MC 1
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h12
Test standard	UNI EN ISO 6507-1:2018

Equipments

(Inv.N°9) HARDNESS TESTING MACHINE

Results



CP

Single run

N°	Value HV10
1	**142.0**
2	**143.0**
3	**146.0**
4	**143.0**
5	**146.0**
6	**150.0**
7	**165.0**
8	**168.0**
9	**164.0**
10	**238.0**
11	**203.0**
12	**174.0**
13	**137.0**
14	**136.0**
15	**135.0**

Min: **135.0** Max: **238.0**

D MOOG SAN TOTAL
5/3/19

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA
No. Bo. 0474
Date 05/03/2019
File
Noted ☐
Reviewed ☐
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Signature
Cinotti Davide

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TEST REPORT

HARDNESS TEST

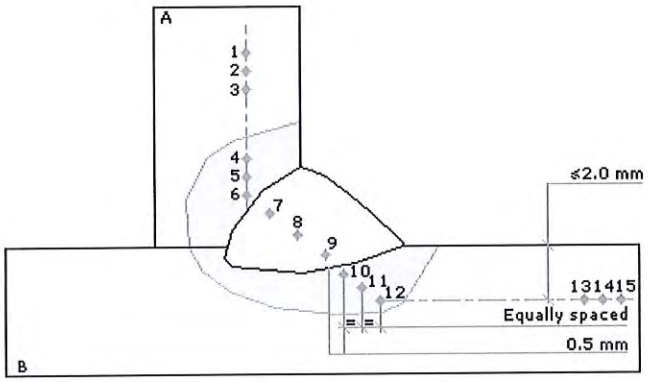
General info

Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	614A19
Client reference	PQR 03/19 PH SL
Identification of specimen (Lab)	614 MC 2
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h3
Test standard	UNI EN ISO 6507-1:2018

Equipments

(Inv.N°9) HARDNESS TESTING MACHINE

Results



Single run

N°	Value HV10
1	**149.0**
2	**147.0**
3	**150.0**
4	**157.0**
5	**162.0**
6	**167.0**
7	**160.0**
8	**164.0**
9	**167.0**
10	**181.0**
11	**171.0**
12	**162.0**
13	**136.0**
14	**135.0**
15	**137.0**

Min: **135.0** Max: **181.0**

HODGSON TOTAL
5/3/19

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimato Davide

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TEST REPORT

NICK BREAK TEST

General info

Test start - Test finish	05/03/2019 - 05/03/2019
MIF reference (Lab)	614A19
Client reference	PQR 03/19 PH SL
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Test standard	UNI EN ISO 9017:2013

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1123) BEND MACHINE

Ref.Lab.	T (°C)	Position	Dimensions (mm)	Results	Note
614 FR 1	20	T WM Full thk	25.01 x 9.95 x 5.87	No defect	

D HODGSON TOTAL
5/3/19

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA
No. Bo. 0474
Date 05/03/2019
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TEST REPORT

Client
Cod. 1737

ROSETTI MARINO S.P.A
VIA TRIESTE, 230
48122 RAVENNA (RA)
Italia

Your ref. :	Document :	Ddt n. 000087	Date:	21/02/2019
Our ref. :	Report :	RPR212-7E1R0A19	Date:	05/03/2019
	Job :	ADC212-1E1R0A19	Date:	22/02/2019

Remarks: PQR 03/19
PIPE DIMENSION : SIde A : Thk 10mm + Side B : 60.3mm x 5.54mm
CLIENT : TOTAL

Project: TYRA DEVELOPMENT PROJECT

Doc. reference: EN ISO 15614-1:2017 LEV. 2

Test standard: UNI EN ISO 17639:2013 - UNI EN ISO 6507-1:2018 - UNI EN ISO 9017:2013

This Report (RPR) contains tests results on the following materials

Ref:	Identification	Material	Dn (mm)	Thk (mm)	Remarks
613A19	PQR 03/19 PD ML	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L			

Report signatories and approval

☐ Third party	☐ Third party	☐ Third party	Client
☐ Witness	☐ Witness	☐ Witness	

ROSETTI MARINO SpA
Welding Dept.

HOOGSAN TOTAL
5/3/19

Digitally signed by
Luca Cantoni
Element Materials Technology Milan S.r.l.
Issue approved
(For and on behalf Element Materials Technology Milan S.r.l)

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimatti Davide

General conditions:
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3. Tests sample will be destroyed 30 days after test except for different written Client request.
4. The spare will be destroyed 90 days after date of receipt for different written Client request.
5. The test results described in the following test report are referring only to the sample mentioned in it.
6. The date of material receivement is the same as the date of job opening. The date of testing is the same as the date of test report, except for different info.
7. The laboratory has examined the material sampled an supplied by the Client in compliance with standard request.
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TEST REPORT

Test	Page	Technician	Department manager
Macrographic examination	Pag. 3..4	**Cristian Piloni**	**Cristian Piloni**
Hardness test	Pag. 5..6	**Cristian Piloni**	**Cristian Piloni**
Nick break test	Pag. 7	**Luigi Vailati**	**Mirko Piloni**

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

D HOGSON TOTAL
5/3/19

RINA Services SpA
No. Bo. 0474
Date 05/03/2019
File
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
Signature
Cimatti Davide

Signatories

Digitally signed by Cristian Piloni
Element Materials Technology Milan S.r.l.

Digitally signed by Luigi Vailati
Element Materials Technology Milan S.r.l.

Digitally signed by Mirko Piloni
Element Materials Technology Milan S.r.l.

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TEST REPORT

MACROGRAPHIC EXAMINATION

General info

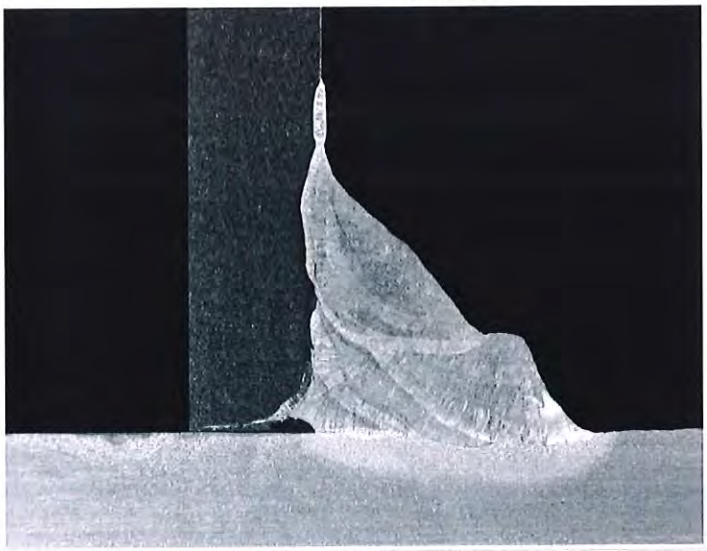
Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	613A19
Client reference	PQR 03/19 PD ML
Identification of specimen (Lab)	613 MC 1
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h12
Test standard	UNI EN ISO 17639:2013

Equipments

(Inv.N°1961) PHOTOCAMERA

Test properties

Etching	Alcoholic hydrochloric acid solution with hydrogen peroxide + Nital 3%



Magnification: ~3X

Result

Test specimen has been examined at low magnification (10x) with and without etching.
According to UNI EN ISO 5817:2014 level B, the result of this exam has show the presence of slag inclusion.

Throat thickness a = 7.76mm
Acceptance criteria h ≤ 0.2a = 1.55mm
Defect height h= 0.76mm

Result: Satisfactory

D HODGSON TOTAL
5/3/19

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimatti Davide

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TEST REPORT

MACROGRAPHIC EXAMINATION

General Info

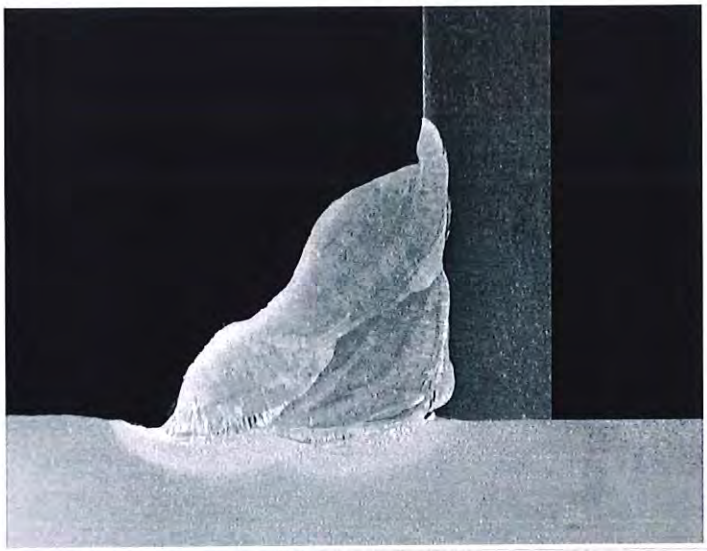
Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	613A19
Client reference	PQR 03/19 PD ML
Identification of specimen (Lab)	613 MC 2
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h3
Test standard	UNI EN ISO 17639:2013

Equipments

(Inv.N°1961) PHOTOCAMERA

Test properties

Etching	Alcoholic hydrochloric acid solution with hydrogen peroxide + Nital 3%



Magnification: ~3X

Result

Test specimen has been examined at low magnification (10x) with and without etching.
According to UNI EN ISO 5817:2014 level B, the result of this exam has show the presence of slag inclusion.

Throat thickness a = 8.14mm
Acceptance criteria h ≤ 0.2a = 1.63mm
Defect height h= 0.29mm

Result: Satisfactory

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

D HODGSON TOTAL
5/3/19

RINA Services SpA
No. Bo. 0474
Date 05/03/2019
Noted ☐
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TEST REPORT

HARDNESS TEST

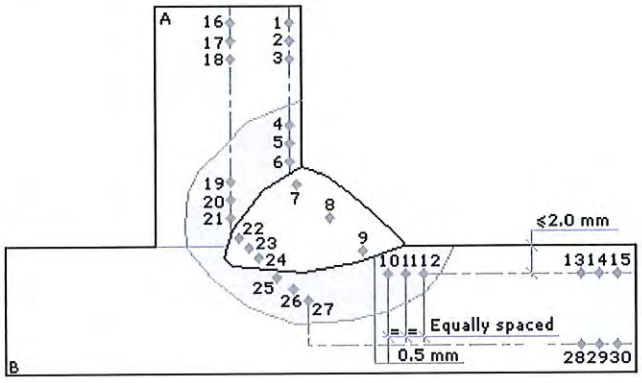
General Info

Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	613A19
Client reference	PQR 03/19 PD ML
Identification of specimen (Lab)	613 MC 1
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h12
Test standard	UNI EN ISO 6507-1:2018

Equipments

(Inv.N°9) HARDNESS TESTING MACHINE

Results



CP

Cap

N°	Value HV10
1	**157.0**
2	**160.0**
3	**154.0**
4	**157.0**
5	**159.0**
6	**168.0**
7	**190.0**
8	**186.0**
9	**182.0**
10	**217.0**
11	**188.0**
12	**165.0**
13	**136.0**
14	**134.0**
15	**139.0**

Root

N°	Value HV10
16	**169.0**
17	**166.0**
18	**170.0**
19	**177.0**
20	**180.0**
21	**184.0**
22	**188.0**
23	**193.0**
24	**185.0**
25	**155.0**
26	**152.0**
27	**149.0**
28	**137.0**
29	**134.0**
30	**137.0**

Min: **134.0** Max: **217.0**

D HODGSON TOTAL
5/3/19

ROSETTI MARINO SpA
Welding Dept.
D. Cencetti

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimatti Davide

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TEST REPORT

HARDNESS TEST

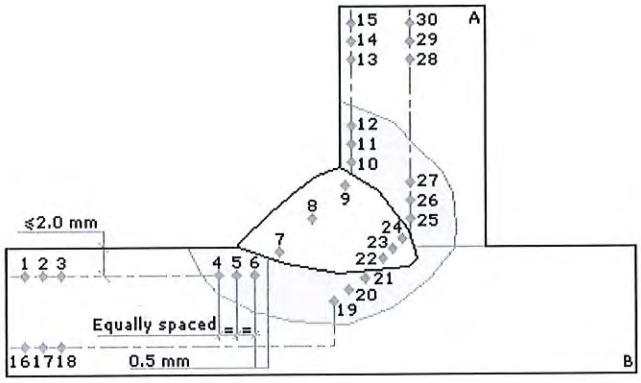
General Info

Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	613A19
Client reference	PQR 03/19 PD ML
Identification of specimen (Lab)	613 MC 2
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h3
Test standard	UNI EN ISO 6507-1:2018

Equipments

(Inv.N°9) HARDNESS TESTING MACHINE

Results



Cap		Root	
N°	Value HV10	N°	Value HV10
1	**149.0**	16	**143.0**
2	**147.0**	17	**141.0**
3	**142.0**	18	**138.0**
4	**151.0**	19	**150.0**
5	**161.0**	20	**162.0**
6	**183.0**	21	**182.0**
7	**162.0**	22	**178.0**
8	**158.0**	23	**182.0**
9	**163.0**	24	**178.0**
10	**155.0**	25	**172.0**
11	**158.0**	26	**167.0**
12	**160.0**	27	**162.0**
13	**146.0**	28	**169.0**
14	**143.0**	29	**164.0**
15	**137.0**	30	**159.0**

Min: **137.0** Max: **183.0**

D HODGSON TOTAL
5/3/19

ROSETTI MARINO SpA
Welding Dept
D. Cenacchi

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐	File Signature Cinotti Davide

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TEST REPORT

NICK BREAK TEST

General Info

Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	613A19
Client reference	PQR 03/19 PD ML
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Test standard	UNI EN ISO 9017:2013

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1123) BEND MACHINE

Ref.Lab.	T (°C)	Position	Dimensions (mm)	Results	Note
613 FR 1	20	T WM Full thk	25.01 x 9.96 x 5.86	No defect	

D HODGSON TOTAL
5/3/19

ROSETTI MARINO SpA
Welding Dept.
D. Corbacchi

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimatti Davide

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TEST REPORT

Client
Cod. 1737

ROSETTI MARINO S.P.A
VIA TRIESTE, 230
48122 RAVENNA (RA)
Italia

Your ref. :	Document :	Ddt n. 000087	Date:	21/02/2019
Our ref. :	Report :	RPR212-6E1R0A19	Date:	05/03/2019
	Job :	ADC212-1E1R0A19	Date:	22/02/2019

Remarks: PQR 03/19
PIPE DIMENSION : SIde A : Thk 10mm + Side B : 60.3mm x 5.54mm
CLIENT : TOTAL

Project: TYRA DEVELOPMENT PROJECT

Doc. reference: EN ISO 15614-1:2017 LEV. 2

Test standard: UNI EN ISO 17639:2013 - UNI EN ISO 6507-1:2018 - UNI EN ISO 9017:2013

This Report (RPR) contains tests results on the following materials

Ref:	Identification	Material	Dn (mm)	Thk (mm)	Remarks
612A19	PQR 03/19 PB ML	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L			

Report signatories and approval

☐ Third party	☐ Third party	☐ Third party	Client
☐ Witness	☐ Witness	☐ Witness	

ROSETTI MARINO SpA Welding Dept. D. Cenacchi

D HODGSON TOTAL
5/3/19

Digitally signed by
Luca Cantoni
Element Materials Technology Milan S.r.l.
Issue approved
(For and on behalf Element Materials Technology Milan S.r.l)

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimatti Davide
Approved ☐	

General conditions:
1. The Customer accepts general conditions and prices fixed by the laboratory to perform the tests.
2. Test results will be communicated only by means of test report except for different contractual agreement.
3. Tests sample will be destroyed 30 days after test except for different written Client request.
4. The spare will be destroyed 90 days after date of receipt for different written Client request.
5. The test results described in the following test report are referring only to the sample mentioned in it.
6. The date of material receivement is the same as the date of job opening. The date of testing is the same as the date of test report, except for different info.
7. The laboratory has examined the material sampled an supplied by the Client in compliance with standard request.
8. This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.
9. Unless otherwise agreed, sales terms and conditions (MOD20-1E1R0) will be apply.

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TEST REPORT

Test	Page	Technician	Department manager
Macrographic examination	Pag. 3..4	**Cristian Piloni**	**Cristian Piloni**
Hardness test	Pag. 5..6	**Cristian Piloni**	**Cristian Piloni**
Nick break test	Pag. 7	**Luigi Vailati**	**Mirko Piloni**

D. HODGSON TOTAL
5/3/19

ROSETTI MARINO SpA
Welding Dept.
D. Cimarelli

RINA Services SpA
No. Bo. 0474
Date 05/03/2019
File
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
Signature
Cimarti Davide

Signatories

Digitally signed by Cristian Piloni
Element Materials Technology Milan S.r.l.

Digitally signed by Luigi Vailati
Element Materials Technology Milan S.r.l.

Digitally signed by Mirko Piloni
Element Materials Technology Milan S.r.l.

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TEST REPORT

MACROGRAPHIC EXAMINATION

General info

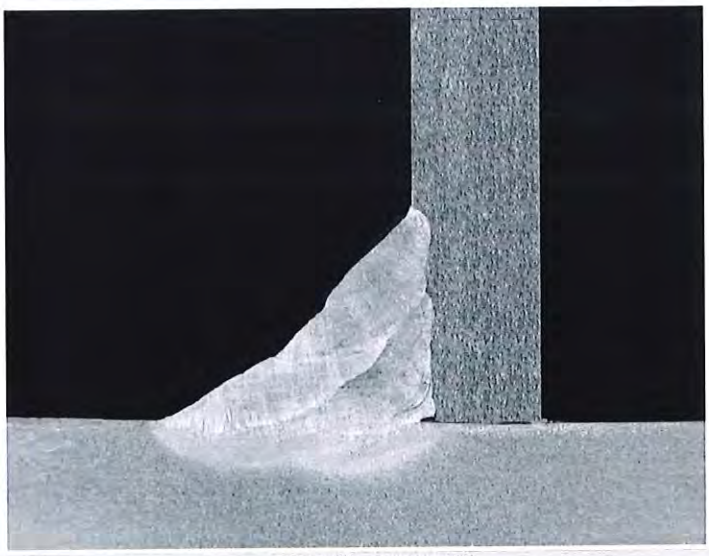
Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	612A19
Client reference	PQR 03/19 PB ML
Identification of specimen (Lab)	612 MC 1
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h12
Test standard	UNI EN ISO 17639:2013

Equipments

(Inv.N°1961) PHOTOCAMERA

Test properties

Etching	Alcoholic hydrochloric acid solution with hydrogen peroxide + Nital 3%



Magnification: ~3X

Result

Test specimen has been examined at low magnification (10x) with and without etching.
According to UNI EN ISO 5817:2014 level B, the result of this exam has show the presence of slag inclusion.

Throat thickness a = 6.33mm
Acceptance criteria h ≤ 0.2a = 1.27mm
Defect height h= 0.23mm

Result: Satisfactory

D. HOOGSAN TOTAL
5/3/19

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimatti Davide

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TEST REPORT

MACROGRAPHIC EXAMINATION

General Info

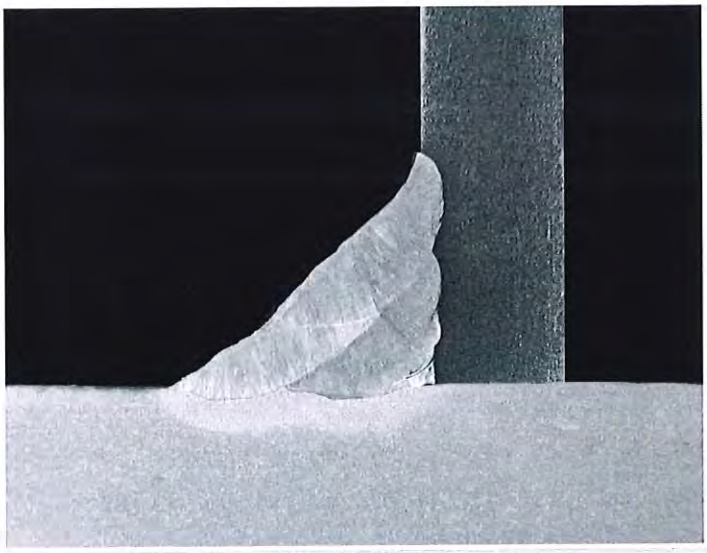
Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	612A19
Client reference	PQR 03/19 PB ML
Identification of specimen (Lab)	612 MC 2
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h3
Test standard	UNI EN ISO 17639:2013

Equipments

(Inv.N°1961) PHOTOCAMERA

Test properties

Etching	Alcoholic hydrochloric acid solution with hydrogen peroxide + Nital 3%



Magnification: ~3X

Result

Test specimen has been examined at low magnification (10x) with and without etching.
According to UNI EN ISO 5817:2014 level B, the result of this exam has show the presence of slag inclusion.

Throat thickness a = 6.89mm
Acceptance criteria h ≤ 0.2a = 1.38mm
Defect height h= 0.11mm

Result: Satisfactory

D HODGSON TOTAL
5/3/19

ROSETTI MARINO SpA
Welded Dept.
D. Cenacchi

RINA Services SpA
No. Bo. 0474
Date 05/03/2019
File
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
Signature
Cimatti Davide

Element Materials Technology Milan S.r.l.
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TEST REPORT

HARDNESS TEST

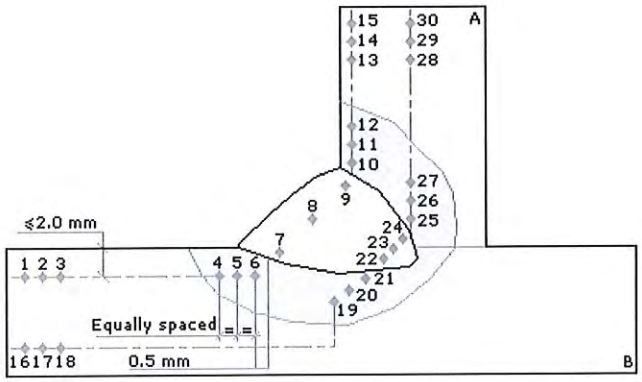
General info

Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	612A19
Client reference	PQR 03/19 PB ML
Identification of specimen (Lab)	612 MC 1
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h12
Test standard	UNI EN ISO 6507-1:2018

Equipments

(Inv.N°9) HARDNESS TESTING MACHINE

Results



CP

Cap

N°	Value HV10
1	**142.0**
2	**144.0**
3	**141.0**
4	**185.0**
5	**199.0**
6	**216.0**
7	**154.0**
8	**151.0**
9	**157.0**
10	**161.0**
11	**157.0**
12	**154.0**
13	**157.0**
14	**153.0**
15	**150.0**

Root

N°	Value HV10
16	**134.0**
17	**132.0**
18	**137.0**
19	**152.0**
20	**157.0**
21	**161.0**
22	**190.0**
23	**178.0**
24	**176.0**
25	**166.0**
26	**164.0**
27	**161.0**
28	**149.0**
29	**147.0**
30	**151.0**

Min: **132.0** Max: **216.0**

D. HODGSON TOTAL
5/3/19

ROSETTI MARINO SpA
Welding Dept.
D. Conacchi

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimatti Davide

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TEST REPORT

HARDNESS TEST

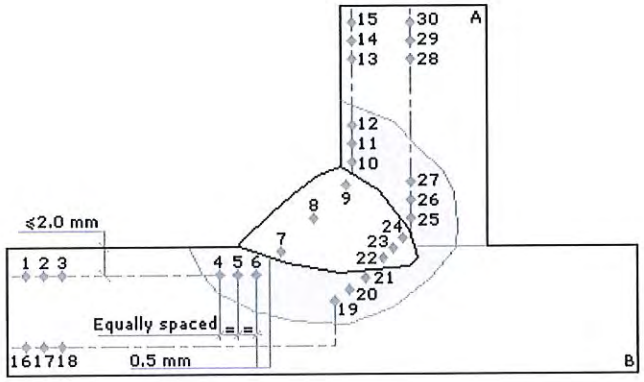
General Info

Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	612A19
Client reference	PQR 03/19 PB ML
Identification of specimen (Lab)	612 MC 2
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h3
Test standard	UNI EN ISO 6507-1:2018

Equipments

(Inv.N°9) HARDNESS TESTING MACHINE

Results



CP

Cap

N°	Value HV5
1	**141.0**
2	**139.0**
3	**144.0**
4	**165.0**
5	**192.0**
6	**225.0**
7	**162.0**
8	**166.0**
9	**160.0**
10	**150.0**
11	**152.0**
12	**154.0**
13	**142.0**
14	**139.0**
15	**143.0**

Root

N°	Value HV5
16	**132.0**
17	**130.0**
18	**135.0**
19	**151.0**
20	**158.0**
21	**165.0**
22	**176.0**
23	**171.0**
24	**166.0**
25	**156.0**
26	**153.0**
27	**150.0**
28	**143.0**
29	**142.0**
30	**140.0**

Min: **130.0** Max: **225.0**

D HODGSON TOTAL
5/3/19

ROSETTI MARINO SpA
Welding Insp.
D. Cenacchi

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimatti Davide

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TEST REPORT

NICK BREAK TEST

General Info

Test start - Test finish	05/03/2019 - 05/03/2019
MIF reference (Lab)	612A19
Client reference	PQR 03/19 PB ML
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Test standard	UNI EN ISO 9017:2013

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1123) BEND MACHINE

Ref.Lab.	T (°C)	Position	Dimensions (mm)	Results	Note
612 FR 1	20	T WM Full thk	25.01 x 9.98 x 5.68	No defect	

D HODGSON TOTAL
5/7/19

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimatti Davide
Approved ☐	

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TEST REPORT

Client
Cod. 1737

ROSETTI MARINO S.P.A
VIA TRIESTE, 230
48122 RAVENNA (RA)
Italia

Your ref. :	Document :	Ddt n. 000087	Date:	21/02/2019
Our ref. :	Report :	RPR212-3E1R0A19	Date:	05/03/2019
	Job :	ADC212-1E1R0A19	Date:	22/02/2019

Remarks: PQR 03/19
PIPE DIMENSION : SIde A : Thk 10mm + Side B : 60.3mm x 5.54mm
CLIENT : TOTAL

Project: TYRA DEVELOPMENT PROJECT

Doc. reference: EN ISO 15614-1:2017 LEV. 2

Test standard: UNI EN ISO 17639:2013 - UNI EN ISO 6507-1:2018 - UNI EN ISO 9017:2013

This Report (RPR) contains tests results on the following materials

Ref:	Identification	Material	Dn (mm)	Thk (mm)	Remarks
593A19	PQR 03/19 PH ML	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L			

Report signatories and approval

☐ Third party	☐ Third party	☐ Third party	Client
☐ Witness	☐ Witness	☐ Witness	

ROSETTI MARINO SpA
Welding Dept
D. Cenacchi

D HODGSON TOTAL
5/3/19

Digitally signed by
Luca Cantoni
Element Materials Technology Milan S.r.l.
Issue approved
(For and on behalf Element Materials Technology Milan S.r.l)

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimatti Davide
Approved ☐	

General conditions:
1. The Customer accepts general conditions and prices fixed by the laboratory to perform the tests.
2. Test results will be communicated only by means of test report except for different contractual agreement.
3. Tests sample will be destroyed 30 days after test except for different written Client request.
4. The spare will be destroyed 90 days after date of receipt for different written Client request.
5. The test results described in the following test report are referring only to the sample mentioned in it.
6. The date of material receivement is the same as the date of job opening. The date of testing is the same as the date of test report, except for different info.
7. The laboratory has examined the material sampled an supplied by the Client in compliance with standard request.
8. This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.
9. Unless otherwise agreed, sales terms and conditions (MOD20-1E1R0) will be apply.

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TEST REPORT

Test	Page	Technician	Department manager
Macrographic examination	Pag. 3..4	**Cristian Piloni**	**Cristian Piloni**
Hardness test	Pag. 5..6	**Cristian Piloni**	**Cristian Piloni**
Nick break test	Pag. 7	**Luigi Vailati**	**Mirko Piloni**

ROSETTI MARINO SpA
Welding Dept.
D. Cerlacchi

D 460 GSW TOTAL
5/3/19

RINA Services SpA
No. Bo. 0474
Date 05/03/2019
File
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
Signature
Cimatti Davide

Signatories

Digitally signed by
Cristian Piloni
Element Materials
Technology Milan S.r.l.

Digitally signed by
Luigi Vailati
Element Materials
Technology Milan S.r.l.

Digitally signed by
Mirko Piloni
Element Materials
Technology Milan S.r.l.

Element Materials Technology
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TEST REPORT

MACROGRAPHIC EXAMINATION

General Info

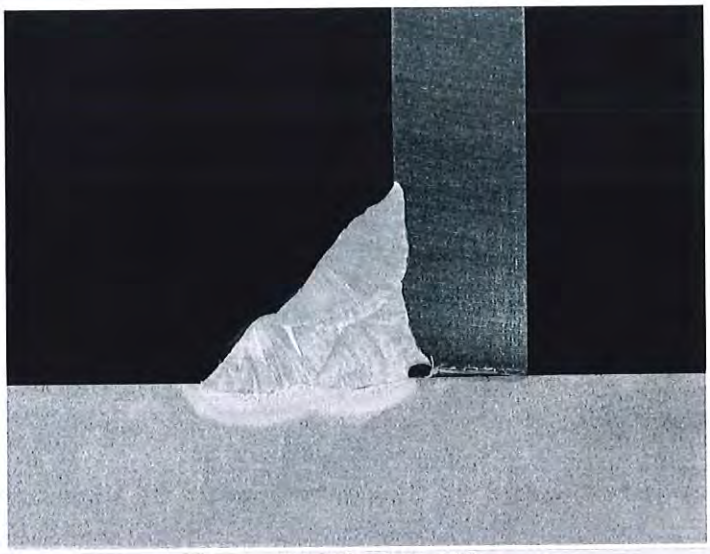
Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	593A19
Client reference	PQR 03/19 PH ML
Identification of specimen (Lab)	593 MC 1
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h12
Test standard	UNI EN ISO 17639:2013

Equipments

(Inv.N°1961) PHOTOCAMERA

Test properties

Etching	Alcoholic hydrochloric acid solution with hydrogen peroxide + Nital 3%



Magnification: ~3X

Result

Test specimen has been examined at low magnification (10x) with and without etching.
According to UNI EN ISO 5817:2014 level B, the result of this exam has show the presence of slag inclusion.

Throat thickness a = 6.55mm
Acceptance criteria h ≤ 0.2a = 1.31mm
Defect height h= 0.0.58mm

Result: Satisfactory

D. HEDGSON TOTAL
5/3/19

RINA Services SpA
No. Bo. 0474
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
Date 05/03/2019
File
Signature
Cimatti Davide

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TEST REPORT

MACROGRAPHIC EXAMINATION

General Info

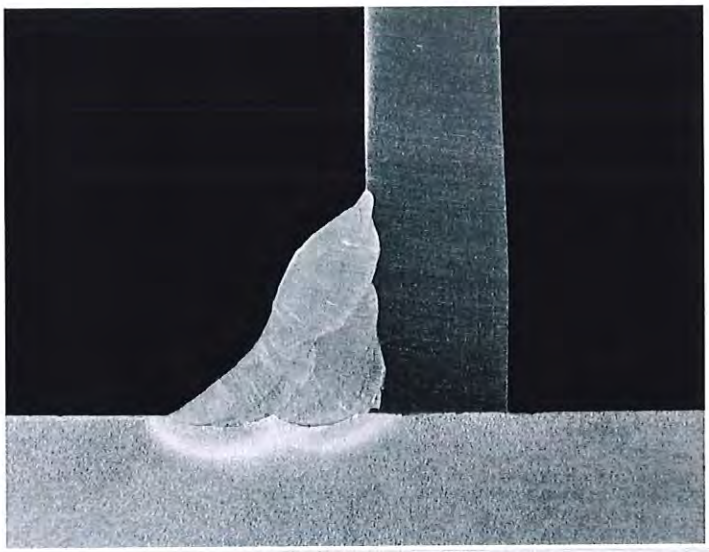
Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	593A19
Client reference	PQR 03/19 PH ML
Identification of specimen (Lab)	593 MC 2
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h3
Test standard	UNI EN ISO 17639:2013

Equipments

(Inv.N°1961) PHOTOCAMERA

Test properties

Etching	Alcoholic hydrochloric acid solution with hydrogen peroxide + Nital 3%



Magnification: ~3X

Result

Test specimen has been examined at low magnification (10x) with and without etching.
According to UNI EN ISO 5817:2014 level B, the result of this exam has show the presence of slag inclusion.

Throat thickness a = 6.39mm
Acceptance criteria h ≤ 0.2a = 1.28mm
Defect height h= 0.23mm

Result: Satisfactory

D HODGSON
DP
5/3/19

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimatti Davide

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TEST REPORT

HARDNESS TEST

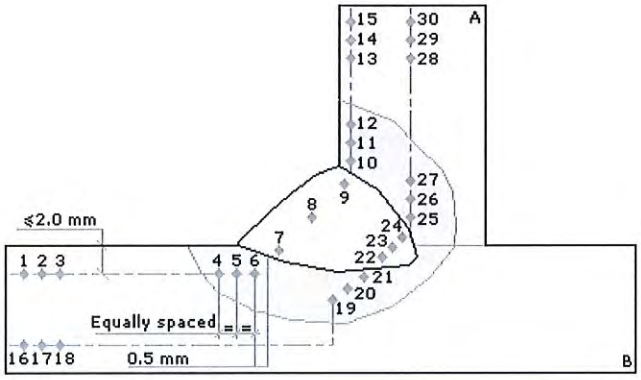
General Info

Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	593A19
Client reference	PQR 03/19 PH ML
Identification of specimen (Lab)	593 MC 1
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h12
Test standard	UNI EN ISO 6507-1:2018

Equipments

(Inv.N°9) HARDNESS TESTING MACHINE

Results



Cap **Root**

N°	Value HV10	N°	Value HV10
1	**134.0**	16	**137.0**
2	**132.0**	17	**135.0**
3	**134.0**	18	**140.0**
4	**233.0**	19	**173.0**
5	**256.0**	20	**185.0**
6	**282.0**	21	**198.0**
7	**173.0**	22	**203.0**
8	**169.0**	23	**196.0**
9	**173.0**	24	**189.0**
10	**177.0**	25	**177.0**
11	**166.0**	26	**170.0**
12	**157.0**	27	**165.0**
13	**161.0**	28	**152.0**
14	**154.0**	29	**148.0**
15	**148.0**	30	**151.0**

Min: **132.0** Max: **282.0**

DUCOGEN TOTAL
5/3/19

ROSETTI MARINO SpA
Welding Dept.
P. Cenacchi

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimatti Davide
Approved ☐	

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TEST REPORT

HARDNESS TEST

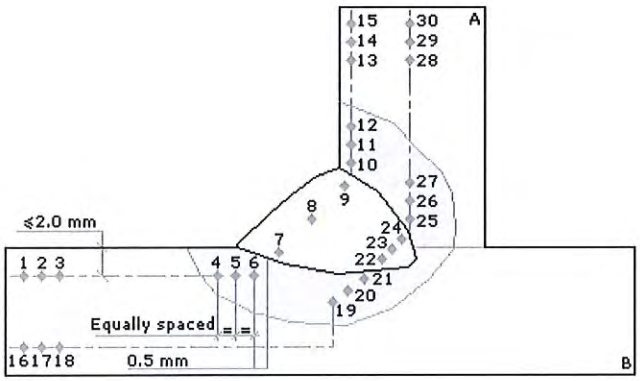
General info

Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	593A19
Client reference	PQR 03/19 PH ML
Identification of specimen (Lab)	593 MC 2
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h3
Test standard	UNI EN ISO 6507-1:2018

Equipments

(Inv.N°9) HARDNESS TESTING MACHINE

Results



CP

Cap		Root	
N°	Value HV10	N°	Value HV10
1	**137.0**	16	**137.0**
2	**135.0**	17	**135.0**
3	**138.0**	18	**137.0**
4	**157.0**	19	**151.0**
5	**194.0**	20	**166.0**
6	**244.0**	21	**183.0**
7	**177.0**	22	**186.0**
8	**174.0**	23	**190.0**
9	**176.0**	24	**184.0**
10	**152.0**	25	**165.0**
11	**157.0**	26	**163.0**
12	**162.0**	27	**161.0**
13	**147.0**	28	**165.0**
14	**145.0**	29	**160.0**
15	**150.0**	30	**155.0**

Min: **135.0** Max: **244.0**

D HODGSON TOTAL
5/3/19

ROSETTI MARINO S.p.A.
Welding Dept.
D. Cenacchi

RINA Services SpA
No. Bo. 0474
Date 05/03/2019
File
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
Signature
Cimatti Davide

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TEST REPORT

NICK BREAK TEST

General info

Test start - Test finish	05/03/2019 - 05/03/2019
MIF reference (Lab)	593A19
Client reference	PQR 03/19 PH ML
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Test standard	UNI EN ISO 9017:2013

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1123) BEND MACHINE

Ref.Lab.	T (°C)	Position	Dimensions (mm)	Results	Note
593 FR 1	20	T WM Full thk	25.01 x 9.97 x 5.56	No defect	

ROSETTI MARINO SpA
Welding Dept.
D. Genacchi

D. HODGSON TOTAL
5/3/19

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimatti Davide

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TEST REPORT

Client
Cod. 1737

ROSETTI MARINO S.P.A
VIA TRIESTE, 230
48122 RAVENNA (RA)
Italia

Your ref. :	Document :	Ddt n. 000087	Date:	21/02/2019
Our ref. :	Report :	RPR212-2E1R0A19	Date:	05/03/2019
	Job :	ADC212-1E1R0A19	Date:	22/02/2019

Remarks: PQR 03/19
PIPE DIMENSION : SIde A : Thk 10mm + Side B : 60.3mm x 5.54mm
CLIENT : TOTAL

Project: TYRA DEVELOPMENT PROJECT

Doc. reference: EN ISO 15614-1:2017 LEV. 2

Test standard: UNI EN ISO 17639:2013 - UNI EN ISO 6507-1:2018 - UNI EN ISO 9017:2013

This Report (RPR) contains tests results on the following materials

Ref:	Identification	Material	Dn (mm)	Thk (mm)	Remarks
592A19	PQR 03/19 PD SL	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L			

Report signatories and approval

☐ Third party	☐ Third party	☐ Third party	Client
☐ Witness	☐ Witness	☐ Witness	

ROSETTI MARINO S.p.A. Welding Dept. D. Cenacchi

D MOOGSAN TOTAL
5/3/19

Digitally signed by
Luca Cantoni
Element Materials Technology Milan S.r.l.
Issue approved
(For and on behalf Element Materials Technology Milan S.r.l)

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimarti Davide
Approved ☐	

General conditions:
1. The Customer accepts general conditions and prices fixed by the laboratory to perform the tests.
2. Test results will be communicated only by means of test report except for different contractual agreement.
3. Tests sample will be destroyed 30 days after test except for different written Client request.
4. The spare will be destroyed 90 days after date of receipt for different written Client request.
5. The test results described in the following test report are referring only to the sample mentioned in it.
6. The date of material receivement is the same as the date of job opening. The date of testing is the same as the date of test report, except for different info.
7. The laboratory has examined the material sampled an supplied by the Client in compliance with standard request.
8. This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.
9. Unless otherwise agreed, sales terms and conditions (MOD20-1E1R0) will be apply.

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TEST REPORT

Test	Page	Technician	Department manager
Macrographic examination	Pag. 3..4	**Cristian Piloni**	**Cristian Piloni**
Hardness test	Pag. 5..6	**Cristian Piloni**	**Cristian Piloni**
Nick break test	Pag. 7	**Luigi Vailati**	**Mirko Piloni**

ROSETTI MARINO SPA
Welding Dept.
D. Corbetti

D HODGSON TOTAL
DP
5/3/19

Signatories

Digitally signed by Cristian Piloni
Element Materials Technology Milan S.r.l.

Digitally signed by Luigi Vailati
Element Materials Technology Milan S.r.l.

Digitally signed by Mirko Piloni
Element Materials Technology Milan S.r.l.

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimatti Davide
Approved ☐	

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TEST REPORT

MACROGRAPHIC EXAMINATION

General info

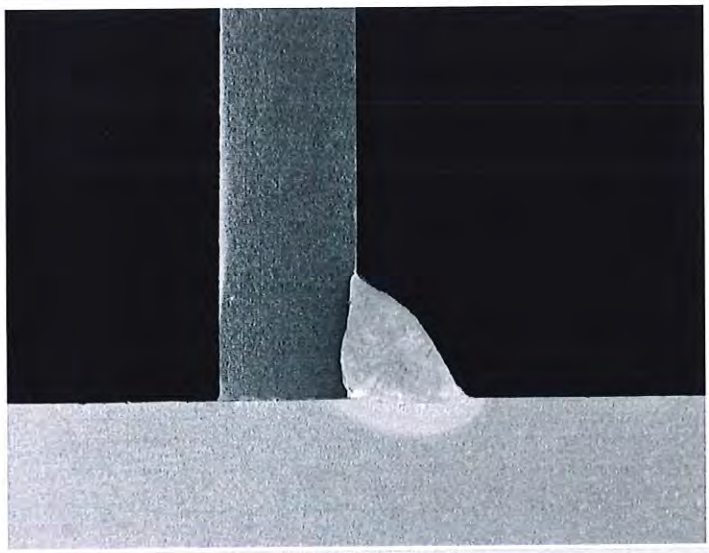
Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	592A19
Client reference	PQR 03/19 PD SL
Identification of specimen (Lab)	592 MC 1
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h12
Test standard	UNI EN ISO 17639:2013

Equipments

(Inv.N°1961) PHOTOCAMERA

Test properties

Etching	Alcoholic hydrochloric acid solution with hydrogen peroxide + Nital 3%



Magnification: ~3X

Result

Test specimen has been examined at low magnification (10x) with and without etching.
According to UNI EN ISO 5817:2014 level B, the results of this exam didn't show the presence of imperfections or defects in weld metal.

ROSE MARINO SpA
Welding Dept.
D. Cernuschi

D. HODGSON TOTAL
5/3/19

RINA Services SpA
No. Bo. 0474
Date 05/03/2019
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
File
Signature
Cimatti Davide

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TEST REPORT

MACROGRAPHIC EXAMINATION

General Info

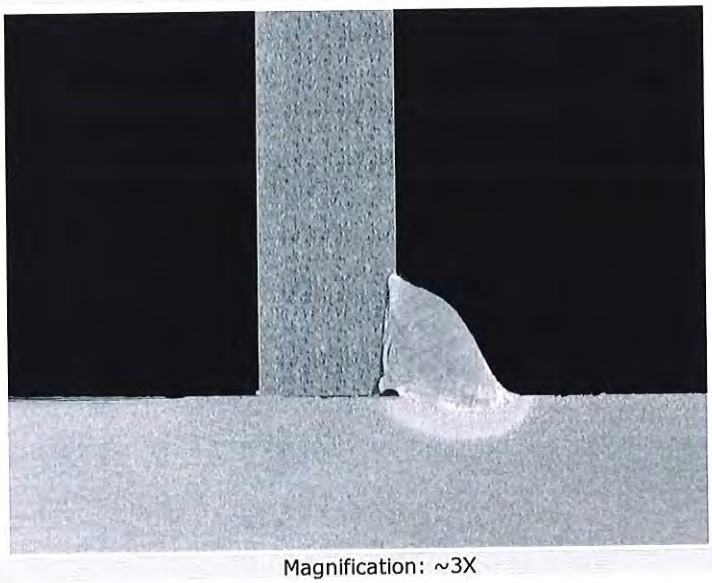
Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	592A19
Client reference	PQR 03/19 PD SL
Identification of specimen (Lab)	592 MC 2
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h3
Test standard	UNI EN ISO 17639:2013

Equipments

(Inv.N°1961) PHOTOCAMERA

Test properties

Etching	Alcoholic hydrochloric acid solution with hydrogen peroxide + Nital 3%



Magnification: ~3X

Result

Test specimen has been examined at low magnification (10x) with and without etching.
According to UNI EN ISO 5817:2014 level B, the result of this exam has show the presence of slag inclusion.

Throat thickness a = 4.52mm
Acceptance criteria h ≤ 0.2a = 0.90mm
Defect height h= 0.31mm

Result: Satisfactory

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

D HODGSON (TOTAL)
5/3/19

RINA Services SpA
No. Bo. 0474
Date 05/03/2019
File
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
Signature
Cimatti Davide

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TEST REPORT

HARDNESS TEST

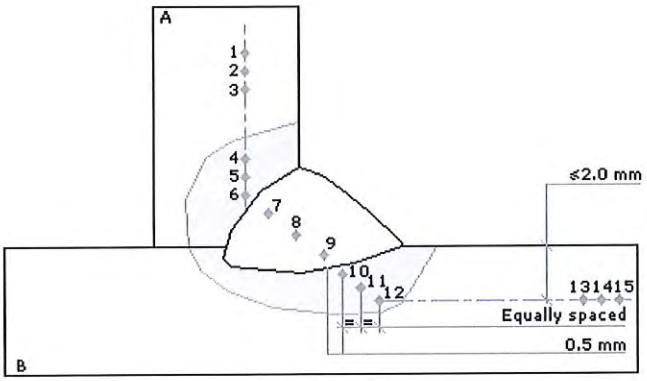
General Info

Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	592A19
Client reference	PQR 03/19 PD SL
Identification of specimen (Lab)	592 MC 1
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h12
Test standard	UNI EN ISO 6507-1:2018

Equipments

(Inv.N°9) HARDNESS TESTING MACHINE

Results



CP

Single run

N°	Value HV10
1	**152.0**
2	**154.0**
3	**148.0**
4	**150.0**
5	**151.0**
6	**157.0**
7	**161.0**
8	**165.0**
9	**161.0**
10	**259.0**
11	**201.0**
12	**160.0**
13	**132.0**
14	**130.0**
15	**127.0**

Min: **127.0** Max: **259.0**

ROSETTI MARINO SPA
Welding Dept.
G. Cenacchi

D HODGSON TOTAL
5/3/19

RINA Services SpA
No. Bo. 0474
Noted ☐
Reviewed ☐
Witnessed ☐
Approved ☐
Date 05/03/2019
File
Signature
Cimatti Davide

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TEST REPORT

HARDNESS TEST

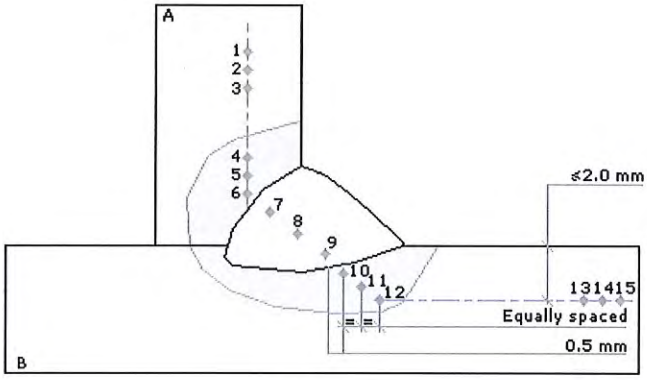
General Info

Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	592A19
Client reference	PQR 03/19 PD SL
Identification of specimen (Lab)	592 MC 2
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h3
Test standard	UNI EN ISO 6507-1:2018

Equipments

(Inv.N°9) HARDNESS TESTING MACHINE

Results



CP

Single run

N°	Value HV10
1	**137.0**
2	**147.0**
3	**145.0**
4	**143.0**
5	**140.0**
6	**149.0**
7	**163.0**
8	**161.0**
9	**158.0**
10	**205.0**
11	**182.0**
12	**162.0**
13	**131.0**
14	**129.0**
15	**127.0**

Min: **127.0** Max: **205.0**

ROSETTI MARINO S.p.A. Welding Dept. D. Cenacchi

D. HODGSON TOTAL
5/3/19

RINA Services SpA No. Bo. 0474 | Date 05/03/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ | File | Signature Cimatti Davide

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TEST REPORT

NICK BREAK TEST

General info

Test start - Test finish	05/03/2019 - 05/03/2019
MIF reference (Lab)	592A19
Client reference	PQR 03/19 PD SL
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Test standard	UNI EN ISO 9017:2013

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1123) BEND MACHINE

Ref.Lab.	T (°C)	Position	Dimensions (mm)	Results	Note
592 FR 1	20	T WM Full thk	25.01 x 9.98 x 5.81	No defect	

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

D. HODGSON TOTAL
5/3/19

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimatti Davide

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TEST REPORT

Client
Cod. 1737

ROSETTI MARINO S.P.A
VIA TRIESTE, 230
48122 RAVENNA (RA)
Italia

Your ref. :	Document :	Ddt n. 000087	Date:	21/02/2019
Our ref. :	Report :	RPR212-1E1R0A19	Date:	05/03/2019
	Job :	ADC212-1E1R0A19	Date:	22/02/2019

Remarks: PQR 03/19
PIPE DIMENSION : SIde A : Thk 10mm + Side B : 60.3mm x 5.54mm
CLIENT : TOTAL

Project: TYRA DEVELOPMENT PROJECT

Doc. reference: EN ISO 15614-1:2017 LEV. 2

Test standard: UNI EN ISO 17639:2013 - UNI EN ISO 6507-1:2018 - UNI EN ISO 9017:2013

This Report (RPR) contains tests results on the following materials

Ref:	Identification	Material	Dn (mm)	Thk (mm)	Remarks
591A19	PQR 03/19 PB SL	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L			

Report signatories and approval

☐ Third party	☐ Third party	☐ Third party	Client
☐ Witness	☐ Witness	☐ Witness	

ROSETTI MARINO SpA
Welding Dept.
D. Cepacchi

D. HODGSON TOTAL
5/3/19

Digitally signed by
Luca Cantoni
Element Materials Technology Milan S.r.l.
Issue approved
(For and on behalf Element Materials Technology Milan S.r.l)

RINA Services SpA
No. Bo. 0474
Date 05/03/2019
Noted ☐
Reviewed ☐
Witnessed ☒
Approved ☐
File
Signature
Cinotti Davide

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4. The spare will be destroyed 90 days after date of receipt for different written Client request.
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7. The laboratory has examined the material sampled an supplied by the Client in compliance with standard request.
8. This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.
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TEST REPORT

Test	Page	Technician	Department manager
Macrographic examination	Pag. 3..4	**Cristian Piloni**	**Cristian Piloni**
Hardness test	Pag. 5..6	**Cristian Piloni**	**Cristian Piloni**
Nick break test	Pag. 7	**Luigi Vailati**	**Mirko Piloni**

ROSETTI MARINO S.p.A.
Welding Dept.
D. Cenacchi

HODGSON TOTAL
5/3/19

RINA Services SpA
No. Bo. 0474
Date 05/03/2019
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
File
Signature
Cimatti Davide

Signatories

Digitally signed by Cristian Piloni
Element Materials Technology Milan S.r.l.

Digitally signed by Luigi Vailati
Element Materials Technology Milan S.r.l.

Digitally signed by Mirko Piloni
Element Materials Technology Milan S.r.l.

Element Materials Technology Milan S.r.l.
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TEST REPORT

MACROGRAPHIC EXAMINATION

General Info

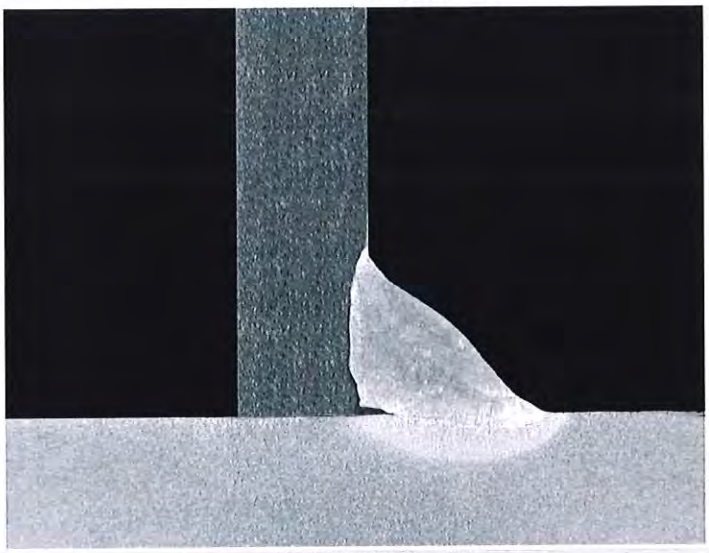
Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	591A19
Client reference	PQR 03/19 PB SL
Identification of specimen (Lab)	591 MC 1
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h12
Test standard	UNI EN ISO 17639:2013

Equipments

(Inv.N°1961) PHOTOCAMERA

Test properties

Etching	Alcoholic hydrochloric acid solution with hydrogen peroxide + Nital 3%



Magnification: ~3X

Result

Test specimen has been examined at low magnification (10x) with and without etching.
According to UNI EN ISO 5817:2014 level B, the result of this exam has show the presence of slag inclusion.

Throat thickness a = 5.47mm
Acceptance criteria h ≤ 0.2a = 1.09mm
Defect height h= 0.45mm

Result: Satisfactory

D. HODGSON TOTAL
5/3/19

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimatti Davide
Approved ☐	

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TEST REPORT

MACROGRAPHIC EXAMINATION

General info

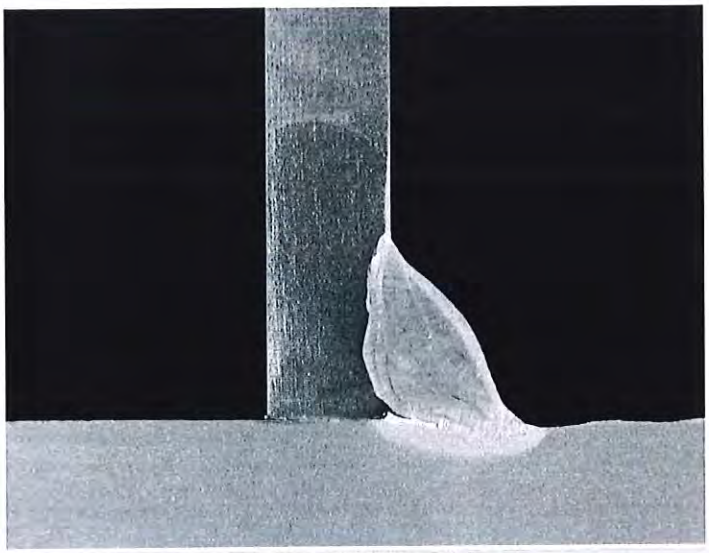
Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	591A19
Client reference	PQR 03/19 PB SL
Identification of specimen (Lab)	591 MC 2
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h3
Test standard	UNI EN ISO 17639:2013

Equipments

(Inv.N°1961) PHOTOCAMERA

Test properties

Etching	Alcoholic hydrochloric acid solution with hydrogen peroxide + Nital 3%



Magnification: ~3X

Result

Test specimen has been examined at low magnification (10x) with and without etching.
According to UNI EN ISO 5817:2014 level B, the result of this exam has show the presence of slag inclusion.

Throat thickness a = 5.35mm
Acceptance criteria h ≤ 0.2a = 1.07mm
Defect height h= 0.39mm

Result: Satisfactory

D HODGSON TOTAL
5/3/19

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimatti Davide

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TEST REPORT

HARDNESS TEST

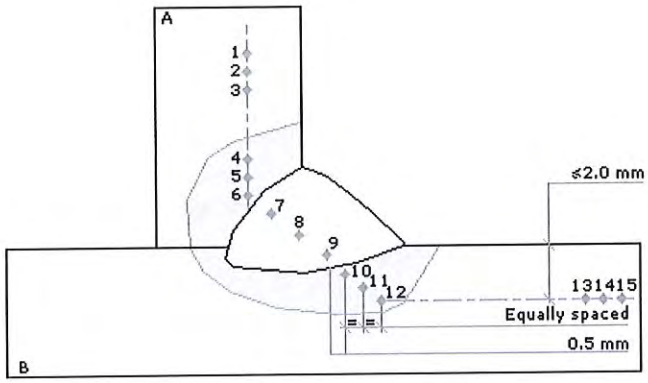
General info

Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	591A19
Client reference	PQR 03/19 PB SL
Identification of specimen (Lab)	591 MC 1
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h12
Test standard	UNI EN ISO 6507-1:2018

Equipments

(Inv.N°9) HARDNESS TESTING MACHINE

Results



CP

Single run

N°	Value HV5
1	**151.0**
2	**149.0**
3	**154.0**
4	**150.0**
5	**142.0**
6	**140.0**
7	**147.0**
8	**156.0**
9	**160.0**
10	**188.0**
11	**168.0**
12	**152.0**
13	**134.0**
14	**133.0**
15	**136.0**

Min: **133.0** Max: **188.0**

D HODGSON TOTAL
DP
5/3/19

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimatti Davide

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TEST REPORT

HARDNESS TEST

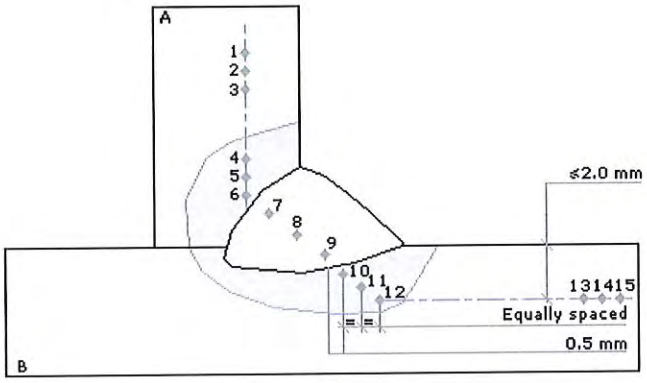
General Info

Test start - Test finish	04/03/2019 - 04/03/2019
MIF reference (Lab)	591A19
Client reference	PQR 03/19 PB SL
Identification of specimen (Lab)	591 MC 2
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Position	T WM Full thk h3
Test standard	UNI EN ISO 6507-1:2018

Equipments

(Inv.N°9) HARDNESS TESTING MACHINE

Results



CP

Single run

N°	Value HV5
1	**145.0**
2	**146.0**
3	**143.0**
4	**144.0**
5	**146.0**
6	**140.0**
7	**160.0**
8	**162.0**
9	**156.0**
10	**180.0**
11	**167.0**
12	**156.0**
13	**133.0**
14	**131.0**
15	**134.0**

Min: **131.0** Max: **180.0**

D HODGSON TOTAL
5/3/19

ROSETTI MARINO SPA
Welding Dept
D. Cerlacchi

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimatti Davide

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TEST REPORT

NICK BREAK TEST

General info

Test start - Test finish	05/03/2019 - 05/03/2019
MIF reference (Lab)	591A19
Client reference	PQR 03/19 PB SL
Material	Side A : ISO EN 10225:S460 G2+M Side B : TP 316 L
Test standard	UNI EN ISO 9017:2013

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1123) BEND MACHINE

Ref.Lab.	T (°C)	Position	Dimensions (mm)	Results	Note
591 FR 1	20	T WM Full thk	25.01 x 9.97 x 5.73	No defect	

ROSETTI MARINO S.p.A.
Welding Dept.
D. Cenacchi

D HODGSON TOTAL
5/3/19

RINA Services SpA No. Bo. 0474	Date 05/03/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimatti Davide

ROSETTI MARINO SPA	Welding Procedure Approval Record form (WPAR) Certificato Approvazione Procedura di Saldatura	Sheet/Foglio 1/4

Welding Procedure Approval Certificate
Approvazione Procedura di Saldatura Certificato **N. 25/98**

Manufacturer's Welding Procedure / Reference No Procedura di saldatura del costruttore. / N. di riferimento	25/98 REV. 1

Manufacturer / Costruttore	ROSETTI MARINO S.p.A.
Address / Indirizzo	VIA TRIESTE 230 - 48100 RAVENNA
Code, Testing Standard / Codice, Normativa	EN 288 - 3:1992/A1 and NORSOK STANDARD M-CR-101 REV. 2
Date of welding / Data esecuzione saggio	02.03.98

EXTENT OF APPROVAL / VALIDITA' DELL'APPROVAZIONE			
Welding process / Processo di saldatura	a) 111/SMAW	b)	c)
Joint type / Tipo di giunto	BW: mb; bs, gg		
Parent metal(s) / Materiale di base	GROUP 1 and 2 to GROUP 9		
Metal thickness / Spessore (mm)	3 ÷ 20 THROAT: ≥ 7,5		
Outside diameter / Diametro esterno (mm)	> 500		
Filler metal type / Tipo materiale d'apporto	EN 1600	E 23 12 L R 32; TRADE NAME: AROSTA 309 S LINCOLN	
Shielding gas, flux / Gas di protezione, flusso	N.A.		
Type of welding current / Corrente di saldatura	DCEP	Heat input / Apporto termico (kJ/mm)	±25% FOR EACH PASS
Welding position / Posizione di saldatura	ALL		
Preheat / Preriscaldo (°C)	15	Interpass temperature / Temp. di interpass (°C)	150 MAX
Post-Weld Heat Treatment and/or ageing / Trattamento Termico e/o Invecchiamento	NONE		
Other information / Altre informazioni	NONE		

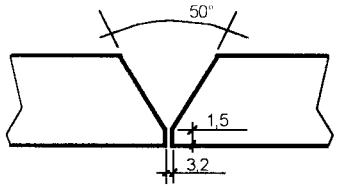
Certified that test welds prepared, welded and tested satisfactorily in accordance with the requirements of the code/testing standards indicated above.
Si certifica che i saggi sono preparati, saldati e provati soddisfacentemente in accordo con i requisiti del codice/normativa indicato sopra.

Location / Luogo	Date of issue / Data di emissione	Examiner or Examining Body / Esaminatore o Ente Certificante
RAVENNA	26.03.98	Name and signature / Nome e firma LLOYD'S REGISTER OF SHIPPING Ravenna 26/3/98 R.H. JONES

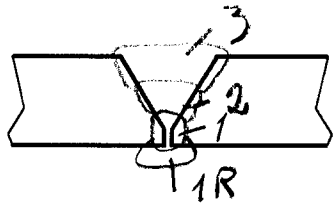
ROSETTI MARINO SPA	WELDING PROCEDURE APPROVAL RECORD QUALIFICA DI PROCEDIMENTO WPAR	WPAR N./PROC. N. 25/98	Sheet/Foglio 2/4

Manufacturer / Costruttore	ROSETTI MARINO S.p.A.
Address / Indirizzo	VIA TRIESTE 230 - 48100 RAVENNA — Examiner or Examining body / Ente certificante
Procedure approval record (WPAR) N° / Qualifica di procedimento N.	25/98 Date/Data 26.03.98 — Ref. N./N. Rif. LLOYDS REGISTER
WPS No. / Procedure N.	25/98 Rev. 1 Date/Data 02.03.98
Welding Process(es) / Processo(i) di saldatura	a) 111/SMAW b) c)
Types / Tipi (Man., Autom., Semi-autom.)	a) MANUAL b) c)
JOINTS / GIUNTI Joint type / Tipo di giunto	BUTT, SINGLE V GROOVE

EDGE PREPARATION / PREPARAZIONE GIUNTO



WELDING SEQUENCE - PASS LOCATION / POSIZIONAM. PASSATE



Run or layers / Passate o strati	Proc.	Filler metal / Materiale d'apporto Size / Dim (mm)		Amp.		Volt.		Travel Speed / Veloc. Sald.	Heat Input / Apporto Termico
		1E	2E	1E	2E	1E	2E	mm/min	kJ/mm
1	137	3,2		129		20		110	1,41
2	137	4		140		22		260	0,71
3	137	4		160		23		300	1,74
1R	137	3,2		135		21		250	1,68

PARENT MATERIAL / MATERIALE DI BASE

Spec. Type & Grade / Specif. Tipo e Grado	PR-EN 10225	S 420 ML 04	
to Spec. Type & Grade / Specif. Tipo e Grado	DIN 17440	WNR 1.4401	
Group No. / Gruppo	2	to / al Group No. / Gruppo	9
Thickness of test coupon / Spessore del saggio (mm)	10	to / con	10
Diameter of test coupon / Diametro del saggio (mm)	N.A.	to / con	N.A.
Other / Altro	NONE		

FILLER METALS / MATERIALE D'APPORTO	a)	b)	c)
Specification No.	EN 1600		
En Class / Classificazione EN	E 23 12 L P 32		
Size of filler metal / Dimensioni materiale d'apporto (mm)	3,2 - 4		
F.M. Trade name / Nome commerciale materiale d'apporto	AROSTA 309 S		
Manufacturer / Fabbricante	LINCOLN		
Flux Trade name / Nome Commerciale Flusso	N.A.		
Manufacturer / Fabbricante	N.A.		
Deposited Weld Metal / Metallo depositato (mm)	10		

Other / Altro NONE

LLOYD'S REGISTER OF SHIPPING Ravenna

ROSETTI MARINO SPA	WELDING PROCEDURE APPROVAL RECORD QUALIFICA DI PROCEDIMENTO WPAR	WPAR N./PROC. N. 25/98	Sheet/Foglio 3/4

ELECTRICAL CHARACTERISTICS / CARATTERISTICHE ELETTRICHE	
Current / Corrente	DC
Polarity / Polarità	EP
Ampere - Volt	SEE TABLES PAGE 2
Tungsten Electrode Type & Size / Tipo e Dimensioni Elettrodo W	N.A.
Mode of Metal Transfer for GMAW / Modo di trasf. per MAG	N.A.
Other / Altro	NONE

TECHNIQUE / TECNICA	
Travel Speed / Velocità	SEE TABLES PAGE 2
String or Weave Bead / Cordoni Stretti o Larghi	STRING
Oscillation / Oscillazione:	
Amplitude / Ampiezza	N.A.
Frequency / Frequenza	N.A.
Multiple, Single Pass (per Side) / Passata Singola o Mult. (per lato)	MULTIPLE / SINGLE
Single or Multiple Electordes / Elettrodi Multipli o Singoli	SINGLE
Other / Altro	GRINDING BEFORE BACK WELDING

WELDING POSITIONS / POSIZIONI DI SALDATURA	
Position of groove or fillet/Posizione dello smusso o del cordone d'angolo	PA (1G)
Welding Progression / Progressione di Saldatura	N.A.
Other / Altro	NONE

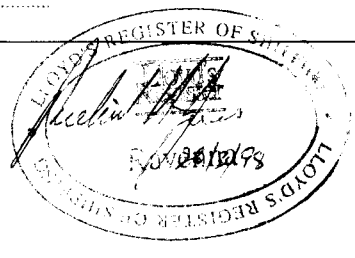
PREHEAT / PRERISCALDO	
Preheat Temperature / Temperatura di Preriscaldo (°C)	15
Interpass Temperature / Tmperatura di Interpass (°C)	150
Other / Altro	NONE

POSTWELD HEAT TREATMENT / TRATTAMENTO TERMICO	
Temperature / Temperatura (°C)	NONE
Time / Tempo (h)	NONE
Other / Altro	NONE

GAS

Percent Composition / Composizione %

	Gas(es) / Gas	(Mixture) / (Miscela)	Flow rate / Portata	
Plasma	N.A.			l/min
Shielding / Protezione	N.A.			l/min
Trailing /Aggiuntivo	N.A.			l/min
Backing / Al rovescio	N.A.			l/min



ROSETTI MARINO SPA	WELDING PROCEDURE APPROVAL RECORD QUALIFICA DI PROCEDIMENTO WPAR	WPAR N./PROC. N. 25/98	Sheet/Foglio 4/4

TEST RESULT / RISULTATO DELLE PROVE

TENSILE TEST / PROVA DI TRAZIONE

Specimen type and No. / Provette tipo e N.	Re N/mm²	Rm N/mm²	A % on/su	Z %	Fracture Location Posizione Rottura	Remarks Note
Requirements / Richieste		500/660				
1 TRANSVERSE		542			DUCTILE O.O.W. C.S.	
2 TRANSVERSE		545			DUCTILE O.O.W. C.S.	

BEND TEST / PROVA DI PIEGAMENTO — Former diameter / Diametro Mandrino mm 4 t

Type & N. / Tipo e N.	Bend angle / Angolo di piega	Elongation / Allungamento	Results / Risultati
TRANSVERSE FACE	180°	NOT REQUIRED	SATISFACTORY
TRANSVERSE FACE	180°	NOT REQUIRED	SATISFACTORY
TRANSVERSE ROOT	180°	NOT REQUIRED	SATISFACTORY
TRANSVERSE ROOT	180°	NOT REQUIRED	SATISFACTORY

IMPACT TEST / PROVA DI RESILIENZA — Requirements / Richieste ≥ joule

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction Posiz. Intaglio / Direzione	Notch Type / Tipo Intaglio	Test Temp. Temp. Prova (°C)	Impact value/average Valori/media (joule)	Remarks / Note

FILLET WELD TEST / PROVA SALDATURA D'ANGOLO

Result - Satisfactory / Risultato - Soddisfacente — Yes - ..... No - .....

Penetration into Parent Metal / Penetrazione nel Materiale Base — Yes - ..... No - .....

Macro Results / Risultati Macro: -

OTHER TESTS / ALTRE PROVE

Location of measurement (Sketch) (if required) / Posizione delle impronte (quando richieste)

Type of test / Tipo di prova: VISUAL, PT AND X-RAY EXAMINATION: SATISFACTORY

MACRO EXAMINATION: SATISFACTORY

C.S. SIDE HARDNESS HV10 TEST: WM = N.A. ; HAZ = 165÷210 ; BM = 162÷164

Welder's name / Nome del saldatore: PACI T. — Stamp N°: 11

Welding test conducted by / Prove condotte da: ROSETTI MARINO S.p.A. - RAVENNA

Mechanical tes conducted by / Prove meccaniche condotte da: ROSETTI MARINO S.p.A. - RAVENNA and CONTROL s.n.c.

Laboratory report reference N. / Rapporto di prova N.: 74/98

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of EN 288/3: 1992/A1 AND NORSK STANDARD M-CR-101 REV. 2

Si certifica che i dati riportati in questo rapporto sono corretti e che i saggi di saldatura sono preparati, saldati e testati in accordo con le richieste di EN 288/3: 1992/A1 AND NORSK STANDARD M-CR-101 REV. 2

Test carried out in the presence of / Test condotti alla presenza di: Mr. R. H. JONES

Test results are / Risultato prove: ACCEPTED

Examiner or Examining Body / Esaminatore o Ente Certificante: LLOYD'S REGISTER OF SHIPPING

Date / Data: 26.03.98

Name, date and signature / Nome, data e firma

LLOYD'S REGISTER OF SHIPPING — Lloyd's Register — Ravenna 26/3/98

ROSETTI MARINO SpA
Agostino Mordenti
(Welding Engineer)

ROSETTI MARINO SPA

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CUSTOMER / Cliente

JOB / Lavoro

FOR PROCEDURE QUALIFICATION

PREP.'D Comp. G.P.R.

APPR.'D Appr. A.M.

WELDING PROCEDURE SPECIFICATION (QW-482)

Specifica di saldatura

COMPANY NAME / Società: ROSETTI MARINO S.p.A. BY / di

WELDING PROCEDURE SPECIFICATION N° / Specifica di saldatura: 25 / 98 DATE / Data: 25.02.98 SUPPORTING PQR N°.(S) / Qualificata da verb: 25/98

REVISION N° / Revisione: 1 DATE / data: 02.03.98

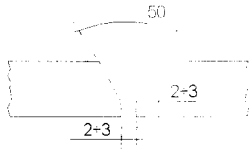
WELDING PROCESS (ES) / Procedimento (i) di saldatura: SMAW TYPE (S) / tipo (i): MANUAL

JOINTS (QW-402) / Giunti — DETAILS / Dettagli

JOINT DESIGN / Tipo di Giunto: SEE DETAILS

BACKING (YES) / Supporto (si): YES (NO) / (no): N.A.

BACKING MATERIAL (TYPE) / Materiale di Supp. (tipo): WELD METAL



METAL / Metallico ☐ NON FUSING METAL / Metallo non fondente

NON METALLIC / Non Metallico ☐ OTHER / Altro

BASE METALS (QW-403) / Materiale Base

P-N / GROUP N° 9 TO P-N° / GROUP N° 2

OR / Oppure

SPECIFICATION TYPE AND GRADE / Tipo e Grado: SA 240 TP 316 L

TO SPECIFICATION TYPE AND GRADE / A Tipo e Grado: S 420 ML 04

OR / Oppure

CHEM. ANALYSIS AND MECH. PROP. / Analisi Chimica e Proprietà Meccaniche: N.A.

TO CHEM. ANALYSIS AND MECH. PROP. / Ad Analisi Chimica e Proprietà Meccaniche: N.A.

THICKNESS RANGE / Gamma Spessori:

BASE METAL: / Metallo Base:	GROOVE / Piena Pen.	10 mm	FILLET / Cord. d'angolo	N.A.
PIPE DIA. RANGE: / Gamma Diametri:	GROOVE / Piena Pen.	N.A.	FILLET / Cord. d'angolo	N.A.

OTHER / Altro

FILLER METALS (QW-404) / Metallo d'apporto

SPEC.N. (SFA)	5.4	EN 1600
AWS N. (CLASS)	E 309 L	E 23 12 L R 32
F-N	5	
A-N	8	

SIZE OF FILLER METALS / Diametro Materiale d'apporto: 3,25÷4,0 mm

DEPOSITED WELD METAL / Metallo depositato: 10 mm

THICKNESS RANGE / Gamma Spessori

GROOVE / Piena Pen: 10 mm

FILLET / Cord. d'angolo: ALL

ELECTRODE-FLUX(CLASS) / Accoppiamento Filo-Flusso: N.A.

FLUX TRADE NAME / Denom. comm. Flusso: N.A.

CONSUMABLE INSERT / Inserto Consumabile: N.A.

OTHER / Altro: ELECTRODE: AROSTA 309

LLOYD'S REGISTER OF SHIPPING 26/3/98

3034106 PRE

25-98.PRE

ROSETTI MARINO SPA

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REV. 0 1 | SHEET foglio 2 di 2

CUSTOMER / Cliente

JOB / Lavoro

FOR PROCEDURE QUALIFICATION

PREP'D Comp. G.P.R.

APPR'D Appr. A.M.

QW-482 (BACK)

POSITION (QW-405) / Posizioni

POSITION(S) OF GROOVE / Posizione (i) cianfrino: 1 G

WELDING PROGRESSION: UP ascendente N.A. DOWN discendente N.A. / Progressione Saldatura:

POSITION(S) OF FILLET / Posiz. cord. d'angolo: N.A.

PREHEAT (QW-406) / Preriscaldo

PREHEAT TEMP. MIN. / Temp. di prerisc. min.: 15°C

INTERPASS TEMP. MAX. / Temp. Max. di Interpass: 150°C

PREHEAT MAINTENANCE / Manten. Preriscaldo: N.A.

POSTWELD HEAT TREATMENT (QW-407) / Trattamento Termico

TEMPERATURE RANGE / temperatura: N.A.

TIME RANGE / Tempo: N.A.

GAS (QW-408) / Gas protettivo

	PERCENT COMPOSITION composiz. percentuale GAS(ES) Gas	(MIXTURE) (miscela)	FLOW RATE Portata
SHIELDING protezione	N.A.	N.A.	N.A.
TRAILING Prot al seguito	N.A.	N.A.	N.A.
BACKING Prot. al rovescio	N.A.	N.A.	N.A.

ELECTRICAL CHARACTERISTICS (QW-409) / Caratteristiche Elettriche

CURRENT AC OR DC / Corrente alt. o cont.: D.C.

POLARITY / Polarità: RP

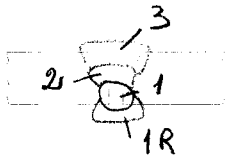
AMPS (RANGE) / Amperaggio: SEE TABLE

VOLTS (RANGE) / Voltaggio: SEE TABLE

TUNGSTEN ELECTRODE SIZE AND TYPE / Diametro e Tipo Elettrodo di Tungsteno: N.A.

MODE FOR METAL TRANSFER FOR GMAW / Metodo di trasferimento per GMAW: N.A.

ELETTRODE WIRE FEED SPEED RANGE / Velocità di alimentazione Filo: N.A.



TECHNIQUE (QW-410) / Tecnica

STRING OR WEAVE BEAD / Passata tirata o a maglia larga: STRING

ORIFICE OR GAS CUP SIZE / Dimensione Bocchello Gas: N.A.

INITIAL AND INTERPASS CLEANING (BRUSHING,GRINDING,ETC.) / Pulizia iniziale e fra le passate: BRUSHING or GRINDING

METHOD OF BACK GOUGING / Metodo di Solcatura a rovescio: GRINDING

OSCILLATION / Oscillazione: N.A.

CONTACT TUBE TO WORK DISTANCE / Distanza tra Tubo di contatto e Pezzo: N.A.

MULTIPLE OR SINGLE PASS (PER SIDE) / Passata multipla o singola (per lato): MULTIPLE/SINGLE

MULTIPLE OR SINGLE ELECTRODES / Elettrodo multiplo o singolo: SINGLE

TRAVEL SPEED (RANGE) / Velocità: N.A.

PEENING / Martellatura: NO

OTHER / Altro: NONE

WELD LAYER(S) Passata(e)	PROCESS Procedim.	FILLER METAL Metallo d'apporto CLASS Classe	FILLER METAL DIA. Diam.	CURRENT TYPE POLAR. Polarita	CURRENT AMP. RANGE Amperaggio	VOLT RANGE Voltaggio	TRAVEL SPEED RANGE Velocità Avanzam.	OTHER Altro HI MAX KJ/cm
1	SMAW	E 309 L	3,25	DC/RP	120÷130	20÷22	10÷11 cm/1'	14,1
2 ÷ 3	SMAW	E 309 L	4,0	DC/RP	130÷170	22÷24	15÷30 cm/1'	
GRINDING								
1R	SMAW	E 309 L	3,25	DC/RP	125÷140	21÷22	15÷25 cm/1'	

LLOYD'S REGISTER OF SHIPPING SURVEYOR'S STAMP Ravenna

26/03/98

3034106.PRE

25/98.PRE

ROSETTI MARINO SPA

TABELLA DI SALDATURA
Welding Table

WPS N. 25/98 | Posizione / Position: 1G

Tipo di saldatura / Welding Process: SMAW	Cliente / Client:
Filo / Wire: LINCOLN 3095 AROSTA	Commessa / Job:
Flusso / Flux:	Materiale base / Base material: TP 316L - SA240 ML 04
	Saldatore/Operatore / Welder Name/Welding Operator: PACI SW. 11

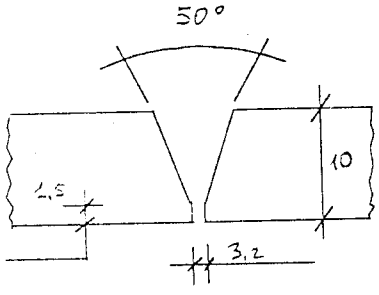
	Gas / Gas (es)	Miscela / Mixture	Portata / Flow Rate
Protezione/Shielding			
Aggiuntivo/Trailing	/	/	/
Al rovescio/Backing			

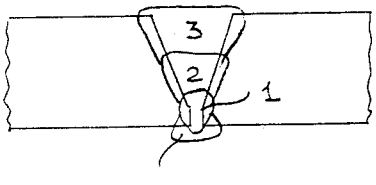
Prerisc. / Preheat: 15°C | Temp. max. di interpass: 150°C

Elettrodo / Electrode: Φ 3.2 - 4 mm

Ravenna, 02-03-98

Preparazione / Joint Design





1R

Pass. N. / Pass N.	Proced. / Process	Elettr. / Electr.	Ampere / Amps	Volts / Volts	Vel.cm/1' / Trav.Sp.	Altro / Other
1	SMAW	3.2	129	20	11 cm/1'	1,41
2	"	4	140	22	26 cm/1'	
3	"	4	160	23	30 cm/1'	7,4
GRINDING						
1R	SMAW	3.2	135	21	25 cm/1'	6,8

LLOYD'S REGISTER OF SHIPPING — Ravenna 26/3/98

ROSETTI MARINO S.p.A. RAVENNA

Note / Notes

Control
RAVENNA

CERTIFICATO CONTROLLO LIQUIDI PENETRANTI
dye penetrant test report
liqüide penetrante certificate

LP. N. 03-10

DATA Date 06/03/98

CLIENTE customer client	ORDINE order commande	PROG. plant project	COMM. job comm.
ROSETTI M. S.p.A.			

OGG. part. object	DIS. dwg plan	
PROCEDURE QUALIFICATION		

CONTROLLO SECONDO SPEC. applicable spec. - selon spec. EN 288. 3 Rev. .....

STATO SUPERFICIE surface condition état de surface

- [x] COME SALDATO as welded brut de soudage
- [x] SPAZZOLATO brushed brossè
- [ ] LAVORATO DI MACCHINA machined usiné
- [ ] COME CALANDRATO as bent embouti
- [ ] MOLATO ground meule
- [ ] COME LAMINATO as rolled brut de laminage
- [ ] GREZZO as forged brut de forgeage
- [ ] .....

PULITORE produit de nettoyage - cleaner: CGM VELNET

PENETRANTE penetrant - penetrant: CGM RED W

REVELATORE revelateur - developer: CGM ROTRIVEL U

PULITURA nettoyage brealable - cleaning: SPRAY / CLOTHS

APPLICAZIONE PENETRANTE application du penetrant - penetrant application: SPRAY

RIMOZIONE PENETRANTE elimination penetrant - removal penetrant: WATER

ESSICAZIONE vage de sechage - dryn process: CLOTHS

APPLICAZIONE RIVELATORE application du revelateur - developer application: SPRAY

PULITORE DOPO CONTROLLO produit de nottayge apres le controle - cleaner after examination

TEMPO MINIMO PENETRAZIONE daige minimum de penetration penetrating time minimum: 10 minuti / minutes / minutes

TEMPERATURA DELLE SUPERFICI surface - temperature: 18 °C

TEMPO DI LETTURA: temp de relage checkingtime: min. 5 minuti max 10 minuti / min. minutes max minutes / min. minutes max minutes

NOTE: TEST PERFORMED ON: WP 25/98 - 26/98.

RISULTATI results résultats

CONFORME ALLA SPECIFICA conforming to spec. conforme à la spécification [x]

NON CONFORME ALLA SPECIFICA non conforming to spec. non conforme à la specification [ ]

OPERATORE operateur operator: CONTROL PROVE MATERIALI

ISPETTORE O.C. supervisor chef departement: [illegible]

ISPETTORE CLIENTE inspecteur client customer's Ispector: [illegible]

LLOYD'S REGISTER OF SHIPPING Ravenna 1508 98

Control
PROVE MATERIALI

SEZIONE COLLAUDI - Testing Department
Via Ponte Mobile, 15 – 48100 RAVENNA

CERTIFICATO COLLAUDO RADIOGRAFICO
Radiographic Test Certificate

Data - Date 06/03/98 | N. 25 | FOGLIO Sheet N. 1

CLIENTE
Customer ROSETTI M. SpA

ORDINE CLIENTE - Customer Order N.

CONFERMA/COMMESSA (Our reference) N.

DISEGNI - Drawings

Oggetto:
Subject

N. schizzo o linea Design	N. sald. Weld. N.	Posizione Position	Materiale Material	Diametro / Spessore Dia/Thk	Saldatore Welder	Radiografia N. Radiographe	Esito Result	Giudizio Judgment
WP 16			Fe	10		0 - 1		2
				"		1 - 2		2
WP 17A/1				"		0 - 1		2
				"		1 - 2		2
WP 17A/2				"		0 - 1		2
WP 17A/3				"		0 - 1		2
WP 17A/4				"		0 - 1		2
WP 19A/1				"		0 - 1		2
				"		1 - 2		2
WP 19A/2				"		0 - 1		2
/3				"		0 - 1		2
/4				"		0 - 1		2
WP 21A/1				"		0 - 1		2
				"		1 - 2		2
/2				"		0 - 1		2
/3				"		0 - 1		2
WP 23A/1				"		0 - 1		2
/2				"		0 - 1		2
/3				"		0 - 1		2
WP 25			Fe / INOX	"		0 - 1		2
WP 26			Fe / INOX	"		0 - 1		2

ESITO - Result

A = **Inclusioni gassose** (Gas cavities)
Aa = **Soffiature tondeggianti** (Porosity)
Ab = **Soffiature vermiculari** (Worm holes)
B = **Inclusioni di scoria** (Slag inclusions)
Ba = **Di forma e di diversi orientamenti** (Of any shape in any direction)
Bb = **Allineate o in serie** (Slag lines)
Bc = **Alternate** (Weaving faults)
C = **Mancanza di fusione incollaggio** (Lack of fusion)
D = **Mancanza di penetraione** (Incomplete penetration)
Da = **Al fondo del cianfrino** (Root penetration)
Dd = **Interna** (Lack root prenetration)
E = **Cricca o fessura** (Craks)
Ea = **Longitudinale** (Longitudinal)
Eb = **Trasversale** (Transversal)
F = **Solchi o incisioni** (Undercut)
K = **Cratere di ritiro** (Shrinkage cavities)
Bd = **Difetto di puntatura** (Local undercut)
Be = **Difetto di ripresa** (Stop-start defect)
Fa = **Irregolarità superficiale** (Surface irregularity)

GIUDIZIO:
Judgment

1 = **Ripetere film conferma difetto** To repeat film to confirm defect
2 = **Accettabile** - Acceptable
3 = **Riparare** - To repair
4 = **Tagliare** - To cut
5 = **Ripetere film** - To repeat film

NOTE

Specifica Specification: EN 288.3 | **Penetrametro** Penetrameter: DIN ☒ ASME ☐

Unità Unit: 300/6 ☒ ☐ | **Energia** - Energy | **Posizione** - Location: **Lato film** ☐ Film side, **Lato sorg.** ☒ Source side | **I.Q.I. Sensibilità** I.Q.I. Sensibility 2%

Sorgente Source: **IRIDIO 192** ☐ | **Pellicola** - Film: D7 | **Schermi rinforzo** - Intensifyng screens: Pb | **Penombra** Geom Unsharpness < 0,1

Macchia focale Focal spot 3x3 | **Film sing.** ☒ **Film doppio** ☐ Double film | **Sviluppo** - Development ☒ Aut. ☐ Man. | **TECNICO LIV. II** TECHNICIAN LEV. II CONTROL PROVE MATERIALI

Tempo d'esposizione Exposure time | **Densità film** Film density > 1.8 | **Distanza focale** - Focal distance 700 mm

Collaudatori - Inspectors	**Nome Ispettore** - Name	**Data** Date	**Firma** - Signature	**Radiografie N.** Radiogr. Gamma Rays N.
26/3/98	ROSETTI MARINO S.p.A.			21

Control
RAVENNA

CERTIFICATO CONTROLLO LIQUIDI PENETRANTI
dye penetrant test report
liqüide penetrante certificate

LP. N./

DATA Date 04 | 03 | 98

CLIENTE customer client: ROSETTI M. SpA	ORDINE order commande: /	PROG. plant project: /	COMM. job comm.: /
OGG. part. object: PQR 25 | 98	DIS. dwg plan:		

CONTROLLO SECONDO SPEC. applicable spec. - selon spec.: EN 288.3 Rev.:

STATO SUPERFICIE surface condition état de surface:
- ■ COME SALDATO as welded brut de soudage
- ■ SPAZZOLATO brushed brossè
- ☐ LAVORATO DI MACCHINA machined usiné
- ☐ COME CALANDRATO as bent embouti
- ☐ MOLATO ground meule
- ☐ COME LAMINATO as rolled brut de laminage
- ☐ GREZZO as forged brut de forgeage
- ☐ .....

PULITORE produit de nettoyage - cleaner: VELVET - CGM

PENETRANTE penetrant - penetrant: RED - CGM

REVELATORE revelateur - developer: WHITE - CGM

PULITURA nettoyage brealable - cleaning: VELVET

APPLICAZIONE PENETRANTE application du penetrant - penetrant application: SPRAY

RIMOZIONE PENETRANTE élimination penetrant - removal penetrant: WATER

ESSICAZIONE vage de sechage - dryn process: ROOM TEMPERATURE

APPLICAZIONE RIVELATORE application du revelateur - developer application: SPRAY

PULITORE DOPO CONTROLLO produit de nottayge apres le controle - cleaner after examination: VELVET

TEMPERATURA DELLE SUPERFICI surface - temperature: ~ 20 °C

TEMPO MINIMO PENETRAZIONE daige minimum de penetration penetrating time minimum: 10 minuti / minutes / minutes

TEMPO DI LETTURA: temp de relage checkingtime: min. 7 minuti max 30 minuti; min. minutes max minutes; min. minutes max minutes

NOTE: CONTROLE HAS BEEN CARRIED OUT ON PQR 25 | 98 7
MATERIAL: INOX

RISULTATI results résultats	CONFORME ALLA SPECIFICA conforming to spec. conforme à la spécification	NON CONFORME ALLA SPECIFICA non conforming to spec. non conforme à la specification
	■	☐

OPERATORE operateur operator: CONTROL GATELLI LUCA [signature] 04/03/98

ISPETTORE O.C. supervisor chef departement:

ISPETTORE CLIENTE inspecteur client customer's ispector: Ravenna [signature] 26/3/98

LLOYD'S REGISTER OF SHIPPING

Control Snc
Sede Amministrativa - Laboratorio
Via Ponte Mobile, 15 - 48100 Ravenna
Telefono - 0544 590597

LABORATORIO DI CONTROLLI E PROVE

CERTIFICATO PROVE MATERIALI
TEST CERTIFICATE

N.74 Fg. 1
DATA / Date 16-mar-98

COMMITTENTE / CUSTOMER: **ROSETTI M. SPA RAVENNA**

OGGETTO / OBJECT: **WP 25 / 98**

NORME DI COLLAUDO / SPECIFICATIONS: EN 288.3 : 1992/A 1

ENTE COLLAUDO / INSPECTOR: LLOYD'S REGISTER

PROVE MECCANICHE
MECHANICAL TESTS

CARATTERISTICHE RICHIESTE / REQUIREMENTS ---------->				Snervamento Yeld stress N	N/nnq	Massimo Total Load N	N/nnq	Allung. Perc. Elong %		Resilienza Impact Test Joule	Piega Bend a / D
											180°/4t
Pos. / Pos.	Prova Nr / Test N°	Dimensioni / Size mm	Area So mmq	L0 mm	LU mm	RISULTATI / RESULT Fs	Rs	Fm	Rm	A %		KV- 40°C	roller dist. = D + 2,5 a
TWTT	25 / 1	9,1 x 24,9	226,6					122700	542		FOW		
TWTT	"	9,3 x 24,9	231,6					126200	545		FOW		
FBB	"	10 x 30											SATISFACTORY
RBB	"	10 x 30											SATISFACTORY
FBB	"	10 x 30											SATISFACTORY
RBB	"	10 x 30											SATISFACTORY
MACRO: SATISFACTORY													

TWTT = TRANSVERSE WELD TENSILE TEST
FOW = DUCTILE FAILURE OUT OF WELD
RBB = TRANSVERSE ROOT BEND TEST
FBB = TRANSVERSE FACE BEND TEST

VWT0/2 = IMPACT TEST IN THE CENTRE OF THE WELD
VHT 0/2 = IMPACT TEST IN FUSION LINE
VHT 2/2 = IMPACT TEST 2 mm FROM FUSION LINE
VHT5/2 = IMPACT TEST 5 mm FROM FUSION LINE

HARDNESS TEST: SEE ATTACHEMENT 2

OPERATORE / Operator — CONTROL MATERIALI

COMMITTENTE / Customer — ROSETTI MARINO SpA RAVENNA

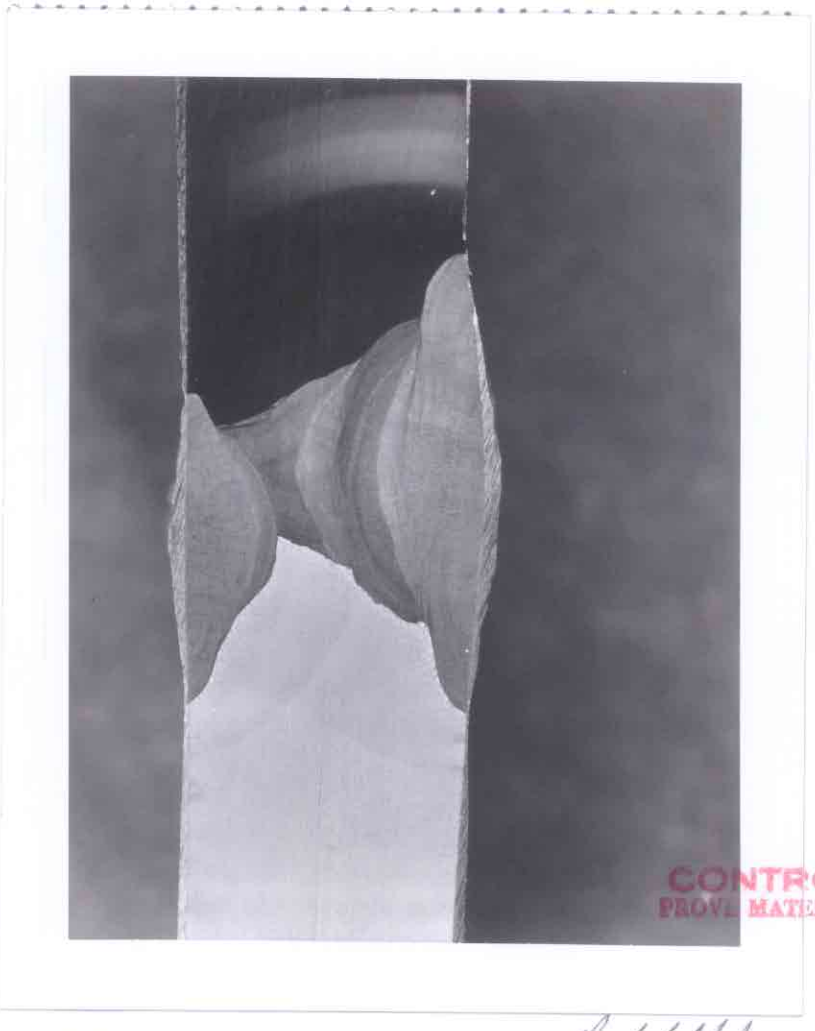
ISPETTORE / Inspector — LLOYD'S REGISTER OF SHIPPING — Ravenna — 16/3/98

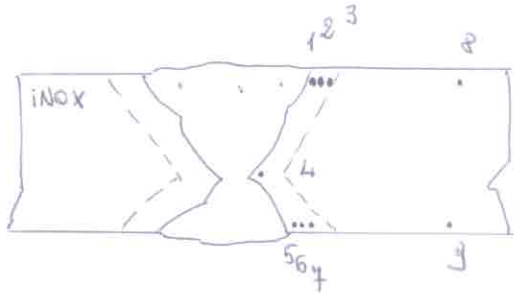
Control Snc	LABORATORIO DI CONTROLLI E PROVE	
Sede Amministrativa - Laboratorio Via Ponte Mobile, 15 - 48100 Ravenna Telefono - 0544 590597	CERTIFICATO PROVE MATERIALI TEST CERTIFICATE	N.74 Fg. 2/2 DATA / Date 16-mar-98

COMMITTENTE / CUSTOMER: ROSETTI M. SPA RAVENNA

OGGETTO / OBJECT: WP 25 / 98

HARDNESS SURVEY





IDENTATION	HV 10
1	165
2	172
3	181
4	209
5	210
6	178
7	166
8	164
9	162

CONTROL PROVE MATERIALI

ETCH : UNICO
MAGNIFICATION : 4X

OPERATORE / Operator	COMMITTENTE / Customer	ISPETTORE / Inspector
CONTROL PROVE MATERIALI	ROSETTI MARINO SpA RAVENNA	Ravenna 26/3/98

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations

A02 ABNAHMEPRUEFZEUGNIS 3.1.B DIN EN 10204 - EN 10204 - DIN 50049
CERTIFICAT DE RECEPTION 3.1.B NF EN 10204
INSPECTION CERTIFICATE 3.1.B BS EN 10204 - ISO 10474 MILL TEST REPORT

A09 Advice of dispatch No./ Date of dispatch: 79999-20.03.97

A08/ Manufacturer's order/ A03 Certificate No.: 604593-001 Sheet: 2/...

A05 Established inspecting body: DH

A06 Purchaser: NORSK STAAL STAVANG. A07.1 No. 7220059
Final receiver: KVAERNER ENERG.EGER A07.2 No.

REF AGENT : 5366

B01 Product: SHOT BLASTED PLATES, PAINTED

B02/ B03 Steel grade / Specifications: S420ML04 / MDS-Y30/R1

--- B01-B99 PRODUCT DESCRIPTION ---

B09 Item No.	B10 Quant	B11 Thickness MM	B12 x Width MM	B13 x Length MM	B14 Mass theoret. KG	B04 Delivery condition		B08 Heat No.	B07 Rol.plate/ Test-No.	B16 Customer reference
**	50				115200					
02	1	10,00	x 3000	x 12000	2880	TM		61608	75944	ITEM0168ARTNA000134
02	2	10,00	x 3000	x 12000	5760	TM	*	61608	75945	ITEM0168ARTNA000134
02	2	10,00	x 3000	x 12000	5760	TM		61799	78437	ITEM0168ARTNA000134
02	2	10,00	x 3000	x 12000	5760	TM		61799	78438	ITEM0168ARTNA000134
02	2	10,00	x 3000	x 12000	5760	TM		61799	78439	ITEM0168ARTNA000134
**	9				25920					
03	2	35,00	x 3000	x 12000	20160	TM		60143	74948	ITEM0170ARTNA000140
***	61				161280					

--- B06 MARKING ---

ITEM NO.: 01-03
STEEL GRADE S420ML04
METHOD OF STEELMAKING/HEAT NO. / TRADEMARK / ROLLED PLATE NO./TEST NO. / INSPECTOR'S STAMP

--- C10-C29 TENSILE TEST ---

B09 Item No.	B08 Heat No.	B07 Rol.plate/ Test No.	B05 Reference condition	C01	C02/ C01	C03 Temp.	C11 RE	C12 RM N/MM2	C13 AZ LO= 5D	C14 REH /RM	C15 ZZ
							REH				
01	61608	75925		K	Q			459	516	32,9	0,89
01	61608	75927		K	Q			473	530	33,8	0,89
01	61608	75934		K	Q			462	517	33,8	0,89
01	61799	78431		K	Q			479	537	32,5	0,89
01	61799	87359		K	Q			497	540	29,4	0,92

A04

Z01/Z02 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001 since 14 March 1990

B. MUELLER
Der Werkssachverständige Inspector's stamp Date 21.03.97 KW

AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Sa
Inspection department

S.4 10 FEB '98 16:05 NORSK STAL AS Page 618 di 1380

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations

A02 ABNAHMEPRUEFZEUGNIS 3.1.B DIN EN 10204 - EN 10204 - DIN 50049
CERTIFICAT DE RECEPTION 3.1.B NF EN 10204
INSPECTION CERTIFICATE 3.1.B BS EN 10204 - ISO 10474 MILL TEST REPORT

A09 Advice of dispatch No./ Date of dispatch: 79999-20.03.97

A08/ Manufacturer's order/ A03 Certificate No.: 604593-001

Sheet: 3/...

A05 Established Inspecting body: DH

A06 Purchaser: NORSK STAAL STAVANG. A07.1 No. 7220059 REF AGENT : 5366
Final receiver: KVAERNER ENERG.EGER A07.2 No.

B01 Product: SHOT BLASTED PLATES, PAINTED

B02/ Steel grade: S420ML04
B03 Specifications: MDS-Y30/R1

--------- C10-C29 TENSILE TEST ----------

B09 Item No.	B08 Heat No.	B07 Rol.plate/ Test No.	B05 Reference condition	C01	C02/ C01	C03 Temp.	C11 RE N/MM2 REH	C12 RM	C13 AZ LO= 5D	C14 REH /RM	C15 ZZ
02	61608	75945		K	Q		455	520	33,3	0,88	
03	60143	74948		K	Q		509	571	28,2	0,89	
				K	SM			550			75,1
				K	SM			546			73,1
				K	SM			546			72,0

--------- C40-C49 IMPACT TEST ----------

B09 Item No.	B08 Heat No.	B07 Rol.plate/ Test No.	B05 Reference condition	C01	C02/ C01	C03 Temp. GR.C	C41 Width	C40 C44 Type of specimen	C45/C42 Individual values AV=J			C43 Average value
01	61608	75916		K	QO	-40	7,5	CHP-V	AV 195	121	203	173
01	61608	75917		K	QO	-40	7,5	CHP-V	AV 208	217	145	190
01	61608	75918		K	QO	-40	7,5	CHP-V	AV 179	170	177	175
01	61608	75919		K	QO	-40	7,5	CHP-V	AV 206	156	202	188
01	61608	75920		K	QO	-40	7,5	CHP-V	AV 189	205	207	200
01	61608	75921		K	QO	-40	7,5	CHP-V	AV 190	198	174	187
01	61608	75922		K	QO	-40	7,5	CHP-V	AV 141	172	174	162
01	61608	75923		K	QO	-40	7,5	CHP-V	AV 132	142	123	132
01	61608	75924		K	QO	-40	7,5	CHP-V	AV 164	168	234	189
01	61608	75925		K	QO	-40	7,5	CHP-V	AV 228	148	131	169
01	61608	75926		K	QO	-40	7,5	CHP-V	AV 236	217	206	220
01	61608	75927		K	QO	-40	7,5	CHP-V	AV 142	149	184	158
01	61608	75928		K	QO	-40	7,5	CHP-V	AV 156	182	178	172
01	61608	75930		K	QO	-40	7,5	CHP-V	AV 225	192	230	216
01	61608	75931		K	QO	-40	7,5	CHP-V	AV 172	199	184	185

A04

Z01/Z02 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001 since 14 March 1990

B. MUELLER
Der Werksachverständige

Inspector's stamp

Date 21.03.97

KW

AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Sa
Inspection department

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DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations

A02 ABNAHMEPRUEFZEUGNIS 3.1.B DIN EN 10204 - EN 10204 - DIN 50049
CERTIFICAT DE RECEPTION 3.1.B NF EN 10204
INSPECTION CERTIFICATE 3.1.B BS EN 10204 - ISO 10474 MILL TEST REPORT

A09 Advice of dispatch No./ Date of dispatch: 79999-20.03.97

A08/ Manufacturer's order/ A03 Certificate No.: 604593-001 Sheet: 4/...

A05 Established inspecting body: DH

A08 Purchaser: NORSK STAAL STAVANG. A07.1 No. 7220059 REF AGENT : 5366
Final receiver: KVAERNER ENERG.EGER A07.2 No.

B01 Product: SHOT BLASTED PLATES, PAINTED

B02/ Steel grade: S420ML04
B03 Specifications: MDS-Y30/R1

--------- C40-C49 IMPACT TEST ----------

B09 Item No.	B08 Heat No.	B07 Rol.plate/ Test No.	B05 Reference condition	C01	C02/ C01	C03 Temp. GR.C	C41 Width	C40 C44 Type of specimen	C45/C42 Individual values AV=J			C43 Average value
01	61608	75932		K	QO	-40	7,5	CHP-V	AV 138	157	227	174
01	61608	75933		K	QO	-40	7,5	CHP-V	AV 132	137	149	139
01	61608	75934		K	QO	-40	7,5	CHP-V	AV 206	200	167	191
01	61608	75935		K	QO	-40	7,5	CHP-V	AV 130	213	171	171
01	61608	75936		K	QO	-40	7,5	CHP-V	AV 146	205	158	170
01	61608	75937		K	QO	-40	7,5	CHP-V	AV 172	147	149	156
01	61608	75938		K	QO	-40	7,5	CHP-V	AV 162	194	162	173
01	61608	75939		K	QO	-40	7,5	CHP-V	AV 153	215	178	182
01	61608	75940		K	QO	-40	7,5	CHP-V	AV 145	194	163	167
01	61799	78431		K	QO	-40	7,5	CHP-V	AV 135	151	202	163
01	61799	87359		K	QO	-40	7,5	CHP-V	AV 184	144	173	167
02	61608	75944		K	QO	-40		CHP-V	AV 312	304	328	315
02	61608	75945		K	QO	-40		CHP-V	AV 373	356	348	359
02	61799	78437		K	QO	-40		CHP-V	AV 244	272	186	234
02	61799	78438		K	QO	-40		CHP-V	AV 334	212	296	281
02	61799	78439		K	QO	-40		CHP-V	AV 214	313	330	286
03	60143	74948		K	QO	-40		CHP-V	AV 288	320	304	304

--------- C66-C69 SUPPLEMENTARY TESTS ON TEST SAMPLES ----------

ITEM NO.: 01-03
DEEP ETCH TESTING AS PER DH-STANDARD <=2A: SATISFACTORY.

A04 D H

Z01/Z02 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001 since 14 March 1990

B. MUELLER
Inspector's stamp

A H B

A01
AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Date 21.03.97 KW 1

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DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations

A02 ABNAHMEPRUEFZEUGNIS 3.1.B DIN EN 10204 - EN 10204 - DIN 50049
CERTIFICAT DE RECEPTION 3.1.B NF EN 10204
INSPECTION CERTIFICATE 3.1.B BS EN 10204 - ISO 10474 MILL TEST REPORT

A08 Advice of dispatch No./ Date of dispatch: 79999-20.03.97

A08/ Manufacturer's order/ A03 Certificate No.: 604593-001 Sheet: 5/...

A05 Established inspecting body: DH

A08 Purchaser: NORSK STAAL STAVANG. A07.1 No. 7220059 REF AGENT : 5366
Final receiver: KVAERNER ENERG.EGER A07.2 No.

B01 Product: SHOT BLASTED PLATES, PAINTED

B02/ Steel grade: S420ML04
B03 Specifications: MDS-Y30/R1

--------- C70-C99 CHEMICAL COMPOSITION % - HEAT ANALYSIS ----------

B08 Heat No.	C70	C93	C	SI	MN	P	S	N	AL	CU	MO	NI	CR	V	NB	TI
			B	AT	FO-31	FO-02	FO-55	FO-52	FO-58							
60143	Y	S	0,074	0,416	1,57	0,014	0,0010	0,003	0,034	0,17	0,008	0,39	0,027	0,001	0,023	0,003
			0,0001	0,035	0,18	0,38	0,60	0,03	11,33							
61608	Y	S	0,084	0,290	1,42	0,014	0,0009	0,005	0,037	0,019	0,022	0,042	0,070	0,001	0,022	0,006
			0,0000	0,038	0,17	0,34	0,15	0,03	7,40							
61799	Y	S	0,092	0,294	1,46	0,012	0,0008	0,004	0,037	0,020	0,007	0,039	0,022	0,001	0,021	0,007
			0,0001	0,038	0,18	0,35	0,09	0,03	9,25							

--------- C95 LADLE TREATMENT ----------

ITEM NO.: 01-03
HEAT OF THE INDICATED ITEM: VACUUM DEGASSSED

--------- C70-C99 CHEMICAL COMPOSITION % - PRODUCT ANALYSIS ----------

B08 Heat No.	C70	C93	B07 Rol.plate/ Test No.	C01	C	SI	MN	P	S	N	AL	CU	MO	NI	CR	V
					NB	TI	B	AT	FO-31	FO-02	FO-55	FO-52	FO-58			
60143	Y		74948	K	0,070	0,399	1,53	0,013	0,0006	0,003	0,038	0,164	0,006	0,383	0,023	0,001
					0,021	0,003	0,0000	0,039	0,18	0,37	0,58	0,03	12,67			
60143	Y		74948	K	0,072	0,404	1,54	0,014	0,0006	0,004	0,038	0,164	0,006	0,385	0,024	0,001
					0,021	0,003	0,0000	0,039	0,18	0,37	0,58	0,03	9,50			
61608	Y		75919	K	0,085	0,285	1,40	0,014	0,0010	0,004	0,034	0,018	0,022	0,041	0,070	0,001
					0,022	0,006	0,0000	0,035	0,17	0,34	0,15	0,03	8,50			
61608	Y		75934	K	0,082	0,282	1,41	0,013	0,0010	0,004	0,038	0,018	0,022	0,041	0,069	0,001
					0,021	0,005	0,0000	0,038	0,17	0,34	0,15	0,03	9,50			
61608	Y		75944	K	0,087	0,286	1,40	0,013	0,0010	0,004	0,040	0,018	0,022	0,041	0,069	0,001
					0,021	0,006	0,0000	0,041	0,17	0,34	0,15	0,03	10,00			
61608	Y		75945	K	0,084	0,288	1,41	0,014	0,0009	0,004	0,040	0,018	0,022	0,041	0,069	0,001
					0,021	0,006	0,0000	0,040	0,17	0,34	0,15	0,03	10,00			

A04 D H

Z01/Z02 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.
QM-System: Certification as per ISO 9001 since 14 March 1990

B. MUELLER
Der Werkssachverständige Inspector's stamp Date 21.03.97 KW 1

AHB

AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saa
Inspection department

A0

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DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations

A02 ABNAHMEPRUEFZEUGNIS 3.1.B DIN EN 10204 - EN 10204 - DIN 50049
CERTIFICAT DE RECEPTION 3.1.B NF EN 10204
INSPECTION CERTIFICATE 3.1.B BS EN 10204 - ISO 10474 MILL TEST REPORT

A09 Advice of dispatch No./ Date of dispatch: 79999-20.03.97

A08/ Manufacturer's order/ A03 Certificate No.: 604593-001 Sheet: 6/...

A05 Established Inspecting body: DH

A06 Purchaser: NORSK STAAL STAVANG. A07.1 No. 7220059 REF AGENT : 5366
Final receiver: KVAERNER ENERG.EGER A07.2 No.

B01 Product: SHOT BLASTED PLATES, PAINTED

B02/ Steel grade: S420ML04
B03 Specifications: MDS-Y30/R1

--------- C70-C99 CHEMICAL COMPOSITION % - PRODUCT ANALYSIS ----------

B08 Heat No.	C70 C93	B07 Rol.plate/ Test No.	C01	C NB	SI TI	MN B	P AT	S FO-31	N FO-02	AL FO-55	CU FO-52	MO FO-58	NI	CR	V
61799	Y	78431	K	0,095 0,019	0,277 0,007	1,44 0,0001	0,012 0,034	0,0009 0,18	0,005 0,34	0,033 0,09	0,020 0,03	0,006 6,60	0,038	0,022	0,001
61799	Y	78439	K	0,089 0,020	0,279 0,007	1,45 0,0001	0,011 0,034	0,0009 0,17	0,005 0,34	0,033 0,09	0,020 0,03	0,006 6,60	0,039	0,023	0,001
61799	Y	87359	K	0,092 0,020	0,284 0,007	1,45 0,0001	0,012 0,037	0,0006 0,18	0,005 0,34	0,036 0,09	0,019 0,03	0,006 7,20	0,038	0,023	0,001

--------- C94 CARBON EQUIVALENT FORMULA / ALLOYING RESTRICTIONS ----------

FO-31 = C+SI/30+(MN+CR+CU)/20+MO/15+V/10+NI/60+5B
FO-02 = C+(MN/6)+(CR+MO+V)/5+(NI+CU)/15
FO-55 = CU+MO+NI+CR
FO-52 = V +NB+TI
FO-58 = AL/N

--------- D01 CHECKING OF MARKING, SURFACE, SHAPE AND DIMENSIONS ----------

ITEM NO.: 01-03
RESULT OF MARKING, SURFACE, SHAPE AND DIMENSIONS: NO REMARKS
SURFACE AS PER EN-10163-A3
THICKNESS AS PER EN-10029A/91
LENGTH AND WIDTH AS PER EN-10029/91

A04 D H

Z01/Z02 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.
QM-System: Certification as per ISO 9001 since 14 March 1990

B. MUELLER
Der Werkssachverständige Inspector's stamp AHB Date 21.03.97

AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saa...
Inspection department

A0

KW 1

S.8
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DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations

A02				A09 Advice of dispatch No./ Date of dispatch	A08/ Manufacturer's order/ A03 Certificate No.	Sheet
ABNAHMEPRUEFZEUGNIS	3.1.B	DIN EN 10204 - EN 10204 - DIN 50049				
CERTIFICAT DE RECEPTION	3.1.B	NF EN 10204		79999-20.03.97	604593-001	7
INSPECTION CERTIFICATE	3.1.B	BS EN 10204 - ISO 10474	MILL TEST REPORT			

A05 Established inspecting body	A06 Purchaser / Final receiver	A07.1 No. / A07.2 No.		B01 Product
DH	NORSK STAAL STAVANG. / KVAERNER ENERG.EGER	7220059	REF AGENT : 5366	SHOT BLASTED PLATES, PAINTED

B02/ Steel grade S420ML04
B03 Specifications MDS-Y30/R1

--- D02 ULTRASONIC TESTING ---

ITEM NO.: 01-03
US TEST AS PER: EURONORM 160-85 LEVEL:AREA: A EDGES: A
APP.: SEGBP-USM2 PROBE : SEZ4R10RS-SEZ4N30-B4S FREQUENCY: 4 MHZ
REG.OF SCANNING: AREA:SCAN LINES TRANSV. INTERVAL 50MM. EDGES=THICKNESS,>= 50MM
NDT SUPERVISOR: LEVEL II NDT PERSONEL IN ACC.ASNT DOC.SNT-TC-1A, SUPPL.C.
THE TEST RESULTS MEET THE REQUIREMENTS.

A04 D H

Z01/Z02 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001 since 14 March 1990

B. MUELLER

A H B

AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saa
Inspection department

S.9
10 FEB '98 16:07 NORSK STAL AS
Page 623 di 1380

naamloze vennootschap
...pelijke zetel
...d : Zone 6A, B 3600 Genk
...9) 30 21 11 - Telefax (089) 30 23 80
...39058 aldozg b
...Tongeren nr 41.051 - B.T.W. nr BE 401.277.914

Der TÜV Rheinland hat mit Schreiben vom 21. Märtz 1972 auf die Gegenzeichnung verzichtet

SURVEYOR'S MARK
CACHET DE L'EXPERT
STEMPEL DES WERKSSACHVERSTÄNDIGEN

Certificate of test - Mill certificate
Certificat de Réception C.C.P.U.
Abnahmeprüfzeugnis B

No 96/0029163
Nr

nach DIN 50049/3.1.B - NFA 00001/3.1.B - EN 10204/3.1.B

Approved as supplier according to AD/WO - TRD 100 statement W E 603
Überprüfung als Hersteller nach AD/WO - TRD 100 Bericht W E 603

PROD.PROCES: Electric Arc Furnace - VOD - Continuous Casting.
PROC. FABRIC.: Four à Arc - VOD - Coulée Continue.
FERTIGUNGSABL.: Elektro-Lichtbogen Ofen - VOD - Strangguss.

your order n° - votre n° de cde - Bestell.Nr	our order n° - notre n° de cde - Werksnr
LAC/OIK/APR96	47400/336/45

ACIER INOXYDABLE, COILS, LAMINES A CHAUD, RECUITS ET DECAPES

heat n°-n° coulée Schmelze Nr: E608080
coil n°-n° bobine Band Nr: 60808023

Specifications - Spécifications - Vorschriften	Type - Nuance - Quality	Finish	Corrosion test - Corr. inter - Int.krist.Korr.
DIN 17440-07/85 960480 96/A01769	WNR 1.4401	IIA	DIN 50914 :OK

dimensions - Abmessungen
mm 10.00 2000.00 0.0
inches

Material (Code Designation) Matière Werkstoff (Normbez.): X5 CRNIMO 17 122

Quenching Hypertrempe Abschreckung: DIN 17440 1050°c — forced air / air poussé / bewegter Luft

Particular requirem. - Prescr. particul. - Sondervorschriften :
MATERIAL MERCURY FREE
TRB 100-AD W2 ED.01/94 UND AD W10 ED.11/87

CHEMICAL ANALYSIS
COMPOSITION CHIMIQUE
CHEMISCHE ZUSAMMENSETZUNG

ELEMENTS	LADLE ACIERIE SCHMELZE	PRODUCT PRODUIT STUCKANAL.
C	0.022	0.022
Mn	1.33	1.31
P	0.027	0.028
S	0.009	0.008
Si	0.45	0.43
Cr	16.82	16.85
Ni	11.02	11.00
Mo	2.10	2.06
Cu		
Ti		
Co		
N		
Al		
α - ferrite		
δ - ferrite		

MECHANICAL PROPERTIES - PROPRIETES MEC. - MECH. WERTE

TENSILE TEST ESSAI DE TRACTION ZUG VERSUCH	ROOM TEMP. - TEMP. AMB. - RAUMTEMP. REQ.-EXIGÉ ANFORDERUNG		OBTAINED - OBTENU - ERGEBNISSE TEST N° - N° TEST - PROBE 60808023		TEMP. °C REQ.-EXIGÉ ANFORDER.	OBTAIN.-OBTENU ERGEBNISSE
EN 10002	N/MM2 min.	max.	A (T)	E	min.	
Section-Q.Schnitt mm²			12.73X	9.90		
yield 0.2% limite él. Str.grenze 1.0%	205 240		338 374	331 367		
tensile strength rupture Zugfestigkeit	510	710	576	564		
along. % A5 allong. Br.Dehn. A50	40		53 53	51 51		
E 0.2 /R max %			58	58		
hardness dureté Härte HRB			84.0	82.5		

grain size astm / grain astm / Korngrösse: 7.0
bend / pliage / Biegeversuch: 180° OK
impact strength test / essai de résilience / Kerbschlagbiegeversuch: °C

TESTS TO VERIFY BATCH AND QUALITY HAVE BEEN CARRIED OUT
TESTS DE VERIFICATION DE LA CONFORMITE DE LA NUANCE FOURNIE
VERWECHSLUNGSPRÜFUNG WURDE DURCHGEFÜHRT: OK

VISUAL INSPECTION AND DIMENSIONAL CHECK
EXAMEN VISUEL ET DIMENSIONEL DE SURFACE
BESICHTIGUNGEN UND ABMESSUNGEN: EXAMEN VISUEL D'ASPECT DE SURFACE ET DIMENSIONS OK

QUANTITY / WEIGHT MEMO / QUANTITÉ MÉMO POIDS LIVRÉ
ÜBERSICHT GELIEFERTER GEWICHTE

PACKAGE Nr N° DE CAISSE PAKET NR	QTY. QTÉ. ANZ.	NET WEIGHT POIDS NET NETTO GEW.	PACKAGE Nr N° DE CAISSE PAKET NR	QTY. QTÉ. ANZ.	NET WEIGHT POIDS NET NETTO GEW.
60342021	1	17570			
TOTAL/GESAMT:	QTY. QTÉ. ANZ. 1		NET WEIGHT POIDS NET NETTO GEW.		17570

Copia conforme all'originale
OIKI ACCIAI S.p.A.

PACKING LIST 610127 - I - 9605147

The delivery is in accordance with the order.
La fourniture est conforme aux exigences de la commande.
Die Lieferung entspricht den Bestellbedingungen.

OIKI ACCIAI INOSSIDABILI SPA
VIA PARADIGNA, 95/A
43100 PARMA
ITALIE

ALZ naamloze vennootschap
THE SURVEYOR - L'EXPERT - DER WERKSSACHVERSTÄNDIGE

Genk the le den: 03.04.1996

H. JANSSEN

EQC011 01.94

PRODUCT CONFORMANCE REPORT

LINCOLN ELECTRIC

Product	AROSTA-309 S		Size(s) mm	4,0 x 350
Class.	AWS 5.4	E309L-16	Lot No.	615246
	DIN 8556	E23 12 L R 26		
	NF A81-343	EZ23 12 LR 26		
	BS 2926	E23 12 L R		
	NEN-ISO 3581	E23 12 L R 26		
Customer	ROSETTI		Cust. Order No.	97AK0368-960013
			LSW Order No.	

Chemical composition w%, all weld metal — typical values acc. EN10204 '3.1.B'

C	Si	Mn	P	S	Cr	Ni	Mo	Nb	Cu
0,022	0,70	0,81	0,018	0,011	23,4	12,2	0,04		0,07

V	Ti	Al	B	Co	W	As	Sn	Sb	Pb	N

Mechanical tests, all weld metal — typical values acc. EN10204 '2.2'

Tension test

Cond.	test temp. [°C]	Rp0.2 [N/mm²]	Rp1 [N/mm²]	Rm [N/mm²]	A5 [%]
AW	RT	478	499	571	37

Charpy V-notch test

test temp. [°C]	CVN, ind. values [J]	CVN ave [J]
+20		62

Additional information

Other tests

ROSETTI MARINO S.p.A.
Conforme alla spec.
According to the spec. A5.4 E309L-16
C.Q. Firma
Q.C.Signature
Data
Date 03-09-97

typical values acc. EN10204 '2.2'
Ferrite Number
FN, acc. AWS A4.2-91: 15,2

Remarks

Typical values for weld metal properties are the results from statistical sampling of routine tests or the result from annual check tests that have been witnessed by Approval Societies in accordance with EN 10204 para. 2.2.
Actual chemical analysis and/or mechanical test values have been obtained from samples of the Lot/Batch above, in accordance with EN 10204 para.3.1B.
The product identified above has been manufactured, tested and supplied in compliance with a Quality Assurance Programme that fulfils the requirements of EN 29000/ISO 9000/BS 5750 or similar standard.
We herewith certify that the product complies with the above-mentioned standards.

Company	Issued by	Signature	Function	Date	Cert.No
Lincoln Smitweld			**QA Administrator**	**10.06.97**	**12710 6**

Registered Office:		*Telephone:*	*Fax:*	*Telex:*	*Reg.No.:*
Nieuwe Dukenburgseweg 20	P.O. Box 253	+31 80 522911	+31 80 522670	48129 smil nl	A309S
6534 AD Nijmegen	6500 AG Nijmegen				
Netherlands	Netherlands				

PRODUCT CONFORMANCE REPORT

Product	AROSTA 309 S		Size(s) mm	3,2 x 350
Class.	AWS 5.4	E309L-16	Lot No.	626305
	DIN 8556	E 23 12 L R 26		
	NF A81-343	EZ 23 12 LR 26		
	BS 2926	E 23 12 L R		
	NEN-ISO 3581	E 23 12 L R 26		
Customer	ROSETTI		Cust. Order No.	97/AK0368-960013
			LSW Order No.	

Chemical composition w%, all weld metal — typical values acc. EN10204 '3.1.B'

C	Si	Mn	P	S	Cr	Ni	Mo	Nb	Cu
0,022	0,76	0,75	0,018	0,013	23,1	12,6	0,04		0,04

V	Ti	Al	B	Co	W	As	Sn	Sb	Pb	N

Mechanical tests, all weld metal — typical values acc. EN10204 '2.2'

Tension test

Cond.	test temp. [°C]	Rp0.2 [N/mm²]	Rp1 [N/mm²]	Rm [N/mm²]	A5 [%]
AW	RT	478	499	571	37

Charpy V-notch test

test temp. [°C]	CVN, ind. values [J]	CVN ave [J]
+20		62

Additional information — ROSETTI MARINO S.p.A

Other tests

Conforme alla spec. / According to the spec. A5.4 E309L-16

C.Q. Firma / Q.C.Signature — Data / Date 03-09-97

typical values acc. EN10204 '2.2'

Ferrite Number

FN, acc. AWS A4.2-91

15,5

Remarks

Typical values for weld metal properties are the results from statistical sampling of routine tests or the result from annual check tests that have been witnessed by Approval Societies in accordance with EN 10204 para. 2.2.
Actual chemical analysis and/or mechanical test values have been obtained from samples of the Lot/Batch above, in accordance with EN 10204 para.3.1B.
The product identified above has been manufactured, tested and supplied in compliance with a Quality Assurance Programme that fulfils the requirements of EN 29000/ISO 9000/BS 5750 or similar standard.
We herewith certify that the product complies with the above-mentioned standards.

Company	Issued by	Signature	Function	Date	Cert.No
Lincoln Smitweld			QA Administrator	10.06.97	97/103

Registered Office:		Telephone:	Fax:	Telex:	Reg.No.:
Nieuwe Dukenburgseweg 20	P.O. Box 253	+31 80 522911	+31 80 522670	48129 smil nl	A309S
6534 AD Nijmegen	6500 AG Nijmegen				
Netherlands	Netherlands				

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 42/19	Sheet/Foglio 1/3

Manufacturer's Welding Procedure. Ref. no.	42/19 REV. 0					
Manufacturer	ROSETTI MARINO S.p.A.					
Address	VIA TRIESTE 230 - 48121 RAVENNA					
Code, Testing Standard	Rina Rules Pt D. Ch 5 Sec. 4; EN ISO 15614-1:2019 Lev.2					
	Location of test specimen according to EN ISO 15614-1:2019 Section 7.2, Fig. 5 Essential variables according to EN ISO 15614-1:2019, Chapter 8 and Rina Rules Pt D. Ch 5 Sec. 4					
Date of welding	Start: November 21st , 2019 Complete: November 21st , 2019					
Examiner of examining body	Rina Services S.p.A.					
RANGE OF QUALIFICATION						
Welding process	136 - FCAW					
Type(s)	Partly Mechanized					
Welding Equipment Type	HF inverter type (BLUE STAR 500)					
Actual parent Material side A	Plate: ASTM A240 Tp. 316L (Heat: 3714787)					
Actual parent Material side B	Plate: EN 10225: S460G2+M Z (Heat: 458532)					
Parent Material grade	ISO 15608 Gr. 8.1 (Material side A); ISO 15608 Gr. 2.1 (Material side B)					
Supply condition	Solution treated (Material side A); Termomechanically rolled (Material side B)					
Groove design/configuration	Single Vee Butt Joint, both sides welding with back gouging (for groove dimension and details see page 4 of 5)					
Parent material thickness (mm)	10 mm (316L material machined from original thickness 20 mm)					
Weld metal thickness (mm)	136 - FCAW - 10 mm					
Single or Multi-pass	136 - FCAW MULTIPLE					
Outside diameter	> 150 mm (PA, PB, PF rotated position) ; >500 mm (other positions)					
Filler material Designation	**136 FCAW** EN ISO 17633: T 23 12 L P M 2 (AWS A5.22: E309LT1-1/-4)					
Filler material Maker	136 - LINCOLN COR-A-ROSTA P309L					
Filler material Size	136 - FCAW ∅ 1,2 mm					
Shielding gas/Flux	ISO 14175 :2008 M20 (85% Ar - 15% CO_2)					
Shielding gas flow rate	20 l/min.					
Backing gas (purging)	None					
Type of welding current & polarity	DC - RP	**Heat input / Apporto termico (kJ/mm) ± 25%**		Diameter	Pos. PC (2G)	Pos. PF (3G)
			Pass	mm		
			Root	∅ 1,2	0,90 to 1,50	1,10 to 1,84
			Hot	∅ 1,2	0,35 to 0,86	1,04 to 1,73
			Fill/Cap	∅ 1,2	0,35 to 0,75	0,83 to 2,08
Welding position	All, vertical down progression excluded					
Preheat (°C)	20	**Interpass temperature / Temp. di interpass (°C)**			150	
Post-Weld Heat Treatment and/or ageing	NONE					
Weld bead width	Max. 16 mm (pos. PF) ; Max. 14 mm (pos. PC)					
Welder's detail	Piccoli Alessio , Stamp 12					
Time lapse between root and hot pass	N.A.					
Other information / Altre informazioni	-Accelerate weld cooling not permitted; -Base material origin: plate					

Manufacturer's Welding Procedure. Ref. no.	42/19 REV. 0		
Test result (WPQR) N°	42/19	Date/Data	28/01/2020
Manufacturer's WPS No.	pWPS 42/19 REV. 0	Date/Data	19/11/2019

TESTS CARRIED OUT ON SAMPLE 42/19 WELDED IN 2G POSITION (PC)

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 42/19
Penetrant test	Acceptable	PT 01-SZ
Magnetic particle test	N.A.	/
Radiographic test	Acceptable	RT 02 SZ
Ultrasonic test	N.A.	/

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2] /	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 515	A [%] /	Z [%] /	Fracture Location /	Remarks /
12-20PC-A			568			Weld metal	
12-20PC-B			564			Weld metal	

BEND TEST

Type & N.	Bend angle	Remarks	Results
2 Face Bend	180°	Former Ø 40 mm	Satisfactory
2 Root Bend	180°	Former Ø 40 mm	Satisfactory

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] Min. 14			Average value [J] Min. 20	Remarks
7,5x10x55	WM 12-20	KV2	-50	42	41	42	42	/
7,5x10x55	FL 12-20 SIDE S460G2+M	KV2	-50	26	30	30	29	/
7,5x10x55	FL+2 12-20 SIDE S460G2+M	KV2	-50	174	141	188	168	/
7,5x10x55	FL 12-20 SIDE Tp. 316L	KV2	-50	90	82	81	84	/
7,5x10x55	FL+2 12-20 SIDE Tp. 316L	KV2	-50	150	139	84	124	/

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
1 Macro examination + Hardness Test (HV10)	Satisfactory-See Inspecta Certificate No. 019-00210-19, max. Hardness: 300HV10
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Inspecta S.r.l. - Ravenna
Laboratory report reference N.	Report No. 019-00210-19 dated JANUARY 28th 2020
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Rina Rules Pt D. Ch 5 Sec. 4; EN ISO 15614-1:2019 Lev. 2.

Date/Data
28-01-2020

ROSETTI MARINO SpA
Welding Dept.
D.Cenacchi

ROSETTI MARINO S.p.A.

Examiner or Examination Body
RINA Services S.p.A.

RINA
F. Lago
RINA Services S.p.A.

Name and signature / Nome e firma

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 42/19	Sheet/Foglio 3/3

Manufacturer's Welding Procedure. Ref. no.	42/19 REV. 0		
Test result (WPQR) N°	42/19	Date/Data	28/01/2020
Manufacturer's WPS No.	pWPS 42/19 REV. 0	Date/Data	19/11/2019

TESTS CARRIED OUT ON SAMPLE 42/19 WELDED IN 3G POSITION (PF)

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 42/19
Penetrant test	Acceptable	PT 06-RN
Magnetic particle test	N.A.	/
Radiographic test	Acceptable	RT 04 SZ
Ultrasonic test	N.A.	/

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2] /	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 515	A [%] /	Z [%] /	Fracture Location /	Remarks /
12-20PF-A			577			FOW, side 316L	
12-20PF-B			553			FOW, side 316L	

BEND TEST

Type & N.	Type & N.	Type & N.	Type & N.
2 Face Bend	2 Face Bend	2 Face Bend	2 Face Bend
2 Root Bend	2 Root Bend	2 Root Bend	2 Root Bend

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] Min. 14			Average value [J] Min. 20	Remarks
7,5x10x55	WM 12-20	KV2	-50	40	41	34	38	/
7,5x10x55	FL 12-20 SIDE S460G2+M	KV2	-50	46	25	35	35	/
7,5x10x55	FL+2 12-20 SIDE S460G2+M	KV2	-50	144	76	150	123	/
7,5x10x55	FL 12-20 SIDE Tp. 316L	KV2	-50	166	87	169	141	/
7,5x10x55	FL+2 12-20 SIDE Tp. 316L	KV2	-50	82	142	63	96	/

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
1 Macro examination + Hardness Test (HV10)	Satisfactory-See Inspecta Certificate No. 019-00210-19, max. Hardness: 260HV10
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Inspecta S.r.l. - Ravenna
Laboratory report reference N.	Report No. 019-00210-19 dated JANUARY 28th 2020
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Rina Rules Pt D. Ch 5 Sec. 4; EN ISO 15614-1:2019 Lev. 2.

Date/Data
28-01-2020

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

Examiner or Examination Body
RINA Services S.p.A.

RINA
F. Lago
RINA Services S.p.A.

ROSETTI MARINO S.p.A.

Name and signature / Nome e firma

RAPPORTO PROVA DI QUALIFICA DI PROCEDIMENTO DI SALDATURA/BRASATURA

N° PRATICA	N° SAGGIO	NORMA
2020 VE 92 PW	42/19	EN ISO 15614-1:2019 Lev.2 and Rina Rules

Società ROSETTI MARINO SPA Localit RAVENNA (RA)

Processo FCAW (136) à Tipo PARTLY MECHANIZED

Posizione Saldatore/ Brasatore ____ Spessore (mm) ____ Diametro (mm) ____

Stamp ____ WPS/BPS 42/19

Materiale base: Gruppo/i	Norma e designazione / tipo backing	*Materiale d'apporto o flusso:* Nome commerciale	Norma / designazione
Backing			

Gas al dritto:	*Gas al rovescio:*
Composizione ____ L/min ____ Ø ugello (mm) ____	Composizione ____ L/min ____

Ø Elettrodo Tungsteno (mm) e tipo ____ Temperatura preriscaldo (°C) ____

PWHT (temperatura, tempo e rampe) ____ Temperatura interpass max (°C) ____

Molatura fra le passate ____ Molatura al rovescio ____ Ripresa al rovescio ____

Passate	Processo	Materiale d'apporto Ø [mm]	Corrente [A]	Tensione [V]	Tipo corrente	Velocità [cm/min]

Preparazione giunto e sequenza saldatura
Per processi multipli indicare spessore depositato (mm/processo)

For all details See As Run Sheets attached

Esito esame visivo: ☒ Positivo ☐ Negativo

Prove di qualifica effettuate a: Ravenna (RA) Data 21/11/2019 Firma ____

Esito prove laboratorio: ☒ Positivo ☐ Negativo

Rapporti laboratorio allegati n° e data: Inspecta srl certificate nr. 0019-00210-19 dated 28/01/2020

A seguito dell'esito positivo delle prove di laboratorio, si propone il rilascio del certificato di qualifica n° ROSETTI FORM PQR 42/19 Data 29/01/2020 Firma ____

Decisione DM– Con riferimento al documento RINA IS-CRT-SAL-01, si autorizza il rilascio dei certificati di qualifica Data ____ Firma DM ____

PQR attachments index:

Base material certificate (Plate 316L)

Base material certificate (Plate S460G2+M Z)

Consumables certificate

preliminary WPS

NDE certificate

Mechanical test report

ROSETTI MARINO

PQR 42/19

Base material certificate (Plate 316L)

ROSETTI MARINO

PQR 42/19

Base material certificate (Plate S460 G2+M Z)

ROSETTI MARINO

MATERIAL CERTIFICATES BOOK

Supplier	Purchase Order nr.	job	Barcode
ARCELORMITTAL PROJECTS EUROPE B.V.	1719000334	118A50C	Q011901058

ROSETTI MARINO

ROSETTI MARINO

Conforme alla spec. **PO**

According to the spc.----------.

TMUGF Firma / MTSMD Signature — Data / Date: **16/04/19**

Emiliani Sonia

[X] REVIEW

[ ] WITNESS

CUSTOMER

NOTE

PACKING LIST / TRACEABILITY LIST

Client: Rosetti Marino SPA
Massimo Gori
Via trieste 230
48122 Ravenna
Italy
Project: 20190211
PO No: 1719000334



ArcelorMittal Projects Netherlands B.V.
Project Nr: 20190211
Orderno. 2100018960
Rev./Date: 0

Item No.	Client Item No.	Material Type	quality	Pcs	Length (MM)	Width (MM)	Th. (mm)	weight per Pc	weight in kgs	heat no	item no.	Certificate no.	
1	1	HRPL	S355G10+M	1	12.000	2.500	15	3.533	3.533	863720	2965291	A0350855	
1	1	HRPL	S355G10+M	1	12.000	2.500	15	3.533	3.533	463103	12825302	60266	
1	1	HRPL	S355G10+M	1	12.000	2.500	15	3.533	3.533	4613	12814302	60266	
2	2	HRPL	S355G10+M Z	1	12.000	2.500	25	5.888	5.888	464711	15714101	61443	
3	3	HRPL	S460G2+M Z	1	12.000	2.050	25	4.828	4.828	811954	3314191	A0361134	
3	3	HRPL	S460G2+M Z	1	12.000	2.055	25	4.710	4.710	458532	96825002	54602	
3	3	HRPL	S460G2+M Z	1	12.000	2.055	25	4.710	4.710	458532	96825001	54602	
4	4	HRPL	S355G10+M Z	1	6.000	2.500	30	3.533	3.533	705587	42950131	286882-B1	
5	5	HRPL	S460G2+M Z	1	12.000	2.500	40	9.420	9.420	461499	6284902	55228	
6	6	HRPL	S460G2+M Z	1	12.000	2.500	40	9.420	9.420	461497	6284301	60384	
6	6	HRPL	S460G2+M Z	1	12.000	2.500	40	9.420	9.420	459485	97316302	55613	
7	7	HRPL	S460G2+M Z	1	12.000	2.500	50	11.775	11.775	459930	02574-01	436420-001	
8	8	HRPL	S460G2+M Z	1	5.000	2.500	80	7.850	7.850	452882	8667001	436421-002	
9	9	HRPL	S460G2+M Z	1	6.000	2.500	100	11.775	11.775	438917	5019101	49575	
				14					93.925				

Marking: RM PO nummer
PO item No.
dimensions and quality

QM-System: Certification as per ISO 9001

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

54602

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A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ A03 Manufacturer's order/ Certificate No.: 434490-001 Sheet: 1/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ B03 Steel design. / Any suppl. requirements: **S460G2+M** OPTION-12;13;18
EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness		B10 Width MM		B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
02	1	25,00	x	2055	x	12000	4932	TM	458532	968250-01	
02	1	25,00	x	2055	x	12000	4932	TM	458532	968250-02	
02	1	25,00	x	2055	x	12000	4932	TM	458809	959322-01	
02	1	25,00	x	2055	x	12000	4932	TM	458809	959322-02	
**	4						19728				
03	1	25,00	x	2500	x	12000	6000	TM	458805	959318-01	
03	1	25,00	x	2500	x	12000	6000	TM	458805	959318-02	
03	1	25,00	x	2500	x	12000	6000	TM	458809	959323-02	
03	1	25,00	x	2500	x	12000	6000	TM	459320	969239-01	
**	4						24000				
04	1	30,00	x	2500	x	12000	7200	TM	459322	969235-02	
04	1	30,00	x	2500	x	12000	7200	TM	459324	969446-02	
**	2						14400				
05	1	40,00	x	2500	x	12000	9600	TM	458809	959316-01	
05	1	40,00	x	2500	x	12000	9600	TM	458809	959316-02	
05	1	40,00	x	2500	x	12000	9600	TM	458809	959317-01	
05	1	40,00	x	2500	x	12000	9600	TM	458809	959317-02	
05	1	40,00	x	2500	x	12000	9600	TM	458809	959320-01	
05	1	40,00	x	2500	x	12000	9600	TM	458810	959252-01	
05	1	40,00	x	2500	x	12000	9600	TM	458810	959252-02	
05	1	40,00	x	2500	x	12000	9600	TM	458810	959315-02	
**	8						76800				
06	1	40,00	x	3050	x	12000	11712	TM	458810	960122-01	

A04 D F Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01 Multigrades

for DNV GL
This document has been digitally signed and will therefore not have handwritten signatures.
F. Swal
Inspector

POISSONNET
Test House Manager

A01
Dillinger France
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais
Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A02	A10 Advice of dispatch No./ Date of dispatch	A08/ Manufacturer's order/ A03 Certificate No.	Sheet
INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013	9398896-21.06.18	434490-001	2/...

A05 Established Inspecting body	A06 Purchaser		A07.1 No.	B01 Product
VLNC	ANCOFERWALDRAM,OOSTE	3064200		HEAVY PLATES
	Final receiver	ANCOFERWALDRAM,OOSTE	A07.2 No.	

B02/ Steel design.	**S460G2+M**	OPTION-12;13;18
B03 Any suppl. requirements	EN-10225:01/AWS-4.11:REV.2	MDS-Y40:REV.5

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness	B10 Width MM	B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
06	1	40,00	x 3050	x 12000	11712	TM	458810	960122-02	
06	1	40,00	x 3050	x 12000	11712	TM	458810	960123-01	
06	1	40,00	x 3050	x 12000	11712	TM	458810	960123-02	
06	1	40,00	x 3050	x 12000	11712	TM	459322	969317-02	
**	5				58560				
***	23				193488				

B01-B03 Further information about product / Steel grade / Requirements

ITEM NO.: 04-06
WELDING QUALIFICATION ACCORDING:
WELDING REPORT 08/2010

B06 Marking of the product

ITEM NO.: 01-06
STEEL DESIGNATION **S460G2+M S460ML**
HEAT NO. / TRADEMARK / ROLLED PLATE NO.-TEST NO. / INSPECTOR'S STAMP

B07-B99 Further information about the product

ITEM NO.: 01-06
THICKNESS REDUCTION RATIO >= 4,00 IS FULFILLED

A04 Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

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Multigrades

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F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais
Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 3/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM, OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM, OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ B03 Steel design. / Any suppl. requirements: **S460G2+M** OPTION-12;13;18
EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C10-C29 Tensile test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C10	C11 MPA RP02	C12 RM	C13 A % L0=5D	C14-C15 RP02/RM	Z %
01	459320	969139*		K7	QO	RT		491	561	28	0,88	
		*		K7	SO	RT			555			68,1
		*		K7	SO	RT			554			61,1
		*		K7	SO	RT			555			72,1
01	459322	969236*		K7	QO	RT		507	571	28	0,89	
		*		K7	SO	RT			564			47,3
		*		K7	SO	RT			559			55,1
		*		K7	SO	RT			562			46,6
02	458532	968250		K7	QO	RT		508	583	26	0,87	
				K7	SO	RT			570			73,2
				K7	SO	RT			571			62,5
				K7	SO	RT			568			71,9
02	458809	959322		K7	QO	RT		515	600	26	0,86	
				K7	SO	RT			578			73,2
				K7	SO	RT			579			74,5
				K7	SO	RT			578			77,3
03	458805	965373*		K7	QO	RT		508	591	25	0,86	
		*		K7	SO	RT			570			74,2
		*		K7	SO	RT			575			76,9
		*		K7	SO	RT			570			78,5
03	459320	969239		K7	QO	RT		513	592	24	0,87	
				K7	SO	RT			577			63,8
				K7	SO	RT			578			63,2

A04 Manufacturer's mark: D F

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01
Multigrades

for DNV GL
This document has been digitally signed and will therefore not have handwritten signatures.
F. Swal
Inspector

POISSONNET
Test House Manager

A01
Dillinger France
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais
Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 4/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design. **S460G2+M** OPTION-12;13;18

B03 Any suppl. requirements: EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C10-C29 Tensile test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C10	C11 MPA RP02	C12 RM	C13	A % L0=5D	C14-C15 RP02/RM	Z %
03	459320	969239		K7	SO	RT			577				64,5
04	458805	965362*		K7	QO	RT		493	591		24	0,83	
04	458810	965330*		K7	QO	RT		498	586		25	0,85	
		*		K7	SO	RT			556				57,4
		*		K7	SO	RT			556				64,4
		*		K7	SO	RT			557				68,7
04	459320	973168*		K7	QO	RT		501	582		28	0,86	
04	459322	969235		K7	QO	RT		482	572		26	0,84	
04	459322	969302*		K7	QO	RT		496	569		26	0,87	
		*		K7	SO	RT			554				51,0
		*		K7	SO	RT			552				33,2
		*		K7	SO	RT			556				54,8
04	459324	969446		K7	QO	RT		513	598		24	0,86	
05	458809	959317		K7	QO	RT		491	591		24	0,83	
05	458809	959320		K7	QO	RT		515	603		23	0,85	
05	458810	959252		K7	QO	RT		489	589		25	0,83	
06	458805	966181*		K7	QO	RT		505	598		22	0,84	
06	458810	960122		K7	QO	RT		511	601		24	0,85	
06	458810	960123		K7	QO	RT		509	600		25	0,85	
06	459322	969317		K7	QO	RT		490	583		27	0,84	
06	459324	971074*		K7	QO	RT		485	582		25	0,83	
		*		K7	SO	RT			554				63,9
		*		K7	SO	RT			552				67,6

A04 D F Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01 Multigrades

for DNV GL
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F. Swal
Inspector

POISSONNET
Test House Manager

A01
Dillinger France
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais
Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 5/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design. **S460G2+M** OPTION-12;13;18

B03 Any suppl. requirements: EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C10-C29 Tensile test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C10	C11 MPA RP02	C12 RM	C13	A % L0=5D	C14-C15 RP02/RM	Z %
06	459324	971074*		K7	SO	RT			558				57,1

C30-C39 Hardness test

B14 Item. No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/C01	C03 Temp. GR.C	C30 Method of test	C35 C31 Individual values	C32 Mean value
01	459320	969139 *		K7	QO	RT	HV10	HV 178	
01	459322	969236 *		K7	QO	RT	HV10	HV 172	
02	458532	968250		K7	QO	RT	HV10	HV 185	
02	458809	959322		K7	QO	RT	HV10	HV 186	
03	458805	965373 *		K7	QO	RT	HV10	HV 192	
03	459320	969239		K7	QO	RT	HV10	HV 191	
04	458810	965330 *		K7	QO	RT	HV10	HV 197	
04	459322	969302 *		K7	QO	RT	HV10	HV 182	
06	459324	971074 *		K7	QO	RT	HV10	HV 186	

C30-C39 Further information about hardness test

ITEM NO.: 01-06
HARDNESS TEST INFORMATIVE

A04 D F Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01
Multigrades

for DNV GL
This document has been digitally signed and will therefore not have handwritten signatures.
F. Swal
Inspector

POISSONNET
Test House Manager

A01
Dillinger France
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais
Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A02	A10 Advice of dispatch No./ Date of dispatch	A08/ Manufacturer's order/ A03 Certificate No.	Sheet
INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013	9398896-21.06.18	434490-001	6/...

A05 Established Inspecting body	A06 Purchaser		A07.1 No.	B01 Product
VLNC	ANCOFERWALDRAM,OOSTE	3064200		HEAVY PLATES
	Final receiver	ANCOFERWALDRAM,OOSTE	A07.2 No.	

B02/ Steel design.	S460G2+M	OPTION-12;13;18
B03 Any suppl. requirements	EN-10225:01/AWS-4.11:REV.2	MDS-Y40:REV.5

C40-C49 Impact test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.		B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C41 Width of test piece	C40 Type of test piece	C44 Testing method	C46 Energy Joule	C45	C42 Individual values AV=J			C43 Mean value
01	459320	969139	*		K7	LO	-50		CHP-V		600	AV 2	296	306	299	300
			*		K7	QO	-40		CHP-V		600	AV 2	164	229	230	208
			*		K7	QO	-40		CHP-V	5,0%	600	AV 2	237	121	235	198
			*		K7	QO	-40		CHP-V	5,0%-250C/60MN	600	AV 2	119	129	114	121
01	459322	969236	*		K7	LO	-50		CHP-V		750	AV 2	335	327	330	331
			*		K7	QO	-40		CHP-V		750	AV 2	125	131	144	133
			*		K7	QO	-40		CHP-V	5,0%	600	AV 2	128	104	106	113
			*		K7	QO	-40		CHP-V	5,0%-250C/60MN	600	AV 2	91	98	86	92
02	458532	968250			K7	LO	-50		CHP-V		600	AV 2	140	125	146	137
					K7	QO	-40		CHP-V		600	AV 2	269	275	271	272
					K7	QO	-40		CHP-V	5,0%	600	AV 2	114	92	118	108
					K7	QO	-40		CHP-V	5,0%-250C/60MN	600	AV 2	95	87	91	91
02	458809	959322			K7	LO	-50		CHP-V		600	AV 2	196	291	271	253
					K7	QO	-40		CHP-V		600	AV 2	132	119	174	142
					K7	QO	-40		CHP-V	5,0%	600	AV 2	113	116	105	111
					K7	QO	-40		CHP-V	5,0%-250C/60MN	600	AV 2	68	86	89	81
03	458805	965373	*		K7	LO	-50		CHP-V		600	AV 2	325	347	338	337
			*		K7	QO	-40		CHP-V		600	AV 2	151	107	149	136
			*		K7	QO	-40		CHP-V	5,0%	600	AV 2	102	143	126	124
			*		K7	QO	-40		CHP-V	5,0%-250C/60MN	600	AV 2	93	104	99	99
03	459320	969239			K7	LO	-50		CHP-V		750	AV 2	296	216	289	267
					K7	QO	-40		CHP-V		750	AV 2	196	184	190	190
					K7	QO	-40		CHP-V	5,0%	750	AV 2	137	113	126	125

A04

D F

Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01
Multigrades

for DNV GL
This document has been digitally signed and will therefore not have handwritten signatures.
F. Swal
Inspector

POISSONNET
Test House Manager

A01

Dillinger France
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais

Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 7/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design. **S460G2+M** OPTION-12;13;18

B03 Any suppl. requirements: EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C40-C49 Impact test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.		B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C41 Width of test piece	C40 Type of test piece	C44 Testing method	C46 Energy Joule	C45	C42 Individual values AV=J			C43 Mean value
03	459320	969239			K7	QO	-40		CHP-V	5,0%-250C/60MN	750	AV 2	86	86	92	88
03	459320	973107	*		K7	LO	-50		CHP-V		750	AV 2	314	332	322	323
04	458805	965362	*		K7	LO	-50		CHP-V		600	AV 2	168	207	171	182
			*		K7	QO	-40		CHP-V		600	AV 2	108	109	125	114
04	458810	965330	*		K7	LO	-50		CHP-V		600	AV 2	301	328	321	317
			*		K7	QO	-40		CHP-V		600	AV 2	249	244	240	244
			*		K7	QO	-40		CHP-V	5,0%	600	AV 2	169	116	122	136
			*		K7	QO	-40		CHP-V	5,0%-250C/60MN	600	AV 2	139	103	106	116
04	459320	973168	*		K7	QO	-40		CHP-V		750	AV 2	216	223	190	210
04	459322	969235			K7	LO	-50		CHP-V		750	AV 2	220	287	208	238
					K7	QO	-40		CHP-V		750	AV 2	122	144	175	147
04	459322	969302	*		K7	LO	-50		CHP-V		750	AV 2	237	181	270	229
			*		K7	QO	-40		CHP-V		750	AV 2	140	171	132	148
			*		K7	QO	-40		CHP-V	5,0%	750	AV 2	101	106	106	104
			*		K7	QO	-40		CHP-V	5,0%-250C/60MN	750	AV 2	81	84	83	83
04	459324	969446			K7	LO	-50		CHP-V		600	AV 2	134	139	176	150
					K7	QO	-40		CHP-V		600	AV 2	274	252	233	253
05	458809	959317			K7	LV	-50		CHP-V		600	AV 2	164	180	166	170
					K7	QO	-40		CHP-V		600	AV 2	183	108	103	131
05	458809	959320			K7	LV	-50		CHP-V		600	AV 2	146	175	247	189
					K7	QO	-40		CHP-V		600	AV 2	191	208	226	208
05	458810	959252			K7	LV	-50		CHP-V		600	AV 2	173	175	186	178
					K7	QO	-40		CHP-V		600	AV 2	222	208	199	210

A04 D F Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01 Multigrades

for DNV GL
This document has been digitally signed and will therefore not have handwritten signatures.
F. Swal
Inspector

POISSONNET
Test House Manager

A01
Dillinger France
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais
Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 8/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design. **S460G2+M** OPTION-12;13;18

B03 Any suppl. requirements: EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C40-C49 Impact test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.		B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C41 Width of test piece	C40 Type of test piece	C44 Testing method	C46 Energy Joule	C45	C42 Individual values AV=J			C43 Mean value
06	458805	966181	*		K7	LV	-50		CHP-V		600	AV 2	99	70	103	91
			*		K7	QO	-40		CHP-V		600	AV 2	248	238	203	230
06	458810	960122			K7	LV	-50		CHP-V		600	AV 2	296	301	282	293
					K7	QO	-40		CHP-V		600	AV 2	219	170	230	206
06	458810	960123			K7	LV	-50		CHP-V		600	AV 2	315	320	306	314
					K7	QO	-40		CHP-V		600	AV 2	252	236	245	244
06	459322	969317			K7	LV	-50		CHP-V		750	AV 2	169	203	158	177
					K7	QO	-40		CHP-V		750	AV 2	166	134	165	155
06	459324	971074	*		K7	LV	-50		CHP-V		750	AV 2	264	287	312	288
			*		K7	QO	-40		CHP-V		750	AV 2	244	193	134	190
			*		K7	QO	-40		CHP-V	5,0%	750	AV 2	229	185	133	182
			*		K7	QO	-40		CHP-V	5,0%-250C/60MN	750	AV 2	105	95	89	96

C70-C99 Chemical composition % - Heat analysis

B07.2 Heat	C70	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	AS	SN
458532	Y	0,085	0,487	1,548	0,015	0,0009	0,0033	0,034	0,007	0,043	0,029	0,001	0,028	0,0008	0,0007
458805	Y	0,089	0,485	1,590	0,017	0,0009	0,0031	0,018	0,005	0,025	0,035	0,001	0,029	0,0034	0,0008
458809	Y	0,089	0,482	1,625	0,017	0,0008	0,0038	0,025	0,009	0,024	0,045	0,002	0,027	0,0027	0,0014
458810	Y	0,081	0,487	1,649	0,013	0,0005	0,0024	0,019	0,004	0,021	0,028	0,001	0,027	0,0024	0,0006
459320	Y	0,085	0,484	1,580	0,014	0,0004	0,0038	0,025	0,005	0,031	0,034	0,001	0,029	0,0025	0,0009
459322	Y	0,086	0,494	1,574	0,013	0,0010	0,0045	0,038	0,005	0,033	0,036	0,002	0,030	0,0030	0,0021
459324	Y	0,095	0,499	1,601	0,011	0,0006	0,0038	0,028	0,007	0,033	0,037	0,001	0,031	0,0027	0,0010

A04 D F Manufacturer's mark

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Multigrades

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Test House Manager

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Service Qualité-Essais

Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 9/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design. **S460G2+M** OPTION-12;13;18

B03 Any suppl. requirements: EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C70-C99 Chemical composition % - Heat analysis

B07.2 Heat	C70	TI	PB	B	SB	CA	BI	AL-T
458532	Y	0,004	0,0002	0,0003	0,0004	0,0017	0,0001	0,044
458805	Y	0,003	0,0004	0,0002	0,0001	0,0018	0,0001	0,028
458809	Y	0,003	0,0005	0,0002	0,0002	0,0020	0,0001	0,039
458810	Y	0,004	0,0004	0,0002	0,0001	0,0017	0,0001	0,039
459320	Y	0,005	0,0003	0,0003	0,0001	0,0019	0,0001	0,035
459322	Y	0,004	0,0002	0,0003	0,0001	0,0020	0,0001	0,031
459324	Y	0,004	0,0002	0,0003	0,0001	0,0023	0,0001	0,033

C94 Heat analysis Carbon equivalent / Alloying restrictions

B07.2 Heat											
458532	FO-02=	0,36	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,11	FO-A1= 13
458805	FO-02=	0,37	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,08	FO-A1= 9
458809	FO-02=	0,37	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,10	FO-A1= 10
458810	FO-02=	0,37	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,07	FO-A1= 16
459320	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,10	FO-A1= 9
459322	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,11	FO-A1= 7
459324	FO-02=	0,37	FO-31=	0,20	FO-51=	0,03	FO-52=	0,04	FO-55=	0,11	FO-A1= 9

C95 Ladle treatment

ITEM NO.: 01-06

HEAT OF THE INDICATED ITEM: VACUUM DEGASSED

C95 Further information about ladle treatment

ITEM NO.: 01-06

VACUUM DEGASSED, FULLY KILLED, FINE GRAIN TREATED

A04 D F Manufacturer's mark

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Multigrades

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A02	A10 Advice of dispatch No./ Date of dispatch	A08/ Manufacturer's order/ A03 Certificate No.	Sheet
INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013	9398896-21.06.18	434490-001	10/...

A05 Established Inspecting body	A06 Purchaser		A07.1 No.	B01 Product
VLNC	Final receiver	ANCOFERWALDRAM,OOSTE ANCOFERWALDRAM,OOSTE	3064200 A07.2 No.	HEAVY PLATES

B02/ Steel design.	**S460G2+M**	OPTION-12;13;18
B03 Any suppl. requirements	EN-10225:01/AWS-4.11:REV.2	MDS-Y40:REV.5

C70-C99 Chemical composition % - Product analysis

B07.2 Heat	B07.1 Test No.	C01	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	TI	B
458532	968250	K7O	0,093	0,510	1,56	0,013	0,0006	0,0049	0,027	0,005	0,031	0,022	0,001	0,030	0,003	0,0004
458805	965362	K7O	0,091	0,491	1,56	0,016	0,0008	0,0034	0,017	0,005	0,024	0,032	0,002	0,028	0,003	0,0003
458805	965373	K7O	0,088	0,489	1,60	0,013	0,0008	0,0036	0,018	0,004	0,026	0,029	0,002	0,028	0,003	0,0003
458809	959316	K7O	0,087	0,485	1,56	0,014	0,0003	0,0049	0,022	0,009	0,023	0,042	0,002	0,026	0,003	0,0003
458809	959322	K7O	0,088	0,476	1,56	0,014	0,0006	0,0029	0,023	0,009	0,023	0,042	0,002	0,026	0,003	0,0003
458810	959252	K7O	0,083	0,478	1,58	0,012	0,0003	0,0024	0,019	0,005	0,022	0,029	0,002	0,027	0,003	0,0003
458810	960122	K7O	0,080	0,477	1,58	0,011	0,0004	0,0026	0,018	0,004	0,021	0,025	0,002	0,026	0,003	0,0003
458810	960123	K7O	0,081	0,464	1,57	0,011	0,0005	0,0016	0,018	0,003	0,021	0,024	0,002	0,026	0,003	0,0003
458810	965330	K7O	0,083	0,484	1,61	0,012	0,0006	0,0021	0,018	0,003	0,021	0,024	0,002	0,027	0,003	0,0003
459320	969139	K7O	0,089	0,501	1,57	0,013	0,0005	0,0040	0,025	0,005	0,032	0,033	0,002	0,029	0,005	0,0004
459320	969238	K7O	0,084	0,480	1,53	0,013	0,0003	0,0042	0,026	0,006	0,032	0,032	0,001	0,027	0,004	0,0004
459320	969239	K7O	0,088	0,506	1,56	0,014	0,0003	0,0042	0,023	0,005	0,031	0,033	0,002	0,030	0,005	0,0004
459320	973107	K7O	0,090	0,488	1,54	0,013	0,0005	0,0048	0,025	0,005	0,031	0,033	0,001	0,028	0,005	0,0004
459322	969236	K7O	0,093	0,491	1,52	0,012	0,0011	0,0051	0,036	0,005	0,033	0,034	0,002	0,028	0,004	0,0004
459322	969302	K7O	0,088	0,512	1,55	0,013	0,0008	0,0053	0,037	0,005	0,034	0,034	0,002	0,030	0,004	0,0004
459322	969317	K7O	0,087	0,492	1,55	0,013	0,0008	0,0065	0,038	0,005	0,035	0,034	0,002	0,030	0,003	0,0004
459324	969446	K7O	0,093	0,500	1,56	0,010	0,0007	0,0038	0,027	0,007	0,032	0,036	0,002	0,030	0,004	0,0004
459324	971074	K7O	0,091	0,500	1,57	0,011	0,0004	0,0038	0,024	0,007	0,034	0,035	0,001	0,032	0,004	0,0004

A04

D F

Manufacturer's mark

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Multigrades

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Test House Manager

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Service Qualité-Essais

Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 11/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design. **S460G2+M** OPTION-12;13;18

B03 Any suppl. requirements: EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C70-C99 Chemical composition % - Product analysis

B07.2 Heat	B07.1 Test No.	C01	AL-T
458532	968250	K7O	0,038
458805	965362	K7O	0,028
458805	965373	K7O	0,033
458809	959316	K7O	0,043
458809	959322	K7O	0,043
458810	959252	K7O	0,042
458810	960122	K7O	0,042
458810	960123	K7O	0,042
458810	965330	K7O	0,039
459320	969139	K7O	0,038
459320	969238	K7O	0,035
459320	969239	K7O	0,038
459320	973107	K7O	0,037
459322	969236	K7O	0,033
459322	969302	K7O	0,032
459322	969317	K7O	0,030
459324	969446	K7O	0,035
459324	971074	K7O	0,034

C94 Product analysis Carbon equivalent / Alloying restrictions

B07.2 Heat	B07.1 Test No.	C01											
458532	968250	K7O	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,09	FO-A1= 8
458805	965362	K7O	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,08	FO-A1= 8
458805	965373	K7O	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,08	FO-A1= 9

A04 Manufacturer's mark

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Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A02	A10 Advice of dispatch No./ Date of dispatch	A08/ Manufacturer's order/ A03 Certificate No.	Sheet
INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013	9398896-21.06.18	434490-001	12/...

A05 Established Inspecting body	A06 Purchaser		A07.1 No.	B01 Product
VLNC	Final receiver	ANCOFERWALDRAM,OOSTE ANCOFERWALDRAM,OOSTE	3064200 A07.2 No.	HEAVY PLATES

B02/ Steel design.	**S460G2+M**	OPTION-12;13;18
B03 Any suppl. requirements	EN-10225:01/AWS-4.11:REV.2	MDS-Y40:REV.5

C94 Product analysis Carbon equivalent / Alloying restrictions

B07.2 Heat	B07.1 Test No.	C01											
458809	959316	K70	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,10	FO-A1= 9
458809	959322	K70	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,10	FO-A1= 15
458810	959252	K70	FO-02=	0,36	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,08	FO-A1= 18
458810	960122	K70	FO-02=	0,35	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,07	FO-A1= 16
458810	960123	K70	FO-02=	0,35	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,07	FO-A1= 26
458810	965330	K70	FO-02=	0,36	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,07	FO-A1= 19
459320	969139	K70	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,10	FO-A1= 10
459320	969238	K70	FO-02=	0,35	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,10	FO-A1= 8
459320	969239	K70	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,09	FO-A1= 9
459320	973107	K70	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,09	FO-A1= 8
459322	969236	K70	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,11	FO-A1= 6
459322	969302	K70	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,11	FO-A1= 6
459322	969317	K70	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,11	FO-A1= 5
459324	969446	K70	FO-02=	0,37	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,10	FO-A1= 9
459324	971074	K70	FO-02=	0,37	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,10	FO-A1= 9

C94 Carbon equivalent formula / Alloying restrictions

FO-02 = C+(MN/6)+(CR+MO+V)/5+(NI+CU)/15
FO-31 = C+SI/30+(MN+CR+CU)/20+MO/15+V/10+NI/60+5B
FO-51 = V +NB
FO-52 = V +NB+TI
FO-55 = CU+MO+NI+CR
FO-A1 = AT/N

A04

D F
Manufacturer's mark

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QM-System: Certification as per ISO 9001

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A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 13

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design. **S460G2+M**

B03 Any suppl. requirements: EN-10225:01/AWS-4.11:REV.2 OPTION-12;13;18 MDS-Y40:REV.5

D01 Marking and identification, surface appearance, shape and dimensional properties

ITEM NO.: 01-06

EXAMINATION OF MARKING, SURFACE, SHAPE AND DIMENSIONS: THE RESULTS MEET THE REQUIREMENTS.

SURFACE	AS PER EN-10163-B3
THICKNESS	AS PER EN-10029:10-A
LENGTH AND WIDTH	AS PER EN-10029:10
FLATNESS	AS PER EN-10029:10-T5L

D02 Non-destructive tests - Ultrasonic testing

ITEM NO.: 01-06

UT-SPECIFICATION	: EN-10160 CLASS S2 AND E3
SCANNING PLAN BODY	: LONGITUDINALLY SCAN LINES SPACING 50 MM
EDGES	: 100 MM
PERSONNEL QUALIFICATION	: LEVEL 2 IN ACCORDANCE TO ISO 9712

THE TEST RESULTS MEET THE REQUIREMENTS OF THE ORDER.

A04 D F Manufacturer's mark

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for DNV GL
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Service Qualité-Essais
Date 22.06.18 EDI CD 1

ROSETTI MARINO

PQR 42/19

Consumables certificate

Inspection Certificate 3.1

LINCOLN ELECTRIC
THE WELDING EXPERTS®

Product	COR-A-ROSTA P-309L		
Size(s) mm	1,2 * n.a.		
Item No.	585285	Customer Ref	email
Lot/Batch	M1FC199096	Our Reference	813619380
Product Line	FCAW	Quantity	20.0 KG
		Customer	
Class	AWS A5.22 : E309LT1-1/-4 T 23 12 L P C / M 2		
	ISO 17633 : T 23 12 L P C/M 2 E309LT1-1 / -4		

Chemical analysis (%) According to EN10204 3.1

C	Si	Mn	P	S	Cr	Ni	Mo	Cu
0.040	0.78	1.23	0.020	0.005	23.6	12.6	0.03	0.05

Mechanical tests, all weld metal

Ferrite According to EN10204 3.1

FN WRC92
12

Remarks

The product identified above has been manufactured, tested and supplied in compliance with a certified ISO 9001 Quality Assurance Programme.

Company
Lincoln Electric Italia srl
Via Fratelli Canepa 8
16010 Serra Riccò
Italy

Printed By **Emil Cristian Pavel**
Function **Warehouse operator**
Date **06/DEC/2019**

Cert. No. **00899762**
ZEU_STAINLES , 1

ROSETTI MARINO

PQR 42/19

preliminary WPS

PQR ref.:	42/19	pWPS (ISO 15614-1 Ed 2017+Rina rules)	42/19	REV.:	0	Data /date	19/11/2019

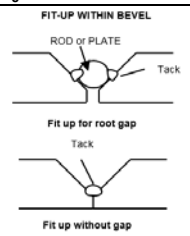
Procedimento di saldatura / Welding process: **136-FCAW** — Tipo / Type: **SEMIAUTOMATIC**

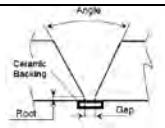
GIUNTO - JOINT

Tipo di giunto / Joint Design: **V** — Supporto / Backing: ☒ Si / Yes ☐ No

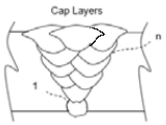
Materiale di supporto (tipo) / Backing material (type): ☐ Metallico / Metal ☒ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:





Angle: 45-60°
Root: 1-2 mm
Gap: 4-6 mm



Note: **1.Surfaces cleaned from moisture, oil, grease, paint before welding (by grinding)/** *Pulire le superfici da liquidi, oli, grasso e vernici con molatura prima di saldare.*
2.Minimum tack weld lengths shall be 4 times the thk or 50 mm, whichever is less/ I tacchetti devono essere lunghi almeno 50 mm o 4 volte lo spessore (il più piccolo dei due);

MATERIALE BASE - BASE MATERIAL

Da / from P-N°: **/** — Group N° **8 in acc. to ISO 15608** — A / to P-N°: **/** — Group N° **2 in acc. to ISO 15608**

DA Tipo e grado / From type and grade: **ASTM A240 Tp. 316L (Heat number: 829053)**

A Tipo e grado / To type and grade: **S460 G2+MZ (Heat number: 458532)**

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove **10 mm**

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove **N.A.**

METALLO D'APPORTO - FILLER METAL

	136-GS FCAW	
Spec. N° (SFA)	**A5.22/** *ISO17663-A*	
AWS N° (CLASS)	**E309LT1-4** *T 23 12 L P C/M 2*	
F-N°	**6**	
A-N°	**8**	
Diametro mat. D'apporto / Size of filler metal	**1,2**	
Gamma spessori /Thick. Range (mm)	**Up to filling**	
Accoppiamento filo-flusso / Electrode-flux (CLASS)	**NA**	
Denom. Comm. Flusso / FLUX trade name	**NA**	
Inserto consumabile / Consumable insert	**NA**	
Altro / other	**Lincoln Cor-A-Rosta P309L**	

POSIZIONI - POSITION

giunto / Joint: **Cianfrino / groove** — Posizione / position **PC+PF** — Progressione / weld progression: **Ascendente / UP hill**

PRERISCALDO - PRE-HEAT

Temp.preriscaldo minima / Min. pre-heat temp: **20°C** — Max temp. Di interpass / Max interpass temp.: **150 °C** — Mantenimento interpass / Interpass maintenance: **N.A.** — Tempo di mantenimento prerisc. / Maintenance timing: **N.A.**

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs): **N.A.** — Temperatura di stasi / Holding temperature °C: **N.A.** — Tempo di stasi / Holding time (min.): **N.A.** — Velocità di raffreddamento / Cooling rate (°C/Hrs): **N.A.**

GAS DI PROTEZIONE - GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	**Ar+CO2**	**85%+15%**	**15-25 lt/min**
Protezione al seguito / Trailing:	**N.A.**	**N.A.**	**N.A.**
Prot. Al rovescio / Backing:	**N.A.**	**N.A.**	**N.A.**

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current: **DC** — Polarità / Polarity **RP**

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: **N.A.**

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: **N.A.**

Velocità alimentazione filo / Electr. Wire feed speed range: **Self regulated**

TECNICA - TECHNIQUE

Passata / Bead: **Tirata/String** — Dimensione bocchello gas / Orifice of gas cup size: **1/2"** — Pulizia iniziale e fra le passate / Initial and interpass cleaning: **Spazzolatura/Brushing**

Metodo di solcatura a rovescio / Method of back gouging: **Molatura/Grinding** — Oscillazione / Oscillation: **N.A.** — Distanza zona di contatto e pezzo / Contact zone to work distance: **N.A.**

N°Passate / Passes nr.: **Singola-Multiple/Single-Multiple** — Elettrodo multiplo o singolo / Multiple or single electrodes: **Singolo/Single** — Martellatura / Peening: **N.A.**

Altro / Other:

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range		Vel. Avanzamento / Travel speed range (mm/min)		Apporto termico / Heat input (KJ/cm)	
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. Range						
Tack-1	FCAW	E309LT1-4	1,2	RP	180 220	24	28	120	200	10,4	24,6
2	FCAW	E309LT1-4	1,2	RP	180 240	25	29	120	300	7,2	27,8
3-n	FCAW	E309LT1-4	1,2	RP	180 240	25	29	120	300	7,2	27,8
Cap layers	FCAW	E309LT1-4	1,2	RP	180 240	25	29	120	300	7,2	27,8
Grinding											
1R	FCAW	E309LT1-4	1,2	RP	180 220	24	28	120	200	10,4	24,6

Preparato da / prepared by:	Client/Third part signature:	Client/Third part signature:
M.Del Prete		

NDE certificate

ROSETTI MARINO	VERBALE DI CONTROLLO VISIVO/DIMENSIONALE visual/dimensional inspection report	VDR N° 42-19 data: 10/01/2020
progetto project: NAVALE	cliente client: QATARGAS	commessa job: 119N12
disegno dwg: /	ITP N°: N.A.	fase step: N.A.

oggetto – item

Procedure Qualification Record (PQR) 42/19 samples PC-PF

Certificato di Qualifica di Procedimento di Saldatura (PQR) 42/19 campioni PC-PF

WE CERTIFY THAT:

ITEMS INDICATED ABOVE HAVE UNDERGONE A VISUAL INSPECTION AND HAVE BEEN ACCEPTED ACCORDING TO THE SPECIFICATION / PROCEDURE MENTIONED AND TO ACCEPTANCE CRITERIA DEFINED IN IT

SI CERTIFICA CHE LE SALDATURE DEI SAGGI SOPRA CITATI SONO STATI SOTTOPOSTI AD ESAME VISIVO AL 100% ALLO STATO COME SALDATO IN ACCORDO ALLE SPECIFICHE E STANDARD CITATI.

RINA Services SpA No. Bo. 0474	Date 29/01/2020
Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐	File Signature Cimatti Davide

note – remarks

No visible defects have been detected.

Non sono stati rilevati difetti visibili.

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

ISO EN 15614-1 and RINA Rules 2018

Operatore – Operator	Controllo Qualita' - Quality Control	Cliente - Client
ROSETTI MARINO SpA Welding Dept. D. Cenacchi		

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n°			
		19246	RT 02 SZ	Rev. 0	
RAPPORTO D'ESAME RADIOGRAFICO RADIOGRAPHIC TEST		DATA / Date 10/01/2020	FOGLIO / Sheet 1		

CLIENTE / Client	ORDINE / Order	PROGETTO / Project	COMMESSA / Job	
ROSETTI MARINO	/		119N12	
CLIENTE FINALE /Customer	OGGETTO / Object	DISEGNO / Dwg	P.F.C. / Q.C.P.	Fase / Step
/	PQR	/	/	/

Schizzo Sketch	Saldatura Weld	Diametro Diameter	Spessore Thikeness	Punzone Welder	Posizione Position	Difetto Defect	Giudizio Judgement
PQR 42/19 PC	W01	/	10	6	0-1	/	A
					1-2	/	A

101	Longitudinal crack	2014	Linear porosity	3041	Tungsten inclusion	501	Undercut
104	Crater crack	2016	Wormholes	3042	Copper inclusion	504	Excess penetration
2011	Porosity	301	Slag inclusion	401	Lack of fusion	507	misaligment
2013	Clustered	DF	Difetto film Film defect	402	Lack of penetration	515	Root concavity
A	Accettabile Acceptable	NR	Riparare Repair	NX	Ripetere Film Repeat Film		

Riferimento Normativo / Reference Rina Rules for the Classification of Ship Part (D)	Schermi / Lead screen PB 0,10 Front and Back	Pellicole / Film type KODAK T200 (C4)
Tipo macchina Rɣ / Type machine Rɣ Gilardono GMF 300 D	Densità / Density Range 2÷4 base material	Densità / Density Range 2÷3 welded area

TECNICA DI ESPOSIZIONE / Exposure Technique	SINGOLA PARETE SINGOLA IMMAGINE SWSI

Tipo di sorgente / source type			Tipo di IQI / IQI type	
☑ RX	☐ IR 192	☐ SE 75	☐ ASTM	☑ EN
Macchia focale focal spot		4,5	Posizione / position	
Attività activity			☐ Lato film film side	☑ Lato sorgente Source side
Ci	kV	mA	Esposizione / esposition	
	190	4,5	☑ Film singolo Single film	☐ Film doppio Double ilm
Tempo di esposizione exposure time			Tecnica di sviluppo / Film processing	
3'			☐ Manuale / manual	☑ Automatico / Automatic

Sp. Attraversato Crossed thickness	Distanza sorgente-film Source film distance	Dist. oggetto film Film object distance	Distanza minima f-min	Filo visibile n° Visible Wire n°	Lastre n° Films n°
Range 8÷12	1000	10	313	14	1

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Stefano Zauli 2° Livello SNT [illegible]	ROSETTI MARINO SpA Welding Dept. D.Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 10/01/2020 File Signature Cimatti Davide

E' vietata la riproduzione parziale del certificato senza l'autorizzazione scritta. Partial reproduction of this certificate must be written authorized.
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QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n°			
		19246	RT 04 SZ	Rev. 0	
RAPPORTO D'ESAME RADIOGRAFICO RADIOGRAPHIC TEST		DATA / Date 14/01/2020	FOGLIO / Sheet 1		

CLIENTE / Client	ORDINE / Order	PROGETTO / Project	COMMESSA / Job	
ROSETTI MARINO	/		119N12	
CLIENTE FINALE /Customer	OGGETTO / Object	DISEGNO / Dwg	P.F.C. / Q.C.P.	Fase / Step
/	PQR	/	/	/

Schizzo Sketch	Saldatura Weld	Diametro Diameter	Spessore Thikeness	Punzone Welder	Posizione Position	Difetto Defect	Giudizio Judgement
PQR 42/19 PF	W01	/	15		0-1	/	A
					1-2	/	A

101	Longitudinal crack	2014	Linear porosity	3041	Tungsten inclusion	501	Undercut
104	Crater crack	2016	Wormholes	3042	Copper inclusion	504	Excess penetration
2011	Porosity	301	Slag inclusion	401	Lack of fusion	507	misaligment
2013	Clustered	DF	Difetto film Film defect	402	Lack of penetration	515	Root concavity
A	Accettabile Acceptable	NR	Riparare Repair	NX	Ripetere Film Repeat Film		

Riferimento Normativo / Reference Rina Rules for the Classification of Ship Part (D)	Schermi / Lead screen PB 0,10 Front and Back	Pellicole / Film type KODAK T200 (C4)
Tipo macchina Rγ / Type machine Rγ Gilardono GMF 300 D	Densità / Density Range 2÷4 base material	Densità / Density Range 2÷3 welded area

TECNICA DI ESPOSIZIONE / Exposure Technique	SINGOLA PARETE SINGOLA IMMAGINE SWSI
Tipo di sorgente / source type	Tipo di IQI / IQI type
☑ RX ☐ IR 192 ☐ SE 75	☐ ASTM ☑ EN
Macchia focale focal spot 4,5	Posizione / position
Attività activity	☐ Lato film film side ☑ Lato sorgente Source side
Ci / kV / mA	Esposizione / esposition
260 / 4,5	☑ Film singolo Single film ☐ Film doppio Double ilm
Tempo di esposizione exposure time	Tecnica di sviluppo / Film processing
1'	☐ Manuale / manual ☑ Automatico / Automatic

Sp. Attraversato Crossed thickness	Distanza sorgente-film Source film distance	Dist. oggetto film Film object distance	Distanza minima f-min	Filo visibile n° Visible Wire n°	Lastre n° Films n°
Range 12÷20	700	15	411	13	1

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Stefano Zanli 3° Livello ENT - TC - 1A / ISO 9712	ROSETTI MARINO SpA Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 29/01/2020 File Signature Cimatti Davide

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Test results relate only to examined items.

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QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n°	
		19249 PT 06 RN Rev. 00	
RAPPORTO D'ESAME LIQUIDI PENETRANTI NDT REPORT - DYE PENETRANT TEST		DATA / Date 14/01/2020	FOGLIO / Sheet 1

CLIENTE/Client	ORDINE/Order	PROGETTO/Project	COMMESSA/Job	
ROSETTI MARINO	/	/	119N12	
CLIENTE FINALE/Final client	OGGETTO/Object	DISEGNO/Dwg	P.F.C./Q.C.P.	FASE/Step
/	PQR	/	/	/

NORMA DI RIFERIMENTO/Reference Normative	PROCEDURA/Procedure	ACCETTABILITA'/Acceptance level
RINA RULES FOR THE CLASSIFICATION OF SHIP PART (D)	/	/

MATERIALE/Material	TEMP. SUPERFICI/ Surface temperature	INTENSITA' LUMINOSA/ Light intensity	
ASTM A240 Tp316L S460	23C°	☑ LUCE BIANCA >500 Lux	☐ LUCE NERA 1000 µW/cm²

STATO DELLA SUPERFICIE – Surface condition			
☑ COME SALDATO/As welded	☑ SPAZZOLATO - Brushed		☐ LAVORATO DI MACCHINA - Machined
☐ MOLATO - Ground	☐ LAMINATO - Rolled		☐ GREZZO - Forged
MATERIALI UTILIZZATI - Material Used	NDT	TIPO/Type	LOTTO NUMERO/Back No.
PULITORE PRELIMINARE/Cleaner	BC1	CLASSE 2 TIPO II METODO A	180607s
PENETRANTE - Penetrant SENSIBILITA' Sensitivity level	K71B2P	TIPO II METODO A	180305Ps
RIVELATORE/Developer	D112A	FORMA d	181025W150s

ISTRUZIONE DI LAVORO/Works instruction		
Step 1 PULITURA PRELIMINARE/Preliminary Cleaning	BY BRUSCHING PLUS BC1	
Step 2 ASCIUGATURA / Drying	CLOTH	
Step 3 APPLICAZIONE PENETRANT/ Penetrant application	SPRAY	
Step3a TEMPO PENETRAZIONE/Dwel time (min)	5÷60	
Step 4 RIMOZIONE PENETRANTE/Removal penetrant	WATER	
Step 5 ASCIUGATURA/Drying process	CLOTH	
Step 6 INTERVALLO APP. RIVELATORE/time int. developer app.	/	
Step 7 APPLICAZIONE RIVELATORE/Developer application	SPRAY	
Step 8 TEMPO DI LETTURA/Checking time	RANGE 10÷30	
Step 8 PULIZIA DOPO CONTROLLO/Cleaner after examination	☐ NO/No	☑ SI/Yes

SALDATURE CONTROLLATE / Welds Verified

THE CONTROL HAS BEEN CARRIED OUT ON THE FOLLOWING COUPON:

PQR 42/19 PF

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
RICCARDO NOCERA 2° Livello ISO 9712 / SNT-TC-1A	ROSETTI MARINO SpA Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 29/01/2020 File Signature Cimatti Davide

E' vietata la riproduzione parziale del certificato senza l'autorizzazione scritta.
I risultati delle prove si riferiscono unicamente ai particolari esaminati.
Partial reproduction of this certificate must be written authorized.
Test results relate only to examined items.

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QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n°
		19249 PT 01 SZ Rev. 00

RAPPORTO D'ESAME LIQUIDI PENETRANTI NDT REPORT - DYE PENETRANT TEST	DATA / Date 10/01/2020	FOGLIO / Sheet 1

CLIENTE/Client	ORDINE/Order	PROGETTO/Project	COMMESSA/Job	
ROSETTI MARINO	/	/	119N12	
CLIENTE FINALE/Final client	OGGETTO/Object	DISEGNO/Dwg	P.F.C./Q.C.P.	FASE/Step
/	PQR	/	/	/

NORMA DI RIFERIMENTO/Reference Normative	PROCEDURA/Procedure	ACCETTABILITA'/Acceptance level
RINA RULES FOR THE CLASSIFICATION OF SHIP PART (D)	/	/

MATERIALE/Material	TEMP. SUPERFICI/ Surface temperature	INTENSITA' LUMINOSA/ Light intensity	
ASTM A240 Tp316L S460	23C°	☑ LUCE BIANCA >500 Lux	☐ LUCE NERA 1000 µW/cm²

STATO DELLA SUPERFICIE – Surface condition			
☑ COME SALDATO/As welded	☑ SPAZZOLATO - Brushed		☐ LAVORATO DI MACCHINA - Machined
☐ MOLATO - Ground	☐ LAMINATO - Rolled		☐ GREZZO - Forged
MATERIALI UTILIZZATI - Material Used	NDT	TIPO/Type	LOTTO NUMERO/Back No.
PULITORE PRELIMINARE/Cleaner	BC1	CLASSE 2 TIPO II METODO A	180607s
PENETRANTE - Penetrant SENSIBILITA' Sensitivity level	K71B2P	TIPO II METODO A	180305Ps
RIVELATORE/Developer	D112A	FORMA d	181025W150s

ISTRUZIONE DI LAVORO/Works instruction		
Step 1 PULITURA PRELIMINARE/Preliminary Cleaning	BY BRUSCHING PLUS BC1	
Step 2 ASCIUGATURA / Drying	CLOTH	
Step 3 APPLICAZIONE PENETRANT/ Penetrant application	SPRAY	
Step3a TEMPO PENETRAZIONE/Dwel time (min)	5÷60	
Step 4 RIMOZIONE PENETRANTE/Removal penetrant	WATER	
Step 5 ASCIUGATURA/Drying process	CLOTH	
Step 6 INTERVALLO APP. RIVELATORE/time int. developer app.	/	
Step 7 APPLICAZIONE RIVELATORE/Developer application	SPRAY	
Step 8 TEMPO DI LETTURA/Checking time	RANGE 10÷30	
Step 8 PULIZIA DOPO CONTROLLO/Cleaner after examination	☐ NO/No	☑ SI/Yes

SALDATURE CONTROLLATE / Welds Verified

THE CONTROL HAS BEEN CARRIED OUT ON THE FOLLOWING COUPON:

PQR 46/19 PC

PQR 46/19 PF

PQR 42/19 PC

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Stefano Zauli 3° Livello SNT-TC-1A / 180[illegible]12	ROSETTI MARINO SpA Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 29/01/2020 File Signature Cimatti Davide

E' vietata la riproduzione parziale del certificato senza l'autorizzazione scritta.
I risultati delle prove si riferiscono unicamente ai particolari esaminati.
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Test results relate only to examined items.

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ROSETTI MARINO

PQR 42/19

Mechanical test report

INSPECTA S.R.L.	TEST REPORT *RAPPORTO DI PROVA*		ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO LAB N°1607 L
	N° 019-00210-19 Data: 28/01/2020	Rev.00	

Object: *Oggetto:*	**MECHANICAL TEST ON PQR 42/19 (PC+PF)**					Pag. 1 di 12
Specimen: *Saggio:*	**12/2020PC** **12/2020PF**	**#Base Material:** *Materiale Base:*	**ASTM A240 Tp 316L with** **EN10225 S460G2+M**	**Thk 10,00 mm with** **10,00 mm**		
		# Informazione fornita dal cliente/ Information provided by the customer				
Customer: *Committente:*	**ROSETTI MARINO SPA**					
Address: *Indirizzo:*	**Via Trieste, 230 - 48122 Ravenna (RA)**					
Final customer:. *Cliente finale:*	//					
Your delivery note n°: *Vs. DDT di consegna*	**n°** // *n°*	**Date:** *Data:* //	**MD52** *MD 52*	**004/2020**	**Date:** *Data:*	**10/01/2020**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **28/01/2020**	**End of activities:** *Fine prove:*			**Date:** *Data:*	**28/01/2020**

PROVE RICHIESTE

☒ **TENSILE TEST**/*Trazione*	☒ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*
☒ **BEND TEST**/*Piega*	☐ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☒ Face/Root /*Dritto/Rovescio* ☐ Side/ *Laterale*
☒ **IMPACT TEST**/*Resilienza*	☐ Trasversal/ *Trasversale*	☒ Longitudinal/ *Longitudinale*
☒ **MACROEXAMINATION TEST /** *Macrografia*		
☒ **HARDNESS TEST/** *Durezza*	☐ HV 5	☒ HV 10
☐ **FRACTURE TEST/** *Frattura*	☐ Plate on Plate/ *Piastra su Piastra*	☐ Pipe on Plate/*Tubo su Piastra*
☐ **CHEMICAL ANALYSIS**/*Analisi Chimica*		
☐ **MICROEXAMINATION TEST /** *Micrografia*		
☐ **OTHER (Specify)**/*Altro/(Specificare)*		

Allegati /Attachments: NONE

NOTE/ Remarks: **REFERENCE CODE FROM CUSTOMER REQUEST: EN 15614-1** + RINA RULES : 2018

Informazioni aggiuntive fornite dal cliente:
Additional information provided by the customer

*** Dove indicato la prova si intende non accreditata da ACCREDIA**

Laboratory Responsible *Responsabile Laboratorio* Sig. Claudio Pettinato	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
INSPECTA Srl Via Ravegnana, 379/a 28-01-2020	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services S.p.A. No. Bo. 0114 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ File Signature Cimatti Davide 28/01/2020

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I risultati di prova si riferiscono al campione così come ricevuto,essendo il campionamento eseguito dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%.The results in this test report refers only to the specimen that has been tested.The customer undertakes to print out /reproduce the test report. Any partial reproduction is prohibited.Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory.The test results refer to the sample as received, since the sampling is performed by the customer..Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku = 2 equivalent to a level of confidence of 95 % .

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

Date of Testing::28/01/2020
Data esecuzione prova:

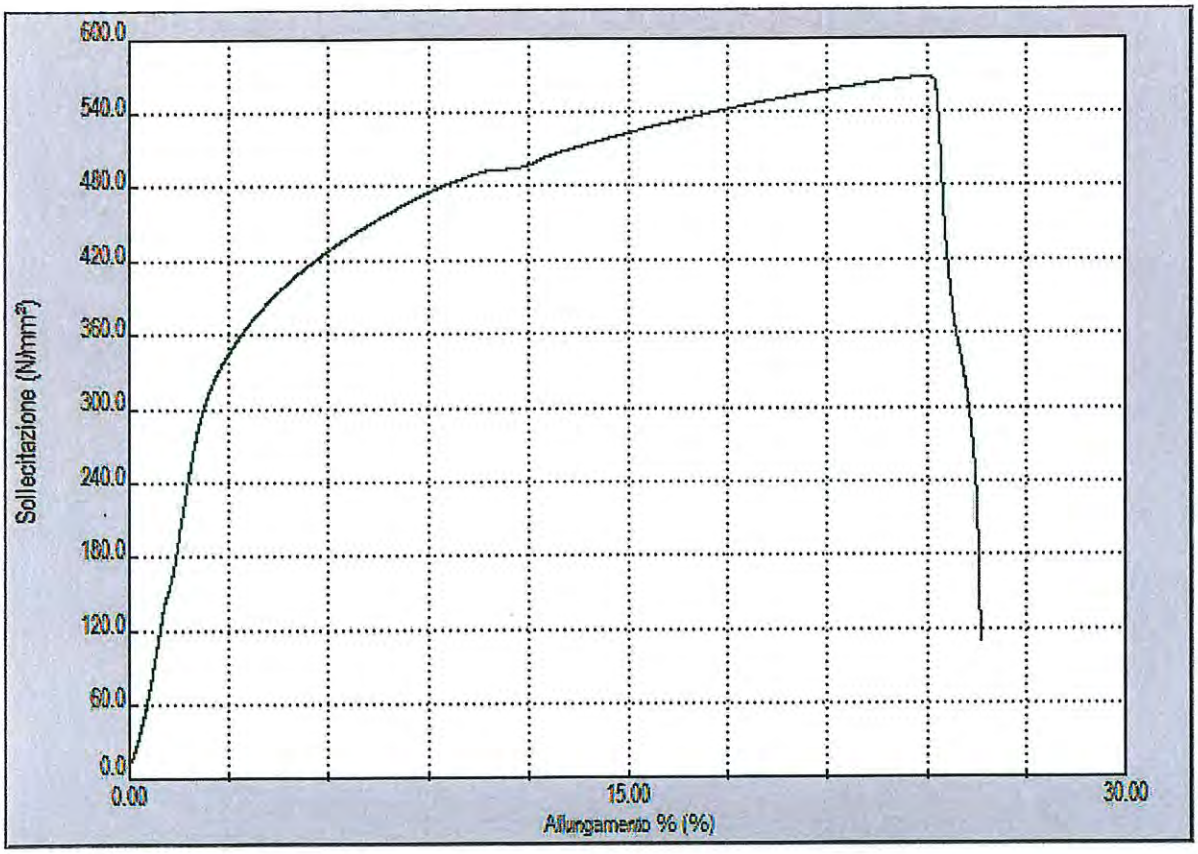
Serial N. VAUP 01

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2019 method B* ☐ *ASTM A370-19e1*
☐ *ASME IX QW–150:2019* ☐ *ASTM E8 / E8M 16a* ☐ _____

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *Procedura interna :* ***PP08 rev.07***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti*	☐ Standards	☐ Client Spec.												
12-20PC - A	9.63x25.02	**240,94**	22°C	//	//	/	//	/	136'841	**568**	/	//	/	**FIW**



Remarks */ Note:*	
Legend / *Legenda*	**TT = Transverse Tension***/Trazione.trasversale;* **FOW = Failure Out of Weld***/Rottura fuori dalla saldatura*
	TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;* **FIW = Failure in Weld***/Rottura in saldatura*

Laboratory Technician
Tecnico di Laboratorio
Dott.Ing. Davide Ciregia
28/01/2020

Laboratory Responsible
Responsabile Laboratorio
sig. Claudio Pettinato
INSPECTA srl
28-1-2020
Via Ravegnana, 379/a
47121 Forlì (FC)
P. IVA 03944480403

Customer Inspector
Ispettore del cliente
ROSETTI MARINO SpA
A. Khalifa
Welding Dept.

RINA Services S.p.A. No. Bo. 0474
Noted ☐
Reviewed ☐
Witnessed ☐
Approved ☐

Third part Inspector
Ispettore Terza parte 28/01/2020
File
Signature
Cinelli Davide

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

Date of Testing::28/01/2020
Data esecuzione prova:

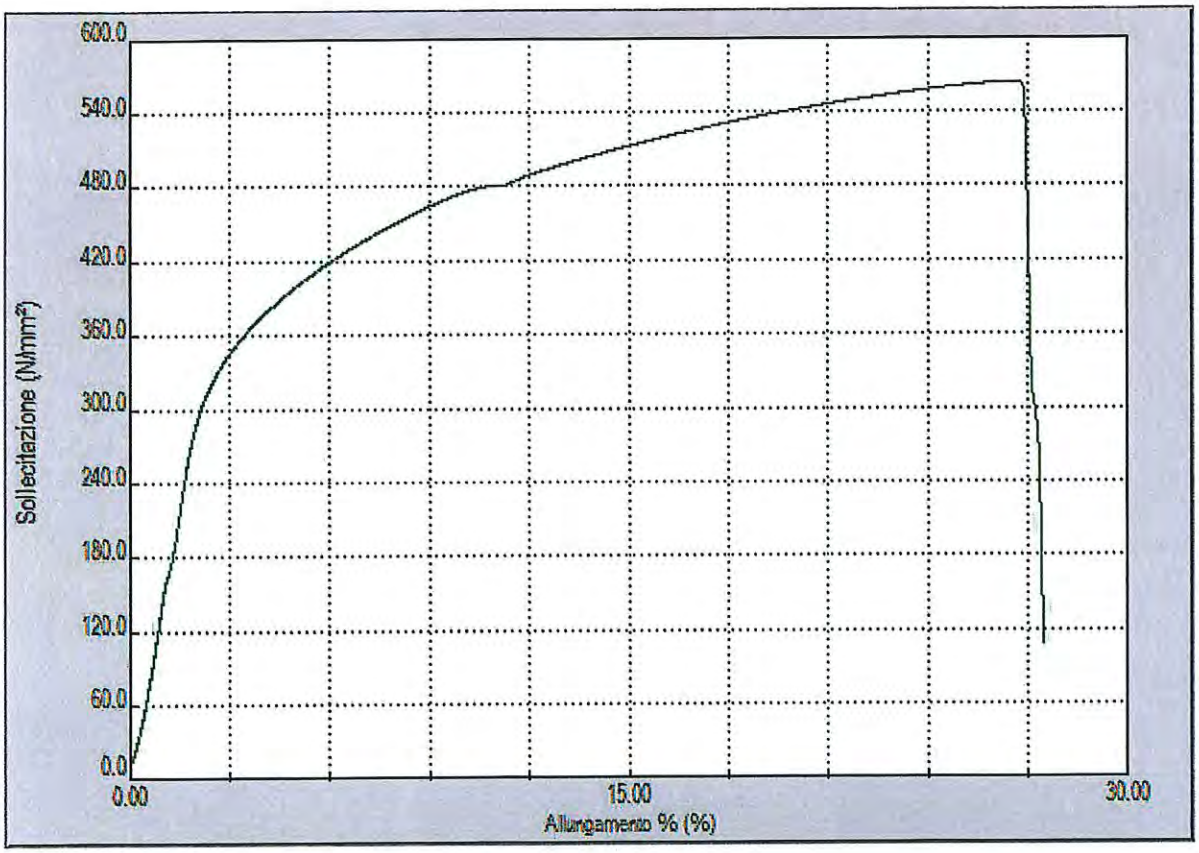
Serial N. VAUP 01

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2019 method B* ☐ *ASTM A370-19e1*
☐ *ASME IX QW–150:2019* ☐ *ASTM E8 / E8M 16a* ☐ _____

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *Procedura interna :* ***PP08 rev.07***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti*		☐ Standards	☐ Client Spec.											
12-20PC - B	9.99x25,02	**249,95**	22°C	//	//	/	//	/	140'919	**564**	/	//	/	**FIW**



Remarks */ Note:*

Legend */ Legenda*

TT = Transverse Tension*/Trazione.trasversale;*
TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;*
FOW = Failure Out of Weld*/Rottura fuori dalla saldatura*
FIW = Failure in Weld*/Rottura in saldatura*

Laboratory Technician
Tecnico di Laboratorio
Dott. Ing. Davide Cregia
Laboratory Technician
28/01/2020

Laboratory Responsible
Responsabile Laboratorio
sig. Claudio Pettinato
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20-01-2020
Via Ravegnana, 379/a
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P. IVA 03944480403

Customer Inspector
Ispettore del cliente
ROSETTI MARINO SpA
Khalifa
Welding Dept.

Third part Inspector
Ispettore Terza parte
RINA Services SpA
No. Bo. 0474
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
Date 28/01/2020
File
Signature
Cimatti Davide

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

Date of Testing::28/01/2020
Data esecuzione prova:

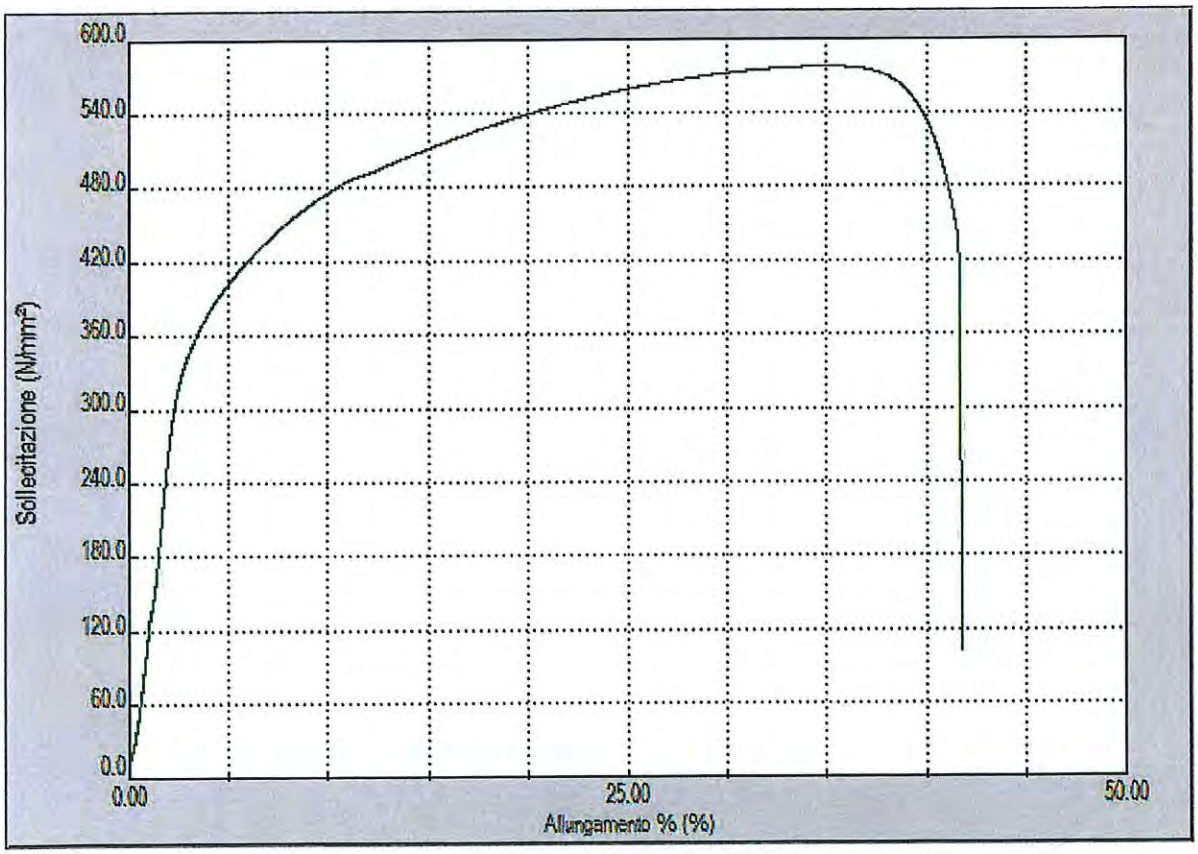
Serial N. VAUP 01

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2019 method B* ☐ *ASTM A370-19e1*
☐ *ASME IX QW–150:2019* ☐ *ASTM E8 / E8M 16a* ☐ _____

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *Procedura interna* : ***PP08 rev.07***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
12-20PF- A	9.99x25,02	249,95	22°C	//	//	/	//	/	144'215	577	/	//	/	FOW SIDE Tp316L



Remarks / *Note:*

Legend / *Legenda*

TT = Transverse Tension/*Trazione trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura*
TWT = Transverse Weld Tension/*Trazione trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Davide Ciregia	Sig. Claudio Pettinato	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ File _____ Signature Cimatti Davide
Laboratory Technician 28/01/2020	INSPECTA 28-01-2020 Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403		28/01/2020

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

Date of Testing::28/01/2020
Data esecuzione prova:

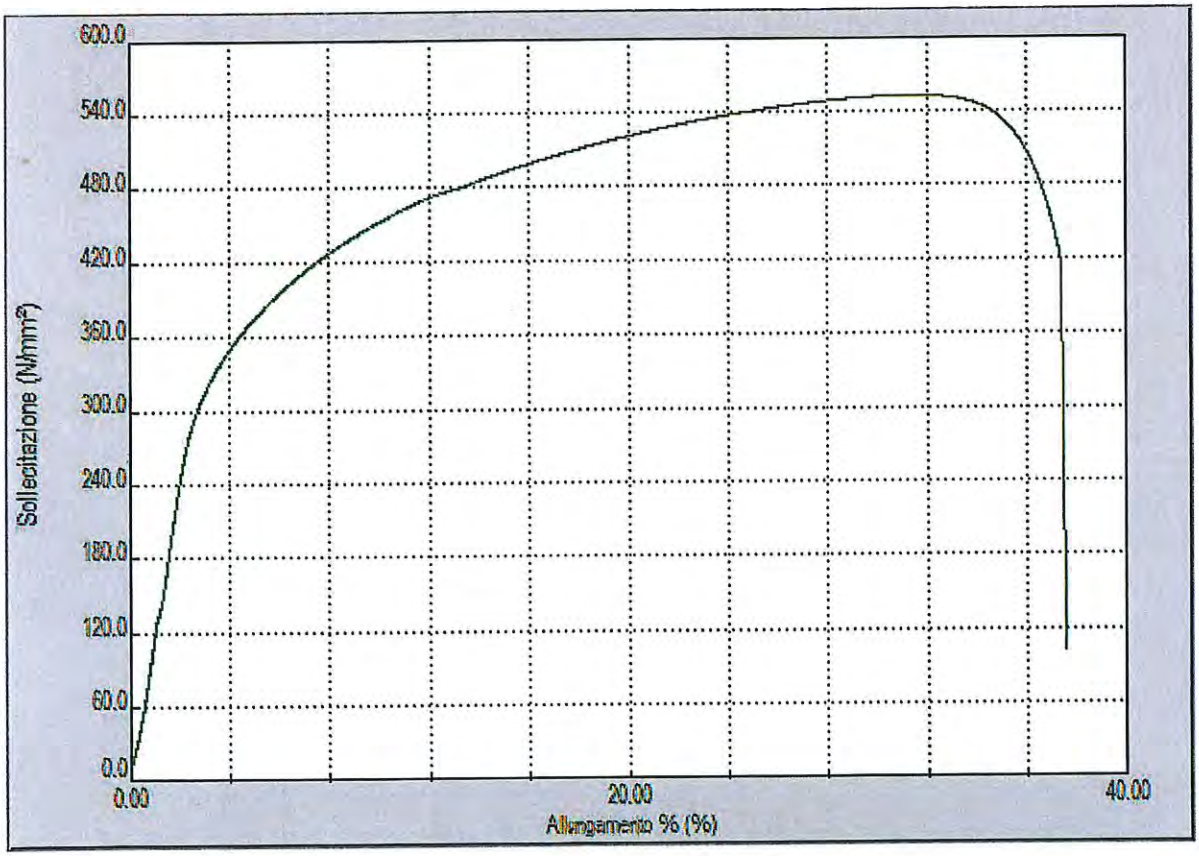
☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2019 method B* ☐ *ASTM A370-19e1*
☐ *ASME IX QW-150:2019* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *Procedura interna :* ***PP08 rev.07***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti*		☐ Standards	☐ Client Spec.											
12-20PF- B	9.95x25,00	**248,75**	22°C	//	//	/	//	/	137'476	**553**	/	//	/	**FOW SIDE Tp316L**



Remarks */ Note:*	
Legend / *Legenda*	**TT = Transverse Tension***/Trazione.trasversale;* **FOW = Failure Out of Weld***/Rottura fuori dalla saldatura*
	TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;* **FIW = Failure in Weld***/Rottura in saldatura*

Laboratory Technician
Tecnico di Laboratorio
Dott. Ing. Davide Ciregia
- INSPECTA srl -
29/01/2020

Laboratory Responsible
Responsabile Laboratorio
sig. Claudio Pettinato
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P. IVA 03944480403

Customer Inspector
Ispettore del cliente
ROSETTI MARINO SpA
A. Khalifa
Welding Dept.

Third part Inspector
Ispettore Terza parte
Date 28/01/2020
RINA Services S.p.A.
No. Bo. 0474
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
File
Signature
Cimatti Davide

BEND TEST
Prova di piega

Date of Testing::28/01/2020
Data esecuzione prova:

☒ *UNI EN ISO 5173: 2012* | ☐ *ASME IX QW-160: 2019* | ☐ _____

Serial N. VAUP / 01

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *Procedura interna* **:PP11 rev.04**

Specimen id. *Identificazione provino*		Dimension *Dimensioni (mm)*	Test Temp. *Temp.test °C*	Bend Angle *Angolo di piega*	Ø Former *ø Mandrino (mm)*	Distance between rollers *Distanza appoggi (mm)*	Remarks *Note*
12/2020 PC TFB	A	10,00x40,00	22°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone
12/2020 PC TFB	B	10,00x40,00	22°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone
12/2020 PC TRB	C	10,00x40,00	22°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone
12/2020 PC TRB	D	10,00x40,00	22°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone

Remarks *Note:* //

Legend *Legenda*

SBB. = Transverse Side Bend/*Piega Trasversale laterale*
TRB. = Transverse Root Bend/*Piega Trasversale al rovescio*
TFB. = Transverse Face Bend/*Piega Trasversale al dritto*
LRB = Longitudinal Root Bend */ Piega Longitudinale al rovescio*
LFB. = Longitudinal Face Bend */ Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Davide Carégia	sig. Claudio Pettinato	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Servizi SpA No. Bo. 0 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ File Signature Cinotti Davide
28/01/2020	28-01-2020		28/01/2020

Via Ravegnana, 379/a
47122 Forlì (FC)
P. IVA 03944480403

BEND TEST
Prova di piega

Date of Testing::28/01/2020
Data esecuzione prova:

☒ *UNI EN ISO 5173: 2012* | ☐ *ASME IX QW-160: 2019* | ☐ _____

Serial N. VAUP / 01

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *Procedura interna* **:*PP11 rev.04***

Specimen id. *Identificazione provino*		Dimension *Dimensioni (mm)*	Test Temp. *Temp.test °C*	Bend Angle *Angolo di piega*	Ø Former *ø Mandrino (mm)*	Distance between rollers *Distanza appoggi (mm)*	Remarks *Note*
12/2020 PF TFB	A	10,00x40,00	22°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone
12/2020 PF TFB	B	10,00x40,00	22°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone
12/2020 PF TRB	C	10,00x40,00	22°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone
12/2020 PF TRB	D	10,00x40,00	22°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone

Remarks *Note:* //

Legend *Legenda*

SBB. = Transverse Side Bend/*Piega Trasversale laterale*
TRB. = Transverse Root Bend/*Piega Trasversale al rovescio*
TFB. = Transverse Face Bend/*Piega Trasversale al dritto*
LRB = Longitudinal Root Bend */ Piega Longitudinale al rovescio*
LFB. = Longitudinal Face Bend */ Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Davide Ciregia	sig. Claudio Pellinato		
27/01/2020	28-01-2020	IOSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services S.p.A. No. Bo... 28/01/2020
	Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403		Noted ☐ File ___ Reviewed ☐ Witnessed ☑ Signature Approved ☐ Cimatti Davide

IMPACT TEST
Prova di resilienza

Date of Testing::28/01/2020
Data esecuzione prova:

☐ *UNI EN ISO 148-1: 2016* | ☒ *UNI EN ISO 9016: 2012* | ☐ *ASTM E23: 18* | ☐ *ASME IX QW-170: 2019*
☐ *ASTM A923-14 Method B*

Serial N. VAUP / 02

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *Procedura interna* **:PP09 rev.06**

Specimen id. *Identificazione provino*	Direction *Direzione*	Dimension *Dimensioni (mm)*	Test Temp. *Temp .test*	Notch Type *Intaglio*	Knife / *coltello*	Requirement / Requisiti: Energy absorbed/ / Energia assorbita — Individual *Individuale Joule* 1	2	3	Average *Media Joule*	U	Lateral Expansion *Espansione laterale (mm)* 1	2	3	Shear Area *Area fragile %* 1	2	3	Remarks *Note*
WM 12-20	T	7.5x10x55	-50°C	V	2	42	41	42	42		/	/	/	/	/	/	PC
FL 12-20 SIDE S460G2+M	T	7.5x10x55	-50°C	V	2	26	30	30	29		/	/	/	/	/	/	PC
FL+2 12-20 SIDE S460G2+M	T	7.5x10x55	-50°C	V	2	174	141	188	168		/	/	/	/	/	/	PC
FL 12-20 SIDE Tp 316l	T	7.5x10x55	-50°C	V	2	90	82	81	84		/	/	/	/	/	/	PC
FL+2 12-20 SIDE Tp 316l	T	7.5x10x55	-50°C	V	2	150	139	84	124		/	/	/	/	/	/	PC
WM 12-20	T	7.5x10x55	-50°C	V	2	40	41	34	38		/	/	/	/	/	/	PF
FL 12-20 SIDE S460G2+M	T	7.5x10x55	-50°C	V	2	46	25	35	35		/	/	/	/	/	/	PF
FL+2 12-20 SIDE S460G2+M	T	7.5x10x55	-50°C	V	2	144	76	150	123		/	/	/	/	/	/	PF
FL 12-20 SIDE Tp 316l	T	7.5x10x55	-50°C	V	2	166	87	169	141		/	/	/	/	/	/	PF
FL+2 12-20 SIDE Tp 316l	T	7.5x10x55	-50°C	V	2	82	142	63	96		/	/	/	/	/	/	PF

Remarks *Note:*

Legend *Legenda*

L= Longitudinal / Longitudinale
T= Trasversal / Trasversale
VWT 0/2 = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
VHT 0/2 = Impact Test on Fusion Line / *Resilienza Trasversale in linea di fusione*
VHT 1/2 = Impact Test at 1mm from Fusion Line / *Resilienza trasversale a 1 mm dalla linea di fusione*
VHT 2/2 = Impact Test at 2 mm from Fusion Line / *Resilienza trasversale a 2 mm dalla linea di fusione*
VHT 5/2 = Impact Test at 5 mm from Fusion Line / *Resilienza trasversale a 5 mm dalla linea di fusione*
WM = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
HAZ = Impact Test on Heat Affected Zone / *Resilienza Trasversale in zona termicamente alterata*
BM = Impact Test on Base Metal / *Resilienza Trasversale in materiale base*

FL = Fusion Line/ *Linea di fusione*
FL+1 = Fusion Line + 1mm/ *Linea di fusione+1mm*
FL+2 = Fusion Line + 2mm/ *Linea di fusione+2mm*
FL +5= Fusion Line + 5mm/ *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician
Tecnico di Laboratorio
Dott. Ing. Davide Giregia
- INSPECTA srl -
Laboratory Technician
28/01/2020

Laboratory Responsible
Responsabile Laboratorio
sig. Claudio Pettinato
INSPECTA srl
28-01-20
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47122 Forlì (FC)
P. IVA 03944480403

Customer Inspector
Ispettore del cliente
ROSETTI MARINO SpA
A. Khalifa
Welding Dept.

Third part Inspector
Ispettore Terza parte
RINA Services SpA
No. Bo. 0474
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
Date 28/01/2020
File
Signature
Cimatti Daniele

VICKERS HARDNESS TEST METHOD

Prova di durezza Vickers

Date of Testing:28/01/2020
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* | ☒ *UNI EN ISO 9015-1: 2011* | ☐ *ASTM E 92-17* | ☐ _____

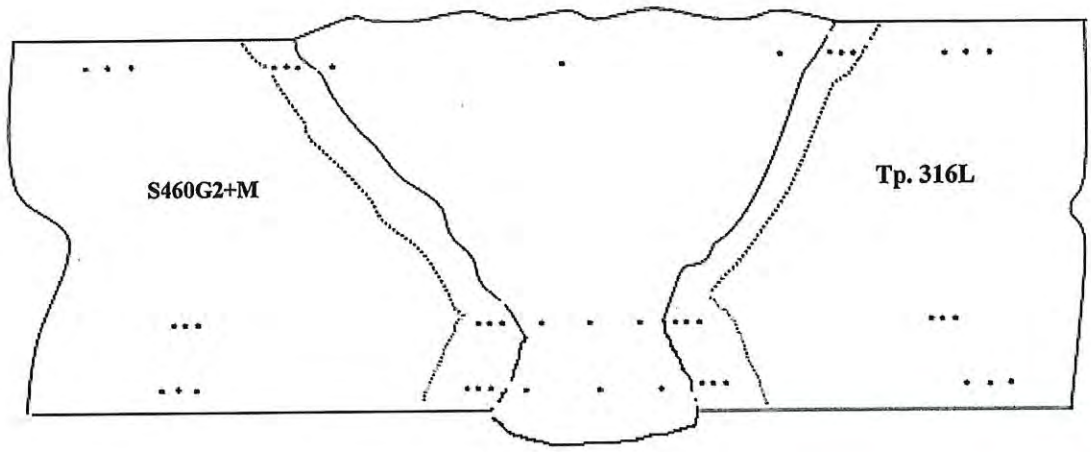
Serial N. 43030614C

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *Procedura interna*	**PP10 rev.03**	**Sample Identification** *Identificazione provino*	**12/2020 PC**	**Hardness test type** *Tipo di durezza*	**HV10**	**Test Temp.** *Temp.test*	22°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A:			**Base Material Side B:**	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
31 - 32 - 33	34 - 35 - 36	37 - 38 - 39	40 - 41 - 42	43 - 44 - 45
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30



Reference points *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U
1 – 2 - 3	**183-176-175**	//	16 – 17 - 18	**196-193-198**	//	31 – 32 - 33	**187-188-184**	//
4 - 5 - 6	**200-254-300**	//	19 - 20 - 21	**223-230-239**	//	34 - 35 - 36	**213-207-217**	//
7 – 8 - 9	**175-177-187**	//	22 – 23 - 24	**187-193-202**	//	37 – 38 - 39	**197-202-211**	//
10 - 11 - 12	**172-174-173**	//	25 - 26 - 27	**200-198-195**	//	40 - 41 - 42	**202-199-200**	//
13 – 14 - 15	**150-150-149**	//	28 – 29 - 30	**169-165-163**	//	43 – 44 - 45	**164-159-163**	//
Remarks/ *Note:*								

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Davide Ciregia	sig. Claudio Fettinato	A. Khalifa	
28/01/2020	28-01-2020	ROSETTI MARINO SpA Welding Dept.	RINA Services S.p.A. No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File _____ Signature _____ Cinzia Bonvicini 29/01/2020

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing:28/01/2020
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* | ☒ *UNI EN ISO 9015-1: 2011* | ☐ *ASTM E 92-17* | ☐ _____

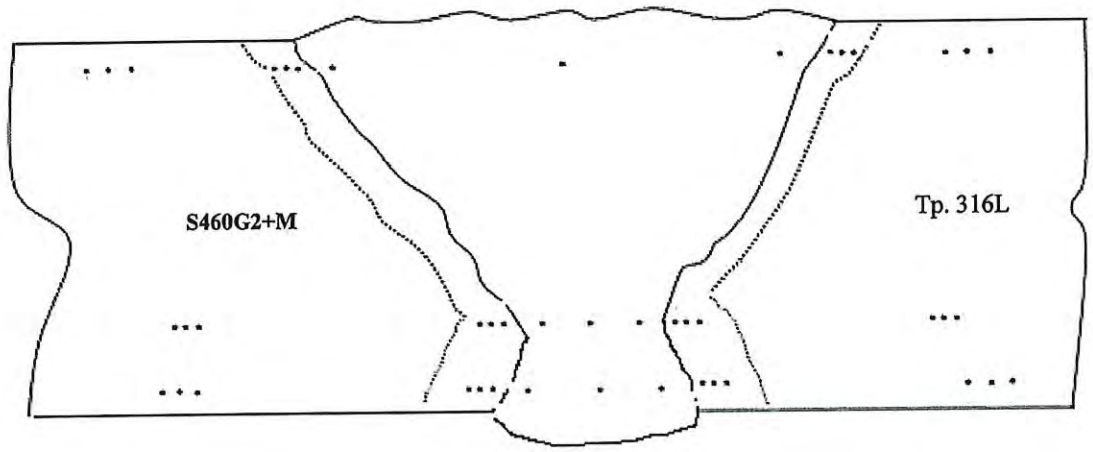
Serial N. 43030614C

* Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA

Internal procedure *Procedura interna*	PP10 rev.03	Sample Identification *Identificazione provino*	12/2020 PF	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	22°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A:			Base Material Side B:	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
31 - 32 - 33	34 - 35 - 36	37 - 38 - 39	40 - 41 - 42	43 - 44 - 45
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	191-188-188	//	16 – 17 - 18	200-199-198	//	31 – 32 - 33	198-196-195	//
4 - 5 - 6	194-213-259	//	19 - 20 - 21	213-218-234	//	34 - 35 - 36	201-203-210	//
7 – 8 - 9	260-178-183	//	22 – 23 - 24	182-162-170	//	37 – 38 - 39	188-183-199	//
10 - 11 - 12	175-165-167	//	25 - 26 - 27	170-179-183	//	40 - 41 - 42	201-202-202	//
13 – 14 - 15	161-159-157	//	28 – 29 - 30	158-160-157	//	43 – 44 - 45	187-176-184	//
Remarks/ *Note:*								

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Davide Giregia	sig. Claudio Pelunaio	A. Khalifa	Cimatti Davide
28/01/2020	28-01-2020	Welding Dept.	28/01/2020

INSPECTA srl Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403

ROSETTI MARINO SpA

RINA Service S.p.A. No. Bo. 0
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐
File _____ Signature

MACRO EXAMINATION TEST
Prova Macrografica

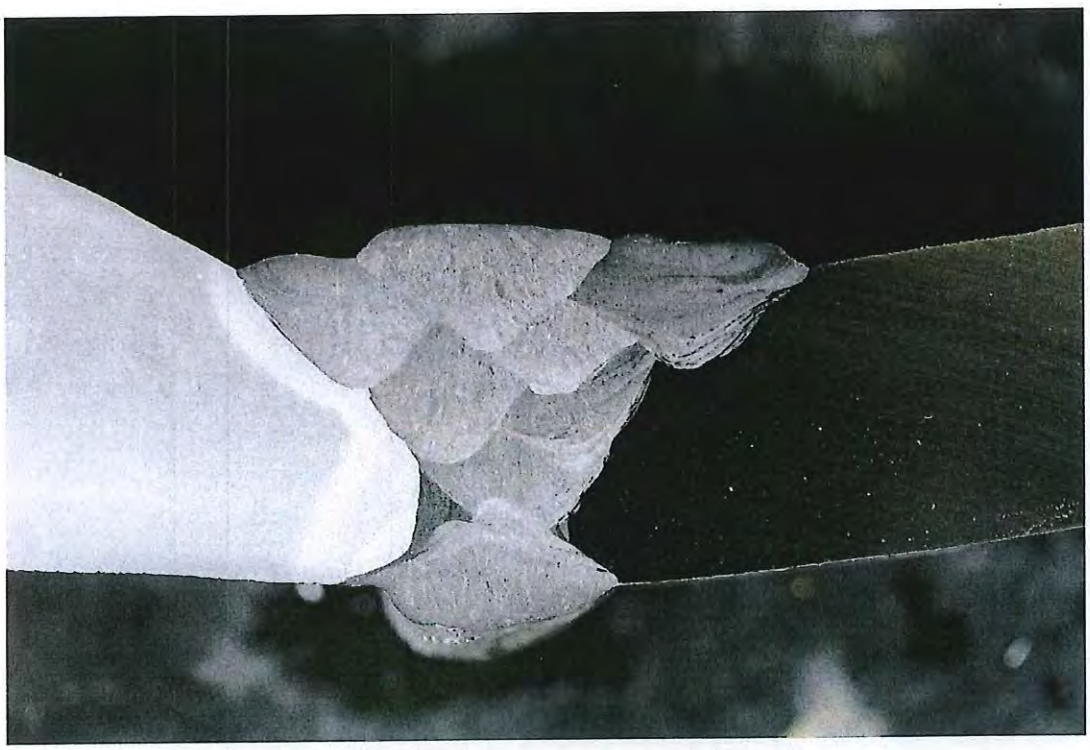
Date of Testing:28/01/2020
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2019* ☐ *AWS D1.1:2015*

Serial N.. EOS 650D/EFS

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *PP12 rev.01* *Procedura internal*		**Test temperatura** *Temperature Test*	**22°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**AQUA REGIA + NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**12/2020 A PF**	**Magnification:** *Ingrandimento:*	**Photo at: 4x** **Examination at: 10x**
Designation: *Designazione:*	**ISO 17639-A-E-1.2/8.1/8.1 AQUA REGIA + NITAL 5%**		



Remarks / *Note:*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Davide Ciregia	*sig. Claudio Pettinato*	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services SpA No Bo. 0474
28/01/2020	INSPECTA srl 28-01-2020 Via Ravegnana, 379/a 47122 Forlì (FC) P. IVA 03944480403		Noted ☐ Reviewed ☐ Witnessed ☐ Approved ☐
			Date 28/01/2020 File Signature Cimatti Davide

MACRO EXAMINATION TEST
Prova Macrografica

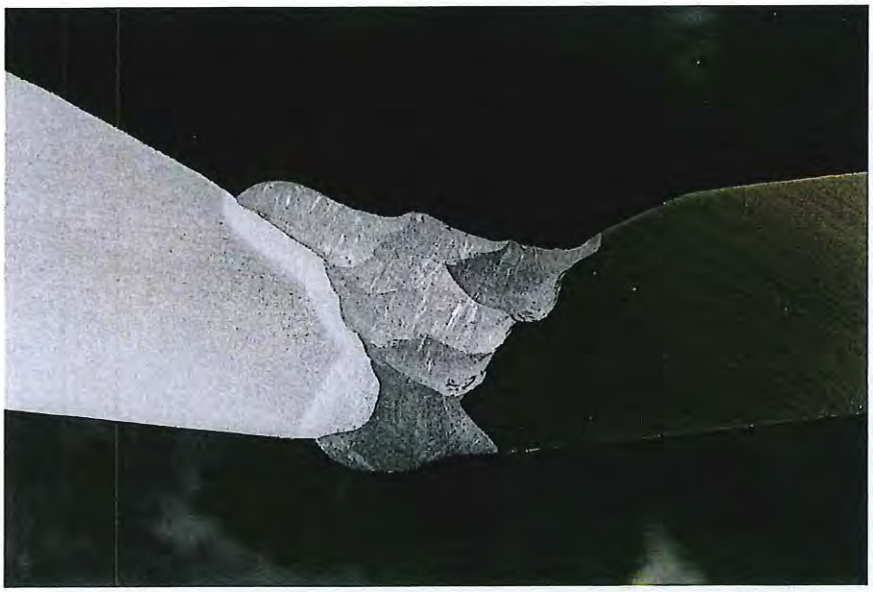
Date of Testing:28/01/2020
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* | ☐ *ASME IX QW-183: 2019* | ☐ *AWS D1.1:2015*

Serial N.. EOS 650D/EFS

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *PP12 rev.01* *Procedura internal*		**Test temperatura** *Temperature Test*	**22°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**AQUA REGIA + NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**12/2020 A PC**	**Magnification:** *Ingrandimento:*	**Photo at: 3x** **Examination at: 10x**
Designation: *Designazione:*	**ISO 17639-A-E-1.2/8.1/8.1 AQUA REGIA + NITAL 5%**		



Remarks /
Note:

Laboratory Technician *Tecnico di Laboratorio* *Dott. Ing. Davide Ciregia*	**Laboratory Responsible** *Responsabile Laboratorio* *sig. Claudio Pettinato*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Laboratory Technician 28/01/2020	INSPECTA srl 28-01-2020 Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403	ROSETTI MARINO SpA A. Khalifa Welding Dept	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☐ Approved ☐ Date 28/01/2020 File Signature Ciriani Davide

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 44/19	Sheet/Foglio 1/2

Manufacturer's Welding Procedure. Ref. no.	44/19 REV. 0		
Manufacturer	ROSETTI MARINO S.p.A.		
Address	VIA TRIESTE 230 - 48121 RAVENNA		
Code, Testing Standard	Rina Rules Pt D. Ch 5 Sec. 4; EN ISO 15614-1:2019 Lev.2		
	Location of test specimen according to EN ISO 15614-1:2019 Section 7.2, Fig. 7 Essential variables according to EN ISO 15614-1:2019, Chapter 8 and Rina Rules Pt D. Ch 5 Sec. 4		
Date of welding	Start: November 20th , 2019 Complete: November 20th , 2019		
Examiner of examining body	Rina Services S.p.A.		
RANGE OF QUALIFICATION			
Welding process	136 - FCAW		
Type(s)	Partly Mechanized		
Welding Equipment Type	HF inverter type (BLUE STAR 500)		
Actual parent Material side A	Plate: ASTM A240 Tp. 316L (Heat: 829053)		
Actual parent Material side B	Plate: EN 10225: S460G2+M Z (Heat: 458532)		
Parent Material grade	ISO 15608 Gr. 8.1 (Material side A); ISO 15608 Gr. 2.1 (Material side B)		
Supply condition	Solution treated (Material side A); Termomechanically rolled (Material side B)		
Groove design/configuration	Plate to Plate Fillet Joint in Single Pass, (for dimension and details see page 3 of 3)		
Parent material thickness (mm)	10 mm (S460G2+M Z machined from original thickness: 15mm)		
Weld metal thickness (mm)	136 - FCAW	Throat thickness (Pos. PB): Macro 1: 3,3 mm Macro 2: 3,3 mm	Throat thickness (Pos. PF): Macro 1: 4,6 mm Macro 2: 4,6 mm
Single or Multi-pass	136 - FCAW SINGLE		
Outside diameter	> 150 mm (PA, PB, PF rotated position) ; >500 mm (other positions)		
Filler material Designation	**136 FCAW** EN ISO 17633: T 23 12 L P M 2 (AWS A5.22: E309LT1-1/-4)		
Filler material Maker	136 - LINCOLN COR-A-ROSTA P309L		
Filler material Size	136 - FCAW ∅ 1,2 mm		
Shielding gas/Flux	ISO 14175 :2008 M20 (85% Ar - 15% CO_2)		
Shielding gas flow rate	20 l/min.		
Backing gas (purging)	None		

Type of welding current & polarity	DC - RP	Heat input / Apporto termico (kJ/mm) ± 25%	Pass	Diameter mm	Pos. PB (2F)	Pos. PF (3F)
			Root	∅ 1,2	0,79 to 1,31	0,78 to 1,30

Welding position	All, vertical down progression excluded		
Preheat (°C)	20	Interpass temperature / Temp. di interpass (°C)	N.A.
Post-Weld Heat Treatment and/or ageing	NONE		
Weld bead width	Max. 10 mm		
Welder's detail	Piccoli Alessio , Stamp 12		
Time lapse between root and hot pass	N.A.		
Other information / Altre informazioni	-Accelerate weld cooling not permitted; -Base material origin: pipe and plate		

RAPPORTO PROVA DI QUALIFICA DI PROCEDIMENTO DI SALDATURA/BRASATURA

N° PRATICA	N° SAGGIO	NORMA
2020 VE 92 PW	44/19	EN ISO 15614-1:2019 Lev.2 and Rina Rules

Società ROSETTI MARINO SPA Localit RAVENNA (RA)

Processo FCAW (136) à Tipo PARTLY MECHANIZED

Posizione Saldatore/ Brasatore ____ Spessore (mm) ____ Diametro (mm) ____

Stamp ____ WPS/BPS 44/19

Materiale base: Gruppo/i	Norma e designazione / tipo backing	*Materiale d'apporto o flusso:* Nome commerciale	Norma / designazione
Backing			

Gas al dritto:	*Gas al rovescio:*
Composizione ____ L/min ____ Ø ugello (mm) ____	Composizione ____ L/min ____

Ø Elettrodo Tungsteno (mm) e tipo ____ Temperatura preriscaldo (°C) ____

PWHT (temperatura, tempo e rampe) ____ Temperatura interpass max (°C) ____

Molatura fra le passate ____ Molatura al rovescio ____ Ripresa al rovescio ____

Passate	Processo	Materiale d'apporto Ø [mm]	Corrente [A]	Tensione [V]	Tipo corrente	Velocità [cm/min]

Preparazione giunto e sequenza saldatura
Per processi multipli indicare spessore depositato (mm/processo)

For all details See As Run Sheets attached

Esito esame visivo: ☒ Positivo ☐ Negativo

Prove di qualifica effettuate a: Ravenna (RA) Data 20/11/2019 Firma ____

Esito prove laboratorio: ☒ Positivo ☐ Negativo

Rapporti laboratorio allegati n° e data: Inspecta srl certificate nr. 016-00210-19 dated 17/06/2019

A seguito dell'esito positivo delle prove di laboratorio, si propone il rilascio del certificato di qualifica n° ROSETTI FORM PQR 44/19 Data 29/01/2020 Firma ____

Decisione DM– Con riferimento al documento RINA IS-CRT-SAL-01, si autorizza il rilascio dei certificati di qualifica Data ____ Firma DM ____

PQR attachments index:

Base material certificate (Plate 316L)

Base material certificate (Plate S460G2+M Z)

Consumables certificate

preliminary WPS

NDE certificate

Mechanical test report

ROSETTI MARINO

PQR 44/19

Base material certificate (Plate 316L)

aperam

Correspondentieadres:
Aperam Genk
Swinnenwijerweg 5, Poort Genk 7523
3600 Genk, Belgium
Tel. +32 (0)89 30 21 11

MILL CERTIFICATE BS EN 10204/3.1
CERTIFICAT DE RECEPTION NF EN 10204/3.1
ABNAHMEPRUEFZEUGNIS DIN EN 10204/3.1

N-Nr-N **18K0038049-01 V01**

Certified acc.PED 2014/68/EU Annex I § 4.3 by Certification Body 0036 of TUV SUD Industrie Service GmbH with cert.No.:314/2007/MUC.Renounced of counter signature agreed byTÜV SÜD (9/5/2007).Approved acc.AD 2000-Merkblatt W0/TRD 100 by TÜV SÜD Industrie Service GmbH.Confirmation letter from TÜVSÜD Industrie Service GmbH of 07/05/2010 about the uniformity of coils acc.AD2000 W2 §4.1.1

Tech.Req.:AD 2000 W2 -- AD 2000 W10 -- EN 13445-2

Manufacturer's works order number
N° de la commande usine productrice
Werksauftragsnummer
80452934/01-07964/927/01

Surveyor's mark
Cachet de l'expert
Stempel des
Werkssachverstaendigen
GNK1

Purchaser and/or consignee
Client et/ou destinataire
Besteller und/oder Empfaenger

ACCIAI VENDER SPA
VIA NOBEL 4/A

43100 PARMA
ITALIE

Purchaser's order number
N° de commande client
Kundenbestellnummer
ORD SETT 316L AGG

Product - Produit - Erzeugnis
COILS, HOT ROLLED, ANNEALED AND PICKLED
COILS, LAMINE A CHAUD, RECUITS + DECAPE
COILS, WARMGEWALZT, GEGLUEHT UND GEBEIZT

Customer article number
N.article client
Artikelnummer des Kunden

Steel designation
Désignation de l'acier
Stahlbezeichnung

EN 10028-7-2016 1.4404 / 1.4401
EN 10088-2-2014 1.4404 / 1.4401
EN 10088-4-2009 1.4404 / 1.4401
ASTM A 240-2017 TYPE 316L / 316
ASME SA 240-2017 TYPE 316L / 316

Finish
Présentation
Ausfuehrung

1D
1D
1D
NO 1
NO 1

Steelmaking process
Mode d'élaboration de l'acier - Stahlherstellungverfahren
Prod.proces: Electric arc furnace - VOD/AOD - Continuous casting
Proc.fabric.: Four à arc - VOD/AOD - Coulée continue
Fertigungsablauf: Elektro-Ofen - VOD/AOD - Stranggussanlage

Any supplementary requirements
Prescriptions supplémentaires - Zusätzliche Anforderungen
ST 009 REV.4

Product delivery condition
Etat de livraison du produit - Lieferzustand

Solution treated:
Hypertrempe: **1050 °C**
Loesungsgegl+abgeschreckt:

Forced air-water/air forcé-eau
Geblaese Luft-Wasser

NACE MR 0175 / ISO 15156-1 / ISO 15156-3 -- NACE MR 0103 // CORR. TEST: ASTM A262-E: OK

Identification of the product
Identification du produit - Identifizierung des Erzeugnisses
MELTED IN BELGIUM, MADE IN BELGIUM

Dimensions
Dimensions - Abmessungen

Thickness	Width	Length
Epaisseur - Staerke	Largeur - Breite	Longueur - Laenge
10.00 mm	1500.00 mm	

Number of pieces
Nb de pièces - Stueckzahl: **2**

Coil n.
N.Bobine - Band Nr.: 82905310

Heat n.
N.Coulée - Schmelz Nr.: 829053

Net weight
Poids net - netto Gewicht: **25430 KG**

CHEMICAL ANALYSIS - ANALYSE CHIMIQUE - CHEMISCHE ZUSAMMENSETZUNG

	C	Si	Mn	Ni	Cr	Mo	Ti	N	S	P
Required -Exigé %mini				10.00	16.50	2.00				
Anforderung. %maxi	0.030	0.75	2.00	13.00	18.00	2.50		0.100	0.015	0.045
Cast Analysis	0.021	0.46	1.26	10.04	16.67	2.04		0.035	0.006	0.032
Analyse coulee										
Analyse Schmelze	C71	C72	C73	C74	C75	C76	C77	C78	C79	C80

	C81	C82	C83	C84	C85	C86

Positive material identification carried out : OK
Tests de vérification de la conformité de la nuance fournie : OK
Verwechslungpruefung wurde durchgefuehrt : OK

C04 C93 D52

Location (1) | Direction (2)

MECHANICAL PROPERTIES - PROPRIETES MECANIQUES - MECHANISCHE WERTE EN ISO 6892-1 B / A-SA 370 C20

Room temperature - Température ambiante - Raumtemperatur | Test temperature (°C) : C03

			Yield or proof strength Limite d'élasticité Dehngrenze MPa		Tensile Strength Résistance à la traction Zugfestigkeit MPa	Elongation after fracture Allongement après rupt. Bruchdehnung %		Hardness Dureté Haerte	Yield or proof strength Limite d'élasticité Dehngrenze MPa		Tensile str. Résist. MPa Zugfestigkeit	Elongation % Allongement. Bruchdehnung
			Rp0.2%	Rp1%	Rm	A5	50mm	HRBW	Rp0.2%	Rp1%	Rm	A5
		Required Exigé Anforderung mini	220	260	530	40	40					
		maxi			680			95				
1	T	Obtained Obtenu Ergebnisse	337	368	586	52	55	76				
2								75				
			C11	C14	C12	C13	C15	C31	C16	C17	C18	C19

Impact strength test Essai de résilience Kerbschlagzaehigkeitstest			Corrosion test Test de corrosion Korrosionstest	E0.2(T)/R(T) %						
C40	t(°c)	C44	EN ISO 3651/2 - A:OK	57						
		C42	D51	C50	C51	C52	C53	C54	C55	C05

Internal cleanliness: A: B: C: D: C57

Location of the sample (1)
Emplacement de l'échantillon
Lage des Probenabschnittes
1. Front - Début - Anfang
2. Back - Fin - Ende
3. Middle - Milieu - Mitte
C01

Direction of the test pieces (2)
Orientation des éprouvettes
Probenrichtung
T. Transverse - Travers - Quer
L. Longitudinal - Long - Laengs
C02

The delivery is in accordance with the order
La fourniture est conforme aux exigences de la commande
Die lieferung entspricht den Bestellbedingungen Z01

Packing list
Avis d'expédition **2018047318-7964**
LieferscheinNummer A10

Marking, inspection and measurement : without objection
Contrôle de marquage, d'aspect et de dimensions : satisfaisants
Pruefung der Stempelung, des Oberflaechenaspekts und der Abmessungen : ohne Beanstandung
D01

Organisation inspection
Organisme et/ou service contrôle
Ueberwachungsabteilung A05

Quality Department

28/8/2018

The inspector
Le responsable
Der Werkssachverstaendige D. Raemaekers Z02

ZSQ701 - PS5

A04

aperam

Correspondentieadres:
Aperam Genk
Swinnenwijerweg 5, Poort Genk 7523
3600 Genk, Belgium
Tel. +32 (0)89 30 21 11

A01

MILL CERTIFICATE BS EN 10204/3.1
CERTIFICAT DE RECEPTION NF EN 10204/3.1
ABNAHMEPRUEFZEUGNIS DIN EN 10204/3.1

A02

Factory Production Control certified by TUV SUD Industrie Service Gmbh
with certificate nr 0036-CPR-M-043-2011.
In compliance with the Construction Product Regulation Nr 305/2011/EU.

Z05

N-Nr-N **18K0038049-CE V01** A03

Manufacturer's works order number
N° de la commande usine productrice
Werksauftragsnummer
80452934/01-07964/927/01 A08

Surveyor's mark
Cachet de l'expert
Stempel des
Werkssachverstaendigen
GNK1 Z03

Purchaser and/or consignee
Client et/ou destinataire
Besteller und/oder Empfaenger

ACCIAI VENDER SPA
VIA NOBEL 4/A

43100 PARMA
ITALIE

A06

Purchaser's order number
N° de commande client
Kundenbestellnummer
ORD SETT 316L AGG A07

Product - Produit - Erzeugnis
COILS, HOT ROLLED, ANNEALED AND PICKLED
COILS, LAMINE A CHAUD, RECUITS + DECAPE
COILS, WARMGEWALZT, GEGLUEHT UND GEBEIZT
B01

Customer article number
N.article client
Artikelnummer des Kunden
A09

Steel designation B02
Désignation de l'acier
Stahlbezeichnuug

EN 10088-4-2009 1.4404/1.4401

Finish
Présentation
Ausfuehrung

1D

Steelmaking process C70
Mode d'élaboration de l'acier - Stahlherstellungverfahren
Prod.proces: Electric arc furnace - VOD/AOD - Continuous casting
Proc.fabric.: Four à arc - VOD/AOD - Coulée continue
Fertigungsablauf: Elektro-Ofen - VOD/AOD - Stranggussanlage

Any supplementary requirements B03
Prescriptions supplémentaires - Zusätzliche Anforderungen
ST 009 REV.4

Product delivery condition
Etat de livraison du produit - Lieferzustand

Solution treated:
Hypertrempe: **1050 °C**
Loesungsgegl+abgeschreckt:

Forced air-water/air forcé-eau
Geblaese Luft-Wasser B04

Z06

Identification of the product B07
Identification du produit - Identifizierung des Erzeugnisses
MELTED IN BELGIUM, MADE IN BELGIUM

Dimensions
Dimensions - Abmessungen

Thickness B09	Width B10	Length B11
Epaisseur - Staerke	Largeur - Breite	Longueur - Laenge
10.00 mm	1500.00 mm	

Number of pieces B08
Nb de pièces - Stueckzahl
2

Net weight B13
Poids net - netto Gewicht
25430 KG

Coil n.
N.Bobine - Band Nr.
82905310

Heat n.
N.Coulée - Schmelz Nr.
829053

CHEMICAL ANALYSIS - ANALYSE CHIMIQUE - CHEMISCHE ZUSAMMENSETZUNG

	C	Si	Mn	Ni	Cr	Mo	Ti	N	S	P						
Required -Exigé %mini				10.00	16.50	2.00										
Anforderung. %maxi	0.030	0.75	2.00	13.00	18.00	2.50		0.100	0.015	0.045						
Cast Analysis	0.021	0.46	1.26	10.04	16.67	2.04		0.035	0.006	0.032						
Analyse coulee																
Analyse Schmelze	C71	C72	C73	C74	C75	C76	C77	C78	C79	C80	C81	C82	C83	C84	C85	C86

Positive material identification carried out : OK
Tests de vérification de la conformité de la nuance fournie : OK
Verwechslungpruefung wurde durchgefuehrt : OK
C04 C93 D52

Location (1)

MECHANICAL PROPERTIES - PROPRIETES MECANIQUES - MECHANISCHE WERTE EN ISO 6892-1 B / A-SA 370 C20

Room temperature - Température ambiante - Raumtemperatur

Test temperature (°C) : C03

	Direction (2)		Yield or proof strength Limite d'élasticité Dehngrenze MPa		Tensile Strength Résistance à la traction Zugfestigkeit MPa	Elongation after fracture Allongement après rupt. Bruchdehnung %		Hardness Dureté Haerte	Yield or proof strength Limite d'élasticité Dehngrenze MPa		Tensile str. Résist. MPa Zugfestigkeit	Elongation % Allongement. Bruchdehnung
		Required Exigé Anforderung	**Rp0.2%**	**Rp1%**	**Rm**	**A5**	**50mm**	**HRBW**	**Rp0.2%**	**Rp1%**	**Rm**	**A5**
		mini	220	260	530	40	40					
		maxi			680			95				
1	T	**Obtained** Obtenu Ergebnisse	337	368	586	52	55	76				
2								75				
			C11	C14	C12	C13	C15	C31	C16	C17	C18	C19

Impact strength test Essai de résilience Kerbschlagzaehigkeitstest			Corrosion test Test de corrosion Korrosionstest	E0.2(T)/R(T) %						
C40	t(°c)	C44	EN ISO 3651/2 - A:OK	57						
		C42	D51	C50	C51	C52	C53	C54	C55	C05

Internal cleanliness: A: B: C: D: C57

Location of the sample (1)
Emplacement de l'échantillon
Lage des Probenabschnittes
1. Front - Début - Anfang
2. Back - Fin - Ende
3. Middle - Milieu - Mitte
C01

The delivery is in accordance with the order
La fourniture est conforme aux exigences de la commande
Die lieferung entspricht den Bestellbedingungen Z01

Packing list
Avis d'expédition **2018047318-7964**
LieferscheinNummer A10

Organisation inspection
Organisme et/ou service contrôle
Ueberwachungsabteilung A05

Quality Department

28/8/2018

The inspector
Le responsable
Der Werkssachverstaendige D. Raemaekers Z02

Direction of the test pieces (2)
Orientatiou des éprouvettes
Probenrichtung
T. Transverse - Travers - Quer
L. Longitudinal - Long - Laengs
C02

Marking, inspection and measurement : without objection
Contrôle de marquage, d'aspect et de dimensions : satisfaisants
Pruefung der Stempelung, des Oberflaechenaspekts und der
Abmessungen : ohne Beanstandung
D01

ZSQ701 - PS5

aperam

Correspondance address
Adresse de correspondance - Adresse für briefwechsel

Swinnenwijerweg 5, Poort Genk 7523
3600 Genk, Belgium
CE01

Annex to certificate 18K0038049-01 V01
Annexe du CCPU
Anlage Zum Zeugnis
CE02

Certificate
CCPU - Zeugnis
18K0038049-CE V01
CE05

Certificate of Production Control Number
Numéro du certificat de contrôle de la production
Zeugnisnummer von Produktionskontrolle
0036-CPD-43-2011
CE03

Year 11
Année
Jahr
CE04

CE
0036
CE06

Manufacturer's works order number
N° de la commande usine productrice
Werksauftragsnummer

80452934/01-07964/927/01
CE07

Purchaser and/or consignee
Client et/ou destinataire
Besteller und/oder Empfaenger

ACCIAI VENDER SPA
VIA NOBEL 4/A

43100 PARMA
ITALIE
CE08

Purchaser's order number
N° de commande client
Kundenbestellnummer
ORD SETT 316L AGG
CE09

Customer article number
N° d'article client
Artikelnummer des Kundes
CE10

Identification of the product
Identifictaion du produit - Identifizierung des Erzeugnisses

Dimensions
Dimensions - Abmessungen

Coil n°
N° de bobine - Band Nr
82905310
CE11

Thickness
Epaisseur - Dicke
10.00 mm
CE12

Width
Largeur - Breite
1500.00 mm
CE13

Length
Longueur - Laenge
CE14

Stainless steel / Acier inoxydable / Rostfreier Stahl
CE15

EN10088-4
CE16

Intended uses : building constructions or civil engineering
Usages prévus : construction immobilière ou génie civil
Vorgesehene Verwendungen : Hochbauten und Ingenieurbauwerke
CE17

Declaration of performance :
Déclaration des performances : DOP.Nr.GNK.08.01/GNK.10.01
Leistungserklärung :
DoP available on website Aperam : www.aperam.com/europe/news-publications/documentation/certifications/approvals
CE18

Steel
Acier 1.4404/1.4401
Werkstoff
CE19

Hot rolled
Laminé à chaud
Warmgewalzt
CE20

Coil / bobine / Band
CE21

Elongation / Allongement / Bruchdehnung
Tensile strength / Résistance à la traction / Zugfestigkeit
Yield strength / Limite d'élasticité / Dehngrenze
Impact strength / Résistance au choc / Kerbschlagzähigkeit
Weldability / Aptitude au soudage / Schweisseignung
Durability / Durabilité / Dauerhaftigkeit
Characteristics expressed as indicated in the above mentioned DOP
Tolerances on dimension and shape / Tolérances sur les dimensions et sur forme / Grenzabmasse unf Formtoleranzen : EN ISO 9444-2
CE22

Regulated substance : no performance determined
Substance réglementée : aucune performance determinée
Regulierter Stoff: keine Leistung festgestellt
CE23

ROSETTI MARINO

PQR 44/19

Base material certificate (Plate S460 G2+M Z)

MATERIAL CERTIFICATES BOOK

Supplier	Purchase Order nr.	job	Barcode
ARCELORMITTAL PROJECTS EUROPE B.V.	1719000334	118A50C	Q011901058

ROSETTI MARINO

ROSETTI MARINO
Conforme alla spec. PO
According to the spc.----------.
TMUGF Firma / MTSMD Signature — Data / Date: 16/04/19
Emiliani Sonia
[X] REVIEW
[ ] WITNESS

CUSTOMER

NOTE

PACKING LIST / TRACEABILITY LIST

Client: Rosetti Marino SPA
Massimo Gori
Via trieste 230
48122 Ravenna
Italy
Project: 20190211
PO No: 1719000334



ArcelorMittal Projects Netherlands B.V.
Project Nr: 20190211
Orderno. 2100018960
Rev./Date: 0

Item No.	Client Item No.	Material Type	quality	Pcs	Length (MM)	Width (MM)	Th. (mm)	weight per Pc	weight in kgs	heat no	item no.	Certificate no.	
1	1	HRPL	S355G10+M	1	12.000	2.500	15	3.533	3.533	863720	2965291	A0350855	
1	1	HRPL	S355G10+M	1	12.000	2.500	15	3.533	3.533	463103	12825302	60266	
1	1	HRPL	S355G10+M	1	12.000	2.500	15	3.533	3.533	4613	12814302	60266	
2	2	HRPL	S355G10+M Z	1	12.000	2.500	25	5.888	5.888	464711	15714101	61443	
3	3	HRPL	S460G2+M Z	1	12.000	2.050	25	4.828	4.828	811954	3314191	A0361134	
3	3	HRPL	S460G2+M Z	1	12.000	2.055	25	4.710	4.710	458532	96825002	54602	
3	3	HRPL	S460G2+M Z	1	12.000	2.055	25	4.710	4.710	458532	96825001	54602	
4	4	HRPL	S355G10+M Z	1	6.000	2.500	30	3.533	3.533	705587	42950131	286882-B1	
5	5	HRPL	S460G2+M Z	1	12.000	2.500	40	9.420	9.420	461499	6284902	55228	
6	6	HRPL	S460G2+M Z	1	12.000	2.500	40	9.420	9.420	461497	6284301	60384	
6	6	HRPL	S460G2+M Z	1	12.000	2.500	40	9.420	9.420	459485	97316302	55613	
7	7	HRPL	S460G2+M Z	1	12.000	2.500	50	11.775	11.775	459930	02574-01	436420-001	
8	8	HRPL	S460G2+M Z	1	5.000	2.500	80	7.850	7.850	452882	8667001	436421-002	
9	9	HRPL	S460G2+M Z	1	6.000	2.500	100	11.775	11.775	438917	5019101	49575	
				14					93.925				

Marking: RM PO nummer
PO item No.
dimensions and quality

QM-System: Certification as per ISO 9001

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

54602

DILLINGER

A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ A03 Manufacturer's order/ Certificate No.: 434490-001 Sheet: 1/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ B03 Steel design. / Any suppl. requirements: **S460G2+M** OPTION-12;13;18
EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness		B10 Width MM		B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
02	1	25,00	x	2055	x	12000	4932	TM	458532	968250-01	
02	1	25,00	x	2055	x	12000	4932	TM	458532	968250-02	
02	1	25,00	x	2055	x	12000	4932	TM	458809	959322-01	
02	1	25,00	x	2055	x	12000	4932	TM	458809	959322-02	
**	4						19728				
03	1	25,00	x	2500	x	12000	6000	TM	458805	959318-01	
03	1	25,00	x	2500	x	12000	6000	TM	458805	959318-02	
03	1	25,00	x	2500	x	12000	6000	TM	458809	959323-02	
03	1	25,00	x	2500	x	12000	6000	TM	459320	969239-01	
**	4						24000				
04	1	30,00	x	2500	x	12000	7200	TM	459322	969235-02	
04	1	30,00	x	2500	x	12000	7200	TM	459324	969446-02	
**	2						14400				
05	1	40,00	x	2500	x	12000	9600	TM	458809	959316-01	
05	1	40,00	x	2500	x	12000	9600	TM	458809	959316-02	
05	1	40,00	x	2500	x	12000	9600	TM	458809	959317-01	
05	1	40,00	x	2500	x	12000	9600	TM	458809	959317-02	
05	1	40,00	x	2500	x	12000	9600	TM	458809	959320-01	
05	1	40,00	x	2500	x	12000	9600	TM	458810	959252-01	
05	1	40,00	x	2500	x	12000	9600	TM	458810	959252-02	
05	1	40,00	x	2500	x	12000	9600	TM	458810	959315-02	
**	8						76800				
06	1	40,00	x	3050	x	12000	11712	TM	458810	960122-01	

A04 D F Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01
Multigrades

for DNV GL
This document has been digitally signed and will therefore not have handwritten signatures.
F. Swal
Inspector

POISSONNET
Test House Manager

A01
Dillinger France
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais
Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

DILLINGER

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 2/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ B03 Steel design. / Any suppl. requirements: **S460G2+M** OPTION-12;13;18
EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness	B10 Width MM	B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
06	1	40,00	x 3050	x 12000	11712	TM	458810	960122-02	
06	1	40,00	x 3050	x 12000	11712	TM	458810	960123-01	
06	1	40,00	x 3050	x 12000	11712	TM	458810	960123-02	
06	1	40,00	x 3050	x 12000	11712	TM	459322	969317-02	
**	5				58560				
***	23				193488				

B01-B03 Further information about product / Steel grade / Requirements

ITEM NO.: 04-06
WELDING QUALIFICATION ACCORDING:
WELDING REPORT 08/2010

B06 Marking of the product

ITEM NO.: 01-06
STEEL DESIGNATION **S460G2+M S460ML**
HEAT NO. / TRADEMARK / ROLLED PLATE NO.-TEST NO. / INSPECTOR'S STAMP

B07-B99 Further information about the product

ITEM NO.: 01-06
THICKNESS REDUCTION RATIO >= 4,00 IS FULFILLED

A04 Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

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Multigrades

for DNV GL
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Inspector

POISSONNET
Test House Manager

A01
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3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais
Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 3/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ B03 Steel design. / Any suppl. requirements: **S460G2+M** OPTION-12;13;18
EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C10-C29 Tensile test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C10	C11 MPA RP02	C12 RM	C13 A % L0=5D	C14-C15 RP02/RM	Z %
01	459320	969139*		K7	QO	RT		491	561	28	0,88	
		*		K7	SO	RT			555			68,1
		*		K7	SO	RT			554			61,1
		*		K7	SO	RT			555			72,1
01	459322	969236*		K7	QO	RT		507	571	28	0,89	
		*		K7	SO	RT			564			47,3
		*		K7	SO	RT			559			55,1
		*		K7	SO	RT			562			46,6
02	458532	968250		K7	QO	RT		508	583	26	0,87	
				K7	SO	RT			570			73,2
				K7	SO	RT			571			62,5
				K7	SO	RT			568			71,9
02	458809	959322		K7	QO	RT		515	600	26	0,86	
				K7	SO	RT			578			73,2
				K7	SO	RT			579			74,5
				K7	SO	RT			578			77,3
03	458805	965373*		K7	QO	RT		508	591	25	0,86	
		*		K7	SO	RT			570			74,2
		*		K7	SO	RT			575			76,9
		*		K7	SO	RT			570			78,5
03	459320	969239		K7	QO	RT		513	592	24	0,87	
				K7	SO	RT			577			63,8
				K7	SO	RT			578			63,2

A04 Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01
Multigrades

for DNV GL
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F. Swal
Inspector

POISSONNET
Test House Manager

A01
Dillinger France
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais
Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

DILLINGER

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 4/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design. **S460G2+M** OPTION-12;13;18

B03 Any suppl. requirements: EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C10-C29 Tensile test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C10	C11 MPA RP02	C12 RM	C13	A % L0=5D	C14-C15 RP02/RM	Z %
03	459320	969239		K7	SO	RT			577				64,5
04	458805	965362*		K7	QO	RT		493	591		24	0,83	
04	458810	965330*		K7	QO	RT		498	586		25	0,85	
		*		K7	SO	RT			556				57,4
		*		K7	SO	RT			556				64,4
		*		K7	SO	RT			557				68,7
04	459320	973168*		K7	QO	RT		501	582		28	0,86	
04	459322	969235		K7	QO	RT		482	572		26	0,84	
04	459322	969302*		K7	QO	RT		496	569		26	0,87	
		*		K7	SO	RT			554				51,0
		*		K7	SO	RT			552				33,2
		*		K7	SO	RT			556				54,8
04	459324	969446		K7	QO	RT		513	598		24	0,86	
05	458809	959317		K7	QO	RT		491	591		24	0,83	
05	458809	959320		K7	QO	RT		515	603		23	0,85	
05	458810	959252		K7	QO	RT		489	589		25	0,83	
06	458805	966181*		K7	QO	RT		505	598		22	0,84	
06	458810	960122		K7	QO	RT		511	601		24	0,85	
06	458810	960123		K7	QO	RT		509	600		25	0,85	
06	459322	969317		K7	QO	RT		490	583		27	0,84	
06	459324	971074*		K7	QO	RT		485	582		25	0,83	
		*		K7	SO	RT			554				63,9
		*		K7	SO	RT			552				67,6

A04 D F Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01 Multigrades

for DNV GL
This document has been digitally signed and will therefore not have handwritten signatures.
F. Swal
Inspector

POISSONNET
Test House Manager

A01
Dillinger France
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais
Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

DILLINGER

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 5/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design. **S460G2+M** OPTION-12;13;18

B03 Any suppl. requirements: EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C10-C29 Tensile test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C10	C11 MPA RP02	C12 RM	C13	C14-C15 A % L0=5D	C14-C15 RP02/RM	Z %
06	459324	971074*		K7	SO	RT			558				57,1

C30-C39 Hardness test

B14 Item. No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/C01	C03 Temp. GR.C	C30 Method of test	C35 C31 Individual values	C32 Mean value
01	459320	969139 *		K7	QO	RT	HV10	HV 178	
01	459322	969236 *		K7	QO	RT	HV10	HV 172	
02	458532	968250		K7	QO	RT	HV10	HV 185	
02	458809	959322		K7	QO	RT	HV10	HV 186	
03	458805	965373 *		K7	QO	RT	HV10	HV 192	
03	459320	969239		K7	QO	RT	HV10	HV 191	
04	458810	965330 *		K7	QO	RT	HV10	HV 197	
04	459322	969302 *		K7	QO	RT	HV10	HV 182	
06	459324	971074 *		K7	QO	RT	HV10	HV 186	

C30-C39 Further information about hardness test

ITEM NO.: 01-06
HARDNESS TEST INFORMATIVE

A04 D F Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01
Multigrades

for DNV GL
This document has been digitally signed and will therefore not have handwritten signatures.
F. Swal
Inspector

POISSONNET
Test House Manager

A01
Dillinger France
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais
Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

DILLINGER

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02	A10 Advice of dispatch No./ Date of dispatch	A08/ Manufacturer's order/ A03 Certificate No.	Sheet
INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013	9398896-21.06.18	434490-001	6/...

A05 Established Inspecting body	A06 Purchaser		A07.1 No.	B01 Product
VLNC	ANCOFERWALDRAM,OOSTE	3064200		HEAVY PLATES
	Final receiver	ANCOFERWALDRAM,OOSTE	A07.2 No.	

B02/ Steel design.	S460G2+M	OPTION-12;13;18
B03 Any suppl. requirements	EN-10225:01/AWS-4.11:REV.2	MDS-Y40:REV.5

C40-C49 Impact test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.		B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C41 Width of test piece	C40 Type of test piece	C44 Testing method	C46 Energy Joule	C45	C42 Individual values AV=J			C43 Mean value
01	459320	969139	*		K7	LO	-50		CHP-V		600	AV 2	296	306	299	300
			*		K7	QO	-40		CHP-V		600	AV 2	164	229	230	208
			*		K7	QO	-40		CHP-V	5,0%	600	AV 2	237	121	235	198
			*		K7	QO	-40		CHP-V	5,0%-250C/60MN	600	AV 2	119	129	114	121
01	459322	969236	*		K7	LO	-50		CHP-V		750	AV 2	335	327	330	331
			*		K7	QO	-40		CHP-V		750	AV 2	125	131	144	133
			*		K7	QO	-40		CHP-V	5,0%	600	AV 2	128	104	106	113
			*		K7	QO	-40		CHP-V	5,0%-250C/60MN	600	AV 2	91	98	86	92
02	458532	968250			K7	LO	-50		CHP-V		600	AV 2	140	125	146	137
					K7	QO	-40		CHP-V		600	AV 2	269	275	271	272
					K7	QO	-40		CHP-V	5,0%	600	AV 2	114	92	118	108
					K7	QO	-40		CHP-V	5,0%-250C/60MN	600	AV 2	95	87	91	91
02	458809	959322			K7	LO	-50		CHP-V		600	AV 2	196	291	271	253
					K7	QO	-40		CHP-V		600	AV 2	132	119	174	142
					K7	QO	-40		CHP-V	5,0%	600	AV 2	113	116	105	111
					K7	QO	-40		CHP-V	5,0%-250C/60MN	600	AV 2	68	86	89	81
03	458805	965373	*		K7	LO	-50		CHP-V		600	AV 2	325	347	338	337
			*		K7	QO	-40		CHP-V		600	AV 2	151	107	149	136
			*		K7	QO	-40		CHP-V	5,0%	600	AV 2	102	143	126	124
			*		K7	QO	-40		CHP-V	5,0%-250C/60MN	600	AV 2	93	104	99	99
03	459320	969239			K7	LO	-50		CHP-V		750	AV 2	296	216	289	267
					K7	QO	-40		CHP-V		750	AV 2	196	184	190	190
					K7	QO	-40		CHP-V	5,0%	750	AV 2	137	113	126	125

A04

D F

Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01
Multigrades

for DNV GL
This document has been digitally signed and will therefore not have handwritten signatures.
F. Swal
Inspector

POISSONNET
Test House Manager

A01

Dillinger France
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais

Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 7/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design. **S460G2+M** OPTION-12;13;18

B03 Any suppl. requirements: EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C40-C49 Impact test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.		B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C41 Width of test piece	C40 Type of test piece	C44 Testing method	C46 Energy Joule	C45	C42 Individual values AV=J			C43 Mean value
03	459320	969239			K7	QO	-40		CHP-V	5,0%-250C/60MN	750	AV 2	86	86	92	88
03	459320	973107	*		K7	LO	-50		CHP-V		750	AV 2	314	332	322	323
04	458805	965362	*		K7	LO	-50		CHP-V		600	AV 2	168	207	171	182
			*		K7	QO	-40		CHP-V		600	AV 2	108	109	125	114
04	458810	965330	*		K7	LO	-50		CHP-V		600	AV 2	301	328	321	317
			*		K7	QO	-40		CHP-V		600	AV 2	249	244	240	244
			*		K7	QO	-40		CHP-V	5,0%	600	AV 2	169	116	122	136
			*		K7	QO	-40		CHP-V	5,0%-250C/60MN	600	AV 2	139	103	106	116
04	459320	973168	*		K7	QO	-40		CHP-V		750	AV 2	216	223	190	210
04	459322	969235			K7	LO	-50		CHP-V		750	AV 2	220	287	208	238
					K7	QO	-40		CHP-V		750	AV 2	122	144	175	147
04	459322	969302	*		K7	LO	-50		CHP-V		750	AV 2	237	181	270	229
			*		K7	QO	-40		CHP-V		750	AV 2	140	171	132	148
			*		K7	QO	-40		CHP-V	5,0%	750	AV 2	101	106	106	104
			*		K7	QO	-40		CHP-V	5,0%-250C/60MN	750	AV 2	81	84	83	83
04	459324	969446			K7	LO	-50		CHP-V		600	AV 2	134	139	176	150
					K7	QO	-40		CHP-V		600	AV 2	274	252	233	253
05	458809	959317			K7	LV	-50		CHP-V		600	AV 2	164	180	166	170
					K7	QO	-40		CHP-V		600	AV 2	183	108	103	131
05	458809	959320			K7	LV	-50		CHP-V		600	AV 2	146	175	247	189
					K7	QO	-40		CHP-V		600	AV 2	191	208	226	208
05	458810	959252			K7	LV	-50		CHP-V		600	AV 2	173	175	186	178
					K7	QO	-40		CHP-V		600	AV 2	222	208	199	210

A04 D F Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01 Multigrades

for DNV GL
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F. Swal
Inspector

POISSONNET
Test House Manager

A01
Dillinger France
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais
Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 8/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design. **S460G2+M** OPTION-12;13;18

B03 Any suppl. requirements: EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C40-C49 Impact test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.		B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C41 Width of test piece	C40 Type of test piece	C44 Testing method	C46 Energy Joule	C45	C42 Individual values AV=J			C43 Mean value
06	458805	966181	*		K7	LV	-50		CHP-V		600	AV 2	99	70	103	91
			*		K7	QO	-40		CHP-V		600	AV 2	248	238	203	230
06	458810	960122			K7	LV	-50		CHP-V		600	AV 2	296	301	282	293
					K7	QO	-40		CHP-V		600	AV 2	219	170	230	206
06	458810	960123			K7	LV	-50		CHP-V		600	AV 2	315	320	306	314
					K7	QO	-40		CHP-V		600	AV 2	252	236	245	244
06	459322	969317			K7	LV	-50		CHP-V		750	AV 2	169	203	158	177
					K7	QO	-40		CHP-V		750	AV 2	166	134	165	155
06	459324	971074	*		K7	LV	-50		CHP-V		750	AV 2	264	287	312	288
			*		K7	QO	-40		CHP-V		750	AV 2	244	193	134	190
			*		K7	QO	-40		CHP-V	5,0%	750	AV 2	229	185	133	182
			*		K7	QO	-40		CHP-V	5,0%-250C/60MN	750	AV 2	105	95	89	96

C70-C99 Chemical composition % - Heat analysis

B07.2 Heat	C70	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	AS	SN
458532	Y	0,085	0,487	1,548	0,015	0,0009	0,0033	0,034	0,007	0,043	0,029	0,001	0,028	0,0008	0,0007
458805	Y	0,089	0,485	1,590	0,017	0,0009	0,0031	0,018	0,005	0,025	0,035	0,001	0,029	0,0034	0,0008
458809	Y	0,089	0,482	1,625	0,017	0,0008	0,0038	0,025	0,009	0,024	0,045	0,002	0,027	0,0027	0,0014
458810	Y	0,081	0,487	1,649	0,013	0,0005	0,0024	0,019	0,004	0,021	0,028	0,001	0,027	0,0024	0,0006
459320	Y	0,085	0,484	1,580	0,014	0,0004	0,0038	0,025	0,005	0,031	0,034	0,001	0,029	0,0025	0,0009
459322	Y	0,086	0,494	1,574	0,013	0,0010	0,0045	0,038	0,005	0,033	0,036	0,002	0,030	0,0030	0,0021
459324	Y	0,095	0,499	1,601	0,011	0,0006	0,0038	0,028	0,007	0,033	0,037	0,001	0,031	0,0027	0,0010

A04 D F Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01
Multigrades

for DNV GL
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F. Swal
Inspector

POISSONNET
Test House Manager

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Dillinger France
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais
Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ A03 Manufacturer's order/ Certificate No.: 434490-001 Sheet: 9/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ B03 Steel design. / Any suppl. requirements: **S460G2+M** OPTION-12;13;18
EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C70-C99 Chemical composition % - Heat analysis

B07.2 Heat	C70	TI	PB	B	SB	CA	BI	AL-T
458532	Y	0,004	0,0002	0,0003	0,0004	0,0017	0,0001	0,044
458805	Y	0,003	0,0004	0,0002	0,0001	0,0018	0,0001	0,028
458809	Y	0,003	0,0005	0,0002	0,0002	0,0020	0,0001	0,039
458810	Y	0,004	0,0004	0,0002	0,0001	0,0017	0,0001	0,039
459320	Y	0,005	0,0003	0,0003	0,0001	0,0019	0,0001	0,035
459322	Y	0,004	0,0002	0,0003	0,0001	0,0020	0,0001	0,031
459324	Y	0,004	0,0002	0,0003	0,0001	0,0023	0,0001	0,033

C94 Heat analysis Carbon equivalent / Alloying restrictions

B07.2 Heat											
458532	FO-02=	0,36	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,11	FO-A1= 13
458805	FO-02=	0,37	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,08	FO-A1= 9
458809	FO-02=	0,37	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,10	FO-A1= 10
458810	FO-02=	0,37	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,07	FO-A1= 16
459320	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,10	FO-A1= 9
459322	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,11	FO-A1= 7
459324	FO-02=	0,37	FO-31=	0,20	FO-51=	0,03	FO-52=	0,04	FO-55=	0,11	FO-A1= 9

C95 Ladle treatment

ITEM NO.: 01-06
HEAT OF THE INDICATED ITEM: VACUUM DEGASSED

C95 Further information about ladle treatment

ITEM NO.: 01-06
VACUUM DEGASSED, FULLY KILLED, FINE GRAIN TREATED

A04 D F Manufacturer's mark

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Multigrades

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Inspector

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Test House Manager

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A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ A03 Manufacturer's order/ Certificate No.: 434490-001 Sheet: 10/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design. **S460G2+M** OPTION-12;13;18

B03 Any suppl. requirements: EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C70-C99 Chemical composition % - Product analysis

B07.2 Heat	B07.1 Test No.	C01	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	TI	B
458532	968250	K7O	0,093	0,510	1,56	0,013	0,0006	0,0049	0,027	0,005	0,031	0,022	0,001	0,030	0,003	0,0004
458805	965362	K7O	0,091	0,491	1,56	0,016	0,0008	0,0034	0,017	0,005	0,024	0,032	0,002	0,028	0,003	0,0003
458805	965373	K7O	0,088	0,489	1,60	0,013	0,0008	0,0036	0,018	0,004	0,026	0,029	0,002	0,028	0,003	0,0003
458809	959316	K7O	0,087	0,485	1,56	0,014	0,0003	0,0049	0,022	0,009	0,023	0,042	0,002	0,026	0,003	0,0003
458809	959322	K7O	0,088	0,476	1,56	0,014	0,0006	0,0029	0,023	0,009	0,023	0,042	0,002	0,026	0,003	0,0003
458810	959252	K7O	0,083	0,478	1,58	0,012	0,0003	0,0024	0,019	0,005	0,022	0,029	0,002	0,027	0,003	0,0003
458810	960122	K7O	0,080	0,477	1,58	0,011	0,0004	0,0026	0,018	0,004	0,021	0,025	0,002	0,026	0,003	0,0003
458810	960123	K7O	0,081	0,464	1,57	0,011	0,0005	0,0016	0,018	0,003	0,021	0,024	0,002	0,026	0,003	0,0003
458810	965330	K7O	0,083	0,484	1,61	0,012	0,0006	0,0021	0,018	0,003	0,021	0,024	0,002	0,027	0,003	0,0003
459320	969139	K7O	0,089	0,501	1,57	0,013	0,0005	0,0040	0,025	0,005	0,032	0,033	0,002	0,029	0,005	0,0004
459320	969238	K7O	0,084	0,480	1,53	0,013	0,0003	0,0042	0,026	0,006	0,032	0,032	0,001	0,027	0,004	0,0004
459320	969239	K7O	0,088	0,506	1,56	0,014	0,0003	0,0042	0,023	0,005	0,031	0,033	0,002	0,030	0,005	0,0004
459320	973107	K7O	0,090	0,488	1,54	0,013	0,0005	0,0048	0,025	0,005	0,031	0,033	0,001	0,028	0,005	0,0004
459322	969236	K7O	0,093	0,491	1,52	0,012	0,0011	0,0051	0,036	0,005	0,033	0,034	0,002	0,028	0,004	0,0004
459322	969302	K7O	0,088	0,512	1,55	0,013	0,0008	0,0053	0,037	0,005	0,034	0,034	0,002	0,030	0,004	0,0004
459322	969317	K7O	0,087	0,492	1,55	0,013	0,0008	0,0065	0,038	0,005	0,035	0,034	0,002	0,030	0,003	0,0004
459324	969446	K7O	0,093	0,500	1,56	0,010	0,0007	0,0038	0,027	0,007	0,032	0,036	0,002	0,030	0,004	0,0004
459324	971074	K7O	0,091	0,500	1,57	0,011	0,0004	0,0038	0,024	0,007	0,034	0,035	0,001	0,032	0,004	0,0004

A04 D F Manufacturer's mark

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DNV GL Cert. No. N141KG8B-01
Multigrades

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Inspector

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Test House Manager

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QM-System: Certification as per ISO 9001

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A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 11/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design. **S460G2+M** OPTION-12;13;18

B03 Any suppl. requirements: EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C70-C99 Chemical composition % - Product analysis

B07.2 Heat	B07.1 Test No.	C01	AL-T
458532	968250	K7O	0,038
458805	965362	K7O	0,028
458805	965373	K7O	0,033
458809	959316	K7O	0,043
458809	959322	K7O	0,043
458810	959252	K7O	0,042
458810	960122	K7O	0,042
458810	960123	K7O	0,042
458810	965330	K7O	0,039
459320	969139	K7O	0,038
459320	969238	K7O	0,035
459320	969239	K7O	0,038
459320	973107	K7O	0,037
459322	969236	K7O	0,033
459322	969302	K7O	0,032
459322	969317	K7O	0,030
459324	969446	K7O	0,035
459324	971074	K7O	0,034

C94 Product analysis Carbon equivalent / Alloying restrictions

B07.2 Heat	B07.1 Test No.	C01											
458532	968250	K7O	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,09	FO-A1= 8
458805	965362	K7O	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,08	FO-A1= 8
458805	965373	K7O	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,08	FO-A1= 9

A04 Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

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Multigrades

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QM-System: Certification as per ISO 9001

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A02	A10 Advice of dispatch No./ Date of dispatch	A08/ Manufacturer's order/ A03 Certificate No.	Sheet
INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013	9398896-21.06.18	434490-001	12/...

A05 Established Inspecting body	A06 Purchaser		A07.1 No.	B01 Product
VLNC	Final receiver	ANCOFERWALDRAM,OOSTE ANCOFERWALDRAM,OOSTE	3064200 A07.2 No.	HEAVY PLATES

B02/ Steel design.	**S460G2+M**	OPTION-12;13;18
B03 Any suppl. requirements	EN-10225:01/AWS-4.11:REV.2	MDS-Y40:REV.5

C94 Product analysis Carbon equivalent / Alloying restrictions

B07.2 Heat	B07.1 Test No.	C01													
458809	959316	K7O	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,10	FO-A1=	9
458809	959322	K7O	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,10	FO-A1=	15
458810	959252	K7O	FO-02=	0,36	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,08	FO-A1=	18
458810	960122	K7O	FO-02=	0,35	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,07	FO-A1=	16
458810	960123	K7O	FO-02=	0,35	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,07	FO-A1=	26
458810	965330	K7O	FO-02=	0,36	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,07	FO-A1=	19
459320	969139	K7O	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,10	FO-A1=	10
459320	969238	K7O	FO-02=	0,35	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,10	FO-A1=	8
459320	969239	K7O	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,09	FO-A1=	9
459320	973107	K7O	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,09	FO-A1=	8
459322	969236	K7O	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,11	FO-A1=	6
459322	969302	K7O	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,11	FO-A1=	6
459322	969317	K7O	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,11	FO-A1=	5
459324	969446	K7O	FO-02=	0,37	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,10	FO-A1=	9
459324	971074	K7O	FO-02=	0,37	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,10	FO-A1=	9

C94 Carbon equivalent formula / Alloying restrictions

FO-02 = C+(MN/6)+(CR+MO+V)/5+(NI+CU)/15
FO-31 = C+SI/30+(MN+CR+CU)/20+MO/15+V/10+NI/60+5B
FO-51 = V +NB
FO-52 = V +NB+TI
FO-55 = CU+MO+NI+CR
FO-A1 = AT/N

A04

D F

Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01
Multigrades

for DNV GL
This document has been digitally signed and will therefore not have handwritten signatures.
F. Swal
Inspector

POISSONNET
Test House Manager

A01

Dillinger France
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais

Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

DILLINGER

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013		A10 Advice of dispatch No./ Date of dispatch 9398896-21.06.18	A08/ Manufacturer's order/ A03 Certificate No. 434490-001 Sheet 13
A05 Established Inspecting body VLNC	A06 Purchaser ANCOFERWALDRAM,OOSTE A07.1 No. 3064200 Final receiver ANCOFERWALDRAM,OOSTE A07.2 No.		B01 Product HEAVY PLATES
B02/ Steel design. **S460G2+M** B03 Any suppl. requirements EN-10225:01/AWS-4.11:REV.2		OPTION-12;13;18 MDS-Y40:REV.5	

D01 Marking and identification, surface appearance, shape and dimensional properties

ITEM NO.: 01-06

EXAMINATION OF MARKING, SURFACE, SHAPE AND DIMENSIONS: THE RESULTS MEET THE REQUIREMENTS.

SURFACE	AS PER EN-10163-B3
THICKNESS	AS PER EN-10029:10-A
LENGTH AND WIDTH	AS PER EN-10029:10
FLATNESS	AS PER EN-10029:10-T5L

D02 Non-destructive tests - Ultrasonic testing

ITEM NO.: 01-06

UT-SPECIFICATION	: EN-10160 CLASS S2 AND E3
SCANNING PLAN BODY	: LONGITUDINALLY SCAN LINES SPACING 50 MM
EDGES	: 100 MM
PERSONNEL QUALIFICATION	: LEVEL 2 IN ACCORDANCE TO ISO 9712

THE TEST RESULTS MEET THE REQUIREMENTS OF THE ORDER.

A04 D F Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01
Multigrades

for DNV GL
This document has been digitally signed and will therefore not have handwritten signatures.
F. Swal
Inspector

POISSONNET
Test House Manager

A01
Dillinger France
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais
Date 22.06.18 EDI CD 1

Consumables certificate

Inspection Certificate 3.1

LINCOLN ELECTRIC
THE WELDING EXPERTS®

Product	COR-A-ROSTA P-309L		
Size(s) mm	1,2 * n.a.		
Item No.	585285	Customer Ref	email
Lot/Batch	M1FC199096	Our Reference	813619380
Product Line	FCAW	Quantity	20.0 KG
		Customer	
Class	AWS A5.22 : E309LT1-1/-4 T 23 12 L P C / M 2		
	ISO 17633 : T 23 12 L P C/M 2 E309LT1-1 / -4		

Chemical analysis (%) According to EN10204 3.1

C	Si	Mn	P	S	Cr	Ni	Mo	Cu
0.040	0.78	1.23	0.020	0.005	23.6	12.6	0.03	0.05

Mechanical tests, all weld metal

Ferrite According to EN10204 3.1

FN WRC92
12

Remarks

The product identified above has been manufactured, tested and supplied in compliance with a certified ISO 9001 Quality Assurance Programme.

Company
Lincoln Electric Italia srl
Via Fratelli Canepa 8
16010 Serra Riccò
Italy

DUCTIL S.A.

Printed By: **Emil Cristian Pavel**
Function: **Warehouse operator**
Date: **06/DEC/2019**

Cert. No. **00899762**
ZEU_STAINLES , 1

METRODE
SPECIAL ALLO

ROSETTI MARINO

PQR 44/19

preliminary WPS

PQR ref.:	44/19	pWPS (ISO 15614-1 Ed 2017+Rina rules)	44/19	REV.:	0	Data /date	19/11/2019

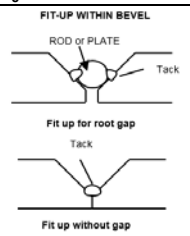
Procedimento di saldatura / Welding process: **136-FCAW** — Tipo / Type: **SEMIAUTOMATIC**

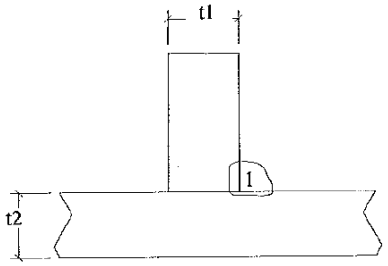
GIUNTO - JOINT

Tipo di giunto / Joint Design: **Fillet** — Supporto / Backing: ☒ Si / Yes ☐ No

Materiale di supporto (tipo) / Backing material (type): ☐ Metallico / Metal ☒ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:





Note: **1.Surfaces cleaned from moisture, oil, grease, paint before welding (by grinding)/** *Pulire le superfici da liquidi, oli, grasso e vernici con molatura prima di saldare.*
2.Minimum tack weld lengths shall be 4 times the thk or 50 mm, whichever is less/ I tacchetti devono essere lunghi almeno 50 mm o 4 volte lo spessore (il più piccolo dei due);

MATERIALE BASE - BASE MATERIAL

Da / from P-N°: /	Group N° 8 in acc. to ISO 15608	A / to P-N°: /	Group N° 2 in acc. to ISO 15608

DA Tipo e grado / From type and grade: **ASTM A240 Tp. 316L (Heat number: 829053)**

A Tipo e grado / To type and grade: **S460 G2+MZ (Heat number: 458532)**

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove **10 mm**

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove **N.A.**

METALLO D'APPORTO - FILLER METAL

	136-GS FCAW	
Spec. N° (SFA)	**A5.22/** *ISO17663-A*	
AWS N° (CLASS)	**E309LT1-4** *T 23 12 L P C/M 2*	
F-N°	**6**	
A-N°	**8**	
Diametro mat. D'apporto / Size of filler metal	**1,2**	
Gamma spessori /Thick. Range (mm)	**A= 6 mm**	
Accoppiamento filo-flusso / Electrode-flux (CLASS)	**NA**	
Denom. Comm. Flusso / FLUX trade name	**NA**	
Inserto consumabile / Consumable insert	**NA**	
Altro / other	**Lincoln Cor-A-Rosta P309L**	

POSIZIONI - POSITION

giunto / Joint: **Cordone d'angolo / fillet** — Posizione / position **PB+PF** — Progressione / weld progression: **Ascendente / UP hill**

PRERISCALDO - PRE-HEAT

Temp.preriscaldo minima / Min. pre-heat temp:	Max temp. Di interpass / Max interpass temp.:	Mantenimento interpass / Interpass maintenance :	Tempo di mantenimento prerisc.: / Maintenance timing:
20°C	**150 °C**	**N.A.**	**N.A.**

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs):	Temperatura di stasi / Holding temperature °C:	Tempo di stasi / Holding time (min.):	Velocità di raffreddamento: / Cooling rate (°C/Hrs):
N.A.	**N.A.**	**N.A.**	**N.A.**

GAS DI PROTEZIONE - GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	**Ar+CO2**	**85%+15%**	**15-25 lt/min**
Protezione al seguito / Trailing:	**N.A.**	**N.A.**	**N.A.**
Prot. Al rovescio / Backing:	**N.A.**	**N.A.**	**N.A.**

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current : **DC** — Polarità / Polarity **RP**

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: **N.A.**

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: **N.A.**

Velocità alimentazione filo / Electr. Wire feed speed range: **Self regulated**

TECNICA - TECHNIQUE

Passata / Bead: **Tirata/String** — Dimensione bocchello gas / Orifice of gas cup size: **1/2"** — Pulizia iniziale e fra le passate / Initial and interpass cleaning: **Spazzolatura/Brushing**

Metodo di solcatura a rovescio / Method of back gouging: **Molatura/Grinding** — Oscillazione / Oscillation: **N.A.** — Distanza zona di contatto e pezzo / Contact zone to work distance: **N.A.**

N°Passate / Passes nr.: **Singola/Single** — Elettrodo multiplo o singolo / Multiple or single electrodes: **Singolo/Single** — Martellatura / Peening: **N.A.**

Altro / Other:

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range	Vel. Avanzamento / Travel speed range (mm/min)	Apporto termico / Heat input (KJ/cm)
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. Range			
Single pass								
Tack-1	FCAW	E309LT1-4	1,2	RP	180 220	24 28	120 200	10,4 24,6

Preparato da / prepared by:	Client/Third part signature:	Client/Third part signature:
M.Del Prete		

NDE certificate

ROSETTI MARINO	VERBALE DI CONTROLLO VISIVO/DIMENSIONALE visual/dimensional inspection report	VDR N° 44-19 data: 22/11/2019
progetto project: NAVALE	cliente client: QATARGAS	commessa job: 119N12
disegno dwg: /	ITP N°: N.A.	fase step: N.A.

oggetto – item

Procedure Qualification Record (PQR) 44/19 PB-PF

Certificato di Qualifica di Procedimento di Saldatura (PQR) 44/19 PB-PF

WE CERTIFY THAT:

ITEMS INDICATED ABOVE HAVE UNDERGONE A VISUAL INSPECTION AND HAVE BEEN ACCEPTED ACCORDING TO THE SPECIFICATION / PROCEDURE MENTIONED AND TO ACCEPTANCE CRITERIA DEFINED IN IT

SI CERTIFICA CHE LE SALDATURE DEI SAGGI SOPRA CITATI SONO STATI SOTTOPOSTI AD ESAME VISIVO AL 100% ALLO STATO COME SALDATO IN ACCORDO ALLE SPECIFICHE E STANDARD CITATI.

RINA Services SpA No. Bo. 0474	Date 29/11/2019
Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐	File Signature Cimatti Davide

note – remarks

No visible defects have been detected.

Non sono stati rilevati difetti visibili.

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

ISO EN 15614-1 and RINA Rules 2018

Operatore – Operator	Controllo Qualita' - Quality Control	Cliente - Client
ROSETTI MARINO SpA Welding Dept. D. Cenacchi		

ROSETTI MARINO

PQR 44/19

Mechanical test report

INSPECTA S.R.L.	TEST REPORT *RAPPORTO DI PROVA*		ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO LAB N°1607 L
	N° 016-00210-19 Data: 28/01/2020	Rev.00	

Object: *Oggetto:*	**MECHANICAL TEST ON PQR 44/19 (PB+PF)**					Pag. 1 di 12
Specimen: *Saggio:*	**525/19PB** **525/19PF**	**#Base Material:** *Materiale Base:*	**ASTM A240 Tp 316L with** **EN10225 S460G2+M**	**Thk 10,00 mm with** **10,00 mm**		
		# Informazione fornita dal cliente/ Information provided by the customer				
Customer: *Committente:*	**ROSETTI MARINO SPA**					
Address: *Indirizzo:*	**Via Trieste, 230 - 48122 Ravenna (RA)**					
Final customer:. *Cliente finale:*	//					
Your delivery note n°: *Vs. DDT di consegna*	**n°** // *n°*	**Date:** *Data:* //	**MD52** *MD 52*	**146/19**	**Date:** *Data:*	**20/12/2019**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **28/01/2020**	**End of activities:** *Fine prove:*			**Date:** *Data:*	**28/01/2020**

PROVE RICHIESTE

☐ **TENSILE TEST**/*Trazione*	☐ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*
☐ **BEND TEST**/*Piega*	☐ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root /*Dritto/Rovescio* ☐ Side/ *Laterale*
☐ **IMPACT TEST**/*Resilienza*	☐ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*
☒ **MACROEXAMINATION TEST** / *Macrografia*		
☒ **HARDNESS TEST**/ *Durezza*	☐ HV 5	☒ HV 10
☒ **FRACTURE TEST**/ *Frattura*	☒ Plate on Plate/ *Piastra su Piastra*	☐ Pipe on Plate/*Tubo su Piastra*
☐ **CHEMICAL ANALYSIS**/*Analisi Chimica*		
☐ **MICROEXAMINATION TEST** / *Micrografia*		
☐ **OTHER (Specify)**/*Altro/(Specificare)*		

Allegati /Attachments: NONE

NOTE/ Remarks: **REFERENCE CODE FROM CUSTOMER REQUEST: EN 15614-1** + RINA RULES 2018

Informazioni aggiuntive fornite dal cliente:
Additional information provided by the customer

*** Dove indicato la prova si intende non accreditata da ACCREDIA**

Laboratory Responsible *Responsabile Laboratorio* Sig. Claudio Pettinato	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
INSPECTA srl 28-01-2020 Via Ravegnana, 379/a 47122 Forlì (FC)	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services S.p.A. No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 28/01/2020 File Signature Cimatti Davide

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I risultati di prova si riferiscono al campione così come ricevuto,essendo il campionamento eseguito dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%.The results in this test report refers only to the specimen that has been tested.The customer undertakes to print out /reproduce the test report. Any partial reproduction is prohibited.Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory.The test results refer to the sample as received, since the sampling is performed by the customer..Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku = 2 equivalent to a level of confidence of 95 % .

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing:28/01/2020
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* | ☒ *UNI EN ISO 9015-1: 2011* | ☐ *ASTM E 92-17* | ☐ _____

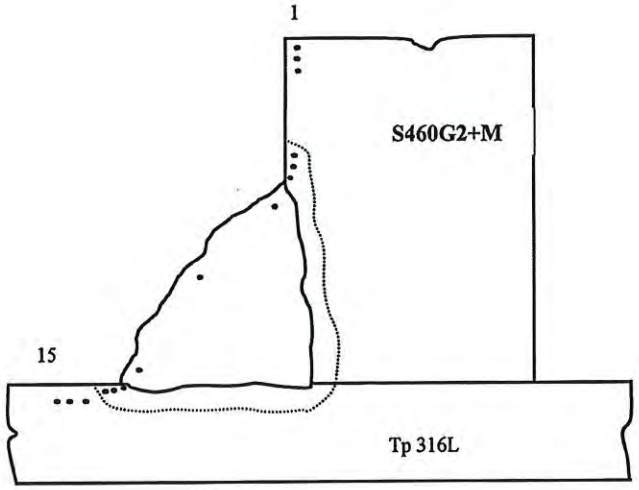
Serial N. 43030614C

* Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA

Internal procedure *Procedura interna*	PP10 rev.03	Sample Identification *Identificazione provino*	525A/19 PB	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	22°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A:			Base Material Side B:	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30
31 - 32 - 33	34 - 35 - 36	37 - 38 - 39	40 - 41 - 42	43 - 44 - 45



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**165-162-156**	//	16 – 17 - 18	//	//	31 – 32 - 33	//	//
4 - 5 - 6	**193-220-316**	//	19 - 20 - 21	//	//	34 - 35 - 36	//	//
7 – 8 - 9	**184-172-170**	//	22 – 23 - 24	//	//	37 – 38 - 39	//	//
10 - 11 - 12	**178-170-175**	//	25 - 26 - 27	//	//	40 - 41 - 42	//	//
13 – 14 - 15	**146-146-145**	//	28 – 29 - 30	//	//	43 – 44 - 45	//	//

Remarks/ *Note:*

Laboratory Technician
Tecnico di Laboratorio
Dott. Ing. Davide Ciregia
28/01/2020

Laboratory Responsible
Responsabile Laboratorio
sig. Claudio Pettinato
INSPECTA srl
28-01-2020
Via Ravegnana, 379/a
47121 Forlì (FC)
P. IVA 03944480403

Customer Inspector
Ispettore del cliente
ROSETTI MARINO SpA
A. Khalifa
Welding Dept.

Third part Inspector
Ispettore Terza parte 28/01/2020

RINA Service S.p.A.
No. Bo. 0474
Noted ☐
Reviewed ☐
Witnessed ☒
Approved ☐
File
Signature
Ciregia Davide

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing:28/01/2020
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* | ☒ *UNI EN ISO 9015-1: 2011* | ☐ *ASTM E 92-17* | ☐ _____

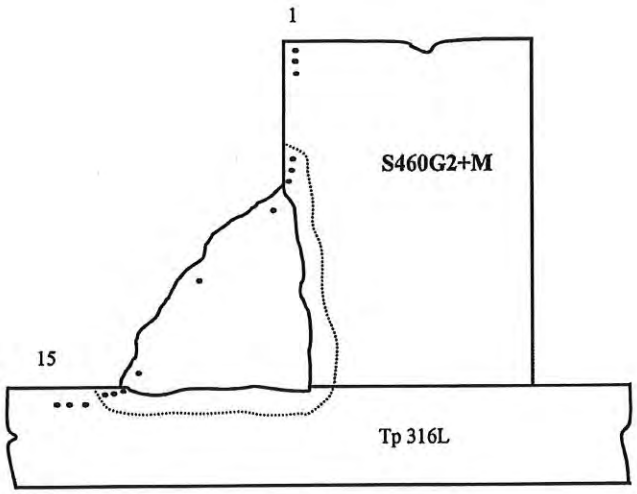
Serial N. 43030614C

* Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA

Internal procedure *Procedura interna*	PP10 rev.03	Sample Identification *Identificazione provino*	525B/19 PB	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	22°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A:			Base Material Side B:	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30
31 - 32 - 33	34 - 35 - 36	37 - 38 - 39	40 - 41 - 42	43 - 44 - 45



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**160-154-151**	//	16 – 17 - 18	//	//	31 – 32 - 33	//	//
4 - 5 - 6	**181-223-317**	//	19 - 20 - 21	//	//	34 - 35 - 36	//	//
7 – 8 - 9	**173-172-167**	//	22 – 23 - 24	//	//	37 – 38 - 39	//	//
10 - 11 - 12	**170-175-176**	//	25 - 26 - 27	//	//	40 - 41 - 42	//	//
13 – 14 - 15	**151-150-145**	//	28 – 29 - 30	//	//	43 – 44 - 45	//	//
Remarks/ *Note:*								

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Davide Ciregia	sig. Claudio Pettinato	ROSETTI MARINO SpA Khalifa Welding Dept.	RINA Services S.p.A. No. Bo.
Laboratory Technician 28/01/2020	INSPECTA srl 28-01-2020 Via Ravegnana, 379/a 47122 Forlì (FC) P. IVA 03944480403		Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ File Signature Cimatti Davide 28/01/2020

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing:28/01/2020
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* | ☒ *UNI EN ISO 9015-1: 2011* | ☐ *ASTM E 92-17* | ☐ _____

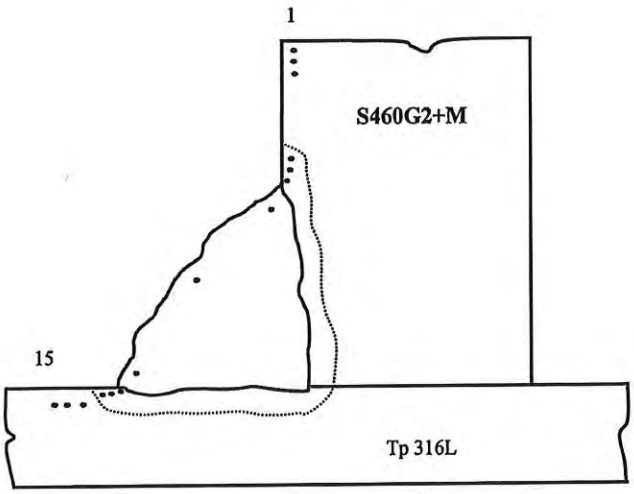
Serial N. 43030614C

* Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA

Internal procedure *Procedura interna*	PP10 rev.03	Sample Identification *Identificazione provino*	525A/19 PF	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	22°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A:			Base Material Side B:	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30
31 - 32 - 33	34 - 35 - 36	37 - 38 - 39	40 - 41 - 42	43 - 44 - 45



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**153-155-153**	//	16 – 17 - 18	//	//	31 – 32 - 33	//	//
4 - 5 - 6	**192-218-313**	//	19 - 20 - 21	//	//	34 - 35 - 36	//	//
7 – 8 - 9	**177-166-170**	//	22 – 23 - 24	//	//	37 – 38 - 39	//	//
10 - 11 - 12	**168-173-175**	//	25 - 26 - 27	//	//	40 - 41 - 42	//	//
13 – 14 - 15	**150-149-147**	//	28 – 29 - 30	//	//	43 – 44 - 45	//	//

Remarks/ *Note:*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Davide Ciregia	sig. Claudio Pettinato	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Service S.p.A. No. Bo. 04 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ File Signature Cimatti Davide
28/01/2020	INSPECTA srl 29-01-2020 Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403		28/01/2020

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing:28/01/2020
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* ☒ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

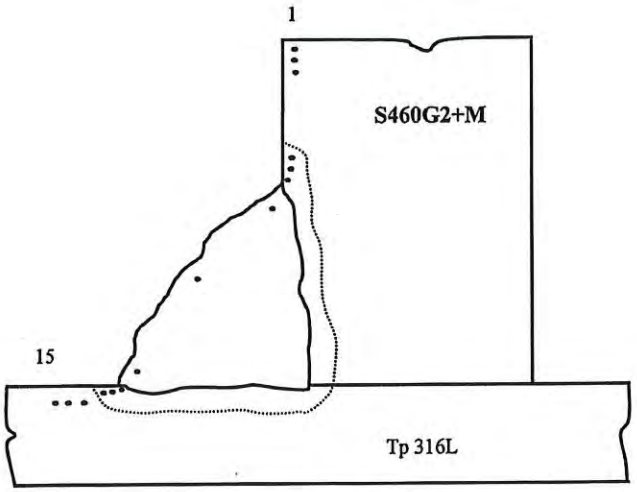
Serial N. 43030614C

* Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA

Internal procedure *Procedura interna*	PP10 rev.03	Sample Identification *Identificazione provino*	525B/19 PF	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	22°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A:			Base Material Side B:	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30
31 - 32 - 33	34 - 35 - 36	37 - 38 - 39	40 - 41 - 42	43 - 44 - 45



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	152-154-158	//	16 – 17 - 18	//	//	31 – 32 - 33	//	//
4 - 5 - 6	231-314-316	//	19 - 20 - 21	//	//	34 - 35 - 36	//	//
7 – 8 - 9	178-192-170	//	22 – 23 - 24	//	//	37 – 38 - 39	//	//
10 - 11 - 12	169-173-174	//	25 - 26 - 27	//	//	40 - 41 - 42	//	//
13 – 14 - 15	155-150-150	//	28 – 29 - 30	//	//	43 – 44 - 45	//	//

Remarks/ *Note:*

Laboratory Technician
Tecnico di Laboratorio
Dott. Ing. Davide Cinegia
Laboratory Technician
28/01/2020

Laboratory Responsible
Responsabile Laboratorio
sig. Claudio Pettinato
INSPECTA S.R.L.
28-01-2020
Via Ravegnana, 379/a
47121 Forlì (FC)
P. IVA 03944480403

Customer Inspector
Ispettore del cliente
ROSETTI MARINO SpA
A. Khalifa
Welding Dept.

RINA Services S.p.A.
No. Bo. 04 [illegible]
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐

Third part Inspector
Ispettore Terza parte
28/01/2020
File
Signature
Cinegia Davide

MACRO EXAMINATION TEST
Prova Macrografica

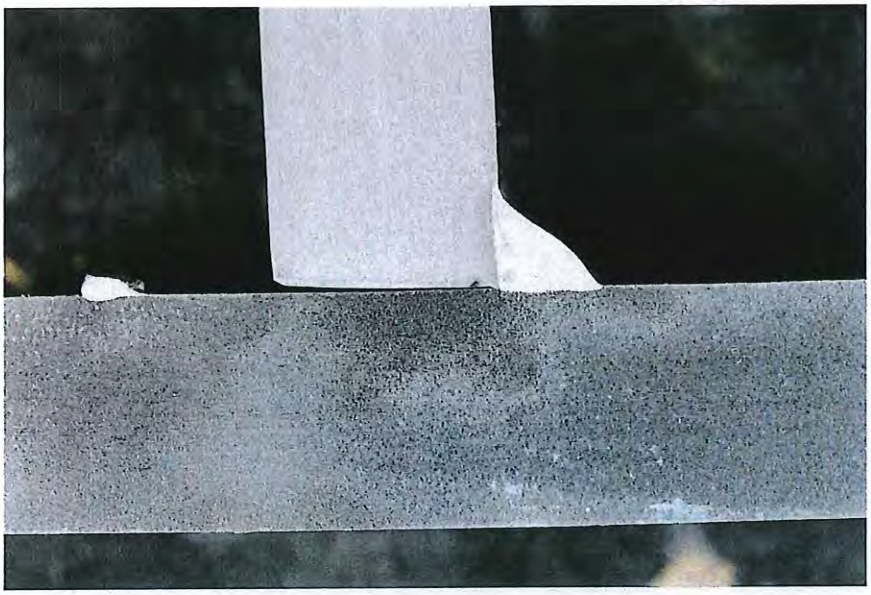
Date of Testing:28/01/2020
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2019* ☐ *AWS D1.1:2015*

Serial N.. EOS 650D/EFS

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *PP12 rev.01* *Procedura internal*		**Test temperatura** *Temperature Test*	**22°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**AQUA REGIA + NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**525/19 A PB**	**Magnification:** *Ingrandimento:*	**Photo at: 3.2x** **Examination at: 10x**
Designation: *Designazione:*	**ISO 17639-A-E-1.2/8.1/8.1 AQUA REGIA + NITAL 5%**		



Remarks / *Note:*

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Davide Ciregia	*sig. Claudio Pettinato*	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services SpA No. Bo. 0474
- INSPECTA srl -	INSPECTA srl 28-01-2020 Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403		Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐
28/01/2020			Date 28/01/2020 File Signature Ciman Daniele

MACRO EXAMINATION TEST
Prova Macrografica

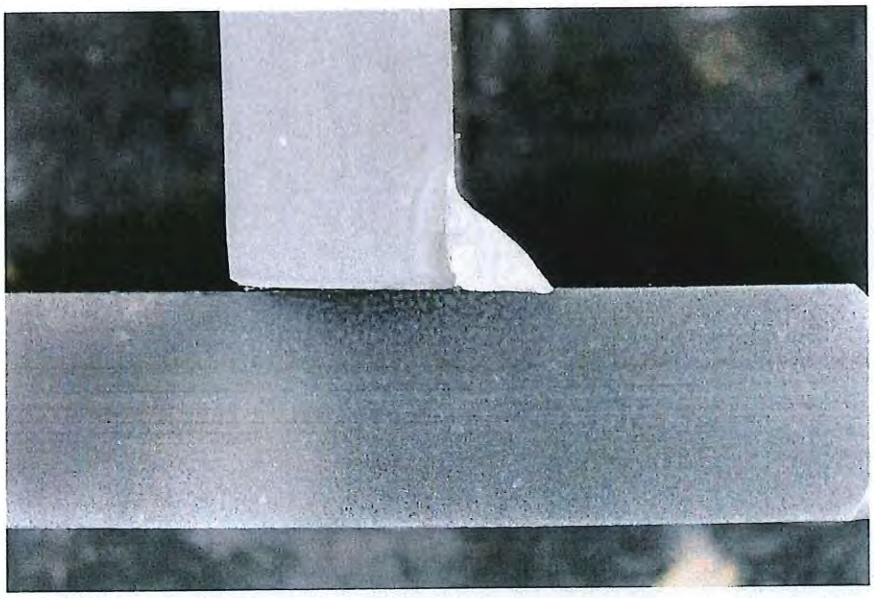
Date of Testing:28/01/2020
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2019* ☐ *AWS D1.1:2015*

Serial N.. EOS 650D/EFS

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *PP12 rev.01* *Procedura internal*		**Test temperatura** *Temperature Test*	**22°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**AQUA REGIA + NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**525/19 A PB**	**Magnification:** *Ingrandimento:*	**Photo at: 3.2x** **Examination at: 10x**
Designation: *Designazione:*	**ISO 17639-A-E-1.2/8.1/8.1 AQUA REGIA + NITAL 5%**		



Remarks / *Note:*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Davide Ciregia	sig. Claudio Pettinato	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services SpA No. Bo. 0474
- INSPECTA S.R.L. - Laboratorio Tecnico 28/01/2020	INSPECTA srl 28-01-2020 Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403		Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ Date 28/01/2020 File Signature Cimatti Davide

MACRO EXAMINATION TEST
Prova Macrografica

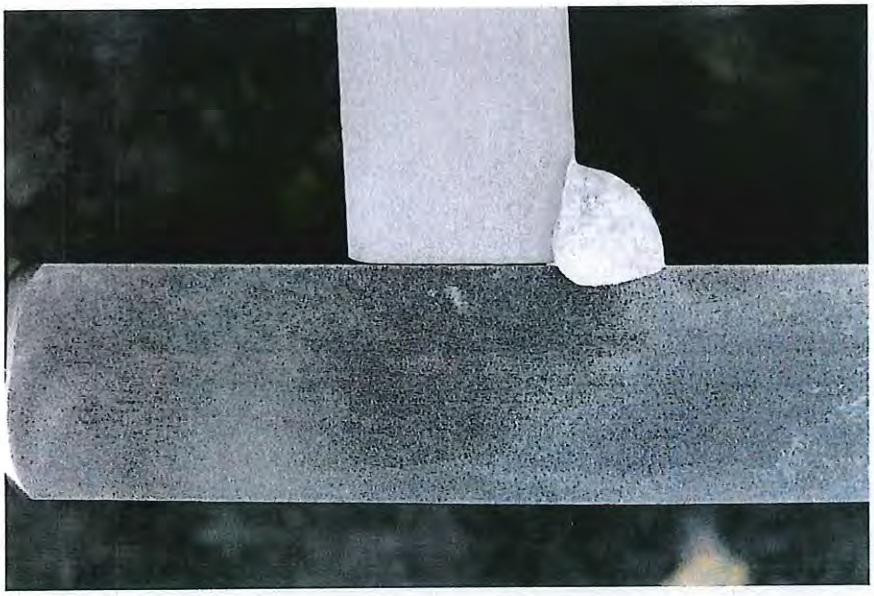
Date of Testing:28/01/2020
Data esecuzione prova:

Serial N.. EOS 650D/EFS

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2019* ☐ *AWS D1.1:2015*

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *PP12 rev.01* *Procedura internal*		**Test temperatura** *Temperature Test*	**22°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**AQUA REGIA + NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**525/19 A PF**	**Magnification:** *Ingrandimento:*	**Photo at: 3.2x** **Examination at: 10x**
Designation: *Designazione:*	**ISO 17639-A-E-1.2/8.1/8.1 AQUA REGIA + NITAL 5%**		



Remarks / *Note:*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Davide Ciregia	sig. Claudio Pettinato	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 28/01/2020 File Signature Cimatti Daniele
28/01/2020	INSPECTA srl 28-01-2020 Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403		

MACRO EXAMINATION TEST
Prova Macrografica

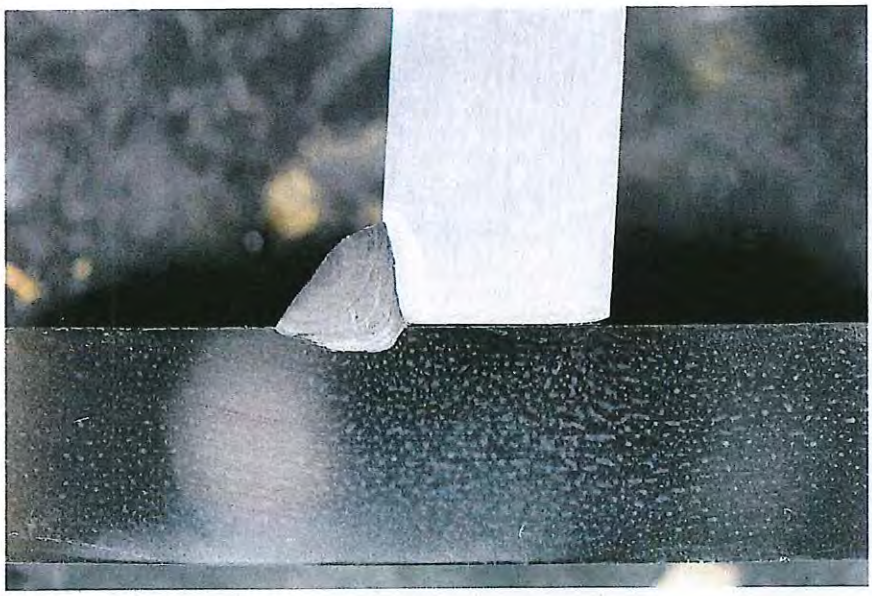
Date of Testing::28/01/2020
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2019* ☐ *AWS D1.1:2015*

Serial N.. EOS 650D/EFS

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *PP12 rev.01* *Procedura internal*		**Test temperatura** *Temperature Test*	**22°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**AQUA REGIA + NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**525/19 B PF**	**Magnification:** *Ingrandimento:*	**Photo at: 3.2x** **Examination at: 10x**
Designation: *Designazione:*	**ISO 17639-A-E-1.2/8.1/8.1 AQUA REGIA + NITAL 5%**		



Remarks / *Note:*

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Davide Ciregia	*sig. Claudio Pettinato*	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Service S.p.A. No. Bo. 0474
- INSPECTA srl - Laboratory Technician	INSPECTA srl 28-01-2020 Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403		Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐
28/01/2020			Date 28/01/2020 File Signature Cimatti Davide

FRACTURE TEST
Prova Frattura

Date of Testing:28/01/2020
Data esecuzione prova:

☒ *UNI EN ISO 9017:2018* ☐ *ASME IX QW-182:2019* ☐ _____

Serial N.. VAUP 01

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure/*Procedura interna* **PP 13 rev.03**	**Identification Speciment/***Denominazione Provino* **525/19 PC**	**Test temperatura** *Temperature Test*	*22°*
Designation: *Designazione:*	*N.A.*		



Remarks/ *Note:* **In the specimen fracture, the fractured surface not show evidence of crack or incomplete root fusion**

28/01/2020

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Davide Ciregia	sig. Claudio Pettinato	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services SpA No. Bo. 047 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File _____ Signature Cimatti Davide
28/01/2020	28-01-2020		

INSPECTA S.R.L. Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403

FRACTURE TEST
Prova Frattura

Date of Testing:28/01/2020
Data esecuzione prova:

☒ *UNI EN ISO 9017:2018* ☐ *ASME IX QW-182:2019* ☐ _____

Serial N.. VAUP 01

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure/*Procedura interna* **PP 13 rev.03**	**Identification Speciment**/*Denominazione Provino* **525/19PF**	**Test temperatura** *Temperature Test*	22°
Designation: *Designazione:*	*N.A.*		



Remarks / *Note:*	**In the specimen fracture, the fractured surface not show evidence of crack or incomplete root fusion**

Laboratory Technician *Tecnico di Laboratorio* Dott. Ing. Davide Ciregia	**Laboratory Responsible** *Responsabile Laboratorio* sig. Claudio Petrinato	**Customer Inspector** *Ispettore del cliente* ROSETTI MARINO SpA A. Khalifa Welding Dept.	**Third part Inspector** *Ispettore Terza parte* RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File ____ Signature Cimarelli Davide
28/01/2020	INSPECTA srl 28-01-2020 Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403		28/01/2020

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 44/19	Sheet/Foglio 2/2

Manufacturer's Welding Procedure. Ref. no.	44/19 REV. 0		
Test result (WPQR) N°	44/19	Date/Data	28/01/2020
Manufacturer's WPS No.	pWPS 44/19 REV. 0	Date/Data	19/11/2019

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 44/19
Penetrant test	Acceptable	08-SZ
Magnetic particle test	N.A.	/
Radiographic test	N.A.	/
Ultrasonic test	N.A.	/

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2]	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2]	A [%]	Z [%]	Fracture Location	Remarks
/	/	/	/	/	/	/	/

BEND TEST

Type & N.	Bend angle	Remarks	Results
/	/	/	/

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J]			Avarage value [J]	Remarks
/	/	/	/	/	/	/	/	/

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
2 Macro examination (Pos. PB, PF)	Satisfactory-See Inspecta Certificate No. 016-00210-19
Fracture test (Pos. PB, PF)	Satisfactory
HV10 Hardness test (Pos. PB)	Satisfactory, max. Hardness: 317HV10
HV10 Hardness test (Pos. PF)	Satisfactory, max. Hardness: 316HV10
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Inspecta S.r.l. - Ravenna
Laboratory report reference N.	Report No. 016-00210-19 dated JANUARY 28th 2020
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Rina Rules Pt D. Ch 5 Sec. 4; EN ISO 15614-1:2019 Lev. 2.

Date/Data
28-01-2020

Examiner or Examination Body
RINA Services S.p.A.

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA
F. Lago
RINA Services S.p.A

ROSETTI MARINO S.p.A.

Name and signature / Nome e firma

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 46/19	Sheet/Foglio 1/2

Manufacturer's Welding Procedure. Ref. no.	46/19 REV. 0		
Manufacturer	ROSETTI MARINO S.p.A.		
Address	VIA TRIESTE 230 - 48121 RAVENNA		
Code, Testing Standard	Rina Rules Pt D. Ch 5 Sec. 4; EN ISO 15614-1:2019 Lev.2		
	Location of test specimen according to EN ISO 15614-1:2019 Section 7.2, Fig. 5 Essential variables according to EN ISO 15614-1:2019, Chapter 8 and Rina Rules Pt D. Ch 5 Sec. 4		
Date of welding	Start: November 20th , 2019 Complete: November 21st , 2019		
Examiner of examining body	Rina Services S.p.A.		
RANGE OF QUALIFICATION			
Welding process	136 - FCAW		
Type(s)	Partly Mechanized		
Welding Equipment Type	HF inverter type (BLUE STAR 500)		
Actual parent Material side A	Plate: ASTM A240 Tp. 316L (Heat: 829053)		
Actual parent Material side B	Plate: EN 10225: S460G2+M Z (Heat: 458532)		
Parent Material grade	ISO 15608 Gr. 8.1 (Material side A); ISO 15608 Gr. 2.1 (Material side B)		
Supply condition	Solution treated (Material side A); Termomechanically rolled (Material side B)		
Groove design/configuration	Single K Butt Joint, both sides welding with back gouging (for groove dimension and details see page 4 of 5)		
Parent material thickness (mm)	10 mm (S460G2+M Z material machined from original thickness 15 mm)		
Weld metal thickness (mm)	136 - FCAW - 10 mm		
Single or Multi-pass	136 - FCAW MULTIPLE		
Outside diameter	> 150 mm (PA, PB, PF rotated position) ; >500 mm (other positions)		
Filler material Designation	**136 FCAW** EN ISO 17633: T 23 12 L P M 2 (AWS A5.22: E309LT1-1/-4)		
Filler material Maker	136 - LINCOLN COR-A-ROSTA P309L		
Filler material Size	136 - FCAW ∅ 1,2 mm		
Shielding gas/Flux	ISO 14175 :2008 M20 (85% Ar - 15% CO_2)		
Shielding gas flow rate	20 l/min.		
Backing gas (purging)	None		

Type of welding current & polarity	DC - RP	Heat input / Apporto termico (kJ/mm) ± 25%		Diameter	Pos. PC (2G)	Pos. PF (3G)
			Pass	mm		
			Root	∅ 1,2	0,95 to 1,58	0,77 to 1,29
			Hot	∅ 1,2	0,55 to 0,91	0,85 to 1,41
			Fill/Cap	∅ 1,2	0,39 to 0,86	0,67 to 2,05

Welding position	All, vertical down progression excluded		
Preheat (°C)	20	Interpass temperature / Temp. di interpass (°C)	150
Post-Weld Heat Treatment and/or ageing	NONE		
Weld bead width	Max. 16 mm (pos. PF) ; Max. 14 mm (pos. PC)		
Welder's detail	Piccoli Alessio , Stamp 12		
Time lapse between root and hot pass	N.A.		
Other information / Altre informazioni	-Accelerate weld cooling not permitted; -Base material origin: plate		

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 46/19	Sheet/Foglio 2/2

Manufacturer's Welding Procedure. Ref. no.	46/19 REV. 0		
Test result (WPQR) N°	46/19	Date/Data	28/01/2020
Manufacturer's WPS No.	pWPS 46/19 REV. 0	Date/Data	19/11/2019

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 46/19
Penetrant test	Acceptable	PT 01-SZ
Magnetic particle test	N.A.	/
Radiographic test	N.A.	/
Ultrasonic test	Acceptable	UT 03-SZ

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2]	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2]	A [%]	Z [%]	Fracture Location	Remarks
/	/	/	/	/	/	/	/

BEND TEST

Type & N.	Type & N.	Type & N.	Type & N.
/	/	/	/

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J]			Average value [J]	Remarks
/	/	/	/	/	/	/	/	/

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
2 Macro examination + Hardness Test (HV10) (Pos. PC)	Satisfactory-See Inspecta Certificate No. 018-00210-19, max. Hardness: 207HV10
2 Macro examination + Hardness Test (HV10) (Pos. PF)	Satisfactory-See Inspecta Certificate No. 018-00210-19, max. Hardness: 215HV10
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Inspecta S.r.l. - Ravenna
Laboratory report reference N.	Report No. 018-00210-19 dated JANUARY 28th 2020
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Rina Rules Pt D. Ch 5 Sec. 4; EN ISO 15614-1:2019 Lev. 2.

Date/Data
28-01-2020

ROSETTI MARINO S.p.A.

Examiner or Examination Body
RINA Services S.p.A.

F. Lago
RINA Services S.p.A.

Name and signature / Nome e firma

RAPPORTO PROVA DI QUALIFICA DI PROCEDIMENTO DI SALDATURA/BRASATURA

N° PRATICA	N° SAGGIO	NORMA
2020 VE 92 PW	46/19	EN ISO 15614-1:2019 Lev.2 and Rina Rules

Società ROSETTI MARINO SPA Localit RAVENNA (RA)

Processo FCAW (136) à Tipo PARTLY MECHANIZED

Posizione Saldatore/ Brasatore _____ Spessore (mm) _____ Diametro (mm) _____

_____ Stamp _____ WPS/BPS 46/19

_____ _____ _____

Materiale base: Gruppo/i	Norma e designazione / tipo backing	*Materiale d'apporto o flusso:* Nome commerciale	Norma / designazione
_____	_____	_____	_____
_____	_____	_____	_____
Backing _____		_____	_____

Gas al dritto:	*Gas al rovescio:*
Composizione _____ L/min _____ Ø ugello (mm) _____	Composizione _____ L/min _____

Ø Elettrodo Tungsteno (mm) e tipo _____ Temperatura preriscaldo (°C) _____

PWHT (temperatura, tempo e rampe) _____ Temperatura interpass max (°C) _____

Molatura fra le passate _____ Molatura al rovescio _____ Ripresa al rovescio _____

Passate	Processo	Materiale d'apporto Ø [mm]	Corrente [A]	Tensione [V]	Tipo corrente	Velocità [cm/min]

Preparazione giunto e sequenza saldatura
Per processi multipli indicare spessore depositato (mm/processo)

For all details See As Run Sheets attached

Esito esame visivo: ☒ Positivo ☐ Negativo

Prove di qualifica effettuate a: Ravenna (RA) Data 20-21/11/2019 Firma _____

Esito prove laboratorio: ☒ Positivo ☐ Negativo

Rapporti laboratorio allegati n° e data: Inspecta srl certificate nr. 018-00210-19 dated 28/01/2020

A seguito dell'esito positivo delle prove di laboratorio, si propone il rilascio del certificato di qualifica n° ROSETTI FORM PQR 46/19 Data 29/01/2020 Firma _____

Decisione DM– Con riferimento al documento RINA IS-CRT-SAL-01, si autorizza il rilascio dei certificati di qualifica Data _____ Firma DM _____

PQR attachments index:

Base material certificate (Plate 316L)

Base material certificate (Plate S460G2+M Z)

Consumables certificate

preliminary WPS

NDE certificate

Mechanical test report

ROSETTI MARINO

PQR 46/19

Base material certificate (Plate 316L)

aperam
Correspondentieadres:
Aperam Genk
Swinnenwijerweg 5, Poort Genk 7523
3600 Genk, Belgium
Tel. +32 (0)89 30 21 11

MILL CERTIFICATE BS EN 10204/3.1
CERTIFICAT DE RECEPTION NF EN 10204/3.1
ABNAHMEPRUEFZEUGNIS DIN EN 10204/3.1

N-Nr-N **18K0038049-01 V01**

Certified acc.PED 2014/68/EU Annex I § 4.3 by Certification Body 0036 of TUV SUD Industrie Service GmbH with cert.No.:314/2007/MUC.Renounced of counter signature agreed byTÜV SÜD (9/5/2007).Approved acc.AD 2000-Merkblatt W0/TRD 100 by TÜV SÜD Industrie Service GmbH.Confirmation letter from TÜVSÜD Industrie Service GmbH of 07/05/2010 about the uniformity of coils acc.AD2000 W2 §4.1.1

Tech.Req.:AD 2000 W2 -- AD 2000 W10 -- EN 13445-2

Manufacturer's works order number
N° de la commande usine productrice
Werksauftragsnummer
80452934/01-07964/927/01

Surveyor's mark
Cachet de l'expert
Stempel des Werkssachverstaendigen
GNK1

Purchaser and/or consignee
Client et/ou destinataire
Besteller und/oder Empfaenger
ACCIAI VENDER SPA
VIA NOBEL 4/A
43100 PARMA
ITALIE

Purchaser's order number
N° de commande client
Kundenbestellnummer
ORD SETT 316L AGG

Product - Produit - Erzeugnis
COILS, HOT ROLLED, ANNEALED AND PICKLED
COILS, LAMINE A CHAUD, RECUITS + DECAPE
COILS, WARMGEWALZT, GEGLUEHT UND GEBEIZT

Customer article number
N.article client
Artikelnummer des Kunden

Steel designation
Désignation de l'acier
Stahlbezeichnung
EN 10028-7-2016 1.4404 / 1.4401
EN 10088-2-2014 1.4404 / 1.4401
EN 10088-4-2009 1.4404 / 1.4401
ASTM A 240-2017 TYPE 316L / 316
ASME SA 240-2017 TYPE 316L / 316

Finish
Présentation
Ausfuehrung
1D
1D
1D
NO 1
NO 1

Steelmaking process
Mode d'élaboration de l'acier - Stahlherstellungverfahren
Prod.proces: Electric arc furnace - VOD/AOD - Continuous casting
Proc.fabric.: Four à arc - VOD/AOD - Coulée continue
Fertigungsablauf: Elektro-Ofen - VOD/AOD - Stranggussanlage

Any supplementary requirements
Prescriptions supplémentaires - Zusätzliche Anforderungen
ST 009 REV.4

Product delivery condition
Etat de livraison du produit - Lieferzustand
Solution treated:
Hypertrempe: **1050 °C**
Loesungsgegl+abgeschreckt:
Forced air-water/air forcé-eau
Geblaese Luft-Wasser

NACE MR 0175 / ISO 15156-1 / ISO 15156-3 -- NACE MR 0103 // CORR. TEST: ASTM A262-E: OK

Identification of the product
Identification du produit - Identifizierung des Erzeugnisses
MELTED IN BELGIUM, MADE IN BELGIUM

Dimensions
Dimensions - Abmessungen

Thickness	Width	Length
Epaisseur - Staerke	Largeur - Breite	Longueur - Laenge
10.00 mm	1500.00 mm	

Number of pieces
Nb de pièces - Stueckzahl: **2**

Coil n.
N.Bobine - Band Nr.: 82905310

Heat n.
N.Coulée - Schmelz Nr.: 829053

Net weight
Poids net - netto Gewicht: **25430 KG**

CHEMICAL ANALYSIS - ANALYSE CHIMIQUE - CHEMISCHE ZUSAMMENSETZUNG

	C	Si	Mn	Ni	Cr	Mo	Ti	N	S	P
Required -Exigé %mini				10.00	16.50	2.00				
Anforderung. %maxi	0.030	0.75	2.00	13.00	18.00	2.50		0.100	0.015	0.045
Cast Analysis	0.021	0.46	1.26	10.04	16.67	2.04		0.035	0.006	0.032
Analyse coulee										
Analyse Schmelze	C71	C72	C73	C74	C75	C76	C77	C78	C79	C80

Required -Exigé %mini				10.00	16.50	2.00										
Anforderung. %maxi	0.030	0.75	2.00	13.00	18.00	2.50		0.100	0.015	0.045						
Cast Analysis	0.021	0.46	1.26	10.04	16.67	2.04		0.035	0.006	0.032						
Analyse coulee																
Analyse Schmelze	C71	C72	C73	C74	C75	C76	C77	C78	C79	C80	C81	C82	C83	C84	C85	C86

Positive material identification carried out : OK
Tests de vérification de la conformité de la nuance fournie : OK
Verwechslungpruefung wurde durchgefuehrt : OK
C04 C93 D52

Location (1) | Direction (2)

MECHANICAL PROPERTIES - PROPRIETES MECANIQUES - MECHANISCHE WERTE EN ISO 6892-1 B / A-SA 370 C20
Room temperature - Température ambiante - Raumtemperatur
Test temperature (°C) : C03

		Yield or proof strength Limite d'élasticité Dehngrenze MPa		Tensile Strength Résistance à la traction Zugfestigkeit MPa	Elongation after fracture Allongement après rupt. Bruchdehnung %		Hardness Dureté Haerte	Yield or proof strength Limite d'élasticité Dehngrenze MPa		Tensile str. Résist. MPa Zugfestigkeit	Elongation % Allongement. Bruchdehnung
	Required Exigé Anforderung	Rp0.2%	Rp1%	Rm	A5	50mm	HRBW	Rp0.2%	Rp1%	Rm	A5
	mini	220	260	530	40	40					
	maxi			680			95				
1 T	Obtained Obtenu Ergebnisse	337	368	586	52	55	76				
2							75				
		C11	C14	C12	C13	C15	C31	C16	C17	C18	C19

Impact strength test Essai de résilience Kerbschlagzaehigkeitstest			Corrosion test Test de corrosion Korrosionstest	E0.2(T)/R(T) %						
C40	t(°c)	C44	EN ISO 3651/2 - A:OK	57						
		C42	D51	C50	C51	C52	C53	C54	C55	C05

Internal cleanliness: A: B: C: D: C57

Location of the sample (1)
Emplacement de l'échantillon
Lage des Probenabschnittes
1. Front - Début - Anfang
2. Back - Fin - Ende
3. Middle - Milieu - Mitte
C01

Direction of the test pieces (2)
Orientation des éprouvettes
Probenrichtung
T. Transverse - Travers - Quer
L. Longitudinal - Long - Laengs
C02

The delivery is in accordance with the order
La fourniture est conforme aux exigences de la commande
Die lieferung entspricht den Bestellbedingungen Z01

Packing list
Avis d'expédition
LieferscheinNummer: **2018047318-7964** A10

Marking, inspection and measurement : without objection
Contrôle de marquage, d'aspect et de dimensions : satisfaisants
Pruefung der Stempelung, des Oberflaechenaspekts und der Abmessungen : ohne Beanstandung
D01

Organisation inspection
Organisme et/ou service contrôle
Ueberwachungsabteilung A05

Quality Department

28/8/2018

The inspector
Le responsable
Der Werkssachverstaendige: D. Raemaekers Z02

ZSQ701 - PS5

A04

aperam

Correspondentieadres:
Aperam Genk
Swinnenwijerweg 5, Poort Genk 7523
3600 Genk, Belgium
Tel. +32 (0)89 30 21 11

A01

MILL CERTIFICATE BS EN 10204/3.1
CERTIFICAT DE RECEPTION NF EN 10204/3.1
ABNAHMEPRUEFZEUGNIS DIN EN 10204/3.1

A02

Factory Production Control certified by TUV SUD Industrie Service Gmbh
with certificate nr 0036-CPR-M-043-2011.
In compliance with the Construction Product Regulation Nr 305/2011/EU.

Z05

N-Nr-N **18K0038049-CE V01** A03

Manufacturer's works order number
N° de la commande usine productrice
Werksauftragsnummer
80452934/01-07964/927/01 A08

Surveyor's mark
Cachet de l'expert
Stempel des
Werkssachverstaendigen
GNK1 Z03

Purchaser and/or consignee
Client et/ou destinataire
Besteller und/oder Empfaenger

ACCIAI VENDER SPA
VIA NOBEL 4/A

43100 PARMA
ITALIE

A06

Purchaser's order number
N° de commande client
Kundenbestellnummer
ORD SETT 316L AGG A07

Product - Produit - Erzeugnis
COILS, HOT ROLLED, ANNEALED AND PICKLED
COILS, LAMINE A CHAUD, RECUITS + DECAPE
COILS, WARMGEWALZT, GEGLUEHT UND GEBEIZT
B01

Customer article number
N.article client
Artikelnummer des Kunden
A09

Steel designation B02
Désignation de l'acier
Stahlbezeichnuug

EN 10088-4-2009 1.4404/1.4401

Finish
Présentation
Ausfuehrung

1D

Steelmaking process C70
Mode d'élaboration de l'acier - Stahlherstellungverfahren
Prod.proces: Electric arc furnace - VOD/AOD - Continuous casting
Proc.fabric.: Four à arc - VOD/AOD - Coulée continue
Fertigungsablauf: Elektro-Ofen - VOD/AOD - Stranggussanlage

Any supplementary requirements B03
Prescriptious supplémentaires - Zusätzliche Anforderungen
ST 009 REV.4

Product delivery condition
Etat de livraison du produit - Lieferzustand

Solution treated:
Hypertrempe: **1050 °C**
Loesungsgegl+abgeschreckt:

Forced air-water/air forcé-eau
Geblaese Luft-Wasser B04

Z06

Identification of the product B07
Identification du produit - Identifizierung des Erzeugnisses
MELTED IN BELGIUM, MADE IN BELGIUM

Dimensions
Dimensions - Abmessungen

Thickness B09	Width B10	Length B11
Epaisseur - Staerke	Largeur - Breite	Longueur - Laenge
10.00 mm	1500.00 mm	

Number of pieces B08
Nb de pièces - Stueckzahl
2

Net weight B13
Poids net - netto Gewicht
25430 KG

Coil n.
N.Bobine - Band Nr.
82905310

Heat n.
N.Coulée - Schmelz Nr.
829053

CHEMICAL ANALYSIS - ANALYSE CHIMIQUE - CHEMISCHE ZUSAMMENSETZUNG

	C	Si	Mn	Ni	Cr	Mo	Ti	N	S	P						
Required -Exigé %mini				10.00	16.50	2.00										
Anforderung. %maxi	0.030	0.75	2.00	13.00	18.00	2.50		0.100	0.015	0.045						
Cast Analysis	0.021	0.46	1.26	10.04	16.67	2.04		0.035	0.006	0.032						
Analyse coulee																
Analyse Schmelze	C71	C72	C73	C74	C75	C76	C77	C78	C79	C80	C81	C82	C83	C84	C85	C86

Positive material identification carried out : OK
Tests de vérification de la conformité de la nuance fournie : OK
Verwechslungpruefung wurde durchgefuehrt : OK
C04 C93 D52

Location (1)

MECHANICAL PROPERTIES - PROPRIETES MECANIQUES - MECHANISCHE WERTE EN ISO 6892-1 B / A-SA 370 C20

Room temperature - Température ambiante - Raumtemperatur

Test temperature (°C) : C03

	Direction (2)		Yield or proof strength Limite d'élasticité Dehngrenze MPa		Tensile Strength Résistance à la traction Zugfestigkeit MPa	Elongation after fracture Allongement après rupt. Bruchdehnung %		Hardness Dureté Haerte	Yield or proof strength Limite d'élasticité Dehngrenze MPa		Tensile str. Résist. MPa Zugfestigkeit	Elongation % Allongement. Bruchdehnung
		Required Exigé Anforderung	**Rp0.2%**	**Rp1%**	**Rm**	**A5**	**50mm**	**HRBW**	**Rp0.2%**	**Rp1%**	**Rm**	**A5**
		mini	220	260	530	40	40					
		maxi			680			95				
1	T	**Obtained** Obtenu Ergebnisse	337	368	586	52	55	76				
2								75				
			C11	C14	C12	C13	C15	C31	C16	C17	C18	C19

Impact strength test Essai de résilience Kerbschlagzaehigkeitstest			Corrosion test Test de corrosion Korrosionstest	E0.2(T)/R(T) %						
C40	t(°c)	C44	EN ISO 3651/2 - A:OK	57						
		C42	D51	C50	C51	C52	C53	C54	C55	C05

Internal cleanliness: A: B: C: D: C57

Location of the sample (1)
Emplacement de l'échantillon
Lage des Probenabschnittes
1. Front - Début - Anfang
2. Back - Fin - Ende
3. Middle - Milieu - Mitte
C01

The delivery is in accordance with the order
La fourniture est conforme aux exigences de la commande
Die lieferung entspricht den Bestellbedingungen Z01

Packing list
Avis d'expédition **2018047318-7964**
LieferscheinNummer A10

Organisation inspection
Organisme et/ou service contrôle
Ueberwachungsabteilung A05

Quality Department

28/8/2018

The inspector
Le responsable
Der Werkssachverstaendige D. Raemaekers Z02

Direction of the test pieces (2)
Orientatiou des éprouvettes
Probenrichtung
T. Transverse - Travers - Quer
L. Longitudinal - Long - Laengs
C02

Marking, inspection and measurement : without objection
Contrôle de marquage, d'aspect et de dimensions : satisfaisants
Pruefung der Stempelung, des Oberflaechenaspekts und der
Abmessungen : ohne Beanstandung
D01

ZSQ701 - PS5

aperam

Correspondance address
Adresse de correspondance - Adresse für briefwechsel

Swinnenwijerweg 5, Poort Genk 7523
3600 Genk, Belgium
CE01

Annex to certificate 18K0038049-01 V01
Annexe du CCPU
Anlage Zum Zeugnis
CE02

Certificate
CCPU - Zeugnis
18K0038049-CE V01
CE05

Certificate of Production Control Number
Numéro du certificat de contrôle de la production
Zeugnisnummer von Produktionskontrolle
0036-CPD-43-2011
CE03

CE 0036
CE06

Year 11
Année
Jahr
CE04

Manufacturer's works order number
N° de la commande usine productrice
Werksauftragsnummer

80452934/01-07964/927/01
CE07

Purchaser and/or consignee
Client et/ou destinataire
Besteller und/oder Empfaenger

ACCIAI VENDER SPA
VIA NOBEL 4/A

43100 PARMA
ITALIE
CE08

Purchaser's order number
N° de commande client
Kundenbestellnummer
ORD SETT 316L AGG
CE09

Customer article number
N° d'article client
Artikelnummer des Kundes
CE10

Identification of the product
Identifictaion du produit - Identifizierung des Erzeugnisses

Coil n°
N° de bobine - Band Nr
82905310
CE11

Dimensions
Dimensions - Abmessungen

Thickness
Epaisseur - Dicke
10.00 mm
CE12

Width
Largeur - Breite
1500.00 mm
CE13

Length
Longueur - Laenge
CE14

Stainless steel / Acier inoxydable / Rostfreier Stahl
CE15

EN10088-4
CE16

Intended uses : building constructions or civil engineering
Usages prévus : construction immobilière ou génie civil
Vorgesehene Verwendungen : Hochbauten und Ingenieurbauwerke
CE17

Declaration of performance :
Déclaration des performances : DOP.Nr.GNK.08.01/GNK.10.01
Leistungserklärung :
DoP available on website Aperam : www.aperam.com/europe/news-publications/documentation/certifications/approvals
CE18

Steel
Acier 1.4404/1.4401
Werkstoff
CE19

Hot rolled
Laminé à chaud
Warmgewalzt
CE20

Coil / bobine / Band
CE21

Elongation / Allongement / Bruchdehnung
Tensile strength / Résistance à la traction / Zugfestigkeit
Yield strength / Limite d'élasticité / Dehngrenze
Impact strength / Résistance au choc / Kerbschlagzähigkeit
Weldability / Aptitude au soudage / Schweisseignung
Durability / Durabilité / Dauerhaftigkeit
Characteristics expressed as indicated in the above mentioned DOP
Tolerances on dimension and shape / Tolérances sur les dimensions et sur forme / Grenzabmasse unf Formtoleranzen : EN ISO 9444-2
CE22

Regulated substance : no performance determined
Substance réglementée : aucune performance déterminée
Regulierter Stoff: keine Leistung festgestellt
CE23

ROSETTI MARINO

PQR 46/19

Base material certificate (Plate S460 G2+M Z)

ROSETTI MARINO

MATERIAL CERTIFICATES BOOK

Supplier	Purchase Order nr.	job	Barcode
ARCELORMITTAL PROJECTS EUROPE B.V.	1719000334	118A50C	Q011901058

ROSETTI MARINO

ROSETTI MARINO

Conforme alla spec. **PO**

According to the spc.----------.

TMUGF Firma / MTSMD Signature — Data / Date: **16/04/19**

Emiliani Sonia

[X] REVIEW

[ ] WITNESS

CUSTOMER

NOTE

PACKING LIST / TRACEABILITY LIST

Client: Rosetti Marino SPA
Massimo Gori
Via trieste 230
48122 Ravenna
Italy
Project: 20190211
PO No: 1719000334



ArcelorMittal Projects Netherlands B.V.
Project Nr: 20190211
Orderno. 2100018960
Rev./Date: 0

Item No.	Client Item No.	Material Type	quality	Pcs	Length (MM)	Width (MM)	Th. (mm)	weight per Pc	weight in kgs	heat no	item no.	Certificate no.	
1	1	HRPL	S355G10+M	1	12.000	2.500	15	3.533	3.533	863720	2965291	A0350855	
1	1	HRPL	S355G10+M	1	12.000	2.500	15	3.533	3.533	463103	12825302	60266	
1	1	HRPL	S355G10+M	1	12.000	2.500	15	3.533	3.533	4613	12814302	60266	
2	2	HRPL	S355G10+M Z	1	12.000	2.500	25	5.888	5.888	464711	15714101	61443	
3	3	HRPL	S460G2+M Z	1	12.000	2.050	25	4.828	4.828	811954	3314191	A0361134	
3	3	HRPL	S460G2+M Z	1	12.000	2.055	25	4.710	4.710	458532	96825002	54602	
3	3	HRPL	S460G2+M Z	1	12.000	2.055	25	4.710	4.710	458532	96825001	54602	
4	4	HRPL	S355G10+M Z	1	6.000	2.500	30	3.533	3.533	705587	42950131	286882-B1	
5	5	HRPL	S460G2+M Z	1	12.000	2.500	40	9.420	9.420	461499	6284902	55228	
6	6	HRPL	S460G2+M Z	1	12.000	2.500	40	9.420	9.420	461497	6284301	60384	
6	6	HRPL	S460G2+M Z	1	12.000	2.500	40	9.420	9.420	459485	97316302	55613	
7	7	HRPL	S460G2+M Z	1	12.000	2.500	50	11.775	11.775	459930	02574-01	436420-001	
8	8	HRPL	S460G2+M Z	1	5.000	2.500	80	7.850	7.850	452882	8667001	436421-002	
9	9	HRPL	S460G2+M Z	1	6.000	2.500	100	11.775	11.775	438917	5019101	49575	
				14					93.925				

Marking: RM PO nummer
PO item No.
dimensions and quality

QM-System: Certification as per ISO 9001

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

54602

DILLINGER

A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ A03 Manufacturer's order/ Certificate No.: 434490-001 Sheet: 1/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ B03 Steel design. / Any suppl. requirements: **S460G2+M** OPTION-12;13;18
EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness		B10 Width MM		B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
02	1	25,00	x	2055	x	12000	4932	TM	458532	968250-01	
02	1	25,00	x	2055	x	12000	4932	TM	458532	968250-02	
02	1	25,00	x	2055	x	12000	4932	TM	458809	959322-01	
02	1	25,00	x	2055	x	12000	4932	TM	458809	959322-02	
**	4						19728				
03	1	25,00	x	2500	x	12000	6000	TM	458805	959318-01	
03	1	25,00	x	2500	x	12000	6000	TM	458805	959318-02	
03	1	25,00	x	2500	x	12000	6000	TM	458809	959323-02	
03	1	25,00	x	2500	x	12000	6000	TM	459320	969239-01	
**	4						24000				
04	1	30,00	x	2500	x	12000	7200	TM	459322	969235-02	
04	1	30,00	x	2500	x	12000	7200	TM	459324	969446-02	
**	2						14400				
05	1	40,00	x	2500	x	12000	9600	TM	458809	959316-01	
05	1	40,00	x	2500	x	12000	9600	TM	458809	959316-02	
05	1	40,00	x	2500	x	12000	9600	TM	458809	959317-01	
05	1	40,00	x	2500	x	12000	9600	TM	458809	959317-02	
05	1	40,00	x	2500	x	12000	9600	TM	458809	959320-01	
05	1	40,00	x	2500	x	12000	9600	TM	458810	959252-01	
05	1	40,00	x	2500	x	12000	9600	TM	458810	959252-02	
05	1	40,00	x	2500	x	12000	9600	TM	458810	959315-02	
**	8						76800				
06	1	40,00	x	3050	x	12000	11712	TM	458810	960122-01	

A04 D F Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01
Multigrades

for DNV GL
This document has been digitally signed and will therefore not have handwritten signatures.
F. Swal
Inspector

POISSONNET
Test House Manager

A01
Dillinger France
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais
Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

DILLINGER

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02	A10 Advice of dispatch No./ Date of dispatch	A08/ Manufacturer's order/ A03 Certificate No.	Sheet
INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013	9398896-21.06.18	434490-001	2/...

A05 Established Inspecting body	A06 Purchaser		A07.1 No.	B01 Product
VLNC	ANCOFERWALDRAM,OOSTE	3064200		HEAVY PLATES
	Final receiver	ANCOFERWALDRAM,OOSTE	A07.2 No.	

B02/ Steel design.	**S460G2+M**	OPTION-12;13;18
B03 Any suppl. requirements	EN-10225:01/AWS-4.11:REV.2	MDS-Y40:REV.5

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness	B10 Width MM	B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
06	1	40,00	x 3050	x 12000	11712	TM	458810	960122-02	
06	1	40,00	x 3050	x 12000	11712	TM	458810	960123-01	
06	1	40,00	x 3050	x 12000	11712	TM	458810	960123-02	
06	1	40,00	x 3050	x 12000	11712	TM	459322	969317-02	
**	5				58560				
***	23				193488				

B01-B03 Further information about product / Steel grade / Requirements

ITEM NO.: 04-06
WELDING QUALIFICATION ACCORDING:
WELDING REPORT 08/2010

B06 Marking of the product

ITEM NO.: 01-06
STEEL DESIGNATION **S460G2+M S460ML**
HEAT NO. / TRADEMARK / ROLLED PLATE NO.-TEST NO. / INSPECTOR'S STAMP

B07-B99 Further information about the product

ITEM NO.: 01-06
THICKNESS REDUCTION RATIO >= 4,00 IS FULFILLED

A04 Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01
Multigrades

for DNV GL
This document has been digitally signed and will therefore not have handwritten signatures.
F. Swal
Inspector

POISSONNET
Test House Manager

A01
Dillinger France
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais
Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 3/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM, OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM, OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ B03 Steel design. / Any suppl. requirements: **S460G2+M** EN-10225:01/AWS-4.11:REV.2 OPTION-12;13;18 MDS-Y40:REV.5

C10-C29 Tensile test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C10	C11 MPA RP02	C12 RM	C13 A % L0=5D	C14-C15 RP02/RM	Z %
01	459320	969139*		K7	QO	RT		491	561	28	0,88	
		*		K7	SO	RT			555			68,1
		*		K7	SO	RT			554			61,1
		*		K7	SO	RT			555			72,1
01	459322	969236*		K7	QO	RT		507	571	28	0,89	
		*		K7	SO	RT			564			47,3
		*		K7	SO	RT			559			55,1
		*		K7	SO	RT			562			46,6
02	458532	968250		K7	QO	RT		508	583	26	0,87	
				K7	SO	RT			570			73,2
				K7	SO	RT			571			62,5
				K7	SO	RT			568			71,9
02	458809	959322		K7	QO	RT		515	600	26	0,86	
				K7	SO	RT			578			73,2
				K7	SO	RT			579			74,5
				K7	SO	RT			578			77,3
03	458805	965373*		K7	QO	RT		508	591	25	0,86	
		*		K7	SO	RT			570			74,2
		*		K7	SO	RT			575			76,9
		*		K7	SO	RT			570			78,5
03	459320	969239		K7	QO	RT		513	592	24	0,87	
				K7	SO	RT			577			63,8
				K7	SO	RT			578			63,2

A04 Manufacturer's mark

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Multigrades

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F. Swal
Inspector

POISSONNET
Test House Manager

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F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais
Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 4/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design. **S460G2+M** OPTION-12;13;18

B03 Any suppl. requirements: EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C10-C29 Tensile test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C10	C11 MPA RP02	C12 RM	C13	A % L0=5D	C14-C15 RP02/RM	Z %
03	459320	969239		K7	SO	RT			577				64,5
04	458805	965362*		K7	QO	RT		493	591		24	0,83	
04	458810	965330*		K7	QO	RT		498	586		25	0,85	
		*		K7	SO	RT			556				57,4
		*		K7	SO	RT			556				64,4
		*		K7	SO	RT			557				68,7
04	459320	973168*		K7	QO	RT		501	582		28	0,86	
04	459322	969235		K7	QO	RT		482	572		26	0,84	
04	459322	969302*		K7	QO	RT		496	569		26	0,87	
		*		K7	SO	RT			554				51,0
		*		K7	SO	RT			552				33,2
		*		K7	SO	RT			556				54,8
04	459324	969446		K7	QO	RT		513	598		24	0,86	
05	458809	959317		K7	QO	RT		491	591		24	0,83	
05	458809	959320		K7	QO	RT		515	603		23	0,85	
05	458810	959252		K7	QO	RT		489	589		25	0,83	
06	458805	966181*		K7	QO	RT		505	598		22	0,84	
06	458810	960122		K7	QO	RT		511	601		24	0,85	
06	458810	960123		K7	QO	RT		509	600		25	0,85	
06	459322	969317		K7	QO	RT		490	583		27	0,84	
06	459324	971074*		K7	QO	RT		485	582		25	0,83	
		*		K7	SO	RT			554				63,9
		*		K7	SO	RT			552				67,6

A04 D F Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01 Multigrades

for DNV GL
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F. Swal
Inspector

POISSONNET
Test House Manager

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3032 rue du Comte Jean - CS 56317
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Service Qualité-Essais
Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
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A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 5/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design. **S460G2+M** OPTION-12;13;18

B03 Any suppl. requirements: EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C10-C29 Tensile test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C10	C11 MPA RP02	C12 RM	C13	C14-C15 A % L0=5D	C14-C15 RP02/RM	Z %
06	459324	971074*		K7	SO	RT			558				57,1

C30-C39 Hardness test

B14 Item. No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/C01	C03 Temp. GR.C	C30 Method of test	C35 C31 Individual values	C32 Mean value
01	459320	969139 *		K7	QO	RT	HV10	HV 178	
01	459322	969236 *		K7	QO	RT	HV10	HV 172	
02	458532	968250		K7	QO	RT	HV10	HV 185	
02	458809	959322		K7	QO	RT	HV10	HV 186	
03	458805	965373 *		K7	QO	RT	HV10	HV 192	
03	459320	969239		K7	QO	RT	HV10	HV 191	
04	458810	965330 *		K7	QO	RT	HV10	HV 197	
04	459322	969302 *		K7	QO	RT	HV10	HV 182	
06	459324	971074 *		K7	QO	RT	HV10	HV 186	

C30-C39 Further information about hardness test

ITEM NO.: 01-06
HARDNESS TEST INFORMATIVE

A04 D F Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01
Multigrades

for DNV GL
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F. Swal
Inspector

POISSONNET
Test House Manager

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Dillinger France
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais
Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A02	A10 Advice of dispatch No./ Date of dispatch	A08/ Manufacturer's order/ A03 Certificate No.	Sheet
INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013	9398896-21.06.18	434490-001	6/...

A05 Established Inspecting body	A06 Purchaser		A07.1 No.	B01 Product
VLNC	Final receiver	ANCOFERWALDRAM,OOSTE ANCOFERWALDRAM,OOSTE	3064200 A07.2 No.	HEAVY PLATES

B02/ Steel design.	**S460G2+M**	OPTION-12;13;18
B03 Any suppl. requirements	EN-10225:01/AWS-4.11:REV.2	MDS-Y40:REV.5

C40-C49 Impact test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.		B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C41 Width of test piece	C40 Type of test piece	C44 Testing method	C46 Energy Joule	C45	C42 Individual values AV=J			C43 Mean value
01	459320	969139	*		K7	LO	-50		CHP-V		600	AV 2	296	306	299	300
			*		K7	QO	-40		CHP-V		600	AV 2	164	229	230	208
			*		K7	QO	-40		CHP-V	5,0%	600	AV 2	237	121	235	198
			*		K7	QO	-40		CHP-V	5,0%-250C/60MN	600	AV 2	119	129	114	121
01	459322	969236	*		K7	LO	-50		CHP-V		750	AV 2	335	327	330	331
			*		K7	QO	-40		CHP-V		750	AV 2	125	131	144	133
			*		K7	QO	-40		CHP-V	5,0%	600	AV 2	128	104	106	113
			*		K7	QO	-40		CHP-V	5,0%-250C/60MN	600	AV 2	91	98	86	92
02	458532	968250			K7	LO	-50		CHP-V		600	AV 2	140	125	146	137
					K7	QO	-40		CHP-V		600	AV 2	269	275	271	272
					K7	QO	-40		CHP-V	5,0%	600	AV 2	114	92	118	108
					K7	QO	-40		CHP-V	5,0%-250C/60MN	600	AV 2	95	87	91	91
02	458809	959322			K7	LO	-50		CHP-V		600	AV 2	196	291	271	253
					K7	QO	-40		CHP-V		600	AV 2	132	119	174	142
					K7	QO	-40		CHP-V	5,0%	600	AV 2	113	116	105	111
					K7	QO	-40		CHP-V	5,0%-250C/60MN	600	AV 2	68	86	89	81
03	458805	965373	*		K7	LO	-50		CHP-V		600	AV 2	325	347	338	337
			*		K7	QO	-40		CHP-V		600	AV 2	151	107	149	136
			*		K7	QO	-40		CHP-V	5,0%	600	AV 2	102	143	126	124
			*		K7	QO	-40		CHP-V	5,0%-250C/60MN	600	AV 2	93	104	99	99
03	459320	969239			K7	LO	-50		CHP-V		750	AV 2	296	216	289	267
					K7	QO	-40		CHP-V		750	AV 2	196	184	190	190
					K7	QO	-40		CHP-V	5,0%	750	AV 2	137	113	126	125

A04

D F

Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01
Multigrades

for DNV GL
This document has been digitally signed and will therefore not have handwritten signatures.
F. Swal
Inspector

POISSONNET
Test House Manager

A01

Dillinger France
Port 3032
3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais

Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 7/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design. **S460G2+M** OPTION-12;13;18

B03 Any suppl. requirements: EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C40-C49 Impact test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.		B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C41 Width of test piece	C40 Type of test piece	C44 Testing method	C46 Energy Joule	C45	C42 Individual values AV=J			C43 Mean value
03	459320	969239			K7	QO	-40		CHP-V	5,0%-250C/60MN	750	AV 2	86	86	92	88
03	459320	973107	*		K7	LO	-50		CHP-V		750	AV 2	314	332	322	323
04	458805	965362	*		K7	LO	-50		CHP-V		600	AV 2	168	207	171	182
			*		K7	QO	-40		CHP-V		600	AV 2	108	109	125	114
04	458810	965330	*		K7	LO	-50		CHP-V		600	AV 2	301	328	321	317
			*		K7	QO	-40		CHP-V		600	AV 2	249	244	240	244
			*		K7	QO	-40		CHP-V	5,0%	600	AV 2	169	116	122	136
			*		K7	QO	-40		CHP-V	5,0%-250C/60MN	600	AV 2	139	103	106	116
04	459320	973168	*		K7	QO	-40		CHP-V		750	AV 2	216	223	190	210
04	459322	969235			K7	LO	-50		CHP-V		750	AV 2	220	287	208	238
					K7	QO	-40		CHP-V		750	AV 2	122	144	175	147
04	459322	969302	*		K7	LO	-50		CHP-V		750	AV 2	237	181	270	229
			*		K7	QO	-40		CHP-V		750	AV 2	140	171	132	148
			*		K7	QO	-40		CHP-V	5,0%	750	AV 2	101	106	106	104
			*		K7	QO	-40		CHP-V	5,0%-250C/60MN	750	AV 2	81	84	83	83
04	459324	969446			K7	LO	-50		CHP-V		600	AV 2	134	139	176	150
					K7	QO	-40		CHP-V		600	AV 2	274	252	233	253
05	458809	959317			K7	LV	-50		CHP-V		600	AV 2	164	180	166	170
					K7	QO	-40		CHP-V		600	AV 2	183	108	103	131
05	458809	959320			K7	LV	-50		CHP-V		600	AV 2	146	175	247	189
					K7	QO	-40		CHP-V		600	AV 2	191	208	226	208
05	458810	959252			K7	LV	-50		CHP-V		600	AV 2	173	175	186	178
					K7	QO	-40		CHP-V		600	AV 2	222	208	199	210

A04 D F Manufacturer's mark

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for DNV GL
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Test House Manager

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A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 8/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design. **S460G2+M** OPTION-12;13;18

B03 Any suppl. requirements: EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C40-C49 Impact test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.		B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.C	C41 Width of test piece	C40 Type of test piece	C44 Testing method	C46 Energy Joule	C45	C42 Individual values AV=J			C43 Mean value
06	458805	966181	*		K7	LV	-50		CHP-V		600	AV 2	99	70	103	91
			*		K7	QO	-40		CHP-V		600	AV 2	248	238	203	230
06	458810	960122			K7	LV	-50		CHP-V		600	AV 2	296	301	282	293
					K7	QO	-40		CHP-V		600	AV 2	219	170	230	206
06	458810	960123			K7	LV	-50		CHP-V		600	AV 2	315	320	306	314
					K7	QO	-40		CHP-V		600	AV 2	252	236	245	244
06	459322	969317			K7	LV	-50		CHP-V		750	AV 2	169	203	158	177
					K7	QO	-40		CHP-V		750	AV 2	166	134	165	155
06	459324	971074	*		K7	LV	-50		CHP-V		750	AV 2	264	287	312	288
			*		K7	QO	-40		CHP-V		750	AV 2	244	193	134	190
			*		K7	QO	-40		CHP-V	5,0%	750	AV 2	229	185	133	182
			*		K7	QO	-40		CHP-V	5,0%-250C/60MN	750	AV 2	105	95	89	96

C70-C99 Chemical composition % - Heat analysis

B07.2 Heat	C70	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	AS	SN
458532	Y	0,085	0,487	1,548	0,015	0,0009	0,0033	0,034	0,007	0,043	0,029	0,001	0,028	0,0008	0,0007
458805	Y	0,089	0,485	1,590	0,017	0,0009	0,0031	0,018	0,005	0,025	0,035	0,001	0,029	0,0034	0,0008
458809	Y	0,089	0,482	1,625	0,017	0,0008	0,0038	0,025	0,009	0,024	0,045	0,002	0,027	0,0027	0,0014
458810	Y	0,081	0,487	1,649	0,013	0,0005	0,0024	0,019	0,004	0,021	0,028	0,001	0,027	0,0024	0,0006
459320	Y	0,085	0,484	1,580	0,014	0,0004	0,0038	0,025	0,005	0,031	0,034	0,001	0,029	0,0025	0,0009
459322	Y	0,086	0,494	1,574	0,013	0,0010	0,0045	0,038	0,005	0,033	0,036	0,002	0,030	0,0030	0,0021
459324	Y	0,095	0,499	1,601	0,011	0,0006	0,0038	0,028	0,007	0,033	0,037	0,001	0,031	0,0027	0,0010

A04 D F Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

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Multigrades

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Service Qualité-Essais

Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ A03 Manufacturer's order/ Certificate No.: 434490-001 Sheet: 9/...

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ B03 Steel design. / Any suppl. requirements: **S460G2+M** OPTION-12;13;18
EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C70-C99 Chemical composition % - Heat analysis

B07.2 Heat	C70	TI	PB	B	SB	CA	BI	AL-T
458532	Y	0,004	0,0002	0,0003	0,0004	0,0017	0,0001	0,044
458805	Y	0,003	0,0004	0,0002	0,0001	0,0018	0,0001	0,028
458809	Y	0,003	0,0005	0,0002	0,0002	0,0020	0,0001	0,039
458810	Y	0,004	0,0004	0,0002	0,0001	0,0017	0,0001	0,039
459320	Y	0,005	0,0003	0,0003	0,0001	0,0019	0,0001	0,035
459322	Y	0,004	0,0002	0,0003	0,0001	0,0020	0,0001	0,031
459324	Y	0,004	0,0002	0,0003	0,0001	0,0023	0,0001	0,033

C94 Heat analysis Carbon equivalent / Alloying restrictions

B07.2 Heat											
458532	FO-02=	0,36	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,11	FO-A1= 13
458805	FO-02=	0,37	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,08	FO-A1= 9
458809	FO-02=	0,37	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,10	FO-A1= 10
458810	FO-02=	0,37	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,07	FO-A1= 16
459320	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,10	FO-A1= 9
459322	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,11	FO-A1= 7
459324	FO-02=	0,37	FO-31=	0,20	FO-51=	0,03	FO-52=	0,04	FO-55=	0,11	FO-A1= 9

C95 Ladle treatment

ITEM NO.: 01-06
HEAT OF THE INDICATED ITEM: VACUUM DEGASSED

C95 Further information about ladle treatment

ITEM NO.: 01-06
VACUUM DEGASSED, FULLY KILLED, FINE GRAIN TREATED

A04 D F Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

DNV GL Cert. No. N141KG8B-01
Multigrades

for DNV GL
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F. Swal
Inspector

POISSONNET
Test House Manager

A01
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3032 rue du Comte Jean - CS 56317
F-59379 Dunkerque Cedex 1 - FRANCE
Service Qualité-Essais
Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A02	A10 Advice of dispatch No./ Date of dispatch	A08/ Manufacturer's order/ A03 Certificate No.	Sheet
INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013	9398896-21.06.18	434490-001	10/...

A05 Established Inspecting body	A06 Purchaser		A07.1 No.	B01 Product
VLNC	Final receiver	ANCOFERWALDRAM,OOSTE ANCOFERWALDRAM,OOSTE	3064200 A07.2 No.	HEAVY PLATES

B02/ Steel design. **S460G2+M** OPTION-12;13;18

B03 Any suppl. requirements EN-10225:01/AWS-4.11:REV.2 MDS-Y40:REV.5

C70-C99 Chemical composition % - Product analysis

B07.2 Heat	B07.1 Test No.	C01	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	TI	B
458532	968250	K7O	0,093	0,510	1,56	0,013	0,0006	0,0049	0,027	0,005	0,031	0,022	0,001	0,030	0,003	0,0004
458805	965362	K7O	0,091	0,491	1,56	0,016	0,0008	0,0034	0,017	0,005	0,024	0,032	0,002	0,028	0,003	0,0003
458805	965373	K7O	0,088	0,489	1,60	0,013	0,0008	0,0036	0,018	0,004	0,026	0,029	0,002	0,028	0,003	0,0003
458809	959316	K7O	0,087	0,485	1,56	0,014	0,0003	0,0049	0,022	0,009	0,023	0,042	0,002	0,026	0,003	0,0003
458809	959322	K7O	0,088	0,476	1,56	0,014	0,0006	0,0029	0,023	0,009	0,023	0,042	0,002	0,026	0,003	0,0003
458810	959252	K7O	0,083	0,478	1,58	0,012	0,0003	0,0024	0,019	0,005	0,022	0,029	0,002	0,027	0,003	0,0003
458810	960122	K7O	0,080	0,477	1,58	0,011	0,0004	0,0026	0,018	0,004	0,021	0,025	0,002	0,026	0,003	0,0003
458810	960123	K7O	0,081	0,464	1,57	0,011	0,0005	0,0016	0,018	0,003	0,021	0,024	0,002	0,026	0,003	0,0003
458810	965330	K7O	0,083	0,484	1,61	0,012	0,0006	0,0021	0,018	0,003	0,021	0,024	0,002	0,027	0,003	0,0003
459320	969139	K7O	0,089	0,501	1,57	0,013	0,0005	0,0040	0,025	0,005	0,032	0,033	0,002	0,029	0,005	0,0004
459320	969238	K7O	0,084	0,480	1,53	0,013	0,0003	0,0042	0,026	0,006	0,032	0,032	0,001	0,027	0,004	0,0004
459320	969239	K7O	0,088	0,506	1,56	0,014	0,0003	0,0042	0,023	0,005	0,031	0,033	0,002	0,030	0,005	0,0004
459320	973107	K7O	0,090	0,488	1,54	0,013	0,0005	0,0048	0,025	0,005	0,031	0,033	0,001	0,028	0,005	0,0004
459322	969236	K7O	0,093	0,491	1,52	0,012	0,0011	0,0051	0,036	0,005	0,033	0,034	0,002	0,028	0,004	0,0004
459322	969302	K7O	0,088	0,512	1,55	0,013	0,0008	0,0053	0,037	0,005	0,034	0,034	0,002	0,030	0,004	0,0004
459322	969317	K7O	0,087	0,492	1,55	0,013	0,0008	0,0065	0,038	0,005	0,035	0,034	0,002	0,030	0,003	0,0004
459324	969446	K7O	0,093	0,500	1,56	0,010	0,0007	0,0038	0,027	0,007	0,032	0,036	0,002	0,030	0,004	0,0004
459324	971074	K7O	0,091	0,500	1,57	0,011	0,0004	0,0038	0,024	0,007	0,034	0,035	0,001	0,032	0,004	0,0004

A04 D F Manufacturer's mark

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QM-System: Certification as per ISO 9001

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A05 Established Inspecting body	A06 Purchaser		A07.1 No.	B01 Product
VLNC		ANCOFERWALDRAM,OOSTE	3064200	HEAVY PLATES
	Final receiver	ANCOFERWALDRAM,OOSTE	A07.2 No.	

B02/ Steel design.	**S460G2+M**	
B03 Any suppl. requirements	EN-10225:01/AWS-4.11:REV.2	OPTION-12;13;18 MDS-Y40:REV.5

C70-C99 Chemical composition % - Product analysis

B07.2 Heat	B07.1 Test No.	C01	AL-T
458532	968250	K7O	0,038
458805	965362	K7O	0,028
458805	965373	K7O	0,033
458809	959316	K7O	0,043
458809	959322	K7O	0,043
458810	959252	K7O	0,042
458810	960122	K7O	0,042
458810	960123	K7O	0,042
458810	965330	K7O	0,039
459320	969139	K7O	0,038
459320	969238	K7O	0,035
459320	969239	K7O	0,038
459320	973107	K7O	0,037
459322	969236	K7O	0,033
459322	969302	K7O	0,032
459322	969317	K7O	0,030
459324	969446	K7O	0,035
459324	971074	K7O	0,034

C94 Product analysis Carbon equivalent / Alloying restrictions

B07.2 Heat	B07.1 Test No.	C01											
458532	968250	K7O	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,09	FO-A1= 8
458805	965362	K7O	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,08	FO-A1= 8
458805	965373	K7O	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,08	FO-A1= 9

A04

D F

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Service Qualité-Essais

Date 22.06.18 EDI CD 1

QM-System: Certification as per ISO 9001

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A05 Established Inspecting body	A06 Purchaser		A07.1 No.	B01 Product
VLNC	Final receiver	ANCOFERWALDRAM,OOSTE ANCOFERWALDRAM,OOSTE	3064200 A07.2 No.	HEAVY PLATES

B02/ Steel design.	**S460G2+M**	OPTION-12;13;18
B03 Any suppl. requirements	EN-10225:01/AWS-4.11:REV.2	MDS-Y40:REV.5

C94 Product analysis Carbon equivalent / Alloying restrictions

B07.2 Heat	B07.1 Test No.	C01													
458809	959316	K70	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,10	FO-A1=	9
458809	959322	K70	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,10	FO-A1=	15
458810	959252	K70	FO-02=	0,36	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,08	FO-A1=	18
458810	960122	K70	FO-02=	0,35	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,07	FO-A1=	16
458810	960123	K70	FO-02=	0,35	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,07	FO-A1=	26
458810	965330	K70	FO-02=	0,36	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,07	FO-A1=	19
459320	969139	K70	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,10	FO-A1=	10
459320	969238	K70	FO-02=	0,35	FO-31=	0,18	FO-51=	0,03	FO-52=	0,03	FO-55=	0,10	FO-A1=	8
459320	969239	K70	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,09	FO-A1=	9
459320	973107	K70	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,09	FO-A1=	8
459322	969236	K70	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,03	FO-55=	0,11	FO-A1=	6
459322	969302	K70	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,11	FO-A1=	6
459322	969317	K70	FO-02=	0,36	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,11	FO-A1=	5
459324	969446	K70	FO-02=	0,37	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,10	FO-A1=	9
459324	971074	K70	FO-02=	0,37	FO-31=	0,19	FO-51=	0,03	FO-52=	0,04	FO-55=	0,10	FO-A1=	9

C94 Carbon equivalent formula / Alloying restrictions

FO-02 = C+(MN/6)+(CR+MO+V)/5+(NI+CU)/15
FO-31 = C+SI/30+(MN+CR+CU)/20+MO/15+V/10+NI/60+5B
FO-51 = V +NB
FO-52 = V +NB+TI
FO-55 = CU+MO+NI+CR
FO-A1 = AT/N

A04

Manufacturer's mark

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A02 INSPECTION CERTIFICATE 3.2 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.2 AS PER ISO 10474:2013

A10 Advice of dispatch No./ Date of dispatch: 9398896-21.06.18

A08/ Manufacturer's order/ A03 Certificate No.: 434490-001 Sheet: 13

A05 Established Inspecting body: VLNC

A06 Purchaser: ANCOFERWALDRAM,OOSTE A07.1 No. 3064200

Final receiver: ANCOFERWALDRAM,OOSTE A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design. **S460G2+M**

B03 Any suppl. requirements: EN-10225:01/AWS-4.11:REV.2 OPTION-12;13;18 MDS-Y40:REV.5

D01 Marking and identification, surface appearance, shape and dimensional properties

ITEM NO.: 01-06

EXAMINATION OF MARKING, SURFACE, SHAPE AND DIMENSIONS: THE RESULTS MEET THE REQUIREMENTS.

SURFACE	AS PER EN-10163-B3
THICKNESS	AS PER EN-10029:10-A
LENGTH AND WIDTH	AS PER EN-10029:10
FLATNESS	AS PER EN-10029:10-T5L

D02 Non-destructive tests - Ultrasonic testing

ITEM NO.: 01-06

UT-SPECIFICATION	: EN-10160 CLASS S2 AND E3
SCANNING PLAN BODY	: LONGITUDINALLY SCAN LINES SPACING 50 MM
EDGES	: 100 MM
PERSONNEL QUALIFICATION	: LEVEL 2 IN ACCORDANCE TO ISO 9712

THE TEST RESULTS MEET THE REQUIREMENTS OF THE ORDER.

A04 D F Manufacturer's mark

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Consumables certificate

Inspection Certificate 3.1

LINCOLN ELECTRIC
THE WELDING EXPERTS®

Product	COR-A-ROSTA P-309L		
Size(s) mm	1,2 * n.a.		
Item No.	585285	Customer Ref	email
Lot/Batch	M1FC199096	Our Reference	813619380
Product Line	FCAW	Quantity	20.0 KG
		Customer	
Class	AWS A5.22 : E309LT1-1/-4 T 23 12 L P C / M 2		
	ISO 17633 : T 23 12 L P C/M 2 E309LT1-1 / -4		

Chemical analysis (%) According to EN10204 3.1

C	Si	Mn	P	S	Cr	Ni	Mo	Cu
0.040	0.78	1.23	0.020	0.005	23.6	12.6	0.03	0.05

Mechanical tests, all weld metal

Ferrite According to EN10204 3.1

FN WRC92

12

Remarks

The product identified above has been manufactured, tested and supplied in compliance with a certified ISO 9001 Quality Assurance Programme.

Company
Lincoln Electric Italia srl
Via Fratelli Canepa 8
16010 Serra Riccò
Italy

DUCTIL S.A.

Printed By **Emil Cristian Pavel**
Function **Warehouse operator**
Date **06/DEC/2019**

Cert. No. **00899762**
ZEU_STAINLES , 1

METRODE
SPECIAL ALLO

ROSETTI MARINO

PQR 46/19

preliminary WPS

PQR ref.:	46/19	pWPS (ISO 15614-1 Ed 2019+Rina rules)	46/19	REV.:	0	Data /date	19/11/2019

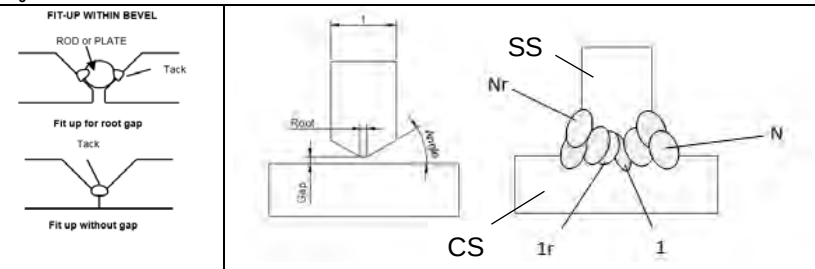
Procedimento di saldatura / Welding process: **136-FCAW** — Tipo / Type: **SEMIAUTOMATIC**

GIUNTO – JOINT

Tipo di giunto / Joint Design: **V** — Supporto / Backing: ☒ Si / Yes ☐ No

Materiale di supporto (tipo) / Backing material (type): ☐ Metallico / Metal ☒ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:



Note: **1.Surfaces cleaned from moisture, oil, grease, paint before welding (by grinding)/** *Pulire le superfici da liquidi, oli, grasso e vernici con molatura prima di saldare.*
2.Minimum tack weld lengths shall be 4 times the thk or 50 mm, whichever is less/ I tacchetti devono essere lunghi almeno 50 mm o 4 volte lo spessore (il più piccolo dei due);

MATERIALE BASE – BASE MATERIAL

Da / from P-N°: **/** — Group N° **8 in acc. to ISO 15608** — A / to P-N°: **/** — Group N° **2 in acc. to ISO 15608**

DA Tipo e grado / From type and grade: **ASTM A240 Tp. 316L (Heat number: 829053)**

A Tipo e grado / To type and grade: **S460 G2+MZ (Heat number: 458532)**

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove **10 mm**

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove **N.A.**

METALLO D'APPORTO – FILLER METAL

	136-GS FCAW	
Spec. N° (SFA)	**A5.22**/ *ISO17663-A*	
AWS N° (CLASS)	**E309LT1-4** *T 23 12 L P C/M 2*	
F-N°	**6**	
A-N°	**8**	
Diametro mat. D'apporto / Size of filler metal	**1,2**	
Gamma spessori /Thick. Range (mm)	**Up to filling**	
Accoppiamento filo-flusso / Electrode-flux (CLASS)	**NA**	
Denom. Comm. Flusso / FLUX trade name	**NA**	
Inserto consumabile / Consumable insert	**NA**	
Altro / other	**Lincoln Cor-A-Rosta P309L**	

POSIZIONI – POSITION

giunto / Joint: **Cianfrino / groove** — Posizione / position **PC+PF** — Progressione / weld progression: **Ascendente / UP hill**

PRERISCALDO – PRE-HEAT

Temp.preriscaldo minima / Min. pre-heat temp: **20°C** — Max temp. Di interpass / Max interpass temp.: **150 °C** — Mantenimento interpass / Interpass maintenance: **N.A.** — Tempo di mantenimento prerisc.: / Maintenance timing: **N.A.**

TRATTAMENTO TERMICO DOPO SALDATURA – POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs): **N.A.** — Temperatura di stasi / Holding temperature °C: **N.A.** — Tempo di stasi / Holding time (min.): **N.A.** — Velocità di raffreddamento: / Cooling rate (°C/Hrs): **N.A.**

GAS DI PROTEZIONE – GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	**Ar+CO2**	**85%+15%**	**15-25 lt/min**
Protezione al seguito / Trailing:	**N.A.**	**N.A.**	**N.A.**
Prot. Al rovescio / Backing:	**N.A.**	**N.A.**	**N.A.**

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current: **DC** — Polarità / Polarity **RP**

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: **N.A.**

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: **N.A.**

Velocità alimentazione filo / Electr. Wire feed speed range: **Self regulated**

TECNICA – TECHNIQUE

Passata / Bead: **Tirata/String** — Dimensione bocchello gas / Orifice of gas cup size: **1/2"** — Pulizia iniziale e fra le passate / Initial and interpass cleaning: **Spazzolatura/Brushing**

Metodo di solcatura a rovescio / Method of back gouging: **Molatura/Grinding** — Oscillazione / Oscillation: **N.A.** — Distanza zona di contatto e pezzo / Contact zone to work distance: **N.A.**

N°Passate / Passes nr.: **Singola-Multiple/Single-Multiple** — Elettrodo multiplo o singolo / Multiple or single electrodes: **Singolo/Single** — Martellatura / Peening: **N.A.**

Altro / Other:

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range		Vel. Avanzamento / Travel speed range (mm/min)		Apporto termico / Heat input (KJ/cm)	
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. Range						
Tack-1	FCAW	E309LT1-4	1,2	RP	180 220	24	28	120	200	10,4	24,6
2	FCAW	E309LT1-4	1,2	RP	180 240	25	29	120	300	7,2	27,8
Grinding											
1R	FCAW	E309LT1-4	1,2	RP	180 220	24	28	120	200	10,4	24,6
2R-nR	FCAW	E309LT1-4	1,2	RP	180 240	25	29	120	300	7,2	27,8

Preparato da / prepared by:	Client/Third part signature:	Client/Third part signature:
M.Del Prete		

NDE certificate

ROSETTI MARINO	VERBALE DI CONTROLLO VISIVO/DIMENSIONALE visual/dimensional inspection report	VDR N° 46-19 data: 10/01/2020
progetto project: NAVALE	cliente client: QATARGAS	commessa job: 119N12
disegno dwg: /	ITP N°: N.A.	fase step: N.A.

oggetto – item

Procedure Qualification Record (PQR) 46/19 PC-PF

Certificato di Qualifica di Procedimento di Saldatura (PQR) 46/19 PC-PF

WE CERTIFY THAT:

ITEMS INDICATED ABOVE HAVE UNDERGONE A VISUAL INSPECTION AND HAVE BEEN ACCEPTED ACCORDING TO THE SPECIFICATION / PROCEDURE MENTIONED AND TO ACCEPTANCE CRITERIA DEFINED IN IT

SI CERTIFICA CHE LE SALDATURE DEI SAGGI SOPRA CITATI SONO STATI SOTTOPOSTI AD ESAME VISIVO AL 100% ALLO STATO COME SALDATO IN ACCORDO ALLE SPECIFICHE E STANDARD CITATI.

RINA Services SpA No. Bo. 0474	Date 29/01/2020
Noted ☐	File
Reviewed ☑	Signature
Witnessed ☐	Cimatti Davide
Approved ☐	

note – remarks

No visible defects have been detected.

Non sono stati rilevati difetti visibili.

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

ISO EN 15614-1 and RINA Rules 2018

Operatore – Operator	Controllo Qualita' - Quality Control	Cliente - Client
ROSETTI MARINO SpA Welding Dept. D. Cenacchi		

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n°
		19249 PT 01 SZ Rev. 00

RAPPORTO D'ESAME LIQUIDI PENETRANTI NDT REPORT - DYE PENETRANT TEST	DATA / Date 10/01/2020	FOGLIO / Sheet 1

CLIENTE/Client	ORDINE/Order	PROGETTO/Project	COMMESSA/Job	
ROSETTI MARINO	/	/	119N12	
CLIENTE FINALE/Final client	OGGETTO/Object	DISEGNO/Dwg	P.F.C./Q.C.P.	FASE/Step
/	PQR	/	/	/

NORMA DI RIFERIMENTO/Reference Normative	PROCEDURA/Procedure	ACCETTABILITA'/Acceptance level
RINA RULES FOR THE CLASSIFICATION OF SHIP PART (D)	/	/

MATERIALE/Material	TEMP. SUPERFICI/ Surface temperature	INTENSITA' LUMINOSA/ Light intensity	
ASTM A240 Tp316L S460	23C°	☑ LUCE BIANCA >500 Lux	☐ LUCE NERA 1000 µW/cm²

STATO DELLA SUPERFICIE – Surface condition			
☑ COME SALDATO/As welded	☑ SPAZZOLATO - Brushed		☐ LAVORATO DI MACCHINA - Machined
☐ MOLATO - Ground	☐ LAMINATO - Rolled		☐ GREZZO - Forged
MATERIALI UTILIZZATI - Material Used	NDT	TIPO/Type	LOTTO NUMERO/Back No.
PULITORE PRELIMINARE/Cleaner	BC1	CLASSE 2 TIPO II METODO A	180607s
PENETRANTE - Penetrant SENSIBILITA' Sensitivity level	K71B2P	TIPO II METODO A	180305Ps
RIVELATORE/Developer	D112A	FORMA d	181025W150s

ISTRUZIONE DI LAVORO/Works instruction		
Step 1 PULITURA PRELIMINARE/Preliminary Cleaning	BY BRUSCHING PLUS BC1	
Step 2 ASCIUGATURA / Drying	CLOTH	
Step 3 APPLICAZIONE PENETRANT/ Penetrant application	SPRAY	
Step3a TEMPO PENETRAZIONE/Dwel time (min)	5÷60	
Step 4 RIMOZIONE PENETRANTE/Removal penetrant	WATER	
Step 5 ASCIUGATURA/Drying process	CLOTH	
Step 6 INTERVALLO APP. RIVELATORE/time int. developer app.	/	
Step 7 APPLICAZIONE RIVELATORE/Developer application	SPRAY	
Step 8 TEMPO DI LETTURA/Checking time	RANGE 10÷30	
Step 8 PULIZIA DOPO CONTROLLO/Cleaner after examination	☐ NO/No	☑ SI/Yes

SALDATURE CONTROLLATE / Welds Verified

THE CONTROL HAS BEEN CARRIED OUT ON THE FOLLOWING COUPON:

PQR 46/19 PC

PQR 46/19 PF

PQR 42/19 PC

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Stefano Zauli 3° Livello SNT-TC-1A / 180[illegible]12	ROSETTI MARINO SpA Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 29/01/2020 File Signature Cimatti Davide

E' vietata la riproduzione parziale del certificato senza l'autorizzazione scritta.
I risultati delle prove si riferiscono unicamente ai particolari esaminati.
Partial reproduction of this certificate must be written authorized.
Test results relate only to examined items.

Z:\Qualita\5 modulistica\Validi\01 moduli cnd\validi\01 2020 rev.0\convenzionali superficiali

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n°	
		19249 UT 03 SZ Rev. 00	
RAPPORTO D'ESAME CON ULTRASUONI Ultrasonic Examination report		DATA / Date 10/01/2020	FOGLIO / Sheet 1

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	/	119N12	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
/	PQR	/	/	/

NORMA DI RIFERIMENTO/Reference Normative	PROCEDURA / Procedure	ACCETTABILITA' / Acceptance level
RINA RULES FOR THE CLASSIFICATION OF SHIP PART (D)	/	/
MATERIALE Material	DIMENSIONI Dimension	SPESSORE NOMINALE / Thk
ASTM A240 Tp316L S460	T-JOINT	15 mm

STATO DELLA SUPERFICIE – Surface condition

☑	COME SALDATO As welded	☐	SPAZZOLATO - Brushed	☐	LAVORATO DI MACCHINA - Machined
☐	MOLATO - Ground	☐	LAMINATO - Rolled	☐	GREZZO - Forged

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG 700	No. SERIE Serial Number	I003937

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	AMPLIFICAZIONE dB value	ONDE Waves
1 IMG	LFI 30	2	10X18	70°	55	LONG
2 Gilardoni	DDM	4	10	0°	46	LONG.

BLOCCO DI CALIBRAZIONE Calibration block	IIW V2	BLOCCO DI RIFERIMENTO Reference block	QT BLOCK 24
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity	DAC ON SDH 3 mm

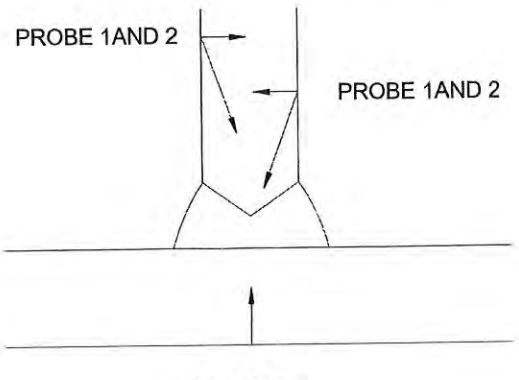
SALDATURE CONTROLLATE / Welds Verified

THE CONTROL HAS BEEN CARRIED OUT ON THE FOLLOWING COUPON:

PQR 46/19 PC

PQR 46/19 PF

PIANO DI SCANSIONE / Scanning plan



RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Not According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Stefano Zauli 2° Livello	ROSETTI MARINO SpA Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 29/01/2020 File Signature Cimatti Davide

E' vietata la riproduzione parziale del certificato senza l'autorizzazione scritta.
I risultati delle prove si riferiscono unicamente ai particolari esaminati.
Partial reproduction of this certificate must be written authorized.
Test results relate only to examined items.

Z:\Qualita\5 modulistica\Validi\01 moduli cnd\validi\01 2020 rev.0\convenzionali volumetrici

ROSETTI MARINO

PQR 46/19

Mechanical test report

INSPECTA S.R.L.	**TEST REPORT** ***RAPPORTO DI PROVA***		ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO **LAB N°1607 L**
	N° 018-00210-19 **Data: 28/01/2020**	**Rev.00**	

Object: *Oggetto:*	**MECHANICAL TEST ON PQR 46/19 (PC+PF)**			Pag. 1 di 12
Specimen: *Saggio:*	**13/2020PC** **13/2020PF**	**#Base Material:** *Materiale Base:*	**ASTM A240 Tp 316L with** **EN10225 S460G2+M**	**Thk 10,00 mm with** **10,00 mm**
		# Informazione fornita dal cliente/ Information provided by the customer		
Customer: *Committente:*	**ROSETTI MARINO SPA**			
Address: *Indirizzo:*	**Via Trieste, 230 - 48122 Ravenna (RA)**			
Final customer:. *Cliente finale:*	//			
Your delivery note n°: *Vs. DDT di consegna*	**n°** //	**Date:** *Data:* //	**MD52** *MD 52* **004/2020**	**Date:** *Data:* **10/01/2020**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **28/01/2020**	**End of activities:** *Fine prove:*		**Date:** *Data:* **28/01/2020**

PROVE RICHIESTE

☐ **TENSILE TEST/***Trazione*	☐ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*
☐ **BEND TEST/***Piega*	☐ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root /*Dritto/Rovescio* ☐ Side/ *Laterale*
☐ **IMPACT TEST/***Resilienza*	☐ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*
☒ **MACROEXAMINATION TEST /** *Macrografia*		
☒ **HARDNESS TEST/** *Durezza*	☐ HV 5	☒ HV 10
☐ **FRACTURE TEST/** *Frattura*	☐ Plate on Plate/ *Piastra su Piastra*	☐ Pipe on Plate/*Tubo su Piastra*
☐ **CHEMICAL ANALYSIS/***Analisi Chimica*		
☐ **MICROEXAMINATION TEST /** *Micrografia*		
☐ **OTHER (Specify)/***Altro/(Specificare)*		

Allegati /Attachments: *NONE*

NOTE/ Remarks: **REFERENCE CODE FROM CUSTOMER REQUEST: EN 15614-1**

Informazioni aggiuntive fornite dal cliente:
Additional information provided by the customer

*** Dove indicato la prova si intende non accreditata da ACCREDIA**

Laboratory Responsible *Responsabile Laboratorio* *Sig. Claudio Pettinato*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
INSPECTA srl 28/01/2020	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services S.p.A. No. Bo. CL 370/a Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 28/01/2020 File Signature Cimetti Davide

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I risultati di prova si riferiscono al campione così come ricevuto,essendo il campionamento eseguito dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%.The results in this test report refers only to the specimen that has been tested.The customer undertakes to print out /reproduce the test report. Any partial reproduction is prohibited.Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory.The test results refer to the sample as received, since the sampling is performed by the customer..Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku = 2 equivalent to a level of confidence of 95 % .

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing:28/01/2020
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* | ☒ *UNI EN ISO 9015-1: 2011* | ☐ *ASTM E 92-17* | ☐ _____

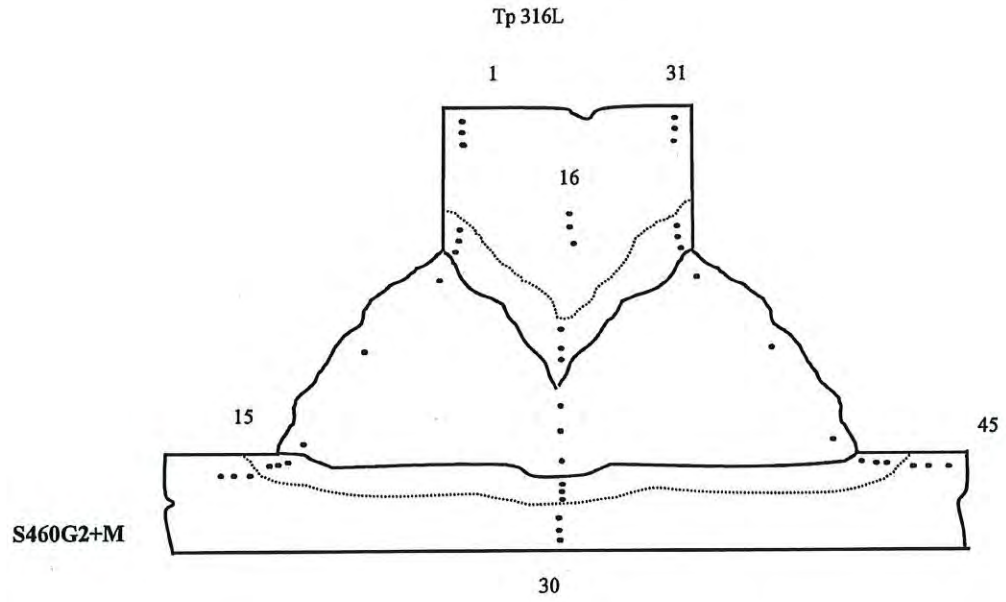
Serial N. 43030614C

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *Procedura interna*	PP10 rev.03	Sample Identification *Identificazione provino*	13A/2020 PC	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	22°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A:			Base Material Side B:	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30
31 - 32 - 33	34 - 35 - 36	37 - 38 - 39	40 - 41 - 42	43 - 44 - 45



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	148-145-151	//	16 – 17 - 18	151-151-153	//	31 – 32 - 33	153-152-151	//
4 - 5 - 6	184-188-192	//	19 - 20 - 21	193-194-186	//	34 - 35 - 36	176-172-175	//
7 – 8 - 9	179-178-179	//	22 – 23 - 24	183-180-179	//	37 – 38 - 39	169-177-185	//
10 - 11 - 12	207-196-194	//	25 - 26 - 27	201-193-202	//	40 - 41 - 42	200-190-201	//
13 – 14 - 15	200-199-198	//	28 – 29 - 30	198-196-199	//	43 – 44 - 45	199-198-198	//

Remarks/ *Note:*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Davide Ciregia	sig. Claudio Pettinato	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Service No. Bo. 0 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ Date 28/01/2020 File Signature Cimatti Davide
28/01/2020	28-01-2020 Via Ravegnana, 379/a 47122 Forlì (FC) P. IVA 03944480403		

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing:28/01/2020
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* | ☒ *UNI EN ISO 9015-1: 2011* | ☐ *ASTM E 92-17* | ☐ _____

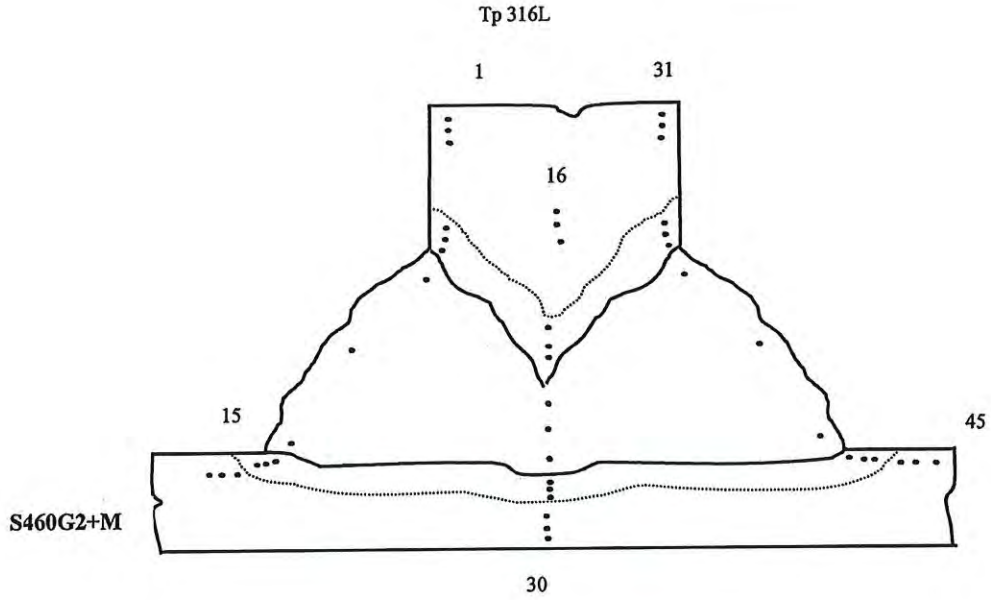
Serial N. 43030614C

* Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA

Internal procedure *Procedura interna*	PP10 rev.03	Sample Identification *Identificazione provino*	13B/2020 PC	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	22°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A:			Base Material Side B:	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30
31 - 32 - 33	34 - 35 - 36	37 - 38 - 39	40 - 41 - 42	43 - 44 - 45



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**151-151-155**	//	16 – 17 - 18	**186-192-185**	//	31 – 32 - 33	**149-157-147**	//
4 - 5 - 6	**181-189-188**	//	19 - 20 - 21	**203-201-203**	//	34 - 35 - 36	**175-178-176**	//
7 – 8 - 9	**182-183-187**	//	22 – 23 - 24	**193-194-186**	//	37 – 38 - 39	**177-175-189**	//
10 - 11 - 12	**207-204-193**	//	25 - 26 - 27	**188-190-198**	//	40 - 41 - 42	**204-191-188**	//
13 – 14 - 15	**198-199-198**	//	28 – 29 - 30	**200-199-200**	//	43 – 44 - 45	**200-198-199**	//
Remarks/ *Note:*								

Laboratory Technician
Tecnico di Laboratorio
Dott. Ing. Davide Ciregia
INSPECTA S.R.L.
Laboratorio Tecnologico
29/01/2020

Laboratory Responsible
Responsabile Laboratorio
sig. Claudio Pattinato
INSPECTA srl
28-01-2020
Via Ravegnana, 379/a
47121 Forlì (FC)
P. IVA 03944480403

Customer Inspector
Ispettore del cliente
CASETTI MARINO SpA
A. Khalifa
Welding Dept.

RINA Services — No. Bo. 047
Third part Inspector *Ispettore Terza parte*
Date 28/01/2020
Noted ☐
Reviewed ☐
Witnessed ☒
Approved ☐
File
Signature
Cimatti Davide

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing:28/01/2020
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* ☒ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

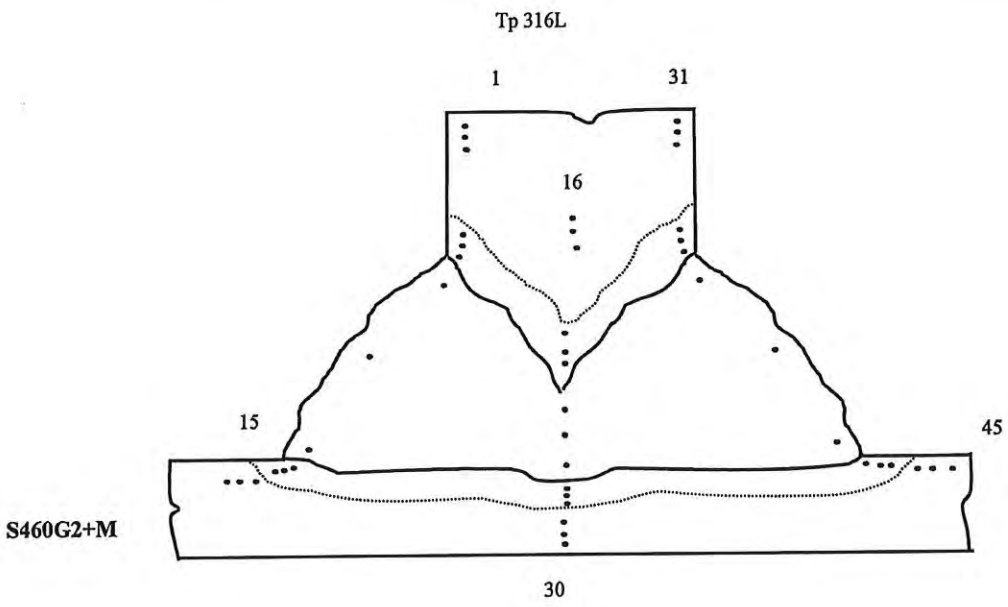
Serial N. 43030614C

* Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA

Internal procedure *Procedura interna*	PP10 rev.03	Sample Identification *Identificazione provino*	13A/2020 PF	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	22°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A:			Base Material Side B:	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30
31 - 32 - 33	34 - 35 - 36	37 - 38 - 39	40 - 41 - 42	43 - 44 - 45



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**156-159-166**	//	16 – 17 - 18	**194-197-198**	//	31 – 32 - 33	**162-161-165**	//
4 - 5 - 6	**178-177-175**	//	19 - 20 - 21	**205-202-193**	//	34 - 35 - 36	**180-178-178**	//
7 – 8 - 9	**179-190-175**	//	22 – 23 - 24	**191-191-201**	//	37 – 38 - 39	**187-189-186**	//
10 - 11 - 12	**200-189-190**	//	25 - 26 - 27	**192-191-197**	//	40 - 41 - 42	**207-192-190**	//
13 – 14 - 15	**198-198-197**	//	28 – 29 - 30	**195-198-198**	//	43 – 44 - 45	**210-215-206**	//

Remarks/ *Note:*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Davide Ciregia	sig. Claudio Pettinato	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Servi... No. Bo. ... Noted ☐ Reviewed ☐ Witnessed ☐ Approved ☐ Date 28/01/2020 File ... Signature Cimatti Davide
Laboratory Technician 28/01/2020	INSPECTA srl 28-01-2020 Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403		

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing:28/01/2020
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* ☒ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

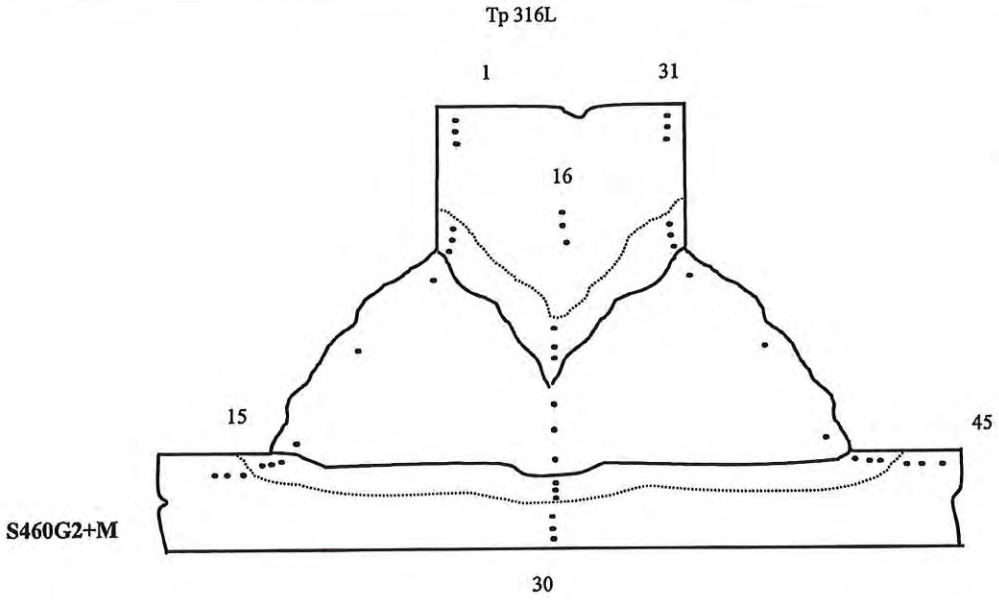
Serial N. 43030614C

* Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA

Internal procedure *Procedura interna*	PP10 rev.03	Sample Identification *Identificazione provino*	13B/2020 PF	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	22°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A:			Base Material Side B:	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30
31 - 32 - 33	34 - 35 - 36	37 - 38 - 39	40 - 41 - 42	43 - 44 - 45



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**152-158-159**	//	16 – 17 - 18	**190-190-201**	//	31 – 32 - 33	**155-156-160**	//
4 - 5 - 6	**178-178-176**	//	19 - 20 - 21	**212-212-209**	//	34 - 35 - 36	**182-181-176**	//
7 – 8 - 9	**172-187-184**	//	22 – 23 - 24	**194-193-187**	//	37 – 38 - 39	**173-181-184**	//
10 - 11 - 12	**206-197-191**	//	25 - 26 - 27	**199-186-180**	//	40 - 41 - 42	**204-193-198**	//
13 – 14 - 15	**199-199-198**	//	28 – 29 - 30	**197-199-198**	//	43 – 44 - 45	**197-196-198**	//

Remarks/ *Note:*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Davide Ciregia	sig. Claudio Pettinato	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services S.p.A. No. Bo. 0171 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ File Signature Cimatti Davide
28/01/2020	28-01-2020		28/01/2020

INSPECTA srl Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403

MACRO EXAMINATION TEST
Prova Macrografica

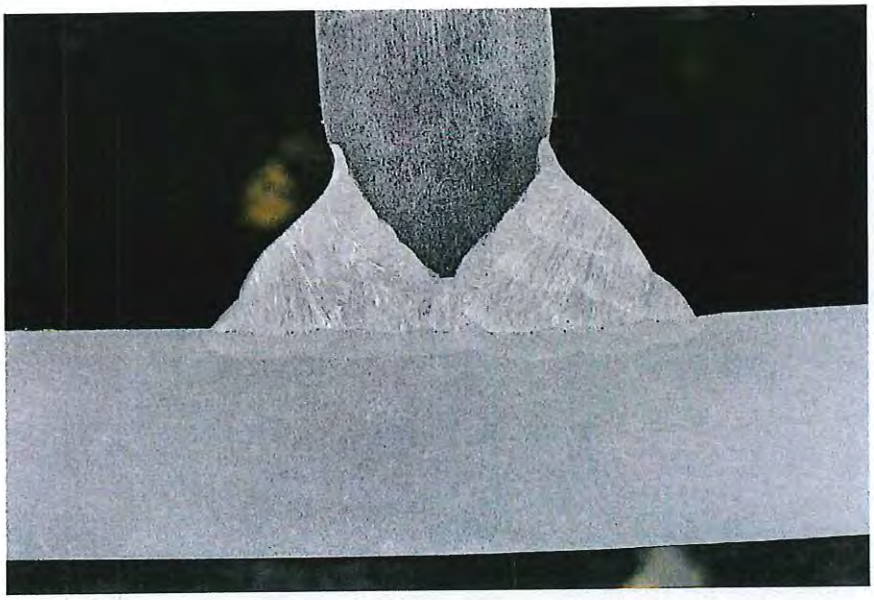
Date of Testing:28/01/2020
Data esecuzione prova::

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2019* ☐ *AWS D1.1:2015*

Serial N.. EOS 650D/EFS

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *PPI2 rev.01* *Procedura internal*		**Test temperatura** *Temperature Test*	**22°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**AQUA REGIA + NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**13/2020 A PC**	**Magnification:** *Ingrandimento:*	**Photo at: 3.2x** **Examination at: 10x**
Designation: *Designazione:*	**ISO 17639-A-E-1.2/8.1/8.1 AQUA REGIA + NITAL 5%**		



Remarks / *Note:*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Davide Ciregia	*sig. Claudio Pettinato*	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services SpA No. Bo. 0474
- INSPECTA srl - Laboratory Technician 28/01/2020	INSPECTA srl 28-01-2020 Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403		Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 28/01/2020 File Signature Cimatti Davide

MACRO EXAMINATION TEST
Prova Macrografica

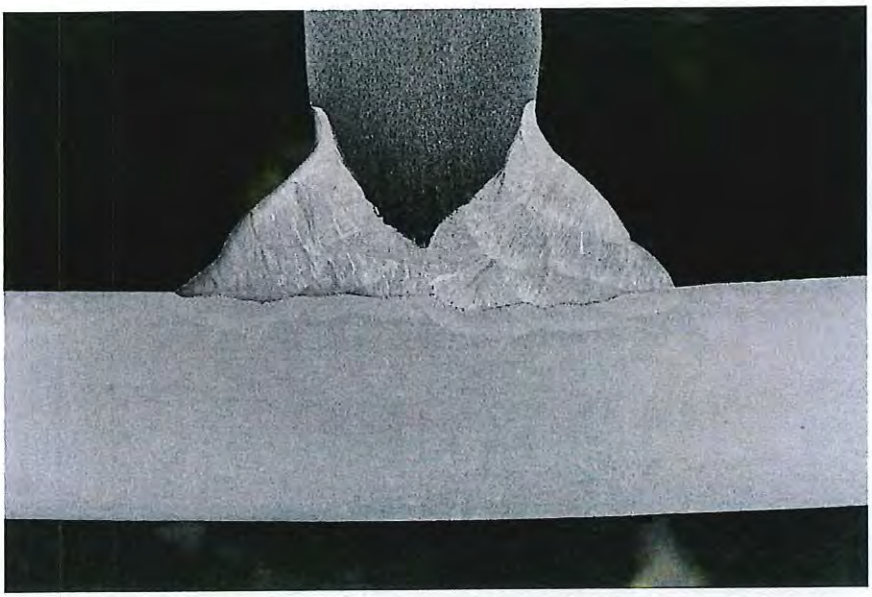
Date of Testing:28/01/2020
Data esecuzione prova::

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2019* ☐ *AWS D1.1:2015*

Serial N.. EOS 650D/EFS

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *PP12 rev.01* *Procedura internal*		**Test temperatura** *Temperature Test*	**22°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**AQUA REGIA + NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**13/2020 B PC**	**Magnification:** *Ingrandimento:*	**Photo at: 3.2x** **Examination at: 10x**
Designation: *Designazione:*	**ISO 17639-A-E-1.2/8.1/8.1 AQUA REGIA + NITAL 5%**		



Remarks / *Note:*

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Davide Ciregia	sig. Claudio Pettinato	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services SpA No. Bo. 0474
Laboratory Technician 28/01/2020	INSPECTA srl 28-01-20 Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403		Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐
			Date 28/01/2020 File Signature Cimatti Davide

MACRO EXAMINATION TEST
Prova Macrografica

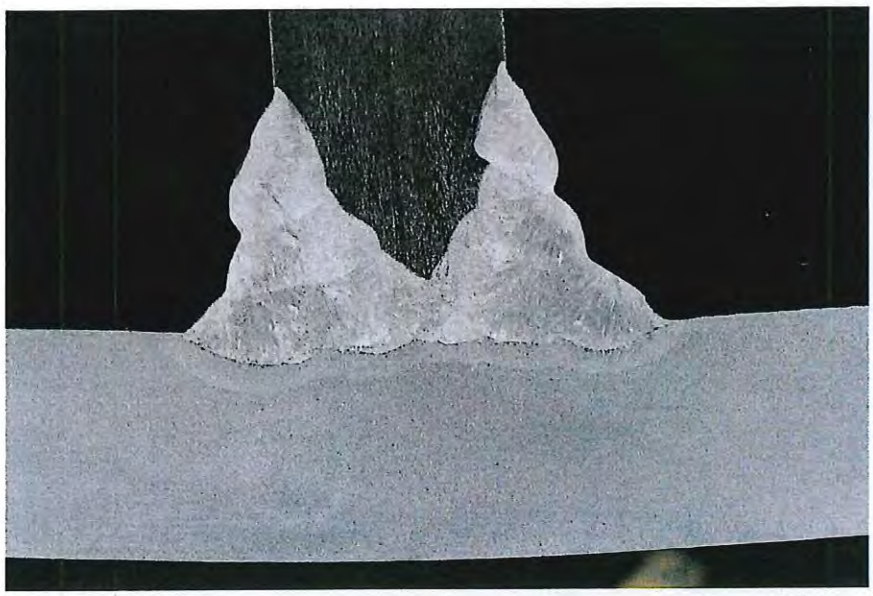
Date of Testing:28/01/2020
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2019* ☐ *AWS D1.1:2015*

Serial N.. EOS 650D/EFS

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *PP12 rev.01* *Procedura internal*		**Test temperatura** *Temperature Test*	**22°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**AQUA REGIA + NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**13/2020 A PF**	**Magnification:** *Ingrandimento:*	**Photo at: 3.2x** **Examination at: 10x**
Designation: *Designazione:*	**ISO 17639-A-E-1.2/8.1/8.1 AQUA REGIA + NITAL 5%**		



Remarks / *Note:*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Davide Ciregia	sig. Claudio Pettinato	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services SpA No. Bo. 0474
Laboratory Technician 28/01/2020	INSPECTA srl 28-01-2020 Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403		Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐
			Date 28/01/2020 File Signature Ciregia Davide

MACRO EXAMINATION TEST
Prova Macrografica

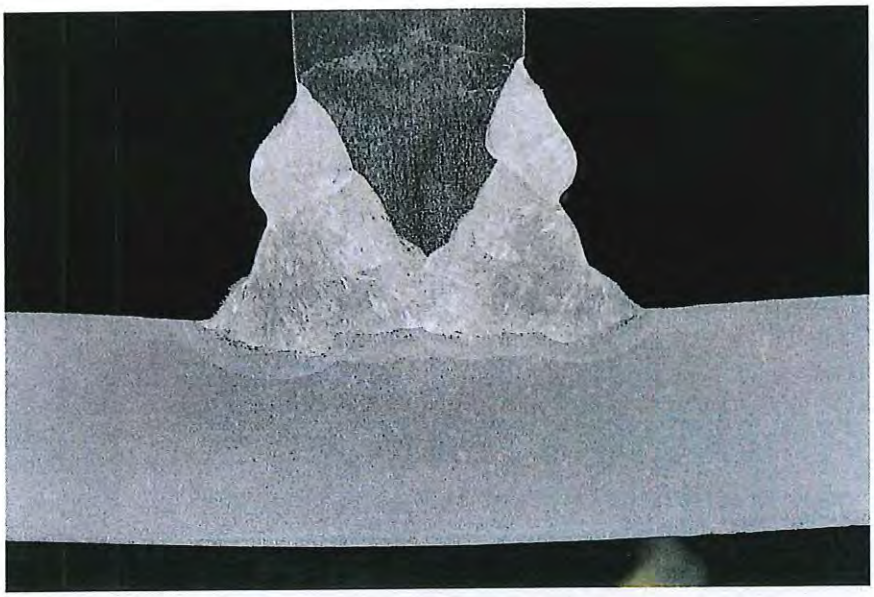
Date of Testing:28/01/2020
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2019* ☐ *AWS D1.1:2015*

Serial N.. EOS 650D/EFS

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *PP12 rev.01* *Procedura internal*		**Test temperatura** *Temperature Test*	**22°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**AQUA REGIA + NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**13/2020 B PF**	**Magnification:** *Ingrandimento:*	**Photo at: 3.2x** **Examination at: 10x**
Designation: *Designazione:*	**ISO 17639-A-E-1.2/8.1/8.1 AQUA REGIA + NITAL 5%**		



Remarks /
Note:

Laboratory Technician *Tecnico di Laboratorio* Dott. Ing. Davide Ciregia	Laboratory Responsible *Responsabile Laboratorio* Sig. Claudio Pettinato	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Laboratory Technician 28/01/2020	INSPECTA srl 28-01-2020 Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 28/01/2020 File Signature Cimatti Davide

ROSETTI MARINO	Welding Procedure Approval Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 49/06	Sheet/Foglio 1/4

Manufacturer's Welding Procedure. Reference No Procedura di saldatura del costruttore. N. di riferimento	49/06 REV. 0				
Manufacturer / Costruttore	ROSETTI MARINO S.p.A.				
Address / Indirizzo	VIA TRIESTE 230 - 48100 RAVENNA				
Code, Testing Standard / Codice, Normativa	EN 15614:2004 & MAERSK OLIE OG GAS AS TECHNICAL STANDARD TS 12 REV 4				
Date of welding / Data esecuzione saggio	06-12-2006				
EXTENT OF APPROVAL / VALIDITA' DELL'APPROVAZIONE					
Welding process / Processo di saldatura	a) 141 - GTAW		b)		c) /
Type(s) / Tipo	a) Manual / Manuale		b)		c) /
Joint type / Tipo di giunto	BW on pipe				
Parent Material Group & sub-Group	Group 1.2 with 8.1				
Parent material thickness / Spessore (mm)	3,73 mm 3,0÷7,46	Fillet weld (mm)	Unlimited throat, base metal thickness 3,0÷4,47		
Weld metal thickness/ spessore saldato	141 3,0÷7,46 mm				
Single or Multi-pass / passata singola o multipla	MULTIPLE				
Outside diameter / Diametro esterno (mm)	21,34 Range 10,67 to 42,				
Filler material Designation / Classificazione materiale d'apporto	**141** :AWS 5.9 ER309L				
Filler material Maker / Produttore materiale d'apporto	ESAB SALDATURA				
Filler material Size / Dimensioni materiale d'apporto	141 ∅ 2,4 mm				
Shielding gas, flux / Gas di protezione, flusso	I 1				
Backing gas, / Gas di supporto	I 1				
Type of welding current & polarity	DC – SP	Heat input / Apporto termico (kJ/mm)	± 25% see sheet 2/4		
Welding position / Posizione di saldatura	PC				
Preheat / Preriscaldo (°C)	20	Interpass temperature / Temp. di interpass (°C)	150		
Post-Weld Heat Treatment and/or ageing / Trattamento Termico e/o Invecchiamento	N.A.				
Other information / Altre informazioni	NONE				
Welder's name / Nome del saldatore	**Farina Salvatore** (punzone H47)				
Welding test conducted by / Prove condotte da	Rosetti Marino S.p.A. – Ravenna				
Mechanical tes conducted by / Prove meccaniche condotte da	Control – Ravenna				
Laboratory report reference N. / Rapporto di prova N.	Report N° 496 Dated 22-12-2006				
Test carried out in the presence of Test condotti alla presenza di	RINA SpA	Test results are Risultato prove	Acceptable		

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of EN 15614:2004 +MAERSK OLIE OG GAS AS TECHNICAL STANDARD TS 12 REV 4

Si certifica che i dati riportati in questo rapporto sono corretti e che i saggi di saldatura sono preparati, saldati e testati in accordo con le richieste di EN 15614:2004 + OLIE OG GAS AS TECHNICAL STANDARD TS 12 REV 4

Location / Luogo	Date of issue / Data di emissione	Examiner or Examining Body /
RAVENNA	22-12-2006	RINA SpA

ROSETTI MARINO S.p.A.

ROSETTI MARINO S.p.A.
Responsabile saldatura
Welding Engineer
S. Solmi

EWF
S. SOLMI
I EWT 30416
EUROPEAN WELDING TECHNOLOGIST

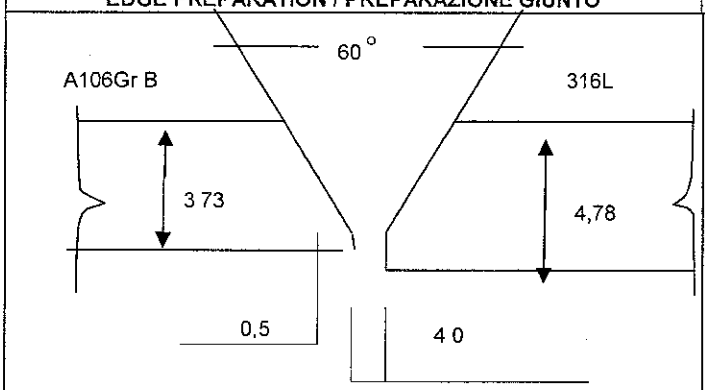
Name and signature / Nome e firma

RINA
1861

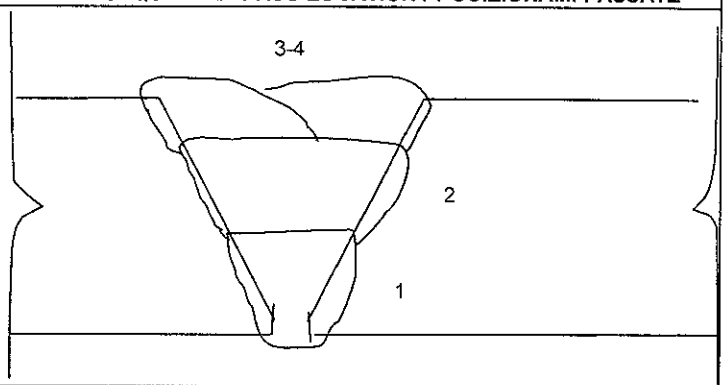
RINA
S. Sabatino

Manufacturer / Costruttore	ROSETTI MARINO S.p.A.					
Address / Indirizzo	VIA TRIESTE 230 - 48100 RAVENNA			Examiner or Examining body / Ente certificante		
Procedure approval record (WPAR) N° / Qualifica di procedimento N.	49/06	Date/Data	22-12-2006	Ref. N./N. Rif.	RINA	
WPS No. / Procedure N.	49/06	Rev.	0	Date/Data	23-11-2006	
Welding Process(es) / Processo(i) di saldatura	a) 141 - GTAW	b)		c) /		
Types / Tipi (Man., Autom., Semi-autom.)	a) Manual / Manuale	b)		c) /		
JOINTS / GIUNTI Joint type / Tipo di giunto	Butt weld "V" groove					
BACKING / Sostegno	WELD METAL GTAW (first pass)					

EDGE PREPARATION / PREPARAZIONE GIUNTO



WELDING SEQUENCE - PASS LOCATION / POSIZIONAM. PASSATE



Run or layers / Passate o strati	Proc.	Filler metal / Materiale d'apporto Size / Dim (mm)		Amp.		Volt.		Travel Speed / Veloc. Sald.	Heat Input / Apporto Termico
		1E	2E	1E	2E	1E	2E	mm/min	kJ/mm
1	141	2,4		82		11		60	0,94
2	141	2,4		85		11		60	0.90
3-4	141	2,4		85		11		80	0,68

PARENT MATERIAL / MATERIALE DI BASE

Spec. Type & Grade / Specif. Tipo e Grado	ASTM A106		Grade B	Yield > 275 N/mm2	
to Spec. Type & Grade / Specif. Tipo e Grado	ASTM A312		Tp 316L		
Group No. / Gruppo	1.2	To / al	Group No. / Gruppo	8.1	
Thickness of test coupon / Spessore del saggio (mm)	3,73	to / con	4,78		
Diameter of test coupon / Diametro del saggio (mm)	21,34	to / con	21,34		
Other / Altro	Heat number 83215 for A106Gr B Heat number 34693 for A312Tp316L				

FILLER METALS / MATERIALE D'APPORTO	a) 141	b) 111	c)
Specification No. EN	AWS 5.9		
Class / Classificazione	ER 309L		
Size of filler metal / Dimensioni materiale d'apporto (mm)	2,4 (heat 672011)		
F.M. Trade name / Nome commerciale materiale d'apporto	SOUDOTIG 309L		
Manufacturer / Fabbricante	SOUDOMETAL		
Flux Trade name / Nome Commerciale Flusso	N.A.		
Manufacturer / Fabbricante	N.A.		
Deposited Weld Metal / Metallo depositato (mm)	3,73		
Other / Altro			

RINA S. Sabatino

EWF EUROPEAN WELDING TECHNOLOGIST S. SOLIMI I EWT 30/06

ELECTRICAL CHARACTERISTICS / CARATTERISTICHE ELETTRICHE		
Current / Corrente		DC
Polarity / Polarità		141 : SP
Ampere – Volt		See table page 2/4 / Vedi tabella pagina 2/4
Tungsten Electrode Type & Size / Tipo e Dimensioni Elettrodo W		AWS 5.12 EWTh2 D 2,4mm
Mode of Metal Transfer for GMAW / Modo di trasf. per MAG		N.A.
Other / Altro		None
TECHNIQUE / TECNICA		
Orifice or gas cup size / Diametro dell'ugello o ceramica		8 mm
String or Weave Bead / Cordoni Stretti o Larghi		String/Stretti
Initial and interpass cleaning / Pulizia iniziale e tra le passate		Brushing and/or grinding - Molatura e/o spazzolatura
Method of back gouging / Metodo di solcatura		N.A.
Oscillation / Oscillazione:		
	Amplitude / Ampiezza	N.A.
	Frequency / Frequenza	N.A.
Distance contact tube-work piece / Distanza libera filo		/
Multiple, Single Pass (per Side) / Passata Singola o Mult. (per lato)		Multiple
Single or Multiple Electrodes / Elettrodi Multipli o SIngoli		Single
Torche angle direction of welding / Angolo e direzione torcia		N.A.
Other / Altro		/
WELDING POSITIONS / POSIZIONI DI SALDATURA		
Position of groove or fillet/Posizione dello smusso o del cordone d'angolo		PC
Other / Altro		/
PREHEAT / PRERISCALDO		
Preheat Temperature / Temperatura di Preriscaldo (°C)		20
Interpass Temperature / Temperatura di Interpass (°C)		150
Other / Altro		/
POSTWELD HEAT TREATMENT / TRATTAMENTO TERMICO		
Temperature / Temperatura (°C)		N.A.
Time / Tempo (h)		N.A.
Other / Altro		

GAS

	Percent Composition / Composizione %			
	Gas(es) / Gas	(Mixture) / (Miscela)	Flow rate / Portata	
Plasma	/	/	/	
Shielding / Protezione	I 1	99,99	14	
Trailing /Aggiuntivo	/	/	/	
Backing / Al rovescio	I 1	99,99	16	
Other / Altro	/	/	/	

RINA 1861

RINA S. Sabatino

EWF S.SOLMI I EWT 30416 EUROPEAN WELDING TECHNOLOGIST

ROSETTI MARINO	Welding Procedure Approval Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 49/06	Sheet/Foglio 4/4

NON DESTRUCTIVE EXAMINATIONS / ESAMI NON DISTRUTTIVI							
	Acceptable/Accettabile			Not performed / Non eseguito			Report No. / Rapporto N.
Visual examinations / Visivo		X					VDR 49/06
Penetrant test / Liquidi penetr.		X					PT Report 49/06
Magnetic particle test / Magnet.					X		
Radiographic test / Radiografico		X					RT Report 330
Ultrasonic test / Ultrasonoro					X		

TEST RESULT / RISULTATO DELLE PROVE

TENSILE TEST / PROVA DI TRAZIONE

Specimen type and No. / Provette tipo e N.	Re N/mm²	Rm N/mm²	A % on/su	Z %	Fracture Location Posizione Rottura	Remarks Note
Requirements / Richieste	/	≥ 415	/	/		
TRANSVERSE 1	/	631	/	/	Weld metal	
TRANSVERSE 2	/	787	/	/	Weld metal	

BEND TEST / PROVA DI PIEGAMENTO — Former diameter / Diametro Mandrino mm

Type & N. / Tipo e N.	Bend angle / Angolo di piega	Elongation / Allungamento	Results / Risultati
N. 2 Transverse root bend	180°	Not required	Satisfactory
N. 2 Transverse face bend	180°	Not required	Satisfactory

IMPACT TEST / PROVA DI RESILIENZA — Requirements / Richieste Joule

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction Posiz. Intaglio / Direzione	Notch Type / Tipo Intaglio	Test Temp. Temp. Prova (°C)	Impact value/average Valori/media (joule)		Remarks / Note
/						
/						
/						
/						

FILLET WELD TEST / PROVA SALDATURA D'ANGOLO

Result – Satisfactory Risultato - Soddisfacente	Yes -	/	No -	/		Penetration into Parent Metal Penetrazione nel Materiale Base	Yes -	/	No -	/
Macro Results / Risultati Macro: -	/									

OTHER TESTS / ALTRE PROVE

Location of measurement (Sketch) (if required) / Posizione delle impronte (quando richieste)

Type of test / Tipo di prova	
Macro results	Satisfactory-See CONTROL Certificate No. 496 dated 22-12-2006
Hardness HV 10 side carbon steel	Root Base metal 195 Heat affected zone 245
	Face Base metal 198 Heat affected zone 220-270

Date / Data
22-12-2006

Examiner or Examining Body / Esaminatore o Ente Certificante
RINA SpA

ROSETTI MARINO S.p.A.

Name and signature / Nome e firma

ROSETTI MARINO S.p.A.
Responsabile saldatura
Welding Engineer
S. Solmi

EWF
S. SOLMI
I EWT 30416
EUROPEAN WELDING TECHNOLOGIST

Control Snc	**LABORATORIO DI CONTROLLI E PROVE**	
Sede Amministrativa - Laboratorio Via Attilio Monti. 15 - 48100 Ravenna Telefono - 0544 590597	***CERTIFICATO PROVE MATERIALI*** *TEST CERTIFICATE*	**N. 496 Fg.1/2** DATA / Date **22-dic-2006**

COMMITTENTE / *CUSTOMER*: **ROSETTI MARINO S.p.A.**

OGGETTO / *OBJECT*	**Dimensione Provino mm.** Size Test mm :	**Commessa** Job	**Materiale** Type Material
WPQR 49/2006	Diam : **1/2"** Spess : **4,8**	**106A10**	**A 312 Tp 316L-A 333 Gr.6**

NORME DI COLLAUDO / *SPECIFICATIONS*	*ENTE COLLAUDO* / *INSPECTOR*
UNI EN 15614-1:2004 / IS 12	**RINA Spa**

PROVE MECCANICHE
MECHANICAL TESTS

CARATTERISTICHE RICHIESTE / *REQUIREMENTS* ---------->						*Snervamento* *Yeld stress* *Fs(N)*	*Rs* *N/mmq*	*Massimo* *Total Load* *Fm(N)*	*Rm* *N/mmq*		*Allung* *Elong* *%*	*Resilienza/Impact Test* JOULE °C *Individual*	*Average*
									415				
Pos. *Pos.*	*Prova Nr* *Test N°*	*Dimensioni* *Size mm*	*Area* *So mmq*	*Lo mm*	*Lu mm*	***RISULTATI / RESULT*** *Fs*	*Rs*	*Fm*	*Rm*		*A%*		
TRANSVERSE TENSILE TEST UNI EN 895													
TWT	1a	12,2 x 3,6	**43,9**					27700	**631**	**FIW**			
TWT	1b	12,6 x 3,5	**44,1**					34700	**787**	**FIW**			

BEND TEST UNI EN 910				
SBB	n° 4	x	N.A.	**N.A.**
RBB	n° 2	10 x 5	ANGLE: 180° DIAMETER OF THE FORMER 20 mm	**ACCEPTABLE**
FBB	n° 2	10 x 5	ANGLE: 180° DIAMETER OF THE FORMER 20 mm	**ACCEPTABLE**

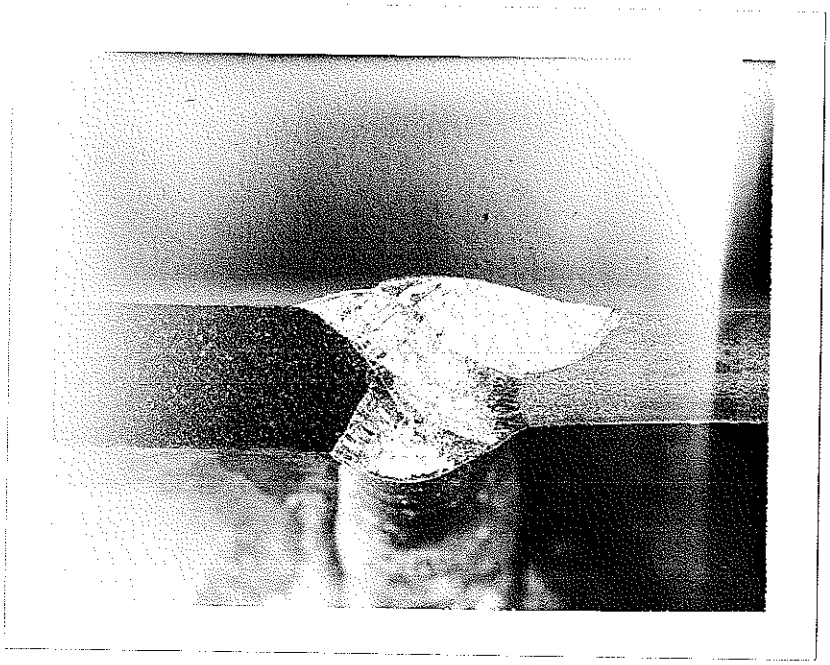
VWT 0/2=ZONA FUSA/WELD MATERIAL
VHT 0/2=LINEA DI FUSIONE/FUSION LINE
VHT 2/2=LINEA DI FUSIONE + 2mm /FUSION LINE + 2mm
VHT 5/2=LINEA DI FUSIONE + 5mm /FUSION LINE + 5mm
TWT=TRAZIONE TRASVERSALE SALDATURA/TRANSVERSE WELD TENSILE TEST
TWL=TRAZIONE LONG SALDATURA / ALL WELD LONG TENSILE
FOW=ROTTURA DUTTILE FUORI SALDATURA/ DUCTILE FAILURE OUT OF WELD
SBB=PIEGA LATERALE TRASVERSALE/TRANSVERSE SIDE BEND TEST
RBB=PIEGA TRASVERSALE AL ROVESCIO/TRANSVERSE ROOT BEND TEST
FBB= PIEGA TRASVERSALE AL DIRITTO/TRANSVERSE FACE BEND TEST
FIW=ROTTURA DUTTILE IN SALDATURA/ DUCTILE FAILURE IN WELD

OPERATORE / Operator	COMMITTENTE / Customer	ISPETTORE / Inspector
CONTROL S.N.C. Sez. Laboratorio Prove Materiali Il Tecnico Mercatali Alessio	ROSETTI MARINO S.p.A. Responsabile Saldatura Welding Engineer S. Solmi	RINA S. Valentino

Control Snc Sede Amministrativa - Laboratorio Via Attilio Monti 15 - 48100 Ravenna Telefono - 0544 590597	LABORATORIO DI CONTROLLI E PROVE CERTIFICATO PROVE MATERIALI TEST CERTIFICATE MACRO EXAMINATION	N. 496 Fg. 2/2 DATA / Date 22-dic-06

COMMITTENTE / CUSTOMER	ROSETTI MARINO S.p.A.		
OGGETTO / OBJECT: WPQR 49/2006	Dimensione Provino/Size mm. Diam.: 1/2" Spess.: 4,8	Wps n° 106A10	Materiale/Material A 312 Tp 316L-A 333 Gr.6

MACRO EXAMINATION UNI EN 1321



HARDNESS HV 10



1 = 220
2 = 245
3 = 270
4 = 265
5 = 245
6 = 198
7 = 195

MACROEXAMINATION:	**ACCEPTABLE**
VISUAL EXAMINATION	**ACCEPTABLE**
ETCH/ATTACCO :	**ACQUA REGIA**
MAGNIFICATION/INGRANDIMENTO:	**4 X**

OPERATORE / Operator	COMMITTENTE / Customer	ISPETTORE / Inspector
CONTROL S.N.C. Sez. Laboratorio Prove Materiali Il Tecnico Mercatali Alessio	ROSETTI MARINO S.p.A. Responsabile saldatura Welding Engineer S. Solmi	RINA S. Capatino

ROSETTI MARINO SPA

TABELLA DI SALDATURA
Welding Table

pWPS	49/06	Posizione / Position	2G

Tipo di saldatura / Welding Process	GTAW
Filo / Wire	SOUDOMETAL SOUDOTIG diam. 2,4 mm heat 672011
Filo / Wire	

PQR49/06

Materiale base **ASTM A 312 Tp 316L**
Base material **PIPE 1/2" Thk. 4,78 Heat 34693**
ASTM A 106Gr.B
PIPE 1/2" Thk. 3,73 Heat 83215

	Gas / Gas (es)	Miscela / Mixture	Portata / Flow Rate
Protezione/Shielding	Ar	99,990%	14 L/min
Protezione/Shielding	N.A	N.A	N.A
Al rovescio/Backing	Ar	99,990%	16 L/min

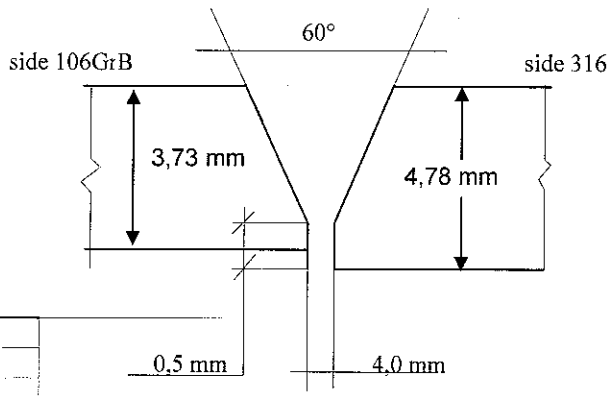
Welder Name/Nome saldatore: **Farina Salvatore stamp H47**
Welder Name/Nome saldatore:

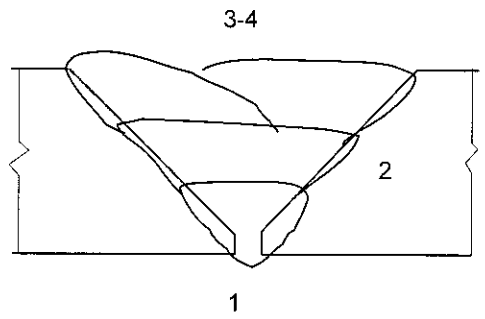
Prerisc: / Preheat: **20°C**
Temp max di interpass: **150°C**

Elettrodo / Electrode
Ravenna: **06/12/06**
Officina Rosetti: **X**
Cantiere:

Corrente / Current: **DC**
Polarità / Polarity: **GTAW DP**
Preparazione / Joint Design: **V**

Pass. N. / Pass N.	Proced. / Process	Elettr. / Electr.	Ampere / Amps	Volts / Volts	Vel.mm/1' / Trav.Sp.	H.I. / KJ/mm
1	GTAW	2,4	82	11	50	1,08
2	GTAW	2,4	85	11	60	0,94
3-4	GTAW	2,4	85	11	70	0,80





Note / Notes

RINA ROSETTI MARINO S.p.A
S. Sabatino Responsabile saldatura
Welding Engineer
S. Solmi

ROSETTI MARINO SPA
Ravenna Works

PROCEDURA DI SALDATURA (in accordo EN 15614/1+TS-12)
Welding Procedure Specification (according EN 15614/1+TS-12)

pWPS N°:	49/06
PQR ref.:	49/06 to qualify
REV.:	0
Data /date	23-11-2006

Procedimento di saldatura / Welding process: **GTAW +** Tipo / Type: **MANUAL +**

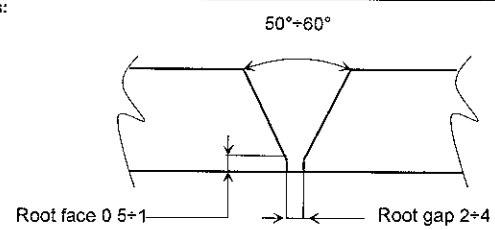
GIUNTO – JOINT (QW-402)

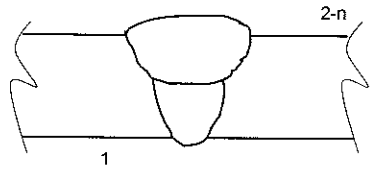
Tipo di giunto / Joint Design: **V**

Supporto / Backing: ☒ Si / Yes **Only for second and other passes** ☒ No **Only for first pass**

Materiale di supporto (tipo) / Backing material (type): ☒ Metallico / Metal ☐ Non metallico / No metal ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:





MATERIALE BASE – BASE MATERIAL (QW-403)

Da / from P-N°: -	Group N°: (EN 15608) 8.1	A / to P-N°: -	Group N° (EN 15608) 1.2 (Yield >275)

Da Tipo e grado / From type and grade: **ASTM A312 Tp 316L thickness 4,78**

A Tipo e grado / To type and grade: **ASTM A106Gr.B thickness 3,73**

Gamma spessori / Thickness range:
- ► Materiale base / Base material: Piena penetrazione / Groove **3,73 mm (range 3,0 to 7,46)**
- ► Gamma diametri / Pipe dia Range: Piena penetrazione / Groove **1/2" (range 1/4" to 1")**

METALLO D'APPORTO – FILLER METAL (QW-404)

	GTAW 141	
Spec. N° (SFA)	AWS 5.9	
AWS N° (CLASS)	ER 309L	
F-N°	6	
A-N°	8	
Diametro mat. d'apporto / Size of filler metal	2,4	
Metallo depositato / Deposit weld metal		
Gamma spessori /Thick. range Piena penetrazione / Groov	3,73 mm	
Accoppiamento filo-flusso / Electrode-flux (CLASS)	N.A.	
Denom. Comm. flusso / FLUX trade name	N.A.	
Inserto consumabile / Consumable insert	N.A.	
Altro / other	WIRE: SOUDOMETAL SOUDOTIG 309L	

POSIZIONI – POSITION (QW 405)

Posizione del giunto / Joint position: **Cianfrino / groove** | Posizione / position **PC (2G)** | Progressione / weld progression: **N.A.**

PRERISCALDO – PRE-HEAT (QW406)

Temp preriscaldo minima / Min pre-heat temp: **20 °C**	Max temp. Di interpass / Max interpass temp: **150°C**	Mantenimento posriscaldo / Postheat maintenance: **N.A.**	Tempo di mantenimento posriscaldo. / Postheat time: **N.A.**

TRATTAMENTO TERMICO DOPO SALDATURA – POST WELD HEAT TREATMENT(QW 407)

Riscaldamento / Heating rate (°C/Hrs): **N.A.**	Temperatura di stasi / Holding temperature °C: **NA**	Tempo di stasi / Holding time (min): **NA**	Velocità di raffreddamento / Cooling rate (°C/Hrs): **N.A.**

GAS DI PROTEZIONE – GAS (QW 408)

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar	99,99 %	10-14 lt/min.
Protezione al seguito / Trailing:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	Ar	99,99 %	12-16 lt/min.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS (QW- 409)

Corrente / Current: **DC** | Polarità / Polarity **SP**

Dia e tipo elettr Tungsteno / Tungsten elctr Size & type: **AWS A 5.12 EWTh2 dia.2,4mm**

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: **N.A.**

Velocità alimentazione filo / Electr. Wire feed speed range: **N.A.**

TECNICA – TECHNIQUE (QW-410)

Passata / Bead: **Tirata/String** | Dimensione bocchello gas / Orifice of gas cup size: **3/8"** | Pulizia iniziale e fra le passate / Initial and interpass cleaning: **Spazzolatura e Molatura/Brushing Grinding**

Metodo di solcatura a rovescio / Method of back gouging: **N.A.** | Oscillazione / Oscillation: **N.A.** | Distanza fra zona di contatto e pezzo / Contact zone to work distance: **N.A.**

N°Passate / Passes nr.: **Multipla/Multiple** | Elettrodo multiplo o singolo / Multiple or single electrodes: **Singolo/Single** | Martellatura / Peening: **N.A.**

Altro / Other: **Leave gas backing up to second pass completed**

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range	Vel. avanzamento / Travel speed range (mm/min)	Apporto termico / Heat input (KJ/mm)
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. range			
1	GTAW	ER 309L	2,4	DC/SP	80 - 90	10 - 12	50 - 60	0,8 – 1,3
2-n	GTAW	ER 309L	2,4	DC/SP	80 - 90	10 - 12	70 - 80	0,6 – 0,9

Preparato da / prepared by: ***A.Khalifa***

Approvato da / approved by: ***S.Solmi***

CONTROL S.N.C.
Via Attilio Monti 15 48100
RAVENNA

NDE ACTIVITIES - TEST SHEET

RAPPORTO CND - LIQUIDI PENETRANTI
NDT REPORT - DYE PENETRANT TEST

NDE-PT Report No 43/06

COMMITTENTE /Customer	**ORDINE N°**/Order No	**COMMESSA N°**/Job No	**PROGETTO**/Project
ROSETTI MARINO S.p.A.		**106A10**	
MATERIALE/Material	**LINEA N°**/ Line No	**OGGETTO** / Object	**DATA**/Date
316 L -333 Gr. 6		**WPQR 49/2006**	

In accordance with specification and rule: **UNI EN 571.1 - UNI EN 1289**

Stato della superficie / Surface Condition

COME SALDATO As Welded	■	SPAZZOLATO Brushed	■	LAV. DI MACCHINA Machined	☐	COME CALANDRATO As Bent	☐
MOLATO Ground	☐	COME LAMINATO As Rolled	☐	GREZZO As Forged	☐		☐

PRODOTTI UTILIZZATI / Products used	PROCEDURA DI ESECUZIONE / Execution of Procedure
PULITORE PRELIMINARE/ Cleaner **VELNET CGM**	1 PULITURA PRELIMINARE / Preliminary Cleanign **SPRAY**
PENETRANTE / Penetrant **RED W - CGM**	2 APPLICAZIONE PENETRANTE / Penetrant application **SPRAY**
PULITORE PENETRANTE/ Penetrant Remover **WATER**	3 RIMOZIONE PENETRANTE / Removal penetrant ■ **WATER** ☐ ☐
RIVELATORE / Developer **WHITE W - CGM**	4 ESSICAZIONE / Drying process **NATURAL**
NOTE / Remarks	5 APPLICAZIONE RIVELATORE / Developer application **SPRAY**
	a (2) TEMPO PENETRAZIONE / Penetrating time (minuti / minutes) **15**
PULITORE POST-CONTROLLO / Cleaner after examination **Cloths and water**	b TEMPO DI LETTURA / Checking time (min) (minuti / minutes) **5**
TEMPERATURA SUPERFICI / Surfaces temperature (°C) (standard range 16-52 °C) **ambient**	c ISPEZIONE VISIVA / Visual Inspection ☐ luce bianca min 1000 Lux ☐ luce U.V. min 1000 mW/cmq
NOTE / Remarks	Difetti / Discontinuities
	a) Cricca a freddo / Crack — e) Cordone irregolare / Irreg. searm
	b) Cricca da stress / Stress Crack — f) Incisione marginale / Undercutting
	c) Difetto di ripresa / 1st run defect — g)
	d) Porosità / Porosity — h)
Saldatura / Weld — spessore/thickness	material/material

ROSETTI MARINO S.p.A.
Responsabile saldatura
Welding Engineer
S. Salmi

RESULTS

NDE COMPANY - II° level NDE Operator	**CONFORME ALLA SPECIFICA** (*) conforming to specification	**NON CONFORME ALLA SPECIFICA** (*) not conforming to specification
MERCATALI ALESSIO II° liv. MT/PT CIC PND	■	☐
Q.C. Supervisor	**CUSTOMER INSPECTOR**	
Date file PT WPQR 49-2006	Date	

CONTROL snc
via Attilio Monti,15 48100 (RA) tel
0544 590597 - fax 590599

NDE ACTIVITIES - TEST SHEET

RAPPORTO CND - RADIOGRAFICO

NDE REPORT -RADIOGRAPHIC TEST

Data / Date 16-12-2006

NDE-RT Report Nr 330

foglio / sheet n° 01 of 01

COMMITTENTE / Customer	OGGETTO / Object	COMMESSA N° / Job No	ORDINE N° / Order No	PROGETTO / Project
ROSETTI MARINO SpA *(Ravenna - ITALIA)*	QUALIFICHE PROCEDIMENTO	106A10	-	HALFDAN HCA
LINEA N°/ Line No	**DWG N° / DWG No**	**CODICE / PROCEDURA/In accordance with**		**ACCETTABILITA'/Acceptance levels**
-		EN 1435 Livello B Radiographic Examination procedure		25817 Livello B (Acceptance Criteria)

ITP N° / ITP No	FASE ITP / Phase ITP		
		● PRIMA ESECUZIONE/ First test	○ PRIMA DEL TT/ Before PWHT
		○ DOPO RIPARAZIONE/ After repair	○ DOPO IL TT/ After PWHT

TRACEABILITY		*JOINT TYPE*				*RESULT*		
weld No - dwg - item	Radiographic Techniques	material	Φ / L	thickness	welder No	position film	defect	judgment
PQR 49 / A	ELLIPTIC	316	1/2"	3,70		A		NA/Ab
		A 106 Gr B				B		A
PQR 49 / B	ELLIPTIC	316	1/2'	3,70		A		A
		A 106 Gr B				B		A
PQR 49 / C	ELLIPTIC	316	1/2'	3,70		A		A
		A 106 Gr B				B		Aa

CLASSIFICAZIONE DIFETTI
Classification defects ref **ISO 6520**

(2011)	Aa	Soffiattura tondeggiante/Porosity < Φ 1mm
(2012)		Uniformly distributed porosity
(2013)		Localized porosity (Clustered)
(2014)		Linear porosity
(2017)		Surface pore
(2015)	Ab	Cavità allungata/Elongated cavity
(2016)	Ab	Tarli/Worm-hole
(300)		Inclusione solide/Solid inclusion
(301)	Ba	Inclusione di scoria/Slag inclusion
(3013)	Bb	Scoria d'orient. diverso/Of any shape in
	Be	Difetto di ripresa/ 1st run irregular
(400)	C	Mancanza di fusione/Lack of fusion
(402)	D	Mancanza di penetrazione/Lack of penet
(100)	E	Cricca o fessura/Crack
(101)	Ea	Cricca longitudinale/Longitudinal crack
(102)	Eb	Cricca trasversale/Transverse crack
(104)	Ec	Cricca di cratere/Crater crack
(502)		Sovrametallo in eccesso/Excess weld metal
(504)	Ex	Eccesso di penetrazione/Penetration excess
(5041)		Sgocciolamento/Local protrusion
(5011)	F	Solco o incisione/Undercut
(514)	Fa	Irregolarità superficiale/Surface irregularity
(509)		Avvallamento/Sagging
(511)		Incom. riempimento/Incom. Filled groove
(515)	In	Insellamento/Root concavity
(517)		Ripresa difettosa/Poor restart
(2024)	K	Cavità di ritiro/Shrinkage cavity
(506)		Traboccamento/Overlap
(507)	Sl	Slivellamento/Misalignment
(3041)	W	Inclusione di tungsteno/Tungsten inclusion
(601)		Innesco d'arco/Arc strike

GIUDIZIO / Judgment

NX-CF	To repeat to confirm defect
A	Accettabile/Acceptable
R	Riparare/To repair
NT	Tagliare/To cut
NX	Ripetere film/To repeat film
EX	Estendere il controllo/Extende test
DF	Difetto film/Film defect
TM	Taglio o modifica/Cut or modification

NOTE / Remarks

RADIOGRAPHIC TECHNIQUE DETAILS

Films: 6 — Film type and Manufact.: AGFA Structurix D4 — IQI type: ASTM 1B-6 ☐ — 10 FE EN ■ Wire n°12

Exposure Date: 16/12/2006

Sorgente X - Unità X-Ray Unit: Seifert 75	**Pellicole per cassetta (Nr)** Films box: 1	**I Q I - Posizione** I Q I - Location: ■ Lato film/Film Side ☐ Lato sorgente/Source	**Distanza sorgente-oggetto (mm)** Distance Source-object: 150 +1 Thk
Sorgente γ γ-Ray Activity		**Schermi di rinforzo (mm)** Intensifying screens: Pb 0.10 x 0,16 Front-Back	**Distanza pezzo lato sorgente-pellicola (mm)** Distance Object (source side)-Film: Weld Thk
Energia (Kev) Energy	**Sviluppo** Developing: ■ Automatic ☐ Manual	**Tecnica radiografica** Radiographic techniques: ☐ Single wall exp ■ Double wall exp ■ Single wall view ☐ Double wall view	
Macchia Focale (mm) Focal Spot: 3			

TECNICO II° livello CND - IMPRESA	CONTROLLO QUALITA'	ISPETTORE CLIENTE	ISPETTORE AI
Operator NDE II° Level SNT-TC-1A / EN473	Q.C. Supervisor	Company Repr.	Inspection Agency
MERCATALI RICCARDO NDE Company Repr. - Date	ROSETTI MARINO S.p.A. Responsabile Saldatura Welding Engineer S. Solmi Q.C. Supervisor - Date	Company Repr.- Date	I. A. - Date

ROSETTI MARINO	VERBALE DI CONTROLLO VISIVO/DIMENSIONALE visual/dimensional inspection report	VDR N° 49-06 data: 06.12.2006

progetto / project	cliente / client	ordine / PO	commessa / job
disegno / dwg	ITP N° /	fase / step	

oggetto - item

Welding Procedure Qualification Record (WPQR) 49/06

Certificato di Qualifica di Procedimento di Saldatura (WPQR) 49/06

WE CERTIFY THAT THE SAMPLE ABOVE MENTIONED HAS BEEN SUBMITTED TO 100% VISUAL EXAMINATION IN AS WELDED STATUS IN ACCORDANCE WITH UNI EN 970:1997

SI CERTIFICA CHE LA SALDATURA DEL SAGGIO SOPRA CITATO E' STATA SOTTOPOSTA AD ESAME VISIVO AL 100% ALLO STATO COME SALDATO IN ACCORDO ALLE UNI EN 970:1997.

ROSETTI MARINO S.p.A.
Responsabile saldatura
Welding Engineer
S. Solmi

note - remarks

No visible defects have been detected.

Non sono stati rilevati difetti visibili.

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

UNI EN 970 : 1997

Operatore - Operator	Controllo Qualita' - Quality Control	Cliente - Client

ROSETTI MARINO	**VERBALE DI CONTROLLO VISIVO/DIMENSIONALE** **visual/dimensional inspection report**	VDR N° 49-06 data: 06.12.2006

progetto / project	cliente / client	ordine / PO	commessa / job
disegno / dwg	ITP N° /	fase / step	

oggetto - item

Welding Procedure Qualification Record (WPQR) 49/06

Certificato di Qualifica di Procedimento di Saldatura (WPQR) 49/06

WE CERTIFY THAT THE SAMPLE ABOVE MENTIONED HAS BEEN SUBMITTED TO 100% VISUAL EXAMINATION IN AS WELDED STATUS IN ACCORDANCE WITH UNI EN 970:1997

SI CERTIFICA CHE LA SALDATURA DEL SAGGIO SOPRA CITATO E' STATA SOTTOPOSTA AD ESAME VISIVO AL 100% ALLO STATO COME SALDATO IN ACCORDO ALLE UNI EN 970:1997

ROSETTI MARINO S.p.A.
Responsabile saldatura
Welding Engineer
S. Solmi

note - remarks

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procedure / specifiche applicabili - applicable procedures / specifications

UNI EN 970 : 1997

Operatore - Operator	Controllo Qualita' - Quality Control	Cliente - Client

T.T.I. - Tubacex Tubos Inoxidables,S.A.

Registro Mercantil de Alava, Tomo 607, Folio 189, Hoja VI 2693 - N.I.F. A-01140227

TUBACEX

Printed on: 17.01.2006

INSPECTION CERTIFICATE
EN 10204 3.1

Number: 375595 Pages: 1 / 2 — Rev: 1

Date: 13.12.2005 — 17.01.2006

CUSTOMER :RACCORTUBI, S.R.L. PO :OS0000174S - 28/7/05 OUR REFERENCE:J4065

STANDARD :ASTM-ASME A/SA312M-04 ED.04

ADDIT. SPECS :312S REV.0 AND NACE MR01.75-03

GRADE :TP316-316L

DIMENSIONS :21,34 X 4,78

MATERIAL :SEAMLESS STAINLESS STEEL TUBE COLD ROLLED; PASSIVATED; PLAIN ENDS SQUARE CUT;

110970

REVIEWED

ITEM YOUR	ITT.	HEAT NR.	NO. OF PIECES	WEIGHT KG	TOTAL LENGTH	UNIT LENGTH
	13	34693	2	24	12,31	5,5 - 6,5 MT
	13	35717	53	652	330,00	5,5 - 6,5 MT

RAW MATERIAL

MELTING PROCESS: ELECTRIC FURNACE + A.O.D FROM: ACERALAVA
PEELED BARS; MACROETCH TESTING: GOOD;

(1)	C	Mn	Si	P	S	Ni	Cr	Mo	Cu	B	N
L 593	0,022	1,47	0,280	0,025	0,0010	11,30	15,60	2,13	0,25	0,0006	0,0630
L 35717	0,010	1,48	0,500	0,030	0,0010	11,30	17,00	2,15	0,50	0,0013	0,0610
C 35717	0,011	1,47	0,490	0,029	0,0010	11,20	17,00	2,21	0,51	0,0008	0,0610
C 34693	0,022	1,47	0,280	0,025	0,0030	11,30	15,60	2,13	0,25	0,0006	0,0630

(1) L: LADLE; C: PRODUCT

HEAT TREATMENT

SOLUTION ANNEALED 1100 °C WATER QUENCHED

TESTS NR. HEAT	TESTS NR. TEST	TEMP.	TENSION MPA RM	RP 0,2	RP 1,0	% A	% Z	IMPACT TEST TEMP.	IMPACT TEST MINIMUM	IMPACT TEST AVERAGE	HARDNESS HRB	
34693	510470	20	536,0	243,0	278,0	65,0					77	79
35717	510469	20	589,0	274,0	311,0	60,0					80	81

TECHNOLOGICALS

FLATTENING TEST: GOOD
FLARING TEST: GOOD
RING EXPANDING TEST: GOOD

METALLURGICAL TEST

INTERGRANULAR CORROSION: A-262"E", DIN 50914, NF A05-159 T1, ISO 3651-2: NO OBJECTIONS

NON DESTRUCTIVE TEST

100 % EDDY CURRENT TEST AT E.426 , GOOD
100 % HYDROSTATIC PRESSURE TESTED AT 175 BAR , DURING 6 SEC, GOOD
STEEL GRADE CHECKING ON EACH TUBE BY SPECTROMETRY (PMI)
DIMENSIONAL CHECKING ON EACH TUBE, SATISFACTORY
VISUAL INSPECTION ON EACH TUBE, SATISFACTORY

OTHER MATERIAL SPECIFICATIONS

DIN 17458 PK1 / NF A49117-85 1.4401-1.4404/Z6-Z2CND17.11/12

MARKS

TXA
TUBACEX 21,34 X 4,78 ASTM-ASME A-SA 312 TP316-316L - DIN 17458 PK1 1.4401-1.4404 NF A49-117 Z6CND17.11-Z2CND17.12 SMLS HEAT/ .... ET PMI

REMARKS

T.T.I GARANTIT QUE TOUS LES TUBES LIVRES SONT CONFORMES AUX SPEC S DE L'ARTICLE 15 DE L'ARRETE MINISTERIEL DU 24 MARS 1978 MODIFIE

AENOR ER Express Registrada ER-0006/1991 — IQNet — AENOR Gestión Ambiental GA-01/145

We hereby certify that the material herein described has been manufactured, sampled, inspected/tested in accordance with above standards and specifications and satisfies the order requirements.
This certificate is issued by a computerised system and is valid without signature. On the original certificate the responsibility and obligations of the issuer is exempted.
In case the receiver of this original certificate would require a copy of it, he must attest its conformity to the original one, assuming the responsibility for any misuse of T.T.I. S.A. (or associates).
Any forgery or falsification of this certificate shall legally prosecuted.

T.T.I. Tubacex Tubos Inoxidables,S.A.
INGENIERIA DE CALIDAD
Jon Aburto Zubiaur

Customer: ROSETTI MARINO S.p A.
Order : OH 20061849 - 25.5.06 Job 106A14 Posiz /Item n.: 5.000
Descr. : 21.34x4.78
Heat n°/Pcs marking : 34693 Qtà/Qty:12,3
Protocollo : CTCERC200600005659 * Certified True Copy * Issued 19/06/06

raccortubi

raccortubi CERTIFICATE N. 160065

T.T.I. - Tubacex Tubos Inoxidables, S.A.

Registro Mercantil de Alava, Tomo 567, Folio 188, Hoja VI-2885 - N.I.F. A-01140227

TUBACEX

Printed on: 17.01.2006

INSPECTION CERTIFICATE
EN 10204 3.1

Number: 375595 Page: 2 / 2 | Rev: 1

Date: 13.12.2005 | 17.01.2006

CUSTOMER :RACCORTUBI, S.R.L. PO :OS0001748 - 28/7/05 OUR REFERENCE:J4065

STANDARD :ASTM-ASME A/SA312M-04 ED.04

ADDIT.SPECS :3128 REV.0 AND NACE MR01.75-03

GRADE :TP316-316L

DIMENSIONS :21,34 X 4,78

MATERIAL :SEAMLESS STAINLESS STEEL TUBE
COLD ROLLED; PASSIVATED;
PLAIN ENDS SQUARE CUT;

110978

C<=0,25%, P<=0,05%, S<=0,05%, R=800 N/MM2, E<=0,9 * R
A% (LO=5,65VSO) MIN, 16% EN LONG. R(A 2)>=10500
MATERIAL MANUFACTURER APPROVED WITH CERTIFICATE NR. 07/2001/MUC BY TÜV SÜDDEUTSCHLAND (NOTIFIED BODY 0036) TO ISSUE CERTIFICATES OF SPECIFIC PRODUCT CONTROL IN ACCORDANCE WITH PRESSURE EQUIPMENT DIRECTIVE 97/23/EC ANNEX 1 POINT 4.3.
MATERIAL CHARACTERISTICS COMPLY WITH POINT 7.5 OF ANNEX I TO PED BY HAVING AN ELONGATION AFTER RUPTURE AT TENSILE TEST NO LESS THAN 14 % AND A BENDING RUPTURE ENERGY AT IMPACT TEST NO LESS THAN 27 J AT 20°C.

ROSETTI MARINO

Conforme alla spec.
According to the spec. BS2 TP316 + P.O.

TMUGF Firma
MTSMD Signature

Data
Date 04 DIC. 2006

☒ REVIEW
☐ WITNESS

AENOR ER Empresa Registrada ER-0006/1991

IQNet

AENOR Gestión Ambiental GCM-0012/97

We hereby certify that the material herein described has been manufactured, examined, tested and inspected in accordance with above standards and specifications and satisfies the order requirements.
This certificate is issued by a computerized system and it is valid without signature. On the original certificate the responsible's red coloured signature is stamped.
In case this owner of this original certificate would release a copy of it, for more utility as conformity to the original one, assuming the responsibility for any anomaly of T.T.I. S.A. is not allowed use.
Any forgery or falsification of this certificate shall legally prosecuted.

T.T.I.
Tubacex Tubos Inoxidables, S.A.
INGENIERÍA DE CALIDAD
Jon Altuna Zuloaga

Customer: ROSETTI MARINO S.p.A.
Order : OH 20061849 - 25.5.06 Job 106A14 Posiz./Item n : 5 000
Descr. : 21.34x4.78
Heat n°/Pcs. marking : 34693 Qtà/Qty:12,3
Protocollo : CTCERC200600005659 * Certified True Copy * Issued 19/06/06

raccortubi

raccortubi CERTIFICATE N. 160065

PIETRA
SOCIETÀ PER AZIONI
25125 BRESCIA - Via Orzinuovi, 2
telef. 030 3540515 - fax 030 3540204

CERTIFICATO DI COLLAUDO

Inspection certificate - Abnahmeprüfzeugnis - Certificat de Réception

EN 10204/3.1.B

N. 84217 FOGLIO 1 di 1
Sheet - Blatt - Page

DATA 03.12.02
Date - Datum - Date

CLIENTE PROSIDER S.R.L.
Customer - Kunde - Acheteur

ORDINE FAX — DATA 30.10.02 — NS. COMMESSA 18483 — DATA 04.11.02
Order - Bestellung - Commande — Date - Datum - Date — Our order - Una auftrags - Cde usine — Date - Datum - Date

DESCRIZIONE: TUBI S.S Lamin. a caldo
Description - Saomiera tubed - Beschreibung - Nahtlose stahlrohre - Description - Tubes sans soudure

STATO DI FORNITURA: ☒ FINITI DI LAVORAZIONE A CALDO CON APPROPRIATA STRUTTURA
Condition of supply - Hot-working finished with proper structure - Lieferzustand - Warmverarbeitet mit einwandfreiem Gefügezustand - Etat de fourniture - Finis de travail à chaud avec convenable structure

NORME DI COLLAUDO ASTM A 106/99-530/01-API 5L/00
Tipiti standards - Abnahmevorschriften - Spécification du produit

☐ TRATTAMENTO TERMICO 000 °C ___ MIN. — Heat treatment - Wärmebehandelt - Traitement thermique
Raffreddamento: aria — Cooling: air — Abkühlung: Luft — Refroidissement: air

PEZZI N. 300 (1800 M) — PESO KG. 2960 — QUALITÀ ACCIAIO Gr.B
Quantity - Stückenmenge - Nombre — Weight - Gewicht - Masse — Quality of steel - Werkstoff - Nuance d'acier

DIMENSIONI 21,30 X 3,73 X lg. 6000 mm - Zincati ASTM A 53
Sizes - Abmessungen - Dimensions

VALORI RICHIESTI / Requirements / Anforderungen / Valeurs	Rp 0,2	Rm	A 2"	5,65√So	H BB	KV ___ °C	Rm x A ≥ 10600	MANDRINATURA Ring expanding - Ringaufdornversuch - Mandrinage	ALLARGAMENTO Flaring test - Aufweitversuch - Evasement	BORDATURA Flaring test - Bördelversuch - Rabattement	SCHIACCIAMENTO Flattening test - Abplattversuch - Aplatissement
	≥240	≥415	≥30,00								
PROVETTA (*) Specimen - Probestab - Eprouvette	SNERVAMENTO Yield point - Streckgrenze - Limite d'élast	ROTTURA Tensil strenght - Zugfestigkeit - Rupture	ALLUNGAMENTO Elongation - Bruchdehnung - Allongement		DUREZZA Hardness - Härte - Dureté	RESILIENZA (J) Impact - Kerbschlagarbeit - Résilience					

RISULTATI OTTENUTI - Results - Ergebnisse - Résultats

N	Sez. mm²	Lo mm	N/mm²	N/mm²	%		1'	2'	3'
1	205,00	51	346	500	40	78			
2	205,30	51	341	494	41	77			

Note : Prove di curvatura a 90 gradi con esito favorevole.
Sec. NACE MR 01.75
Sec. ASME sez II part A ed 2001

Copia conforme all'originale
Cliente: ROSETTI MARINO SPA
Ordine : n. OH-20061929 comm. 105814
Ns. ddt: n. 3666 del 01/06/2006.
Materiale: N. 16x6000 mm
Ravenna: 05 giugno 2006.
PROSIDER SPA

AZIENDA CERTIFICATA — UNI EN ISO 9002:94 — IQNet 9105 — CERTIFIED QUALITY SYSTEM

(*) SENSO PROVINI : LONGITUDINALE
Specimen direction - Probenrichtung - Direction de l'éprouvette — Longitudinal - Längs - Longitudinale

☒ PROVA IDRAULICA ALLA PRESSIONE DI 2500 psi
Hydraulic test pressure - Wasserdruckversuch - Essai hydraulique

☒ CORRENTI INDOTTE SECONDO NORMA A/SA 106
Eddy current according to - Zerstörungsfreie Prüfung - Courant de Foucaut

RISULTATI DELL'ISPEZIONE E CONTROLLO DIMENSIONALE : OK
Results of inspection and dimensional control - Besichtigung und Ausmessung - Résultat de l'inspection et contrôle dimensionnel

DIE ROHRE SIND DICHT UND HABEN FREIEN DURCHGANG

CERTIFICHIAMO CHE LA FORNITURA È CONFORME AGLI ACCORDI DELL'ORDINAZIONE
We here by certify that the material complies with the terms of the order - Es wird bestätigt daßdie Lieferung den Vereinbarungen bei der Bestellung entspricht - Nous certifions que la fourniture est conformeaux accords de la commande

ANALISI CHIMICA PIETRA S.P.A.
Chemical analysis - Chemische analiso - Analyse chimiques

TIPO DI FUSIONE : ELECTRIC FURNACE
Cast type - Erschmelzungsart - Type de fusion

COLATA N. Heat - Schmelze - Coulée	C %	Mn %	Si %	P %	S %	Cr %	Mo %	Ni %	Cu %	Sn %	V %	Al %	N %	Ceq %	CERTIFICATO DI COLATA Heat Certificate - Verhaltnisnaugnis - Cert. d'origine
83215	0,180	0,830	0,200	0,012	0,007	0,070	0,020	0,110	0,220	0,010	0,000	0,027		0,335	

ROSETTI MARINO

NOTE - Notes - Bemerkungen - Notes

I TUBI HANNO SUBITO UN TRATTAMENTO COMPLETO DI DEMAGNETIZZAZIONE.
The tubes have been subjected to a complete demagnetization treatment.

MARCATURA Marking - Kennzeichnung - Marquage
According to the spec API 5L & ASTM

TMUGF Firma — Data
MTSMD Signature — Date
28 GIU 2006

Il Collaudatore d'Officina
Internal authorized inspector - Interner autorisierter Prüfer - Contrôleur d'atelier
QUALITY CONTROL
(A. Zacchi)

☒ REVIEW
☐ WITNESS

S.A. SOUDOMETAL N.V.
Bld. M. Herbettelaan 24
1070 Brussels (Belgium)
Tel.: 32 2 522 98 00 Fax: 32 2 520 08 07 Ilx: 23361 Soudo B
IVA/BTW: BE 401.918.312

Message for FAX number : 13959343297
PLEASE USE OUR REF: CT 00921

FAX : 13959343297
ATTN : Sig. BORTOLACELLI

CERTIFICAT - TESTRAPPORT- TEST REPORT - WERKZEUGNIS - CERTIFICATO - CERTIFICADO
Cliente : E110714 Qualità : SOUDOTIG 309L

SFA 5.9:ER 309 L
ITALSUDO S.R.L. Classificazione
DIN 8556:± SG X2CrNi 24 12

V/o Ordine : V/ FAX DEL 260794 Dimensioni (mm)

N/o Rif : 2,4 x1000

Prodotto : Fili per TIG

N° Produzione(colata,lotto,ecc) 672011

1. Analisi chimica(%) metallo depositato * Valori rilevati

2. Proprieta meccaniche Valori tipici

N°		Rs0,2	Rm	A % (5d)	Z %	KU-J	Tratt.termico Durata(O)
672011	+20	440	620	35		100	

3. Varie Valori tipici Osservazioni

	Cont.Radio.	Sald.d'angolo	FN	Durezza HB	HRC	HRC(WH)
672011						

BOHLER MARINO S.p.A.
Conforme alla spec. According to the spec. AWS 5.9
C.Q. Firma Q.C. Signature Data Date 06/12/96

4. Composizione chimica del filo(%) Valori tipici

N°	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	N
672011	0,015	1,74	0,38	0,009	0,020	23,52	13,55	0,107	0,108	0,049

Data : 18/10/96

Noi certifichiamo che il prodotto sopradescritto risponde alle caratteristiche richieste della sua classific.(Ultima edizione)

T. I & QA Mgr

AIOICI

IIS

ISTITUTO ITALIANO DELLA SALDATURA

ENTE MORALE

CERTIFICATO N. -5284-
CERTIFICATE No

L'ISTITUTO ITALIANO DELLA SALDATURA CERTIFICA CHE / THE ITALIAN INSTITUTE OF WELDING CERTIFIES THAT

the procedure ROSETTI No.76/98 REV.1

E' QUALIFICATO(A) IN ACCORDO A / IS QUALIFIED ACCORDING TO

the Section IX of the ASME Code BPV

NOTE / REMARKS

Annexes No.10

DATA DI EMISSIONE / ISSUE DATE 13 Novembre 1998

AREA CERTIFICAZIONE CSP
CERTIFICATION AREA CSP
(P.I. Antonio Pandolfo)

Pandolf

Membro Fondatore / Founder Member: International Institute of Welding — European Welding Federation

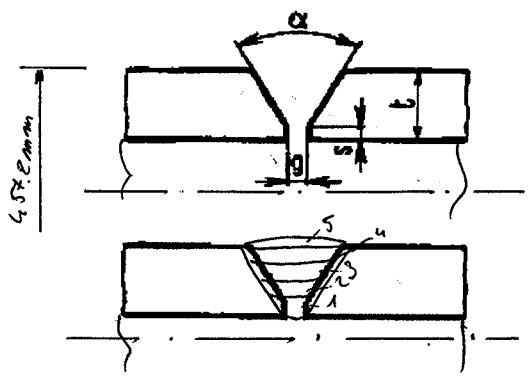
Istituto Italiano della Saldatura Lungobisagno Istria, 15 - 16141 Genova - Tel. (010) 8341.1 - Telefax (010) 836.77.80

Rosetti Marino S.p.A. 48100 RAVENNA	PROCEDURE QUALIFICATION RECORD P Q R	PQR N. 5284 IIS Job N. 10807 sheet 1/2

ISTITUTO ITALIANO DELLA SALDATURA - GENOVA - ENTE MORALE

Company Name ROSETTI MARINO S.P.A. VIA TRIESTE, 230 48100 RAVENNA (RA)
Procedure Qualification Record No. 5284 **Date** 22 October 1998
WPS No. 76/98 **Rev.** 1 **Date** 22 October 1998 **Rev.** _____ **Date** _____
Welding Process(es) a) GMAW b) _____ c) _____
Types (Man.,Aut.,Semi-Aut.) a) SEMIAUTOMATIC b) _____ c) _____

JOINTS (QW-402)
Joint design BUTT WELD SINGLE V GROOVE



t=11.13mm; α=60°; g=5mm; s=0mm

Passes or layers	Process	Filler Metal size mm 1E	Filler Metal size mm 2E	Amp. 1E	Amp. 2E	Volt 1E	Volt 2E	Travel speed mm/min
1	GMAW	1	-	75/265*	-	15	-	145
2	GMAW	1	-	148	-	24	-	232
3	GMAW	1	-	161	-	25	-	250
4	GMAW	1	-	142	-	23.5	-	380
5	GMAW	1	-	142	-	23.5	-	420

Groove Design of Test Coupon
(For combination qualifications, the deposited weld metal shall be recorded for each filler metal or process used)

BASE METAL (QW-403)
Spec. Type & Grade ASTM A 240 TP 316
to Spec. Type & Grade ASTM A 240 TP 316
P-No. 8 Gr.No. 1 to P-No. 8 Gr.No. 1
Thickness of Test Coupon 11.13mm* to 11.13mm*
Diameter of Test Coupon 457.2mmO.D.x to 457.2mmO.D.x
Other * OBTAINED FRM THK.12mm;
x ROLLED AND WELDED PLATE

POSTWELD HEAT TREATMENT (QW-407)
Temperature N.A.
Time N.A.
Other --

GAS (QW-408)

	Percent Composition Gas(es)	Mixture	Flow Rate	
Plasma	N.A.			l/min
Shielding (a)	Ar+CO2	98+2	12	l/min
Shielding ( )	N.A.			l/min
Trailing	N.A.			l/min
Backing	ARGON	99.99	16	l/min

Other --

FILLER METALS (QW-404)

	a)	b)	c)
SFA Specification	5.9		
AWS Classification	ER316LSi		
Filler Metal F-No.	6		
Weld Metal An. A-No.	8		
Size of filler metal	ϕ1.0mm		
F. M. Trade Name	LNM 316LSi		
Manufacturer	LINCOLN		
Flux Trade Name	N.A.		
Manufacturer	N.A.		
Electr.-Flux (Class)	N.A.		
Weld Metal Thickness	11.13mm (*)		

Other (*) 3.5mm Short Arc; 7.63mm Spray Arc
--

ELECTRICAL CHARACTERISTICS (QW-409)
Current DC
Polarity EP
Amps. see table above Volts see table above
Mode of Metal Transfer for GMAW SHORT & SPRAY ARC
Tungsten Electrode Type & Size N.A.
Other * GMAW: AMP.BC=75; PC=265

POSITIONS (QW-405)
Position(s) of groove or fillet 1G/ROTATED
Welding Progression (uphill,downhill) N.A.
Other --

PREHEAT (QW-406)
Preheat Temp. 15°C
Interpass Temp. 150°C
Other --

TECHNIQUE (QW-410)
Travel speed see table above
String or Weave Bead STRING
Oscillation: Amplitude N.A.
Frequency N.A.
Multipass or single pass (per side) MULTIPASS
Single or Multiple Electrodes SINGLE
Other --

[YES] t Pass < ½" [NOT] Sup. powder [NOT] Alloy elements

Rosetti Marino S.p.A. 48100 RAVENNA	PROCEDURE QUALIFICATION RECORD P Q R	PQR N. 5284 IIS Job N. 10807 sheet 2/2

TENSILE TESTS (QW-150)

Specimen Type & Figure	Dimensions (mm) Width	Thickness	Area (mm2)	Ult. Total Load (kN)	Ult. Unit Stress N/mm²	Type of Failure & Location
TRANSVERSE REDUCED QW-462.1(b)	19.1	11.3	215.8	126700	587	BASE METAL DUCTILE
TRANSVERSE REDUCED QW-462.1(b)	19.0	11.0	209.0	124400	595	BASE METAL DUCTILE

GUIDED BEND TESTS (QW-160)

Type and Figure No.	Result
TRANSVERSE FACE QW-462.3(a)	180°SATISFACTORY
TRANSVERSE FACE QW-462.3(a)	180°SATISFACTORY
TRANSVERSE ROOT QW-462.3(a)	180°SATISFACTORY
TRANSVERSE ROOT QW-462.3(a)	180°SATISFACTORY

TOUGHNESS TEST (QW-170)

Sp. size (mm)	Notch Locations	Notch Type	Test T. (°C)	Impact Tests /LATER.EXPANS. Values / Average (Joule)	% shear	(mm)	Drop W. Break (Y/N)
10.02x10	WM	KV	-105	96		1.17	
10.01x10	WM	KV	-105	106		1.13	
10.02x10	WM	KV	-105	108 / 103.3		2.22	
10.02x10	HAZ	KV	-105	296		2.22	
10.02x10	HAZ	KV	-105	226		1.98	
10.02x10	HAZ	KV	-105	260 / 260.6		1.98	

FILLET WELD TEST (QW-180)

Result - Satisfactory :Yes _____ No _____ Penetration into Parent Metal: Yes _____ No _____

Macro-Results: _____

OTHER TESTS

Type of Test VISUAL AN D X-RAY EXAMINATION: SATISFACTORY

Deposit Analisys --

Other MACRO TEST EXAMINATION: SATISFACTORY

Welder's Name GIULIANINI DARIO Stamp No. W6

Welding Test conducted by: ROSETTI MARINO - RAVENNA

Mechanical test conducted by: CONTROL - RAVENNA

Laboratory Test No. 112/98(X-RAY),343

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of the Section IX of the ASME Code BPV.

Date 13 November 1998

Test supervised by Italian Institute of Welding

CERTIFICATION AREA CSP
(P. I. Antonio Pandolfo)

ROSETTI MARINO SpA
(stampa e firma costruttore)
(Welding Engineer)

FOR TEST PIECE ONLY

ROSETTI MARINO SPA

SPEC N°	76 / 98	PAGE pagina	
REV	0 1	SHEET foglio	1 di

CUSTOMER Cliente	JOB Lavoro	PREP'D Comp	G.P.R.
	FOR PROCEDURE QUALIFICATION	APPR'D Appr	A.M.

WELDING PROCEDURE SPECIFICATION (QW-482)

Specifica di saldatura

COMPANY NAME Società: ROSETTI MARINO S.p.A. BY di:

WELDING PROCEDURE SPECIFICATION N° Specifica di saldatura: 76 / 98 DATE Data: 14.10.98 SUPPORTING PQR N° (S) Qualificata da verb: 5284 76/98

REVISION N° Revisione: 1 DATE data: 22.10.98

WELDING PROCESS (ES) Procedimento (i) di saldatura: GMAW TYPE (S) tipo (i): SEMIAUTOMATIC

JOINTS (QW-402) Giunti

JOINT DESIGN Tipo di Giunto: SEE DETAILS

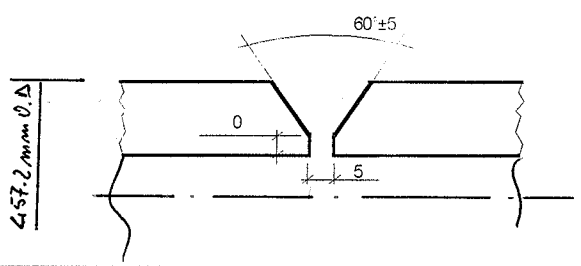
BACKING (YES) Supporto (si): N.A (NO) (no): NO

BACKING MATERIAL (TYPE) Materiale di Supp (tipo): N.A.

☐ METAL Metallico ☐ NON FUSING METAL Metallo non fondente

☐ NON METALLIC Non Metallico ☐ OTHER Altro

DETAILS Dettagli



BASE METALS (QW-403) Materiale Base

P-N° 8 GROUP N° 1 TO P-N° 8 GROUP N° 1

OR / Oppure

SPECIFICATION TYPE AND GRADE Tipo e Grado: ASTM A 240 TP 316

TO SPECIFICATION TYPE AND GRADE A Tipo e Grado: SAME

OR / Oppure

CHEM ANALYSIS AND MECH PROP Analisi Chimica e Proprietà Meccaniche: N.A.

TO CHEM ANALYSIS AND MECH PROP Ad Analisi Chimica e Proprietà Meccaniche: N.A.

THICKNESS RANGE: Gamma Spessori:

BASE METAL: Metallo Base. GROOVE Piena Pen: 11,13 mm ° FILLET Cord d'angolo: N.A.

PIPE DIA. RANGE: Gamma Diametri: GROOVE Piena Pen: 18" * (457.2 mm O.D.) FILLET Cord d'angolo: N.A.

OTHER Altro: *** OBTAINED FROM ROLLED PLATE / ° OBTAINED FROM thk 12 mm**

FILLER METALS (QW-404) Metallo d'apporto

SPEC N° (SFA): 5.9

AWS N° (CLASS): ER 316 L Si

F-N°: 6

A N°: 8

SIZE OF FILLER METALS Diametro Materiale d'apporto: 1,0 mm

DEPOSITED WELD METAL Metallo depositato: 11,13 mm

THICKNESS RANGE Gamma Spessori

GROOVE Piena Pen: 3,5 mm for STT 7.63 mm SPRAY ARC

FILLET Cord d'angolo: N.A.

ELECTRODE-FLUX(CLASS) Accoppiamento Filo-Flusso: N.A.

FLUX TRADE NAME Denom comm Flusso: N.A.

CONSUMABLE INSERT Inserto Consumabile: N.A.

OTHER Altro: ROD: LNM 316 L Si (LINCOLN)

3034106.PRE

76-98 PRE

FOR TEST PIECE ONLY

ROSETTI MARINO SPA

SPEC N°	76 / 98	PAGE pagina	
REV.	0 1	SHEET foglio	2 of 2 di 2

CUSTOMER / Cliente

JOB / Lavoro: **FOR PROCEDURE QUALIFICATION**

PREP'D Comp: G.P.R

APPR'D Appr: A.M.

QW-482 (BACK)

POSITION (QW-405)
Posizioni

POSITION(S) OF GROOVE / Posizione (i) cianfrino: 1G

WELDING PROGRESSION: UP / ascendente: N.A. DOWN / discendente: N.A.
Progressione Saldatura:

POSITION(S) OF FILLET / Posiz cord d'angolo: N.A.

PREHEAT (QW-406)
Preriscaldo

PREHEAT TEMP MIN / Temp di prerisc min: 15°C

INTERPASS TEMP MAX / Temp Max di Interpass: 150°C

PREHEAT MAINTENANCE / Manten Preriscaldo: N.A.

POSTWELD HEAT TREATMENT (QW-407)
Trattamento Termico

TEMPERATURE RANGE / temperatura: N.A

TIME RANGE / Tempo: N.A.

GAS (QW-408)
Gas protettivo

	GAS(ES) Gas	(MIXTURE) (miscela)	FLOW RATE Portata
	PERCENT COMPOSITION composiz. percentuale		
SHIELDING protezione	$Ar+CO_2$	98-2%	~12 l/min
TRAILING Prot al seguito	N.A.	N.A	N.A.
BACKING Prot al rovescio	ARGON	99 99%	~16 l/min

ELECTRICAL CHARACTERISTICS (QW-409)
Caratteristiche Elettriche

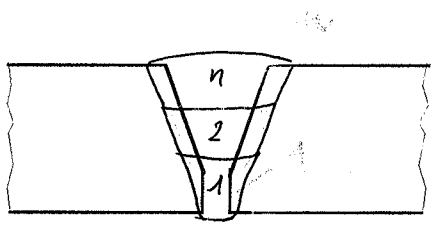
CURRENT AC OR DC / Corrente alt o cont: DC POLARITY / Polarità: RP

AMPS (RANGE) / Amperaggio: SEE TABLE VOLTS (RANGE) / Voltaggio: SEE TABLE

TUNGSTEN ELECTRODE SIZE AND TYPE / Diametro e Tipo Elettrodo di Tungsteno: N.A.

MODE FOR METAL TRANSFER FOR GMAW / Metodo di trasferimento per GMAW: GMAW: SHORT ARC + SPRAY ARC

ELETTRODE WIRE FEED SPEED RANGE / Velocità di alimentazione Filo: 4,3 m/1' for STT



TECHNIQUE (QW-410)
Tecnica

STRING OR WEAVE BEAD / Passata tirata o a maglia larga: STRING

ORIFICE OR GAS CUP SIZE / Dimensione Bocchello Gas: 3/8"

INITIAL AND INTERPASS CLEANING (BRUSHING,GRINDING ETC.) / Pulizia iniziale e fra le passate: BRUSHING and/or GRINDING

METHOD OF BACK GOUGING / Metodo di Solcatura a rovescio: N.A

OSCILLATION / Oscillazione: N.A.

CONTACT TUBE TO WORK DISTANCE / Distanza tra Tubo di contatto e Pezzo: 15 mm

MULTIPLE OR SINGLE PASS (PER SIDE) / Passata multipla o singola (per lato): MULTIPLE

MULTIPLE OR SINGLE ELECTRODES / Elettrodo multiplo o singolo: SINGLE

TRAVEL SPEED (RANGE) / Velocità: N.A

PEENING / Martellatura: NO

OTHER / Altro: FIRST PASS BY STT POWER SOURCE

WELD LAYER(S) Passata(e)	PROCESS Procedim	FILLER METAL Metallo d'apporto CLASS Classe	FILLER METAL DIA Diam	CURRENT TYPE POLAR Polarita	CURRENT AMP RANGE Amperaggio	VOLT RANGE Voltaggio	TRAVEL SPEED RANGE Velocità Avanzam	OTHER Altro HI
1 *	GMAW/STT	ER 316 L	1,0	DC/RP	BC 75 PC 265	15÷16	13÷16 cm/1'	
2 ÷ n	GMAW	ER 316 L	1,0	DC/RP	140÷160	23÷26	20÷45 cm/1'	
* POSITION OF WELDING: 2 HOURS								

76-98.PRE

Control Snc Via Ponte Mobile, 15 48100 Ravenna	CERTIFICATO CONTROLLO RADIOGRAFICO RADIOGRAPHIC TEST CERTIFICATE	RT rapp N° 112/98

COMMITTENTE / Customer	ORDINE N° / Order N°	COMMESSA N° / Job N°	PROGETTO / Project
ROSETTI M. S.p.A		CERT. N. 5284	
	OGGETTO / Part: PQR.		DATA / Date: 26/10/98

ISTITUTO ITALIANO DELLA SALDATURA - GENOVA - ENTE MORALE

Controllo in accordo alla norma: ASME IX

N° schizzo N° Sketch	N° Saldatura	Materiale Material	Diametro Diameter	Spessore Thickness	Saldatore Welder	Posizione Position	Esito Result	Giudizio Judgmen
PQR 75		A516		60		0 - 1		2
"		Gr. 70				1 - 2		2
PQR. 76		S.S.	18"	11,13		0 - 1		2
"						1 - 2		2
"						2 - 3		2
"						3 - 4		2
"						4 - 0		2
PQR 77		S.S.	8"	8,18		0 - 1		2
"						1 - 2		2
"						2 - 3		2
"						3 - 4		2
"						4 - 0		2

Codifica Esito / Code Result

Aa	Soffiatture tondeggianti/Porosity
Ab	Soffiature vermiculari/Worm holes
Ba	Di forma o d'orientamento/Of any shape in
Bb	Allineate o in serie/Slag lines
Be	Difetto di ripresa/Stop start defect
C	Mancanza di fusione/Lack of fusion
D	Mancanza di penetrazione/Incomplete pen
E	Cricca o fessura/Crack
Ea	Longitudinale/Longitudinal
Eb	Trasversale/Transverse
Ex	Eccesso di penetrazione/Excess pen
F	Solco o incisione/Undercut
Fa	Irregolarità superficiale/Surface irregul
In	Insellamento/Root concavity
K	Cratere di ritiro/Shrinkage cavities
Sl	Slivellamento/Misalignment
W	Inclusione di tungsteno/Tungsyen inclusion

Giudizio / Judgment

2	Accettabile/Acceptable
3	NON ACCETTABILE/NOT CONFORM

NOTE / Remarks

N° Radiografie / N° Films: 12		Indicatore Qualità Immagine - Tipo / Indicator Quality Image - Type: DIN 10 FE; ASTM X; altro/other ☐	
Unità / Unit: 300/6	Energia / Energy: 320 ~~200~~	I.Q.I. - Posizione / I.Q.I. - Location: X Lato film/Film Side; X Lato sorgente/Source	I.Q.I. - Sensibilità / I.Q.I - Sensibility: 2-2T
Sorgente γ / Source γ:	Pellicola / Film: D7	Schermi di rinforzo / Intensifyng screens: Pb	Penombra Ug / Unsharpness geom. Ug: <0,3
Macchia Focale / Focal Spot: 3x3	Densità film / Film density: >1.8	Sviluppo / Development: ■ Automatico; ☐ Manuale	Operatore NDT II° Livello SNT-TC-1A / Operator: RICCARDO CERT. N. 98DG05108/IN/001
Tempo di esposizione / Exposure time:		Distanza focale / Focal distance:	

ROSETTI MARINO SpA RAVENNA

CONTROLLO QUALITA'

Supervisor Q.C.

ISPETTORE COMMITTENTE data

ISTITUTO ITALIANO DELLA SALDATURA

L'ISPETTORE INCARICATO

Customer Inspector Geom. Pellachin Amadeo

CERT. N. 5284

Control Snc

Sede Amministrativa - Laboratorio
Via Ponte Mobile, 15 - 48100 Ravenna
Telefono - 0544 590597

LABORATORIO DI CONTROLLI E PROVE

CERTIFICATO PROVE MATERIALI
TEST CERTIFICATE

ISTITUTO ITALIANO DELLA SALDATURA - GENOVA - ENTE MORALE

N° 343 Fg.1/2

DATA / Date
13-nov-98

COMMITTENTE / *CUSTOMER*: **ROSETTI M. SPA RAVENNA**

OGGETTO / *OBJECT*: **PQR. 76/98**

NORME DI COLLAUDO / *SPECIFICATIONS*: **ASME IX**

ENTE COLLAUDO / *INSPECTOR*: **IST.ITAL.SALDATURA**

PROVE MECCANICHE
MECHANICAL TESTS

CARATTERISTICHE RICHIESTE / *REQUIREMENTS* ---------->						*Snervamento Yeld stress N*	*N/nnq*	*Massimo Total Load N*	*N/nnq*	*Allung. Perc Elong %*		*Resilienza Impact Test Joule*	*Piega BEND TEST*
Pos. *Pos.*	*Prova Nr Test N°*	*Dimensioni Size mm*		*Area So mmq*	*L0 mm*	*LU mm*	*RISULTATI / RESULT* *Fs*	*Rs*	*Fm*	*Rm*	*A %*		*Kv -105 °C*	*180°/40*
TWT	1	11,3	x 19,1	215,8					126700	587				
TWT	2	11,0	x 19,0	209,0					124400	595				
FB	1	10,0	x 38,0											Satisfavctory
FB	2	10,0	x 38,0											Satisfavctory
RB	1	10,0	x 38,0											Satisfavctory
RB	2	10,0	x 38,0											Satisfavctory
VWT0/1	1	10,02	x 10		LATERAL EXPANSION =1,17 mm								96	
	2	10,01	x 10		LATERAL EXPANSION =1,13 mm								106	
	3	10,02	x 10		LATERAL EXPANSION =2,22 mm								108	
VHT2/1	1	10,02	x 10		LATERAL EXPANSION =2,22 mm								296	
	2	10,02	x 10		LATERAL EXPANSION =1,98 mm								226	
	3	10,02	x 10		LATERAL EXPANSION =1,98 mm								260	

TWT=TRANSVERSE WELD TENSILE TEST T= TOP B =BOTTOM C = CENTRE
LWTT = LONGITUDINAL WELD TENSILE TEST
SBB=TRANSVERSE SIDE BEND TEST
FB= TRANSVERSE FACE BEND TEST
RB=TRANSVERSE ROOT BEND TEST
FOW=DUCTILE FAILURE OUT OF WELD
FIW= FAILURE IN WELD

VWT0/1 =IMPACT TEST IN THE CENTRE OF THE WELD-1-mm UNDER SURFACE

VHT 2/1 =IMPACT TEST 2 mm FROM FUSION LINE-1 mm UNDER SURFACE

OPERATORE / Operator	COMMITTENTE / Customer	ISPETTORE / Inspector
CONTROL PROVE MATERIALI	ROSETTI MARINO SpA. RAVENNA	ISTITUTO ITALIANO DELLA SALDATURA L'ISPETTORE INCARICATO Geom Pellacani Francesco

Control Snc

Sede Amministrativa - Laboratorio

Via Ponte Mobile, 15 - 48100 Ravenna

Telefono - 0544 590597

Telefax - 0544 590599

LABORATORIO DI CONTROLLI E PROVE

CERT. N. 5284 FOGLIO 9 DI 12

CERTIFICATO PROVE MATERIALI N. 343

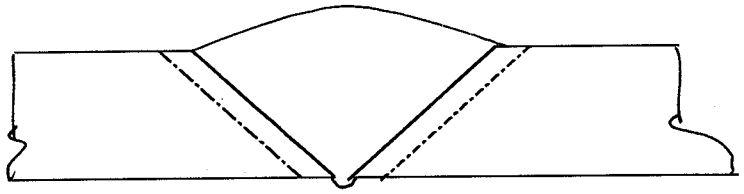
TEST CERTIFICATE

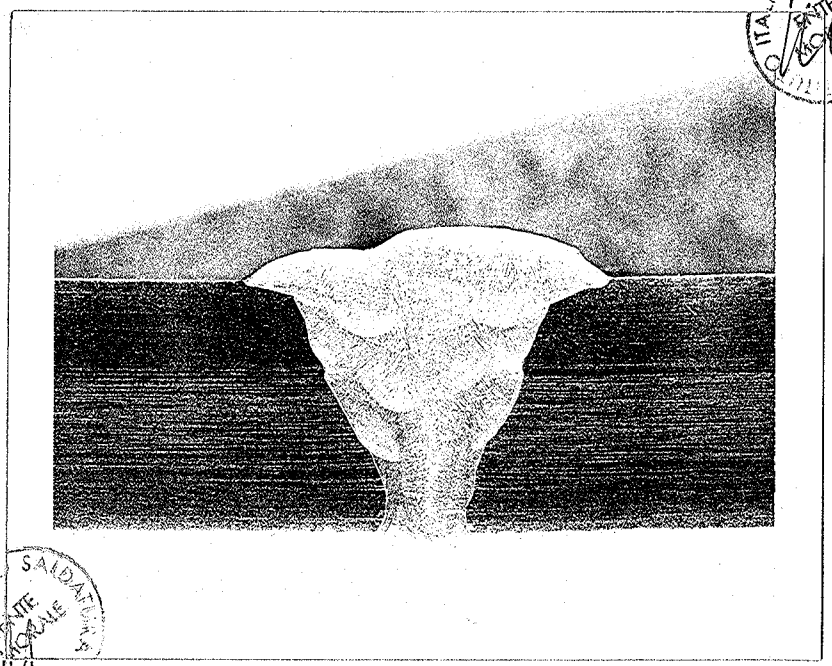
DATA / Date 13 NOV 1998

COMMITTENTE / *CUSTOMER* **ROSETTI MARINO SPA**

OGGETTO / *OBJECT* PQR N. 76/98

MACROEXAMINATION





MACROEXAMINATION: SATISFACTORY

ETCH: UNICO MAGNIFICATION: 3X

OPERATORE / Operator	COMMITTENTE / Customer	ISPETTORE / Inspector
CONTROL PROV. MATERIALI	ROSETTI MARINO SpA RAVENNA	ISTITUTO ITALIANO DELLA SALDATURA L'ISPETTORE INCARICATO Geom Pellacani Francesco

CERT. N. 5 2 8 4

ISTITUTO ITALIANO DELLA SALDATURA - GENOVA - ENTE MORALE

TOTAL SIDER02

2 OF 2

ALZ

Certificate of test – Mill certificate No 98/0051916
Certificat de Réception C.C.P.U. Nr
Abnahmeprüfzeugnis B
nach DIN 50049/3.1.B – MFA 00001/3.1.B – EN 10204/3.1.B

LOT 212569/96
20109/96

27863/024/01

ACIER INOXYDABLE, TOLES, LAMINEES A CHAUD, RECUITES ET DECAPEES

heat

R813065 | 61306539

Specifications	Type	Finish	Corrosion test
ASTM A 240-94	TYPE 316	NO 1	ASTM A262 E – 93A :OK

Dimensions	Marking (Code Designation)	Quantity	Heat treatment
mm 12.00 2000.00 6000.0 inches		ASTM A240 1050°C	air quench

Particular requirements:

CHEMICAL ANALYSIS

ELEMENTS	LADLE	PRODUCT
C	0.050	0.050
Mn	1.28	1.28
P	0.027	0.028
S	0.010	0.010
Si	0.40	0.40
Cr	16.60	16.62
Ni	11.10	11.11
Mo	2.50	2.50
Cu		
Ti		
Co		
N	0.021	
Al		

MECHANICAL PROPERTIES

TENSILE TEST: ASTM A240 | N/mm2 | min. | max. | 61306539 | A (T) E | 12.54X10.40

Yield 0.2% Str.grenze 1.0%	205	341	337	
Tensile strength Rm/mm2	515	597	597	
elong. % A50	40	51	52	
RA %		67	66	
Hardness HRB	95	88.5	90.0	

Impact Strength Test: °C

Bend test: 180° OK

TESTS TO VERIFY BATCH AND QUALITY HAVE BEEN CARRIED OUT: OK

VISUAL INSPECTION AND DIMENSIONAL CHECK: EXAMEN VISUEL D'ASPECT DE SURFACE ET DIMENSIONS OK

QUANTITY / WEIGHT MEMO / QUANTITE MEMO POIDS LIVRE

PACKAGE Nr / N° DE COLIS / PAKET NR	QTY. / QTE. / ANZ.	NET WEIGHT / POIDS NET / NETTO GEW.	PACKAGE Nr / N° DE COLIS / PAKET NR	QTY. / QTE. / ANZ.	NET WEIGHT / POIDS NET / NETTO GEW.
68502388	3	2864			
TOTAL/RESULT:	QTY. / QTE. / ANZ. 3	NET WEIGHT / POIDS NET / NETTO GEW. 2864			

The delivery is in accordance with the order.
La fourniture est conforme aux stipulations de la commande.
Die Lieferung entspricht der Bestellbedingungen.

INOXTECH S.P.A.
VIA ALDO MORO
45026 LENDINARA RO
ITALIE

ALZ

THE SURVEYOR - L'EXPERT - DER SACHVERSTÄNDIGE

Genk the 14.06.1996

H. JANSSEN

CERT. N. 5284

C T R Centro Triveneto per la Ricerca e Prove sui materiali s.r.

ENTE MORALE - ISTITUTO ITALIANO DELLA SALDATURA - GENOVA

ORDINE Nr. 54/95 del 27/02/1995

RAPPORTO DI PROVA N. 5284

PARTICOLARE
Nr. 3 spezzoni di tallone di saldatura
materiale base dichiarato ASTM A 240 Tp 316
spessore 12 mm.

SPECIFICA
Prove di resilienza eseguite secondo norme
ANSI/ASME B 31.3 tabella 323.22.

INOX TECH SPA

VIA ALDO MORO

45026-LENDINARA-RO

P R O V E M E C C A N I C H E

PROVE DI RESILIENZA

Saggio Nr.	Dimensioni provino mm.	Zona fusa KV-196°C Joule	Espansione laterale mm.
1	10x10x55	164	1.15
2	10x10x55	150	0.98
3	10x10x55	168	1.39

#######

64380

INOX TECH S.p.A.

Il Responsabile Prof. Angelo LOVO

Centro triveneto per la ricerca e prove sui materiali PADOVA

PADOVA 01/03/1995

COPIA CONFORME ALL'ORIGINALE

Via A. da Zevio, 27 - 35100 Padova - Tel. 049-610400/610539 - Fax. 049-605228

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PRODUCT CONFORMANCE REPORT

LINCOLN ELECTRIC

Lincoln Smitweld bv

CERT. N. 5284

Product	LNM 316L Si		Size(s) mm	1.0
Class.	AWS A5.9	ER 316L Si	Lot No.	51443737
	DIN 8556	SG X2CrNiMo 19 12		
	NF A35-583	Z2 CNDS 19.12		
	BS 2901-Pt.2	316S93		

ISTITUTO ITALIANO DELLA SALDATURA - GENOVA - ENTE MORALE

Customer	Lincoln Electric S.r.l. GENOVA, ITALY	Cust. Order No.	
		LSW Order No.	

Chemical composition w%, wire — actual values acc. EN10204 '3.1B'

C	Si	Mn	P	S	Cr	Ni	Mo	Nb	Cu	
0.016	0.86	1.75	0.022	0.011	18.15	12.20	2.52		0.23	
V	Ti	Al	B	Co	W	As	Sn	Sb	Pb	N
				0.075						0.043

Mechanical tests, all weld metal — typical values acc. EN10204 '2.2'

Tension test / Charpy V-notch test

Cond.	test temp [°C]	Rp0.2 [N/mm²]	Rp1.0 [N/mm²]	Rm [N/mm²]	A5 [%]	test temp. [°C]	CVN, ind. values [J]	CVN ave [J]
AW	RT	418	448	581	39	-20		108

Additional information

Other tests — actual values acc. EN10204 '3.1B'

Remarks

Typical values for weld metal properties are the results from statistical sampling of routine tests or the result from annual check tests that have been witnessed by Approval Societies in accordance with EN 10204 para. 2.2.
Actual chemical analysis and/or mechanical test values have been obtained from samples of the Lot/Batch above, in accordance with EN 10204 para.3.1B.
The product identified above has been manufactured, tested and supplied in compliance with a Quality Assurance Programme that fulfils the requirements of EN 29000/ISO 9000/BS 5750 or similar standard.
We herewith certify that the product complies with the above-mentioned standards.

Company	Issued by	Signature	Function	Date	Cert.N
Lincoln Smitweld	H. Meelker		QS Manager	02/11/98	514437

Registered Office:
Nieuwe Dukenburgseweg 20
6534 AD Nijmegen
Netherlands

P.O. Box 253
6500 AG Nijmegen
Netherlands

Telephone: +31 24 3522911
Fax: +31 24 3522200

OSETTI MARINO S.p.A.
Conforme alla spec. ER 316L Si
According to the spec.
C.Q. Firma / Q.C.Signature
Data / Date 16-11-98

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 40/18	Sheet/Foglio 1/3

Manufacturer's Welding Procedure. Ref. no.	40/18 REV. 0		
Manufacturer	ROSETTI MARINO S.p.A.		
Address	VIA TRIESTE 230 - 48121 RAVENNA		
Code, Testing Standard	MAERSK OIL Specification MOG-FP-MET-STD-0012 Rev. 4.0; EN ISO 15614-1:2017 Lev. 2		
	Location of test specimen according to EN ISO 15614-1:2017 Section 7.2, Fig. 5 Essential variables according to EN ISO 15614-1:2017, Chapter 8 and MAERSK OIL Specification MOG-FP-MET-STD-0012 Rev. 4.0 par. 6.4		
Date of welding	Start: September 3rd , 2018 Complete: September 4th, 2018		
Examiner of examining body	Rina Services S.p.A.		
RANGE OF QUALIFICATION			
Welding process	136 - FCAW		
Type(s)	Manual		
Welding Equipment Type	HF inverter type		
Actual parent Material side A	Plate: EN 10225: S460G2+M Z35 (Heat: 882852)		
Actual parent Material side B	Plate: EN 10225: S460G2+M Z35 (Heat: 882852)		
Parent Material grade	Carbon steel with maximum strength of 520 MPa		
Supply condition	Thermomechanical rolled and accelerated cooled		
Carbon equivalent/Pcm/C	Max:0,44/0,19 (Heat Values: 0,41/0,17/ C for information only: 0,052)		
Groove design/configuration	Single Bevel Butt Joint (both sides welding), for groove dimension and details see page 4 of 6		
Parent material thickness (mm)	40 mm (obtained from parent material of 80 mm thk.)		
Weld metal thickness (mm)	136 - FCAW 40 mm		
Single or Multi-pass	136 - FCAW MULTIPLE		
Outside diameter	/		
Filler material Designation	**136 FCAW** EN ISO 17632-A: T 46 4 1Ni P M21 2 H5 (AWS 5.36: E81T1-M21A4-Ni1)		
Filler material Maker	136 - Esab OK Tubrod 15.17		
Filler material Size	136 - FCAW ∅ 1,2 mm		
Shielding gas/Flux	ISO 14175 :2008 M21 (80% Ar + 20% CO_2)		
Shielding gas flow rate	20 l/min.		
Backing gas (purging)	None		

Type of welding current & polarity	DC - RP	Heat input / Apporto termico (kJ/mm) ± 25%	Pass	Diameter mm	2G	3G
			Root	∅ 1,2	1,20 to 2,00	1,41 to 2,35
			Hot	∅ 1,2	0,82 to 1,38	1,36 to 2,28
			Filll	∅ 1,2	0,79 to 1,33	1,34 to 2,24
			Cap	∅ 1,2	0,69 to 1,15	1,38 to 2,31

Welding position	All, vertical down progression excluded		
Preheat (°C)	50	Interpass temperature / Temp. di interpass (°C)	250
Post-Weld Heat Treatment and/or ageing	NONE		
Weld bead width	12 mm for 2G position , 15 mm for 3G position		
Welder's detail	Siringo Massimo AX82 (3G Test Coupon) Loffredo Francesco AX61 (2G Test Coupon)		
Time lapse between root and hot pass	N.A.		
Other information / Altre informazioni	- Preheat performed by propane torch -Accelerate weld cooling not permitted; -Base material origin: plate - Grinding 3 mm depth from base metal, before performing reverse passes		

Manufacturer's Welding Procedure. Ref. no.	40/18 REV. 0		
Test result (WPQR) N°	40/18	Date/Data	12/09/2018
Manufacturer's WPS No.	pWPS 40/18 REV. 0	Date/Data	19/07/2018

TESTS CARRIED OUT ON SAMPLE 40/18 WELDED IN 2G POSITION (PC)

NON DESTRUCTIVE EXAMINATIONS

	Judgemen	Report No.
Visual examinations	Acceptable	VDR 40/18
Penetrant test	Acceptable	/
Magnetic particle test	N.A.	01-18205
Radiographic test	Acceptable	/
Ultrasonic test	Acceptable	01-18205

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2] ≥ 420	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 520	A [%] ≥ 18	Z [%] /	Fracture Location /	Remarks /
TRANSVERSE 1	449	/	552	/	/	Base metal	/
TRANSVERSE 2	449	/	563	/	/	Base metal	/
TRANSVERSE 3	448	/	553	/	/	Base metal	/
TRANSVERSE 4	447	/	565	/	/	Base metal	/

BEND TEST

Type & N.	Bend angle	Remarks	Results
4 Side bend	180°	Former Ø 40 mm	Satisfactory

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] ≥ 35J			Avarage value [J] ≥ 50J	Remarks
10x10x55	Weld metal cap	KV	-40°C	78	79	76	78	/
10x10x55	FL cap	KV	-40°C	48	59	177	95	/
10x10x55	FL+1 cap	KV	-40°C	256	261	269	262	/
10x10x55	FL+2 cap	KV	-40°C	270	260	269	266	/
10x10x55	FL+5 cap	KV	-40°C	266	288	229	261	/
10x10x55	Weld metal root	KV	-40°C	89	105	108	101	/
10x10x55	FL root	KV	-40°C	95	92	35	74	/
10x10x55	FL+1 root	KV	-40°C	258	227	232	239	/
10x10x55	FL+2 root	KV	-40°C	216	204	203	208	/
10x10x55	FL+5 root	KV	-40°C	295	260	224	260	/

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
1 Macro examination+Hardness test	Satisfactory-See Inspecta Certificate No. 0319-00850-18
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Inspecta S.r.l. - Ravenna
Laboratory report reference N.	Report No. 0319-00850-18 dated SEPTEMBER 12th 2018
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of MOG-FP-MET-STD-0012 Rev. 4.0 Specification; EN ISO 13847:2013; EN ISO 15614-1:2017 Lev. 2

Date/Data
12-09-2018
ROSETTI MARINO SpA Welding Dept. D. Cenacchi
ROSETTI MARINO S.p.A.

Examiner or Examination Body
RINA Services S.p.A.
RINA F. Lago
Name and signature / Nome e firma

Test result (WPQR) N°	40/18	Date/Data	12/09/2018 & 19/09/2018
Manufacturer's WPS No.	pWPS 40/18 REV. 0	Date/Data	19/07/2018

TESTS CARRIED OUT ON SAMPLE 40/18 WELDED IN 3G POSITION (PF)

NON DESTRUCTIVE EXAMINATIONS

	Judgemen	Report No.
Visual examinations	Acceptable	VDR 40/18
Penetrant test	Acceptable	/
Magnetic particle test	N.A.	01-18205
Radiographic test	Acceptable	/
Ultrasonic test	Acceptable	01-18205

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2] ≥ 420	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 520	A [%] ≥ 18	Z [%] /	Fracture Location /	Remarks /
TRANSVERSE 1	448	/	564	/	/	Base metal	/
TRANSVERSE 2	452	/	558	/	/	Base metal	/
TRANSVERSE 3	445	/	562	/	/	Base metal	/
TRANSVERSE 4	448	/	561	/	/	Base metal	/

BEND TEST

Type & N.	Bend angle	Remarks	Results
4 Side bend	180°	Former Ø 40 mm	Satisfactory

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] ≥ 35J			Avarage value [J] ≥ 50J	Remarks
10x10x55	Weld metal cap	KV	-40°C	68	97	85	83	/
10x10x55	FL cap	KV	-40°C	107	71	30 (*)	69	(*)
10x10x55	FL cap (retest)	KV	-40°C	280	262	201	248	/
10x10x55	FL cap (retest)	KV	-40°C	185	89	118	131	/
10x10x55	FL+1 cap	KV	-40°C	290	250	260	267	/
10x10x55	FL+2 cap	KV	-40°C	300	294	304	299	/
10x10x55	FL+5 cap	KV	-40°C	280	268	290	279	/
10x10x55	Weld metal root	KV	-40°C	75	88	94	86	/
10x10x55	FL root	KV	-40°C	171	16 (*)	72	87	(*)
10x10x55	FL root (retest)	KV	-40°C	52	65	73	63	/
10x10x55	FL root (retest)	KV	-40°C	136	59	48	81	/
10x10x55	FL+1 root	KV	-40°C	307	287	241	278	/
10x10x55	FL+2 root	KV	-40°C	255	270	265	263	/
10x10x55	FL+5 root	KV	-40°C	285	292	280	286	/

(*) Values under the minimum required. Two retests have been performed with positive results, as per Standard requirements. See report nr. 0330-00850-18

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
1 Macro examination+Hardness test	Satisfactory-See Inspecta Certificate No. 0320-00850-18
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Inspecta S.r.l. - Ravenna
Laboratory report reference N.	Report No. 0320-00850-18 dated SEPTEMBER 12th 2018 & 0330-00850-18 dated SEPTEMBER 19th 2018
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of MOG-FP-MET-STD-0012 Rev. 4.0 Specification; EN ISO 13847:2013; EN ISO 15614-1:2017 Lev. 2

Date/Data
19-09-2018
ROSETTI MARINO S.p.A.

Examiner or Examination Body
RINA Services S.p.A.
Name and signature / Nome e firma

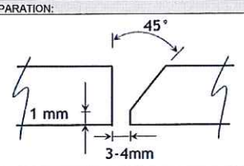
PQR - AS- RUN PARAMETER SHEET

pWPS 40/18			
PQR 40/18			
Coupon Nr. 40/18 (2G)			
Date:	Start 03/09/2018 Finish 04/09/2018	Page:	1 of 2

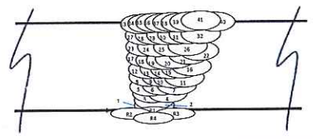
REFERENCE CODE AND PROJECT SPECIFICATIONS: **EN 15614-1 Ed.2017+MOTS 12 Rev. 4.0**

Welder Name(s):	LOFFREDO FRANCESCO		Welder Id No(s):	AX 61	
Welding Process(es):	136-FCAW		Type(s):	SEMIAUTOMATIC	
Welding Position:	2G		Progression:	NA	
Base Materials:	EN10225: S460 G2+M		Wall Thickness:	40 mm (*)	Diameter: NA
Heat No(s):	882852	PLATE:186899\1	Joint Type:	1/2V	

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNS24006	ESAB OK TUBROD 15.17
Hot Pass	1,2	PNS24006	ESAB OK TUBROD 15.17
Filling Runs	1,2	PNS24006	ESAB OK TUBROD 15.17
Cap	1,2	PNS24006	ESAB OK TUBROD 15.17

GAS:

Shielding Gas:	MIXTURE
Composition:	Ar+CO2 80%+20%
Flow:	20 lt/min
Gas Backing:	None
Flow:	_
Gas Size Nozzle:	1/2"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
12 mm	String	MULTIPLE	SINGLE

Preheat °C :	Preheat Method:	Max Interpass Temperature:	Check / Control Method:
50°C	PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER

Heat Treatment Required	Holding Temperature °C	Holding Time °C	Heating Rate °C	Cooling Rate °C
NA	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (Kj/mm) Average	Arc Thermal Efficiency Factor As per EN 1011-1 (CRA Clad PQR's) (Kj/mm)	Interpass Temperature °C	REMARKS
NA	1	FCAW	1	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	166	180	173	26	28	27	_	_	14	1,60	0,8	50	_MANUAL MONITORING
NA	2	FCAW	2	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	230	245	237,5	26	28	27	_	_	28	1,10	0,8	70	_CAP PASSES FROM 33TO 41
NA	3	FCAW	3	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	230	240	235	26	28	27	_	_	30	1,02	0,8	85	(*) MACHINED FROM BASE MATERIAL THICKNESS 80mm
NA	3	FCAW	4	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	230	240	235	27	28	27,5	_	_	33	0,94	0,8	97	HEAT INP. MEAN VALUE FOR FILL (Kj/mm) 1,06
NA	4	FCAW	5	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	240	250	245	27	28	27,5	_	_	35	0,92	0,8	110	HEAT INP. MEAN VALUE FOR CAP (Kj/mm) 0,92
NA	4	FCAW	6	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	250	280	265	27	28	27,5	_	_	38	0,92	0,8	125	Both sides welding
NA	4	FCAW	7	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	36	0,99	0,8	135	
NA	5	FCAW	8	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	30	1,19	0,8	75	
NA	5	FCAW	9	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	33	1,08	0,8	110	
NA	5	FCAW	10	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	35	1,02	0,8	150	
NA	5	FCAW	11	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	38	0,94	0,8	177	
NA	6	FCAW	12	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	36	0,99	0,8	100	
NA	6	FCAW	13	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	30	1,19	0,8	140	
NA	6	FCAW	14	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	33	1,08	0,8	160	
NA	6	FCAW	15	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	35	1,02	0,8	180	
NA	6	FCAW	16	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	38	0,94	0,8	200	
NA	7	FCAW	17	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	36	0,99	0,8	218	
NA	7	FCAW	18	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	30	1,19	0,8	230	
NA	7	FCAW	19	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	33	1,08	0,8	250	
NA	7	FCAW	20	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	35	1,02	0,8	120	
NA	7	FCAW	21	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	38	0,94	0,8	135	
NA	7	FCAW	22	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	36	0,99	0,8	150	
NA	8	FCAW	23	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	30	1,19	0,8	165	
NA	8	FCAW	24	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	33	1,08	0,8	175	
NA	8	FCAW	25	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	35	1,02	0,8	186	
NA	8	FCAW	26	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	38	0,94	0,8	198	

SIGNED BY ROSETTI REPRESENTATIVE:	SIGNED BY TOTAL REPRESENTATIVE:	SIGNED BY ROSETTI THIRD PARTY REPRESENTATIVE:	SIGNED BY TOTAL THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA Welding Dept. D. Cenacchi	Signature:	Signature:	Signature:
Date:	Date:	Date:	Date:

RINA Services SpA No. Re. 0474 Date 04/09/2018
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐
File
Signature
Cimatti Davide

PQR - AS- RUN PARAMETER SHEET

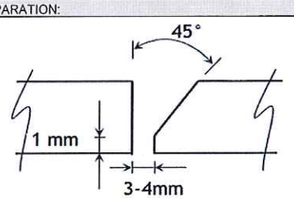
pWPS 40/18			
PQR 40/18			
Coupon Nr. 40/18 (2G)			
Date:	Start 03/09/2018 Finish 04/09/2018	Page:	2 of 2

REFERENCE CODE AND PROJECT SPECIFICATIONS: **EN 15614-1 Ed.2017+MOTS 12 Rev. 4.0**

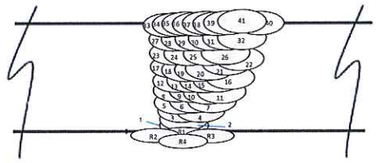
Welder Name(s):	LOFFREDO FRANCESCO	Welder Id No(s):	AX 61
Welding Process(es):	136-FCAW	Type(s):	SEMIAUTOMATIC
Welding Position:	2G	Progression:	NA
Base Materials:	EN10225: S460 G2+M	Wall Thickness:	40 mm (*)
Heat No(s):	882852 PLATE:186899\1	Joint Type:	1/2V

Diameter: NA

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNS24006	ESAB OK TUBROD 15.17
Hot Pass	1,2	PNS24006	ESAB OK TUBROD 15.17
Filling Runs	1,2	PNS24006	ESAB OK TUBROD 15.17
Cap	1,2	PNS24006	ESAB OK TUBROD 15.17

GAS:

Shielding Gas:	MIXTURE
Composition:	Ar+CO2 80%+20%
Flow:	20 lt/min
Gas Backing:	None
Flow:	_
Gas Size Nozzle:	1/2"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
12 mm	String	MULTIPLE	SINGLE

Preheat °C :	Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
50°C	PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER	NA	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (Kj/mm) Average	Arc Thermal Efficiency Factor As per EN 1011-1 (CRA Clad PQR's) (Kj/mm)	Interpass Temperature °C	REMARKS
NA	9	FCAW	27	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	36	0,99	0,8	210	
NA	9	FCAW	28	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	30	1,19	0,8	80	
NA	9	FCAW	29	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	33	1,08	0,8	95	
NA	9	FCAW	30	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	35	1,02	0,8	116	
NA	9	FCAW	31	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	38	0,94	0,8	130	
NA	9	FCAW	32	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	38	0,94	0,8	150	
NA	10	FCAW	33	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	39	0,91	0,8	110	started welding finish
NA	10	FCAW	34	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	38	0,94	0,8	130	
NA	10	FCAW	35	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	39	0,91	0,8	145	
NA	10	FCAW	36	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	39	0,91	0,8	159	
NA	10	FCAW	37	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	39	0,91	0,8	170	
NA	10	FCAW	38	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	38	0,94	0,8	186	
NA	10	FCAW	39	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	39	0,91	0,8	197	
NA	10	FCAW	40	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	39	0,91	0,8	213	
NA	10	FCAW	41	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	39	0,91	0,8	221	
NA	1	FCAW	R1	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	230	240	235	27	29	28	_	_	16	1,97	0,8	50	
NA	2	FCAW	R2	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	240	270	255	27	29	28	_	_	35	0,98	0,8	70	
NA	2	FCAW	R3	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	240	270	255	27	29	28	_	_	40	0,86	0,8	90	
NA	3	FCAW	R4	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	240	270	255	27	29	28	_	_	38	0,90	0,8	100	

SIGNED BY ROSETTI REPRESENTATIVE:	SIGNED BY TOTAL REPRESENTATIVE:	SIGNED BY ROSETTI THIRD PARTY REPRESENTATIVE:	SIGNED BY TOTAL THIRD PARTY REPRESENTATIVE:
Name: ROSETTI MARINO SpA Welding Dept. D. Benacchio	Name:	Name: RINA Services SpA No. Bo. 0474	Name:
Signature:	Signature:	Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	Signature:
Date:	Date:	Date: 04/09/2018 File Signature Cimatti Davide	Date:

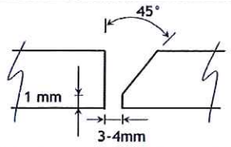
PQR - AS- RUN PARAMETER SHEET

pWPS 40/18			
PQR 40/18			
Coupon Nr. 40/18 (3G)			
Date:	Start 03/09/2018 Finish 04/09/2018	Page:	1_ of _1

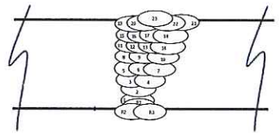
REFERENCE CODE AND PROJECT SPECIFICATIONS: **ISO 15614-1 Ed.2017+MOTS-12 Rev 4.0**

Welder Name(s):	SIRINGO MASSIMO	Welder Id No(s):	AX82
Welding Process(es):	136-FCAW	Type(s):	SEMIAUTOMATIC
Welding Position:	3G	Progression:	UP hill
Base Materials:	EN10225: S460 G2+M	Wall Thickness:	40 mm (*) — Diameter: NA
Heat No(s):	882852 PLATE:186899\1	Joint Type:	1/2V

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNS24006	ESAB OK TUBROD 15.17
Hot Pass	1,2	PNS24006	ESAB OK TUBROD 15.17
Filling Runs	1,2	PNS24006	ESAB OK TUBROD 15.17
Cap	1,2	PNS24006	ESAB OK TUBROD 15.17

GAS:

Shielding Gas:	MIXTURE
Composition:	Ar+CO2 80%+20%
Flow:	20 lt/min
Gas Backing	None
Flow:	_
Gas Size Nozzle:	1/2"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
15mm	String	MULTIPLE	SINGLE

Preheat °C:	Preheat Method:	Max Interpass Temperature:	Check / Control Method:
50°C	PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER

Heat Treatment Required	Holding Temperature °C	Holding Time °C	Heating Rate °C	Cooling Rate °C
NA	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (Kj/mm) Average	Arc Thermal Efficiency Factor As per EN 1011-1 (CRA Clad PQR's) (Kj/mm)	Interpass Temperature °C	REMARKS
NA	1	FCAW	1	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	166	182	174	26	28	27	_	_	12	1,88	0,80	50	_MANUAL MONITORING
NA	2	FCAW	2	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	210	240	225	26	28	27	_	_	16	1,82	0,80	70	_CAP PASSES FROM 19 TO 23
NA	3	FCAW	3	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	215	240	227,5	26	28	27	_	_	18	1,64	0,80	85	(*) MACHINED FROM BASE MATERIAL THICKNESS 80mm
NA	3	FCAW	4	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	17	1,75	0,80	90	HEAT INP. MEAN VALUE FOR FILL (Kj/mm) 1,79
NA	4	FCAW	5	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	16	1,86	0,80	95	HEAT INP. MEAN VALUE FOR CAP (Kj/mm) 1,85
NA	4	FCAW	6	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	16	1,86	0,80	110	Both sides welding
NA	4	FCAW	7	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	17	1,75	0,80	115	
NA	5	FCAW	8	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	18	1,66	0,80	120	
NA	5	FCAW	9	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	16	1,86	0,80	135	
NA	5	FCAW	10	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	17	1,75	0,80	160	
NA	6	FCAW	11	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	18	1,66	0,80	180	
NA	6	FCAW	12	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	16	1,86	0,80	210	
NA	6	FCAW	13	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	17	1,75	0,80	250	
NA	6	FCAW	14	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	17	1,75	0,80	150	
NA	7	FCAW	15	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	16	1,86	0,80	170	
NA	7	FCAW	16	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	17	1,75	0,80	190	
NA	7	FCAW	17	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	16	1,86	0,80	215	
NA	7	FCAW	18	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	220	240	230	26	28	27	_	_	18	1,66	0,80	225	
NA	8	FCAW	19	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	20	1,78	0,80	170	started welding finish
NA	8	FCAW	20	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	20	1,78	0,80	190	
NA	8	FCAW	21	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	21	1,70	0,80	200	
NA	8	FCAW	22	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	20	1,78	0,80	218	
NA	8	FCAW	23	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	260	280	270	27	28	27,5	_	_	20	1,78	0,80	235	
NA	1	FCAW	R1	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	235	245	240	27	29	28	_	_	15	2,15	0,80	50	
NA	2	FCAW	R2	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	240	270	255	27	29	28	_	_	16	2,14	0,80	70	
NA	2	FCAW	R3	_	E81T1-M21A4-Ni1 T 46 3 1Ni P C1 2 H5 T 46 4 1Ni P M21 2 H5	1,2	DC-RP	240	270	255	27	29	28	_	_	20	1,71	0,80	95	

SIGNED BY ROSETTI REPRESENTATIVE:	SIGNED BY TOTAL REPRESENTATIVE:	SIGNED BY ROSETTI THIRD PARTY REPRESENTATIVE:	SIGNED BY TOTAL THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA Welding Dept. D. Cenacchi	Signature:	Signature:	Signature:
Date:	Date:	Date:	Date:

RINA Services SpA No. Bo. 0474 Date: 04/09/2018
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐
File _____ Signature Cimatti Davide

ROSETTI MARINO

PQR 40/18

PQR attachments index:

Base material certificate (Plate S460G2+M)

Shielding gas certificate

Consumables certificate

preliminary WPS

NDE certificate

Mechanical test report

ROSETTI MARINO

PQR 40/18

Base material certificate (Plate S460G2+M)

Certificate Number:VNA 1700015 / 9
Page: 1 of 1

Inspection Certificate

Project: ————
Client: voestalpine Grobblech GmbH
voestalpine-Straße 3, 4020 Linz, Austria

Office: Vienna

Clients Order Number: 6501364

Date: 15-02-2017

Order Status: incomplete

Inspection Dates
First: 10-02-2017

final: 17-02-2017

This certificate is issued to voestalpine Grobblech GmbH, Linz/Austria, to certify that the undersigned Surveyor attended their works Linz for the purpose of testing and inspecting the undernoted material with satisfactory results as stated below.

Purchaser: Rosetti Marino Spa
Via Trieste 230
I-48122 RAVENNA

Order No.: 1716002502 116B20A

Description:

48 piece(s) of steel plate(s) 384580 kg , as per attached inspection Certificate no.: A0357565

Specification

S460G2+M Z35 EN 10225 : 2009

Heat treatment/Delivery Condition: thermomechanical rolled + accelerated cooled

Scope of inspection:

witness mechanical testing: yes ☑
review manufacturer's declared analysis: yes ☑
witness / verify ultrasonic examination: yes ☑ n/a ☐
witness / verify microstructure examination: yes ☐ n/a ☑
witness /verify corrosion testing: yes ☐ n/a ☑
random visual and dimensional control and check of hard stamping: yes ☑

Identification:

Makers Brand voestalpine
Material Quality
Heat No.
Plate No.
Brand of LR

Lloyd's Register EMEA
Vienna Office
Lloyd's Register

24 FEB 2017

Kurt Huber
Surveyor to Lloyd's Register EMEA

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Form 1123 (2015.08)

voestalpine Grobblech GmbH

A02
Inspection certificate
EN 10204 - 3.2

VNA1700015-9

Z02 Date 23-02-2017

voestalpine-Straße 3
4020 Linz, Austria
www.voestalpine.com/grobblech

A03 Document number	A0357565	A08 Order-No.:	6501364	A07 OrderDat.	13-12-2016

4F

A06 Customer	Rosetti Marino Spa Via Trieste 230 I-48122 RAVENNA	B01 Product	Plate		
		B02 Material	S460G2+M Z35	B03 Standard	EN 10225 : 2009
A07 OrderNo.	1716002502 116B20A	Supplementary requirements	Z35 - EN 10164		
A06 Consignee	Rosetti Marino Spa Via Trieste 230 I-48122 RAVENNA	B04 Delivery condition	thermomechanical rolled + accelerated cooled		

A10 - Supplementary Information

SOUTH PARS 13 - PILES

B03 - Supplementary requirements

MATERIAL IS FINE GRAINED, VACUUM DEGASSED AND FULLY KILLED, PRODUCED BY BOF.
MATERIAL IS ACCORDING TO SPECIFICATION SP13-P2-ST-SP-8028.
MATERIAL IS ACCORDING TO EN 10225, OPTIONS 2,6,7,9,10,12 AND 13.

Z01 - Visual Examination and dimensional checking: satisfactory. The results of tests performed are in compliance with the requirements.

Detail of supply

B07 Heat No.	B06 Plate No	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	Ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
882852	186892/1	30 80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
882852	186892/2	30 80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
882852	186894/2	30 80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186894/1	30 80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186895/1	30 80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186895/2	30 80,00	2640,0	4800	1		8.010	56321	15-02-2017	1PLATCS80007
882852	186896/2	30 80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186896/1	30 80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186897/1	30 80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186897/2	30 80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186898/1	30 80,00	2640,0	4800	1		8.020	56268	15-02-2017	1PLATCS80007
882852	186898/2	30 80,00	2640,0	4800	1		8.020	56268	15-02-2017	1PLATCS80007
882852	186899/2	30 80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007

A04
Symbol of the manufacturer's work

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Inspection representative voestalpine Grobblech
Quality Department Heavy Plates
BERGER Alfred

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Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	Ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
882852	186899/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
882852	186900/2	30	80,00	2640,0	4800	1		8.020	56058	15-02-2017	1PLATCS80007
882852	186900/1	30	80,00	2640,0	4800	1		8.020	56058	15-02-2017	1PLATCS80007
882852	186901/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
882852	186901/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972090	186721/2	30	80,00	2640,0	4800	1		8.018	56010	10-02-2017	1PLATCS80007
972090	186723/2	30	80,00	2640,0	4800	1		8.012	56058	14-02-2017	1PLATCS80007
972090	186723/1	30	80,00	2640,0	4800	1		8.012	56058	14-02-2017	1PLATCS80007
972090	186724/1	30	80,00	2640,0	4800	1		8.010	56058	13-02-2017	1PLATCS80007
972090	186724/2	30	80,00	2640,0	4800	1		8.010	56321	13-02-2017	1PLATCS80007
972090	186725/1	30	80,00	2640,0	4800	1		8.010	56010	11-02-2017	1PLATCS80007
972090	186725/2	30	80,00	2640,0	4800	1		8.010	56010	11-02-2017	1PLATCS80007
972090	186726/2	30	80,00	2640,0	4800	1		8.022	56058	10-02-2017	1PLATCS80007
972090	186726/1	30	80,00	2640,0	4800	1		8.022	56010	10-02-2017	1PLATCS80007
972093	181846/2	30	80,00	2640,0	4800	1		8.005	56268	15-02-2017	1PLATCS80007
972093	181846/1	30	80,00	2640,0	4800	1		8.005	56268	15-02-2017	1PLATCS80007
972093	186842/1	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
972093	186842/2	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
972093	186843/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186843/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186844/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186844/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186846/2	30	80,00	2640,0	4800	1		8.007	56058	17-02-2017	1PLATCS80007
972093	186846/1	30	80,00	2640,0	4800	1		8.007	56058	17-02-2017	1PLATCS80007
972093	186902/2	30	80,00	2640,0	4800	1		8.010	56272	15-02-2017	1PLATCS80007
972093	186902/1	30	80,00	2640,0	4800	1		8.010	56272	15-02-2017	1PLATCS80007
972093	186903/2	30	80,00	2640,0	4800	1		8.010	56010	15-02-2017	1PLATCS80007
972093	186903/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186905/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186905/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972096	186841/1	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
972096	186841/2	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
972096	186845/1	30	80,00	2640,0	4800	1		8.010	56272	16-02-2017	1PLATCS80007
972096	186906/2	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007

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Quality Department Heavy Plates
BERGER Alfred

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Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	Ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
972096	186906/1	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
		Sum				48		384.580			

C70 - Method of steelmaking: strand casted material: pure oxygen blown with vacuum treatment; steel is fully killed.

B14 - Supplementary information
Flatness acc. EN 10029/10 class N
Dimensional tolerances acc. EN 10029/10
EN10163-2: Class A3 - Repair-welding not permitted.
Thicknesstolerance acc. EN 10029/10 tab. 1 class A

Chemical composition (Heat analysis) - part 1 of 2

B07 Heat No.		C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %	Pb %	Cae %	Pcm %
	>=		.150				.015																
Set values	<=	.140	.550	1.650	.020	.0050	.055	.250	.700	.250	.300	.080	.040	.025	.0100	.0005	.0200	.0050	.0300	.0100	.010	.43	.22
882852		.052	.182	1.550	.009	.0009	.030	.182	.520	.123	.073	.004	.030	.012	.0051	.0002	.0020	.0003	.0020	.0020	.002	.41	.17
972090		.060	.176	1.520	.007	.0010	.022	.174	.520	.125	.046	.004	.027	.012	.0061	.0002	.0020	.0003	.0020	.0020	.002	.41	.17
972093		.052	.184	1.530	.008	.0011	.027	.172	.530	.125	.068	.004	.029	.012	.0042	.0003	.0020	.0003	.0030	.0020	.002	.41	.17
972096		.054	.177	1.530	.007	.0007	.026	.173	.530	.117	.054	.004	.027	.013	.0040	.0002	.0020	.0003	.0020	.0030	.002	.41	.17

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Chemical composition (Heat analysis) - part 2 of 2

B07

Heat. No.	LF01 %	LF02 %	LF03 %
Set values >= <=	.090	.110	.900
882852	.034	.046	.898
972090	.031	.043	.865
972093	.033	.045	.895
972096	.031	.044	.874

C99 - Supplementary information
BI <= 0,01%
C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF03: Cr+Ni+Cu+Mo
LF02: Nb+V+Ti
LF01: Nb+V

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Test results: C10-C29 Tensile Test acc. EN ISO 6892-1

B07 Heat No.	B06 Plate No	C41 Width	SpThickn mm	C01 loc.	PosTh.	C02 Dir	C11 Reh MPa	C11 Rp0,2 MPa	C12 Rm MPa	L0	C13 E %	C11 Reh/Rm %	C11 Rp0,2/Rm %	Sim.htm	WBH
	>=						405	405	505		17.0				
Set values	<=								665			90.00	90.00		
882852	186892	Ø	9.98	F	V	T	445	445	535	A5	32.0	83.07	83.09		
	186896	Ø	9.98	F	V	T	447	443	535	A5	30.9	83.47	82.69		
	186898	Ø	9.99	F	V	T	441	438	538	A5	31.2	81.97	81.41		
	186900	Ø	9.98	F	V	T	457	440	533	A5	30.3	85.65	82.52		
	186892	Ø	9.99	F	V	T		436	527	A5	30.0		82.78	001	1
	186896	Ø	9.99	F	V	T	468	443	524	A5	32.3	89.30	84.50	001	1
	186898	Ø	9.98	F	V	T	465	445	527	A5	32.4	88.24	84.44	001	1
	186900	Ø	9.99	F	V	T		437	524	A5	31.6		83.43	001	1
972090	184827	Ø	10.00	F	V	T	456	449	541	A5	29.3	84.28	82.93		
	184828	Ø	10.00	F	V	T	442	440	536	A5	30.8	82.41	82.00		
	186723	Ø	9.98	F	V	T		429	545	A5	27.5		78.81		
	184827	Ø	9.99	F	V	T		432	520	A5	28.5		83.09	001	1
	184828	Ø	9.99	F	V	T		440	529	A5	31.2		83.32	001	1
	186723	Ø	9.96	F	V	T	487	474	563	A5	28.1	86.53	84.17	001	1
972093	181846	Ø	9.95	F	V	T		415	564	A5	32.1		73.58		
	186842	Ø	9.98	F	V	T	456	449	540	A5	32.5	84.45	83.24		
	186843	Ø	9.99	F	V	T	461	452	544	A5	32.6	84.74	83.09		
	186902	Ø	9.98	F	V	T	456	448	532	A5	32.5	85.67	84.18		
	181846	Ø	9.98	F	V	T	460	424	524	A5	32.6	87.79	80.92	001	1
	186842	Ø	9.99	F	V	T	471	440	526	A5	32.4	89.49	83.56	001	1
	186843	Ø	9.98	F	V	T	470	443	532	A5	32.6	88.35	83.27	001	1
	186902	Ø	9.99	F	V	T	463	436	518	A5	32.9	89.37	84.16	001	1
972095	186841	Ø	9.98	F	V	T	459	429	529	A5	30.9	86.77	81.10		
	186906	Ø	9.98	F	V	T	466	436	524	A5	31.2	88.86	83.05		
	186841	Ø	9.98	F	V	T	470	441	525	A5	32.1	89.52	84.00	001	1
	186906	Ø	9.97	F	V	T		439	523	A5	32.7		83.96	001	1

SpThickn: specimen thickness
C01;loc.:
F: Bottom
PosTh.: Pos Thickness
V: ¼

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Z02
Inspection representative voestalpine Grobblech
Quality Department Heavy Plates
BERGER Alfred

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Test results: C10-C29 Tensile Test acc. EN ISO 6892-1

B07 Heat No.	B06 Plate No	C41 Width	SpThickn mm	C01 loc.	PosTh.	C02 Dir	C11 Reh MPa	C11 Rp0,2 MPa	C12 Rm MPa	L0	C13 E %	C11 Reh/Rm %	C11 Rp0,2/Rm %	Sim.htm	WBH

C02;Dir:
T: transverse
C12; Rm: Tensile Strength
L0: gauge
A5: Length = 5.65 * sqr (area) mm
C13;E: elongation
Sim.htm: sim. heat treatment
001: Sim.htm group #1
WBH: sim. heat treatment

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Z02
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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07	B06	C40	C01			C02	C03	C42	C42	C42	C43			
Heat No. samp.cond.	Plate No	shape	loc.	Pos.	PosTh.	Dir	temp	SV	SV	SV	AV		Sim.htm	WBH
							°C	J	J	J	J			
>=							-40	42	42	42	60			
Set values <=														

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Z02
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Quality Department Heavy Plates
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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No, samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	42	42	42	60		
882852	186892	CV 10x10	F		O	T	-40	340	328	325	331		
	186896	CV 10x10	F		O	T	-40	345	328	327	333		
	186898	CV 10x10	F		O	T	-40	352	332	322	335		
	186900	CV 10x10	F		O	T	-40	345	348	344	346		
	186892	CV 10x10	F		O	T	-40	307	310	303	307	001	1
	186896	CV 10x10	F		O	T	-40	314	321	315	317	001	1
	186898	CV 10x10	F		O	T	-40	323	311	317	317	001	1
	186900	CV 10x10	F		O	T	-40	334	324	325	328	001	1
	186892	CV 10x10	F		K	T	-40	348	364	385	366		
	186896	CV 10x10	F		K	T	-40	365	356	353	358		
	186898	CV 10x10	F		K	T	-40	352	365	345	354		
	186900	CV 10x10	F		K	T	-40	372	347	354	357		
	186892	CV 10x10	F		K	T	-40	345	329	324	333	001	1

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24 FEB 2017

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Quality Department Heavy Plates
BERGER Alfred

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
Set values >=							-40	42	42	42	60		
Set values <=													
882852	186896	CV 10x10	F		K	T	-40	344	328	284	319	001	1
	186898	CV 10x10	F		K	T	-40	310	337	320	322	001	1
	186900	CV 10x10	F		K	T	-40	357	349	347	351	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	42	42	42	60		
972090	184827	CV 10x10	F	O		T	-40	321	320	314	318		
	184828	CV 10x10	F	O		T	-40	320	303	303	309		
	186723	CV 10x10	F	O		T	-40	323	327	322	324		
	184827	CV 10x10	F	O		T	-40	332	319	327	326	001	1
	184828	CV 10x10	F	O		T	-40	318	323	321	321	001	1
	186723	CV 10x10	F	O		T	-40	295	263	303	287	001	1
	184827	CV 10x10	F	K		T	-40	340	328	251	306		
	184828	CV 10x10	F	K		T	-40	346	336	317	333		
	186723	CV 10x10	F	K		T	-40	268	289	311	289		
	184827	CV 10x10	F	K		T	-40	321	331	357	336	001	1
	184828	CV 10x10	F	K		T	-40	326	353	89	256	001	1
	186723	CV 10x10	F	K		T	-40	284	266	276	275	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>=							-40	42	42	42	60		
Set values <=													
972093	181846	CV 10x10	F		O	T	-40	319	324	322	322		
	186842	CV 10x10	F		O	T	-40	345	347	334	342		
	186843	CV 10x10	F		O	T	-40	343	339	342	341		
	186902	CV 10x10	F		O	T	-40	349	344	335	342		
	181846	CV 10x10	F		O	T	-40	329	302	323	318	001	1
	186842	CV 10x10	F		O	T	-40	312	310	308	310	001	1
	186843	CV 10x10	F		O	T	-40	305	315	311	310	001	1
	186902	CV 10x10	F		O	T	-40	323	322	318	321	001	1
	181846	CV 10x10	F		K	T	-40	304	366	370	347		
	186842	CV 10x10	F		K	T	-40	362	369	351	361		
	186843	CV 10x10	F		K	T	-40	358	366	356	360		
	186902	CV 10x10	F		K	T	-40	357	366	377	366		
	181846	CV 10x10	F		K	T	-40	359	364	355	359	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	42	42	42	60		
972093	186842	CV 10x10	F		K	T	-40	323	298	331	317	001	1
	186843	CV 10x10	F		K	T	-40	313	304	301	306	001	1
	186902	CV 10x10	F		K	T	-40	361	363	364	362	001	1
972096	186841	CV 10x10	F		O	T	-40	345	333	341	339		
	186906	CV 10x10	F		O	T	-40	338	340	346	341		
	186841	CV 10x10	F		O	T	-40	324	316	313	318	001	1
	186906	CV 10x10	F		O	T	-40	317	321	323	320	001	1
	186841	CV 10x10	F		K	T	-40	337	342	353	344		
	186906	CV 10x10	F		K	T	-40	348	357	334	346		
	186841	CV 10x10	F		K	T	-40	309	332	343	328	001	1
	186906	CV 10x10	F		K	T	-40	347	338	278	321	001	1
>= Set values <=							-40	29	29	29	46		

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
	>=						-40	29	29	29	46		
Set values <=													
882852	186892 250°C	CV 10x10	F		ZB2	T	-40	320	310	312	314		strain aged 5%, 60 min. at
	186896 250°C	CV 10x10	F		ZB2	T	-40	305	297	314	305		strain aged 5%, 60 min. at
	186898 250°C	CV 10x10	F		ZB2	T	-40	311	303	309	307		strain aged 5%, 60 min. at
	186900 250°C	CV 10x10	F		ZB2	T	-40	305	317	306	309		strain aged 5%, 60 min. at
972090	184827 250°C	CV 10x10	F		ZB2	T	-40	341	317	326	328		strain aged 5%, 60 min. at
	186723 250°C	CV 10x10	F		ZB2	T	-40	259	299	299	286		strain aged 5%, 60 min. at
972093	181846 250°C	CV 10x10	F		ZB2	T	-40	306	302	323	310		strain aged 5%, 60 min. at
	186842 250°C	CV 10x10	F		ZB2	T	-40	316	299	319	311		strain aged 5%, 60 min. at
	186843 250°C	CV 10x10	F		ZB2	T	-40	322	309	315	315		strain aged 5%, 60 min. at
	186902 250°C	CV 10x10	F		ZB2	T	-40	306	302	323	310		strain aged 5%, 60 min. at
972096	186841 250°C	CV 10x10	F		ZB2	T	-40	311	302	314	309		strain aged 5%, 60 min. at
	186906 250°C	CV 10x10	F		ZB2	T	-40	305	310	313	309		strain aged 5%, 60 min. at

C40;shape:
CV 10x10: Test shape , Dimensions

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07	B06	C40	C01			C02	C03	C42	C42	C42	C43			
Heat No. samp.cond.	Plate No	shape	loc.	Pos.	PosTh.	Dir	temp °C	SV J	SV J	SV J	AV J		Sim.htm	WBH

C01;loc.:
F: Bottom
Pos.: test specimen position
PosTh.: Pos Thickness
K: ½
O: surface
ZB2: 2mm below surface
C02;Dir:
T: transverse
C42;SV: single value
C43;AV: average value
Sim.htm: sim. heat treatment
001: Sim.htm group #1
WBH: sim. heat treatment
samp.cond.: sample condition

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Test results: C10-C29 through Thickness Test acc. DIN / EN

B07 Heat No.	B06 Plate No	C40 Shape	SpThickn mm	C01 loc.	C02 Dir	C12 Rm MPa	C12 Rm MPa	C12 Rm MPa	Z (SV) %	Z (SV) %	Z (SV) %	Z (AV) %
Set values >=						404	404	404	25	25	25	35
882852	186892	Ø	10.01	F	S	531	531	531	72	78	60	70
	186896	Ø	10.00	F	S	539	530	532	78	78	70	75
	186900	Ø	10.00	F	S	526	521	530	77	79	78	78
972090	184827	Ø	10.03	F	S	528	528	525	60	67	58	62
	186723	Ø	9.96	F	S	539	544	525	73	74	79	75
972093	181846	Ø	10.00	F	S	522	520	520	75	74	77	75
	186842	Ø	10.00	F	S	535	533	536	78	75	72	75
	186902	Ø	10.01	F	S	515	520	517	77	71	74	74
972096	186906	Ø	9.87	F	S	527	525	539	77	79	70	75

SpThickn: specimen thickness
C01;loc.:
F: Bottom
C02;Dir:
S: through thickness direction
C12; Rm: Tensile Strength
Z(SV): reduction of area (single value)
Z(AV): reduction of area (average value)

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Chemical composition (Product analysis) - part 1 of 2

B07 Heat No.	B06 Plate No	C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %
	>=		.150				.015													
Set values	<=	.140	.550	1.650	.020	.0050	.055	.250	.700	.250	.300	.080	.040	.025	.0100	.0005	.0200	.0050	.0300	.0100
882852	186892	.052	.184	1.520	.008	.0010	.028	.181	.520	.123	.067	.004	.029	.012	.0058	.0002	.0020	.0002	.0030	.0020
	186896	.052	.185	1.530	.008	.0009	.030	.179	.520	.122	.071	.004	.029	.012	.0053	.0002	.0020	.0003	.0030	.0020
	186898	.052	.175	1.530	.007	.0009	.029	.180	.521	.123	.071	.003	.030	.012	.0051	.0001	.0020	.0002	.0010	.0010
	186900	.052	.184	1.530	.009	.0010	.029	.178	.520	.122	.072	.004	.030	.012	.0050	.0002	.0020	.0003	.0020	.0020
972090	184827	.054	.178	1.530	.007	.0007	.024	.176	.520	.127	.046	.004	.027	.013	.0056	.0002	.0020	.0002	.0030	.0020
	184828	.054	.176	1.530	.007	.0007	.024	.174	.520	.127	.045	.004	.027	.013	.0059	.0002	.0020	.0002	.0020	.0020
	186723	.055	.179	1.540	.007	.0010	.024	.174	.510	.126	.046	.004	.027	.013	.0061	.0002	.0020	.0002	.0030	.0020
972093	181846	.051	.180	1.520	.007	.0010	.029	.170	.520	.122	.060	.004	.029	.012	.0044	.0002	.0020	.0003	.0020	.0020
	186842	.052	.185	1.510	.007	.0012	.028	.168	.510	.124	.061	.004	.029	.013	.0042	.0002	.0020	.0003	.0020	.0020
	186843	.052	.177	1.500	.008	.0010	.027	.173	.531	.125	.066	.004	.029	.011	.0042	.0002	.0030	.0003	.0030	.0020
	186902	.048	.183	1.500	.007	.0010	.028	.168	.510	.122	.060	.004	.028	.012	.0045	.0002	.0020	.0003	.0020	.0020
972096	186841	.054	.175	1.530	.006	.0007	.024	.170	.527	.117	.055	.003	.027	.013	.0040	.0002	.0020	.0003	.0020	.0030
	186906	.053	.179	1.530	.007	.0010	.027	.174	.520	.121	.050	.004	.027	.013	.0040	.0002	.0020	.0002	.0020	.0020

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Chemical composition (Product analysis) - part 2 of 2

B07 Heat No.	B06 Plate No	Pb %	Cae %	Pcm %	LF01 %	LF02 %	LF03 %
Set values >= / <=		.010	.43	.22	.090	.110	.900
882852	186892	.002	.41	.16	.033	.045	.891
	186896	.002	.41	.17	.033	.045	.892
	186898	.002	.41	.16	.033	.045	.895
	186900	.002	.41	.17	.034	.046	.892
972090	184827	.002	.41	.17	.031	.044	.869
	184828	.002	.41	.17	.031	.044	.866
	186723	.002	.41	.17	.031	.044	.856
972093	181846	.002	.40	.16	.033	.045	.872
	186842	.002	.40	.16	.033	.046	.863
	186843	.002	.40	.16	.033	.044	.895
	186902	.002	.39	.16	.032	.044	.860
972096	186841	.002	.41	.17	.030	.043	.869
	186906	.002	.41	.16	.031	.044	.865

C99 - Supplementary information
BI <= 0,01%
C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF03: Cr+Ni+Cu+Mo
LF02: Nb+V+Ti
LF01: Nb+V

Remarks

Simulated heat treatment of test coupons:

Pos 30:
001/1: 1 cycle(s) sim. PWHT: furnace charge temperature at max. 400 °C, heating with max. 55 °C/h up to 580 °C, +20 °C/-20 °C, holding time 240 minutes, cooling with max. 55 °C/h down to 400 °C, final cooling in calm air.

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Remarks

We confirm that the above-mentioned delivery corresponds to the order (and standard).

Reduction of area on tensile test specimens in the through-thickness direction in accordance with EN 10164:2004, class Z35.

The signature of the inspection representative from voestalpine Grobblech GmbH is substituted by a electronic Signature, because the certificates of voestalpine Grobblech GmbH are prepared by a suitable data processing system (EN 10204, Pt.5).

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ULTRASONIC EXAMINATION

SPECIFICATION
Ultrasonic examination acc. to EN 10160, EN 10160 class S1/Body, Grid 200 mm, EN 10160 class E2/Edge Zone, Edge zone 75 mm

VALID TEST EQUIPMENT
mechanized ultrasonic "In-Line testing system" (Manufacturer: NDT-Systems & Services) and
mechanized ultrasonic "off-Line - testing system" (manufacturer: Windhoff Bahn- und Anlagentechnik GmbH) and
MUT (optional): Sonatest D20 no. 90006523 or Sonatest D20 no. 90007346 or Sonatest Masterscan 380 no. 90007347 or Sonatest Masterscan 380 no. 90006522 or Sonatest D50 no. 90010231 or GE - USM 36 no. 90010775

PROBE
(in-line AUT): 3STSE 18.3/8 P5, SEZ5R10RS, SE3 18.3/10 5A, (5MHz)
(off-line AUT): S140 (4MHz) 3T/1R
(MUT): SEB4E (4MHz), SEB4E0° (4MHz), MSEB4E (4MHz), B2SO (2MHz)
watergapcoupling

RESULT
Plate(s) comply with the specification.

INSPECTION OPERATOR
Operators Level 1 or 2: qualified and certified according ÖNORM EN 473 or EN ISO 9712 (since 01.01.2013) respectively according the Written Practice „NDT-WP" (in accordance to Recommended Practice SNT-TC-1A). Operators Level 2 for ASME/ASTM.

INSPECTION SUPERVISOR
Responsible Level 3: Bindreiter Erich

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ROSETTI MARINO

PQR 40/18

Shielding gas certificate



Attenzione

SEZIONE 1: identificazione della sostanza/miscela e della società/impresa

1.1. Identificatore del prodotto

Nome commerciale : Arcal™ 5

Scheda Nr. : AL.5.8.17

1.2. Usi identificati pertinenti della sostanza o della miscela e usi sconsigliati

Usi pertinenti identificati : Impiego industriale e professionale. Fare un'analisi di rischio prima dell'uso.
Gas di protezione nei processi di saldatura.
Contattare il fornitore per ulteriori informazioni sull'utilizzo.

Usi sconsigliati : Uso di consumo.

1.3. Informazioni sul fornitore della scheda di dati di sicurezza

Identificazione della società : Air Liquide Italia Service Srl
Via Calabria, 31
20158 Milano Italia
+39 02 4026.1
https://industria.airliquide.it

Indirizzo e-mail (persona competente): : info_schedesicurezza@airliquide.com

1.4. Numero telefonico di emergenza

Numero telefonico di emergenza : 800.452661 (24h/24h, 365 giorni/anno)

SEZIONE 2: identificazione dei pericoli

2.1. Classificazione della sostanza o della miscela

Classificazione secondo il regolamento (CE) n. 1272/2008 [CLP]

Pericoli fisici Gas sotto pressione: Gas compresso H280

2.2. Elementi dell'etichetta

Etichettatura secondo la regolamento CE n. 1272/2008 [CLP]

Pittogrammi di pericoli (CLP) :



GHS04

Avvertenza (CLP) : Attenzione

Indicazioni di pericolo (CLP) : H280 - Contiene gas sotto pressione; può esplodere se riscaldato.

Consigli di prudenza (CLP)

- Conservazione : P403 - Conservare in luogo ben ventilato.

2.3. Altri pericoli

: Asfissiante in alte concentrazioni.
In alta concentrazione il diossido di carbonio causa rapidamente insufficienza respiratoria. I

sintomi sono mal di testa, nausea e vomito che possono portare alla perdita di conoscenza.

SEZIONE 3: composizione/informazioni sugli ingredienti

3.1. Sostanze : Non applicabile.

3.2. Miscele

Nome	Identificatore del prodotto	%	Classificazione secondo il regolamento (CE) n. 1272/2008 [CLP]
Argon	(Numero CAS) 7440-37-1 (Numero CE) 231-147-0 (Numero indice EU) (no. REACH) *1	resto	Press. Gas (Comp.), H280
Diossido di carbonio	(Numero CAS) 124-38-9 (Numero CE) 204-696-9 (Numero indice EU) (no. REACH) *1	18	Press. Gas (Liq.), H280

Testo integrale delle indicazioni di pericolo H: vedere la sezione 16.

Non contiene altri prodotti e/o impurezze che influenzano la classificazione del prodotto.

**1: Indicata nella lista di sostanze dell'Allegato IV/V del REACH, esente dall'obbligo di registrazione.*

**2: Scadenza di registrazione non superata.*

**3: Registrazione non richiesta: sostanza fabbricata o importata in quantità <1t/anno.*

SEZIONE 4: misure di primo soccorso

4.1. Descrizione delle misure di primo soccorso

- Inalazione : Spostare la vittima in zona non contaminata indossando l'autorespiratore. Mantenere il paziente disteso e al caldo. Chiamare un medico. Procedere alla rianimazione cardiopolmonare in caso di arresto della respirazione.
- Contatto con la pelle : Non si attendono effetti avversi derivanti da questo prodotto.
- Contatto con gli occhi : Non si attendono effetti avversi derivanti da questo prodotto.
- Ingestione : L'ingestione è considerata una via di esposizione poco probabile.

4.2. Principali sintomi ed effetti, sia acuti che ritardati

: In alta concentrazione può causare asfissia. I sintomi possono includere perdita di mobilità e/o conoscenza. Le vittime possono non rendersi conto dell'asfissia.

Fare riferimento alla sezione 11.

4.3. Indicazione dell'eventuale necessità di consultare immediatamente un medico e di trattamenti speciali

: Nessuno(a).

SEZIONE 5: misure antincendio

5.1. Mezzi di estinzione

- Mezzi di estinzione idonei : Acqua nebulizzata.
- Mezzi di estinzione non idonei : Non usare getti d'acqua per estinguere l'incendio.

5.2. Pericoli speciali derivanti dalla sostanza o dalla miscela

Pericoli specifici : L'esposizione alle fiamme può causare la rottura o l'esplosione del recipiente.

Prodotti di combustione pericolosi : Nessuno(a).

5.3. Raccomandazioni per gli addetti all'estinzione degli incendi

Metodi specifici	:	Utilizzare misure antincendio adeguate all'incendio circostante. L'esposizione alle fiamme e al calore può causare la rottura del recipiente. Raffreddare i contenitori esposti al rischio con getti d'acqua a doccia da una posizione protetta. Non riversare l'acqua contaminata dell'incendio negli scarichi fognari. Se possibile arrestare la fuoriuscita di prodotto. Se possibile utilizzare acqua nebulizzata per abbattere i fumi. Spostare i recipienti lontano dall'area dell'incendio se questo può essere fatto senza rischi.
Dispositivi di protezione speciali per addetti antincendio	:	Usare l'autorespiratore in spazi confinati. Indumenti di protezione e dispositivi di protezione (autorespiratori) standard per vigili del fuoco. Norma UNI EN 137 - Dispositivi di protezione delle vie respiratorie - Autorespiratori a circuito aperto ad aria compressa con maschera intera. Norma UNI EN 469 - Indumenti di protezione per vigili del fuoco. Norma UNI EN 659 - Guanti di protezione per vigili del fuoco.

SEZIONE 6: misure in caso di rilascio accidentale

6.1. Precauzioni personali, dispositivi di protezione e procedure in caso di emergenza

: Tentare di arrestare la fuoriuscita.
Evacuare l'area.
Usare l'autorespiratore per entrare nella zona interessata se non è provato che l'atmosfera sia respirabile.
Assicurare una adeguata ventilazione.
Evitarne l'ingresso in fognature, scantinati, scavi e zone dove l'accumulo può essere pericoloso.
Operare in accordo al piano di emergenza locale.
Rimanere sopravvento.
Quando è possibile il rilascio di gas asfissianti, devono essere utilizzati dei rilevatori di ossigeno.

6.2. Precauzioni ambientali

: Tentare di arrestare la fuoriuscita.

6.3. Metodi e materiali per il contenimento e la bonifica

: Ventilare la zona.

6.4. Riferimento ad altre sezioni

: Vedere anche le sezioni 8 e 13.

SEZIONE 7: manipolazione e immagazzinamento

7.1. Precauzioni per la manipolazione sicura

Uso sicuro del prodotto	:	Non respirare il gas. Evitare il rilascio del prodotto in atmosfera. Il prodotto deve essere manipolato in accordo alle buone prassi di sicurezza e di igiene industriale. Soltanto il personale con esperienza e opportunamente addestrato può manipolare i gas sotto pressione. Prendere in considerazione le valvole di sicurezza nelle installazioni per gas. Assicurarsi che l'intero sistema di distribuzione del gas sia stato (o sia regolarmente) verificato contro le fughe prima dell'uso. Non fumare mentre si manipola il prodotto. Utilizzare solo apparecchiature specifiche adatte per il prodotto, la pressione e la temperatura di impiego. In caso di dubbi contattare il fornitore del gas. Evitare il risucchio di acqua, acidi ed alcali.
Manipolazione sicura del contenitore del gas	:	Non permettere il riflusso del gas nel contenitore. Proteggere le bombole da danni fisici; non trascinare, far rotolare, far scivolare o far cadere. Quando si spostano le bombole, anche se per brevi distanze, utilizzare gli opportuni mezzi di

movimentazione (carrelli, carrelli a mano, etc...) progettati per il trasporto delle bombole.

Lasciare i cappellotti di protezione delle valvole in posizione fino a quando il contenitore non è stato fissato a un muro o a un banco di lavoro o posizionato in un opportuno sostegno ed è pronto per l'uso.

Se l'operatore incontra una qualsiasi difficoltà durante il funzionamento della valvola interrompere l'uso e contattare il fornitore.

Mai tentare di riparare o modificare le valvole dei contenitori o i dispositivi di sicurezza.

Le valvole danneggiate devono essere immediatamente segnalate al fornitore.

Mantenere le valvole dei contenitori pulite e libere da contaminanti, in particolare olio e acqua.

Rimontare i tappi e/o i cappellotti delle valvole e dei contenitori, ove forniti, non appena il contenitore è disconnesso dall'apparecchiatura.

Chiudere la valvola del contenitore dopo ogni utilizzo anche se vuoto, anche se ancora connesso all'apparecchiatura.

Mai tentare di trasferire i gas da una bombola/contenitore a un altro.

Non utilizzare fiamme dirette o riscaldamento elettrico per aumentare la pressione interna del contenitore.

Non rimuovere né rendere illeggibili le etichette apposte dal fornitore per l'identificazione del contenuto della bombola.

Evitare il risucchio di acqua nel contenitore.

Aprire lentamente la valvola per evitare colpi di pressione.

7.2. Condizioni per lo stoccaggio sicuro, comprese eventuali incompatibilità

: Osservare le normative e i requisiti legislativi locali relativi allo stoccaggio dei recipienti.

I recipienti non devono essere immagazzinati in condizioni tali da favorire fenomeni corrosivi.

I cappellotti e/o i tappi devono essere montati.

I recipienti devono essere immagazzinati in posizione verticale e ancorati in modo da prevenirne la caduta.

I contenitori in stoccaggio dovrebbero essere controllati periodicamente per verificarne le condizioni generali ed eventuali perdite.

Mantenere il contenitore sotto i 50°C in zona ben ventilata.

Immagazzinare i recipienti in aree dove non vi è rischio di incendio, lontano da sorgenti di calore e da fonti di ignizione.

Tenere lontano da sostanze combustibili.

7.3. Usi finali particolari

: Nessuno(a).

SEZIONE 8: controllo dell'esposizione/protezione individuale

8.1. Parametri di controllo

Diossido di carbonio (124-38-9)		
OEL : Limiti di esposizione professionale		
UE	ILV (EU) - 8 H - [mg/m³]	9000 mg/m³
	ILV (EU) - 8 H - [ppm]	5000 ppm
ACGIH	ACGIH TWA (ppm)	5000 ppm
	ACGIH STEL (ppm)	30000 ppm
	Commento (ACGIH)	Asphyxia
Italia	Valori Limite di Esposizione Professionale (Italia) 8 ore [mg/m3]	9000 mg/m³
	Valori Limite di Esposizione Professionale (Italia) 8 ore [ppm]	5000 ppm

DNEL (Livello derivato senza effetto) : Nessun dato disponibile.

PNEC (Prevedibili concentrazioni prive di effetti) : Nessun dato disponibile.

8.2. Controlli dell'esposizione

8.2.1. Controlli tecnici idonei

: Fornire adeguata ventilazione degli scarichi a livello generale e locale.

I sistemi sotto pressione devono essere controllati periodicamente per verificare l'assenza di perdite.

Assicurare che l'esposizione sia ben al di sotto dei limiti di esposizione professionale (ove disponibili).

Quando è possibile il rilascio di gas asfissianti, devono essere utilizzati dei rilevatori di ossigeno.

Considerare l'uso di un sistema di permessi di lavoro, per esempio per le attività di manutenzione.

8.2.2. Misure di protezione individuale, ad es, dispositivi di protezione individuale

: Dovrebbe essere condotta e documentata un'analisi del rischio in ogni area di lavoro, per valutare il rischio correlato all'utilizzo del prodotto e per individuare i DPI appropriati ai rischi identificati. Devono essere considerate le seguenti raccomandazioni.
Devono essere selezionati DPI conformi agli standard UNI/EN/ISO raccomandati.

• Protezione per occhi/volto : Indossare occhiali di sicurezza con protezione laterale.
Norma UNI EN 166 - Protezione personale degli occhi - Specifiche.

• Protezione per la pelle

- Protezione per le mani : Indossare guanti da lavoro quando si movimentano i contenitori di gas.
Norma UNI EN 388 - Guanti di protezione contro rischi meccanici.

- Altri : Indossare scarpe di sicurezza durante la movimentazione dei contenitori.
Norma UNI EN ISO 20345 - Dispositivi di protezione individuale - Calzature di sicurezza.

• Protezione per le vie respiratorie : Le maschere a filtro possono essere utilizzate se sono note tutte le condizioni dell'ambiente circostante (per es. tipo e concentrazione del/i contaminante/i) e la durata di utilizzo.
Utilizzare maschere a filtro e maschere a pieno facciale quando i limiti di esposizione possono essere superati per un breve periodo, per esempio durante la connessione o la disconnessione dei recipienti.
Le maschere a filtro non proteggono dalle atmosfere sottossigenate.
In ambienti sottossigenati deve essere utilizzato un autorespiratore o un sistema di fornitura di aria respirabile con maschera.
Norma UNI EN 14387 - Apparecchi di protezione delle vie respiratorie - Filtri antigas e filtri combinati. Norma UNI EN 136 - Apparecchi di protezione delle vie respiratorie. Maschere intere.
Norma UNI EN 137 - Dispositivi di protezione delle vie respiratorie - Autorespiratori a circuito aperto ad aria compressa con maschera intera.

• Pericoli termici : Nessuno oltre a quelli indicati nelle sezioni precedenti.

8.2.3. Controlli dell'esposizione ambientale

: Nessuna necessaria.

SEZIONE 9: proprietà fisiche e chimiche

9.1. Informazioni sulle proprietà fisiche e chimiche fondamentali

Aspetto

• Stato fisico a 20°C / 101.3kPa	: Gas
• Colore	: La miscela contiene uno o più componenti che hanno i seguenti colori: Incolore.
Odore	: Inodore.
Soglia olfattiva	: La soglia olfattiva è soggettiva e inadeguata per avvertire di una sovraesposizione.
pH	: Non applicabile per i gas e le miscele di gas.
Punto di fusione / Punto di congelamento	: Non applicabile per le miscele di gas.
Punto di ebollizione	: Non applicabile per le miscele di gas.
Punto di infiammabilità	: Non applicabile per i gas e le miscele di gas.
Velocità di evaporazione	: Non applicabile per i gas e le miscele di gas.
Infiammabilità (solidi, gas)	: Non infiammabile.

Limiti di infiammabilità o esplosività	: Non infiammabile.
Tensione di vapore [20°C]	: Non applicabile.
Tensione di vapore [50°C]	: Non applicabile.
Densità di vapore	: Non applicabile.
Densità relativa, gas (aria=1)	: Più pesante dell'aria.
Idrosolubilità	: Solubilità in acqua dei componenti della miscela: • Argon: 67,3 mg/l • Diossido di carbonio: 2000 mg/l Completamente solubile.
Coefficiente di ripartizione n-ottanolo/acqua (Log Kow)	: Non conosciuto(a).
Temperatura di autoaccensione	: Non infiammabile.
Temperatura di decomposizione	: Non applicabile.
Viscosità	: Non conosciuto(a).
Proprietà esplosive	: Non applicabile.
Proprietà ossidanti	: Non applicabile.

9.2. Altre informazioni

Massa molecolare	: Non applicabile per le miscele di gas.
Altri dati	: Gas/vapore più pesante dell'aria. Può accumularsi in spazi chiusi particolarmente al livello del suolo o al di sotto di esso.

SEZIONE 10: stabilità e reattività

10.1. Reattività

: Non ci sono ulteriori pericoli di reattività oltre a quelli descritti nei paragrafi sottostanti.

10.2. Stabilità chimica

: Stabile in condizioni normali.

10.3. Possibilità di reazioni pericolose

: Nessuno(a).

10.4. Condizioni da evitare

: Evitare l'umidità negli impianti.

10.5. Materiali incompatibili

: Nessuno(a).
Consultare la norma ISO 11114 per informazioni addizionali sulla compatibilità dei materiali.

10.6. Prodotti di decomposizione pericolosi

: In condizioni normali di stoccaggio e utilizzo, non dovrebbero generarsi prodotti di decomposizione pericolosi.

SEZIONE 11: informazioni tossicologiche

11.1. Informazioni sugli effetti tossicologici

Tossicità acuta : Non si aspettano effetti tossicologici da questo prodotto se sono rispettati i valori limite di esposizione.

A differenza degli asfissianti semplici, il diossido di carbonio ha la capacità di provocare la morte anche quando sono mantenuti livelli di ossigeno normale (20-21%). È stato riscontrato che il 5% di CO_2 contribuisce in modo sinergico all'incremento di tossicità di altri gas (CO, NO_2). Il CO_2 ha dimostrato di aumentare la produzione di carbossi oppure meta emoglobina, probabilmente a causa dei suoi effetti stimolatori sull'apparato respiratorio e circolatorio.

Per maggiori informazioni fare riferimento al documento 'EIGA Safety Info 24: Carbon Dioxide, Physiological Hazards' disponibile all'indirizzo www.eiga.eu.

Corrosione/irritazione cutanea	: Nessun effetto conosciuto da parte di questo prodotto.
Lesioni/irritazioni oculari gravi	: Nessun effetto conosciuto da parte di questo prodotto.
Sensibilizzazione respiratoria o cutanea	: Nessun effetto conosciuto da parte di questo prodotto.
Mutagenicità	: Nessun effetto conosciuto da parte di questo prodotto.
Cancerogenicità	: Nessun effetto conosciuto da parte di questo prodotto.

Tossico per la riproduzione: fertilità	: Nessun effetto conosciuto da parte di questo prodotto.
Tossico per la riproduzione: feto	: Nessun effetto conosciuto da parte di questo prodotto.
Tossicità specifica per organi bersaglio (STOT) — esposizione singola	: Nessun effetto conosciuto da parte di questo prodotto.
Tossicità specifica per organi bersaglio (STOT) — esposizione ripetuta	: Nessun effetto conosciuto da parte di questo prodotto.
Pericolo in caso di aspirazione	: Non applicabile per i gas e le miscele di gas.

SEZIONE 12: informazioni ecologiche

12.1. Tossicità

Valutazione	: Questo prodotto non causa alcun danno ecologico.
EC50 48h - Daphnia magna [mg/l]	: Dati non disponibili.
EC50 72h - Algae [mg/l]	: Dati non disponibili.
CL50 96h - Pesce [mg/l]	: Dati non disponibili.

12.2. Persistenza e degradabilità

Valutazione	: Questo prodotto non causa alcun danno ecologico.

12.3. Potenziale di bioaccumulo

Valutazione	: Questo prodotto non causa alcun danno ecologico.

12.4. Mobilità nel suolo

Valutazione	: Questo prodotto non causa alcun danno ecologico.

12.5. Risultati della valutazione PBT e vPvB

Valutazione	: Non classificato come PBT o vPvB.

12.6. Altri effetti avversi

Altri effetti avversi	: Nessun effetto conosciuto da parte di questo prodotto.
Effetto sullo strato d'ozono	: Nessuno(a).
Effetti sul riscaldamento globale	: Contiene gas a effetto serra.

SEZIONE 13: considerazioni sullo smaltimento

13.1. Metodi di trattamento dei rifiuti

Può essere scaricato all'atmosfera in zona ben ventilata.
Non scaricare dove l'accumulo può essere pericoloso.
Restituire al fornitore il prodotto non utilizzato nel recipiente originale.

Elenco dei rifiuti pericolosi : 16 05 05: gas in contenitori a pressione, diversi da quelli di cui alla voce 16 05 04*.

13.2. Informazioni supplementari

: Il trattamento e lo smaltimento dei rifiuti da parte di imprese esterne deve essere effettuato in conformità alla normativa vigente.

SEZIONE 14: informazioni sul trasporto

14.1. Numero ONU

Numero ONU : 1956

14.2. Nome di spedizione dell'ONU

Trasporto su strada/ferrovia (ADR/RID)	:	GAS COMPRESSO N.A.S. (Argon, Diossido di carbonio)
Trasporto per via aerea (ICAO-TI / IATA-DGR)	:	Compressed gas, n.o.s. (Argon, Carbon dioxide)
Trasporto per mare (IMDG)	:	COMPRESSED GAS, N.O.S. (Argon, Carbon dioxide)

14.3. Classi di pericolo connesso al trasporto

Etichettatura :



2.2 : Gas non infiammabili, non tossici.

Trasporto su strada/ferrovia (ADR/RID)

Classe	:	2
Codice classificazione	:	1A
N° di identificazione del pericolo	:	20
Codice di restrizione in galleria	:	E - Passaggio vietato nelle gallerie di categoria E

Trasporto per via aerea (ICAO-TI / IATA-DGR)

Classe/ Divisione(rischio(i) accessorio(i))	:	2.2

Trasporto per mare (IMDG)

Classe/ Divisione(rischio(i) accessorio(i))	:	2.2
Scheda di Emergenza (EmS) - Fuoco	:	F-C
Scheda di Emergenza (EmS) - Sversamento	:	S-V

14.4. Gruppo di imballaggio

Trasporto su strada/ferrovia (ADR/RID)	:	Non applicabile.
Trasporto per via aerea (ICAO-TI / IATA-DGR)	:	Non applicabile.
Trasporto per mare (IMDG)	:	Non applicabile.

14.5. Pericoli per l'ambiente

Trasporto su strada/ferrovia (ADR/RID)	:	Nessuno(a).
Trasporto per via aerea (ICAO-TI / IATA-DGR)	:	Nessuno(a).
Trasporto per mare (IMDG)	:	Nessuno(a).

14.6. Precauzioni speciali per gli utilizzatori

Istruzioni di imballaggio

Trasporto su strada/ferrovia (ADR/RID)	:	P200
Trasporto per via aerea (ICAO-TI / IATA-DGR)		
Aerei passeggeri e cargo	:	200
Solo aerei cargo	:	200
Trasporto per mare (IMDG)	:	P200

Misure di precauzione per il trasporto : Evitare il trasporto su veicoli dove la zona di carico non è separata dall'abitacolo.

Assicurarsi che il conducente sia informato del rischio potenziale del carico e sappia cosa fare in caso di incidente o di emergenza.

Prima di iniziare il trasporto:

- Assicurarsi che vi sia adeguata ventilazione.
- Accertarsi che il carico sia ben assicurato.
- Assicurarsi che la valvola della bombola sia chiusa e che non perda.
- Assicurarsi che il tappo cieco della valvola, ove fornito, sia correttamente montato.
- Assicurarsi che il cappellotto, ove fornito, sia correttamente montato.

Numero telefonico di emergenza nel trasporto: 800.452661 (operativo 24h/24h, 365 giorni all'anno, presso il centro di Risposta Nazionale del Servizio Emergenze Trasporti S.E.T.).

14.7. Trasporto di rinfuse secondo l'allegato II di MARPOL ed il codice IBC

: Non applicabile.

SEZIONE 15: informazioni sulla regolamentazione

15.1. Disposizioni legislative e regolamentari su salute, sicurezza e ambiente specifiche per la sostanza o la miscela

Normative UE

Restrizioni consigliate : Nessuno(a).

Direttiva Seveso: 2012/18/UE (Seveso III) : Non incluso.

Norme nazionali

Legislazione nazionale : Assicurare l'osservanza di tutte le norme nazionali e locali.

15.2. Valutazione della sicurezza chimica

: Per questo prodotto non è necessario effettuare una valutazione della sicurezza chimica (CSA).

SEZIONE 16: altre informazioni

Indicazioni di modifiche : Scheda di dati di sicurezza revisionata in accordo con il Regolamento (UE) 2015/830.

Ridenominazione di alcune sezioni in accordo con il Regolamento (EU) 2015/830. Modifiche editoriali, inclusa la ricollocazione di frasi, ove opportuna, per migliorare leggibilità e coerenza del documento.

Aggiornamento degli usi identificati in sezione 1.

Aggiornamento delle misure di protezione individuale in sezione 8.

Aggiornamento sezione 11.

Aggiornamento sezione 12.

Aggiornamento sezione 13.

Aggiunta di "Abbreviazioni e acronimi" in sezione 16.

Abbreviazioni ed acronimi : ATE - Acute Toxicity Estimate - Stima della tossicità acuta

CLP - Classification Labelling Packaging - Regolamento (CE) N. 1272/2008 relativo alla classificazione, all'etichettatura e all'imballaggio delle sostanze e delle miscele

REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals - Regolamento (CE) N. 1907/2006 concernente la registrazione, la valutazione, l'autorizzazione e la restrizione delle sostanze chimiche

EINECS - European Inventory of Existing Commercial Chemical Substances - Registro europeo delle sostanze chimiche in commercio

n. CAS - Chemical Abstract Service number - Identificativo numerico attribuito dal Chemical Abstract Service alle sostanze chimiche

DPI - Dispositivi di Protezione Individuale

LC50 - Lethal Concentration 50 - Concentrazione letale per il 50% della popolazione sottoposta a test

RMM - Risk Management Measures - Misure di gestione dei rischi

PBT - Persistent, Bioaccumulative and Toxic - Persistente, bioaccumulabile e tossico

vPvB - very Persistent and very Bioaccumulative - Molto persistente e molto bioaccumulabile

STOT-SE: Specific Target Organ Toxicity-Single Exposure - Tossicità specifica per organi bersaglio-esposizione singola

CSA - Chemical Safety Assessment - Valutazione della sicurezza chimica

EN - European Standard - Norma europea

ONU - Organizzazione delle Nazioni Unite

ADR - Accord européen relatif au transport international des marchandises Dangereuses par Route - Accordo europeo relativo al trasporto internazionale di merci pericolose su strada

IATA - International Air Transport Association - Associazione internazionale del trasporto aereo

IMDG code - International Maritime Dangerous Goods code - Codice per il trasporto via mare di merci pericolose

RID - Règlement concernant le trasport International ferroviaire des merchandises Dangereuses - Regolamento concernente il trasporto internazionale di merci pericolose per

ferrovia

WGK - Wassergefährdungsklassen - Classi di pericolo per l'acqua

STOT-RE: Specific Target Organ Toxicity-Repeated Exposure - Tossicità specifica per organi bersaglio-esposizione ripetuta

Consigli per la formazione : Il rischio di asfissia è spesso sottovalutato e deve essere ben evidenziato durante l'addestramento dell'operatore.

Dati supplementari : Classificazione effettuata in base alle informazioni contenute nei database di EIGA (European Industrial Gases Association).

Classificazione in conformità con i metodi di calcolo del Regolamento (CE) n. 1272/2008 (CLP).

Per ulteriori informazioni contattare la Linea Verde: 800.452661 (operativa 24h/24h, 365 giorni all'anno, presso il centro di Risposta Nazionale del Servizio Emergenze Trasporti S.E.T.).

Testo integrale delle indicazioni di pericolo H ed EUH

Press. Gas (Comp.) : Gas sotto pressione: Gas compresso

Press. Gas (Liq.) : Gas sotto pressione: Gas liquefatto

H280 : Contiene gas sotto pressione; può esplodere se riscaldato.

RINUNCIA ALLA RESPONSABILITÀ : Prima di utilizzare questo prodotto in qualsiasi nuovo processo o esperimento, deve essere condotto uno studio approfondito sulla sicurezza e sulla compatibilità del prodotto stesso con i materiali.

Le informazioni contenute in questo documento sono da ritenersi valide al momento della stampa.

Sebbene sia stata posta la massima cura nella redazione di questo documento, la Società non deve essere ritenuta responsabile per eventuali danni o infortuni derivanti dal suo utilizzo.

Fine del documento

ROSETTI MARINO

PQR 40/18

Consumables certificate

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2018-07-27

Numero certificato/Cert no: EC25251151 rev. 0

Nostro ordine/Our order:	2013780	Vostro ordine/Your order:	1718000897
Nostro riferimento/Our ref:	Web user - Movex CMP020 ITB	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB00060	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20180727	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address

ESAB SALDATURA S.P.A. (6155)
STRADA PROVINCIALE 34, N. 7
IT-20010 OSSONA MI
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address

ROSETTI MARINO SPA
.
VIA TRIESTE 230
48100 RAVENNA RA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PNS24006 Quantità/Quantity: 20 CT

PRODOTTO/PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK Tubrod 15.17 1.2mm 16kg
Codice/Item no:	**1517127730**

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.36: E81T1-M21A4-Ni1
EN ISO 17632-A: T 46 3 1Ni P C1 2 H5
EN ISO 17632-A: T 46 4 1Ni P M21 2 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:	M21 (EN ISO 14175)
C	0.05%
Si	0.39%
Mn	1.15%
P	0.01%
S	0.02%
Cr	0.03%
Ni	1.0%
Mo	0.03%
Nb	0.02%
Cu	0.06%
V	0.02%

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:	EN
Altro/Auxiliary:	M21 (EN ISO 14175)
Condizione/Condition:	As welded

TRAZIONE/TENSILE

ReL	Rm	A5
544 MPa	613 MPa	26 %

RESILIENZA/IMPACT

Temp	-40 °C
KV	124 J

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis		Validazione - altro/Validation - Others	
Piotr Grela	Quality Assurance Manager	Neil Farrow	Product Manager

ROSETTI MARINO

PQR 40/18

preliminary WPS

PQR ref.:	40/18 TBQ	WPS (EN 15614-1 Ed.2017+MOTS 12 Rev. 4.0)	40/18	REV.:	0	Data /date	30/08/2018

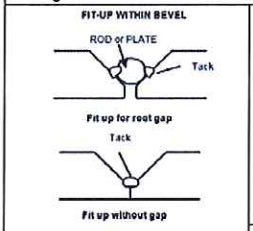
Procedimento di saldatura / Welding process: 136-FCAW — Tipo / Type: SEMIAUTOMATIC

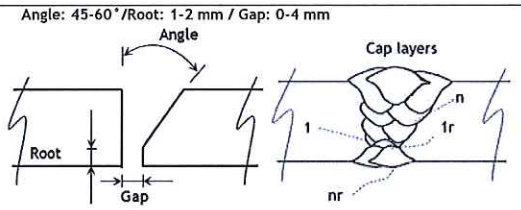
GIUNTO - JOINT

Tipo di giunto / Joint Design: 1/2V — Supporto / Backing: ☐ Si / Yes ☒ No

Materiale di supporto (tipo) / Backing material (type): ☐ Metallico / Metal ☐ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:





Note: 1.Surfaces cleaned from moisture, oil, grease, paint before welding (by grinding)/ *Pulire le superfici da liquidi, oli, grasso e vernici con molatura prima di saldare.*
2.Minimum tack weld lengths shall be 4 times the thk or 50 mm, whichever is less/ I tacchetti devono essere lunghi almeno 50 mm o 4 volte lo spessore (il più piccolo dei due);
3.Welding shall not be discontinued before 25% of the weld thickness or 3 passes are completed, whichever gives adequate cross section to prevent craking/ *La saldatura non può essere interrotta prima di aver completato almeno 3 passate o il 25% dello spessore da saldare*
4.Preheat shall be performed by electrical resistance, induction equipment or with gas burners. Cutting torches shall not be permitted. *Il preriscaldo può essere eseguito con resitenze, induzione o torcia. Non può essere utilizzato l'ossitaglio.*

MATERIALE BASE - BASE MATERIAL

Da / from P-N°: /	Group N° S4	A / to P-N°: /	Group N° S4

DA Tipo e grado / From type and grade: S460 G2+M

A Tipo e grado / To type and grade: S460 G2+M

Gamma spessori / Thickness range: ▶ Materiale base / Base material: Piena penetrazione / Groove 40 mm

▶ Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove N.A.

METALLO D'APPORTO - FILLER METAL

	GS FCAW	
Spec. N° (SFA)	5.29/5.36	
AWS N° (CLASS)	E81T1-1/E81T1-Ni1	
F-N°	6	
A-N°	1	
Diametro mat. D'apporto / Size of filler metal	1,2	
Gamma spessori /Thick. Range (mm)	Up to filling	
Accoppiamento filo-flusso / Electrode-flux (CLASS)	NA	
Denom. Comm. Flusso / FLUX trade name	NA	
Inserto consumabile / Consumable insert	NA	
Altro / other	OK Tubrod 15.17	

POSIZIONI - POSITION

giunto / Joint: Cianfrino / groove — Posizione / position 2G-3G — Progressione / weld progression: Ascendente / UP hill

PRERISCALDO - PRE-HEAT

Temp.preriscaldo minima / Min. pre-heat temp: 50 °C — Max temp. Di interpass / Max interpass temp.: 250 °C — Mantenimento interpass / Interpass maintenance: N.A. — Tempo di mantenimento prerisc. / Maintenance timing: N.A.

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs): N.A. — Temperatura di stasi / Holding temperature °C: N.A. — Tempo di stasi / Holding time (min.): N.A. — Velocità di raffreddamento / Cooling rate (°C/Hrs): N.A.

GAS DI PROTEZIONE - GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar+CO2	80%+20%	16-24 lt/min
Protezione al seguito / Trailing:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current: DC — Polarità / Polarity: RP

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: N.A.

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: N.A.

Velocità alimentazione filo / Electr. Wire feed speed range: Self regulated

TECNICA - TECHNIQUE

Passata / Bead: Tirata/String — Dimensione bocchello gas / Orifice of gas cup size: 1/2" — Pulizia iniziale e fra le passate / Initial and interpass cleaning: Spazzolatura/Brushing

Metodo di solcatura a rovescio / Method of back gouging: Scriccatura + molatura/ Arcair + grinding — Oscillazione / Oscillation: N.A. — Distanza zona di contatto e pezzo / Contact zone to work distance: N.A.

N°Passate / Passes nr.: Multipla/Multiple — Elettrodo multiplo o singolo / Multiple or single electrodes: Singolo/Single — Martellatura / Peening: N.A.

Altro / Other: All arc/air gouged surface shall be dressed to bright clean metal by grinding at an additional depth of minimum 2 mm/ *Molare per una profondità minima di 2 mm dopo scriccatura.*

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current			Voltaggio / Volt range		Vel. Avanzamento / Travel speed range (mm/min)		Apporto termico / Heat input (KJ/mm)	
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. Range							
Tack-1	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	180	195	27	29	160	235	1,24	2,12
2	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	230	250	27	29	210	285	1,31	2,07
3-n; Cap layers	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	240	270	27	29	220	350	1,11	2,14
Back gouging (minimum back gouging layers shall be 2 /Le passate di ripresa devono essere minimo 2)												
1r	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	230	250	27	29	210	285	1,31	2,07
2r-3r	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	240	270	27	29	220	350	1,11	2,14

Preparato da / prepared by:	Client/Third part signature:	Client/Third part signature:
D.Cenacchi	*Maersk*	*DNV*

ROSETTI MARINO

PQR 40/18

NDE certificate

ROSETTI MARINO	**VERBALE DI CONTROLLO VISIVO/DIMENSIONALE** **visual/dimensional inspection report**	VDR N° **40-18** data: **04-09-2018**

progetto project	**TYRA REDEVELOPMENT PROJECT**	cliente **TOTAL** client	ordine **/** PO	commessa **118A10** job
disegno dwg	**/**	ITP N°	fase **/** step	

SI CERTIFICA CHE :

gli item di seguito indicati sono stati sottoposti a controllo dimensionale ed accettati in accordo alla procedura / specifica sotto indicata ed ai criteri di accettabilita' in essa definiti.

WE CERTIFY THAT:

items below indicated have undergone a dimensional inspection and have been accepted according to the specific / procedure mentioned hereunder and to acceptance criteria defined in it.

oggetto – item

COUPON	STAMP	POS	THK	LENGHT	WPS	Date of examination
40/18 2G	AX61	2G	40mm	800mm	pWPS 40/18	04/09/2018
40/18 3G	AX82	3G	40mm	800mm	pWPS 40/18	04/09/2018

note - remarks

Acceptance criteria: EN-ISO 5817-2014 LEV. B

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

UNI EN ISO 17637 REV. 2017

Operatore - Operator	Controllo Qualita' - Quality Control	(Cliente - Client) THIRD PARTY
CSWIP D.CENACCHI 306250 WI 3.1		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 04/09/2018 File Signature Cinatti Davide

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 05/09/2018	FOGLIO – Sheet
RAPPORTO D'ESAME MAGNETOSCOPICO ***MAGNETIC PARTICLE TEST***		MT N° : 01	Ns. Rif./Our Ref. 18205

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	TYRA FUTURE	118A10	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
MAERSK OIL	PQR	/	/	/

CODICE / code	PROCEDURA/Procedure	ACCETTABILITA - Acceptance level	
/	DK-TEHY-MET-PRO-000-10006	Quality Level ISO 5817 ☑ B ☐ C ☐ D Acceptance level ISO 23278 ☑ 2x ☐ 2x ☐ 3x	
MATERIALE Material	TEMPERATURA DELLE SUPERFICI Surface temperature	INTENSITA' LUMINOSA / Light intensity LUCE BIANCA	LUCE NERA
S460 G2 + M	RANGE 5÷52°C	☑ > 500 LUX	☐ 500 µW/cm².

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined
☐ MOLATO – Ground	☐ LAMINATO – Rolled	☐ GREZZO – Forged

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☐ PUNTALI/Prods	☑ GIOGO/Yoke	☐ SOLENOIDE/Solenoid	☐ CONDUTTORE CENTRALE/Central conduttor

TIPO APPARECCHIO/Type of equipment	SILVER YOKE/S.No.04 230-15	DISTANZA PUNTALI/Pole spacing mm	180mm
TIPO DI CORRENTE/Type current	C.A	INTENSITÀ/Intesity (Amp)	4,5 kg

MEZZO DI ISPEZIONE / Examination medium		☑ UMIDO/Wet	☐ ASCIUTTO/Dry
PARTICELLE UTILIZZATE/Particle Type			
POLVERE NERA/Black powder	☑	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	NDT BW2	MARCA TIPO/Mark Type	NDT FW1
LOTTO / Batck No.	7241s	LOTTO / Batck No.	
VERNICE DI CONTRASTO/Contrast Paint		☑ NDT WBL5	☐ CGM VECOPLAST
LOTTO / Batck No.		U171010c	

SALDATURE CONTROLLATE / Welds Verified
PQR 40/18 2G AX61 PQR 40/18 3G AX82

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Stefano Zauli 3° Livello CSQ - IC - IAF ISO 9712	ROSETTI MARINO SpA Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 10/09/2018 File Signature Cimatti Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items esamine*

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 05/09/2018	FOGLIO – Sheet 1
RAPPORTO D'ESAME CON ULTRASUONI ***Ultrasonic examination report***		UT N° : 01	Ns. Rif./Our Ref. 18205

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	TYRA FUTURE	118A10	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
MAERSK OIL			-	-

CODICE / Code	PROCEDURA / Procedure	ACCETTABILITA' / Acceptance level			
/	DK-TEHY-MET-PRO-000-10004	Quality Level ISO 5817	☑ B	☐ C	☐ D
		Acceptance level ISO 11666	☑ 2	☐ 3	☐ 3b

MATERIALE Material	DIMENSIONI Dimension	SPESSORE NOMINALE / Thk
S460 G2 + M	Plate L=800 mm	Butt weld 1\2V 40 mm

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO - Brushed	☐ LAVORATO DI MACCHINA - Machined
☐ MOLATO - Ground	☐ LAMINATO - Rolled	☐ GREZZO - Forged

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG	No. SERIE Serial Number	II03483

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	ONDE Waves
PANAMETRICS	PF4MR	4	10	0°	LONG.
PANAMETRICS	AMR	4	8X9	45°-60°	SHEAR
KRAUTKRAMER	SWB	2	14X14	45°-60°-70°	SHEAR

BLOCCO DI CALIBRAZIONE Calibration block	IIW V2	BLOCCO DI RIFERIMENTO Reference block	QT-REF-BLOCK 5
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity	DAC ON SDH 3 mm

SALDATURE CONTROLLATE / Welds Verified	PIANO DI SCANSIONE / Scanning plan
PQR 40/18 2G AX61 PQR 40/18 3G AX82	The Scanning plan used is in accordance with the requirements of IDL-QCI-UT-0216

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Stefano Zauli 3° Livello SNT-TC-1A / ISO 9712	ROSETTI MARINO SpA Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 10/09/2018 File Signature Cimatti Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items examine*

ROSETTI MARINO

PQR 40/18

Mechanical test report

INSPECTA S.R.L.

TEST REPORT
RAPPORTO DI PROVA

N° 0319-00850-18
Data: 12/09/2018

ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO
LAB N°1607

Object: *Oggetto:*	**MECHANICAL TEST ON PQR 40/2018**			Pag. 1 di 9
Specimen: *Saggio:* **387/18**	**Base Material:** *Materiale Base:*	**Plate THK. 40,00 mm.**		**EN 10225:2009; S460 G2+M**
Customer: ROSETTI MARINO SPA *Committente:* **Address: Via Trieste, 230 - 48122 Ravenna (RA)** *Indirizzo:*		**Witnessed by:** *Presenziato da:*		**ROSETTI S.p.A.** **RINA SERVICES S.p.A** **TOTAL**
Final customer:. *Cliente finale:*	**N.A.**			
Reference Yours bill of landing: *Vs. DDT di consegn*	**n°** // *n°* //	**Date:** *Data:* //	**MD52** *MD 52* **88/18**	**Date:** *Data:* **06/09/2018**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **12/09/2018**	**End of activities:** *Fine prove:*		**Date:** *Data:* **12/09/2018**

PROVE RICHIESTE

☒ **TENSILE TEST/***Trazione*	☒ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*	
☒ **BEND TEST/***Piega*	☒ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root /*Dritto/Rovescio* ☒ Side/ *Laterale*	
☒ **IMPACT TEST/***Resilienza*	☒ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*	
☒ **MACROEXAMINATION TEST /** *Macrografia*			
☒ **HARDNESS TEST/** *Durezza*	☐ HV 5	☒ HV 10	
☐ **FRACTURE TEST/** *Frattura*	☐ Plate on Plate/ *Piastra su Piastra*	☐ Pipe on Plate/*Tubo su Piastra*	
☐ **CHEMICAL ANALYSIS/***Analisi Chimica*			
☐ **MICROEXAMINATION TEST /** *Micrografia*			
☐ **OTHER (Specify)/***Altro/(Specificare)*			

Allegati /Attachments: NONE

NOTE/ Remarks:

REFERENCE CODE FROM CUSTOMER REQUEST:MOG-FP-MET-STD-0012 Rev.04 + UNI EN ISO 15614-1:2017

WELDING POSITION: 2G

Tom
Victor Wilson

*** Prova non accreditata da ACCREDIA**

Laboratory Responsible *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	RINA Services S.p.A. / Third part Inspector *Ispettore Terza parte*
- INSPECTA srl - Francesca Tassi Service Responsible 12/09/18	ROSETTI MARINO SpA Welding Dept. D. Conacchi	No. Bo. ☐ Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 12/09/2018 File Signature Cimatti Davide

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova.. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I campionamenti sono eseguiti dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%
The results in this test report refers only to the specimen that has been tested.The customer undertakes to print out /reproduce the test report. Any partial reproduction is prohibited.Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory.Sampling shall be performed by the custode.Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku = 2 equivalent to a level of confidence of 95 % .

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

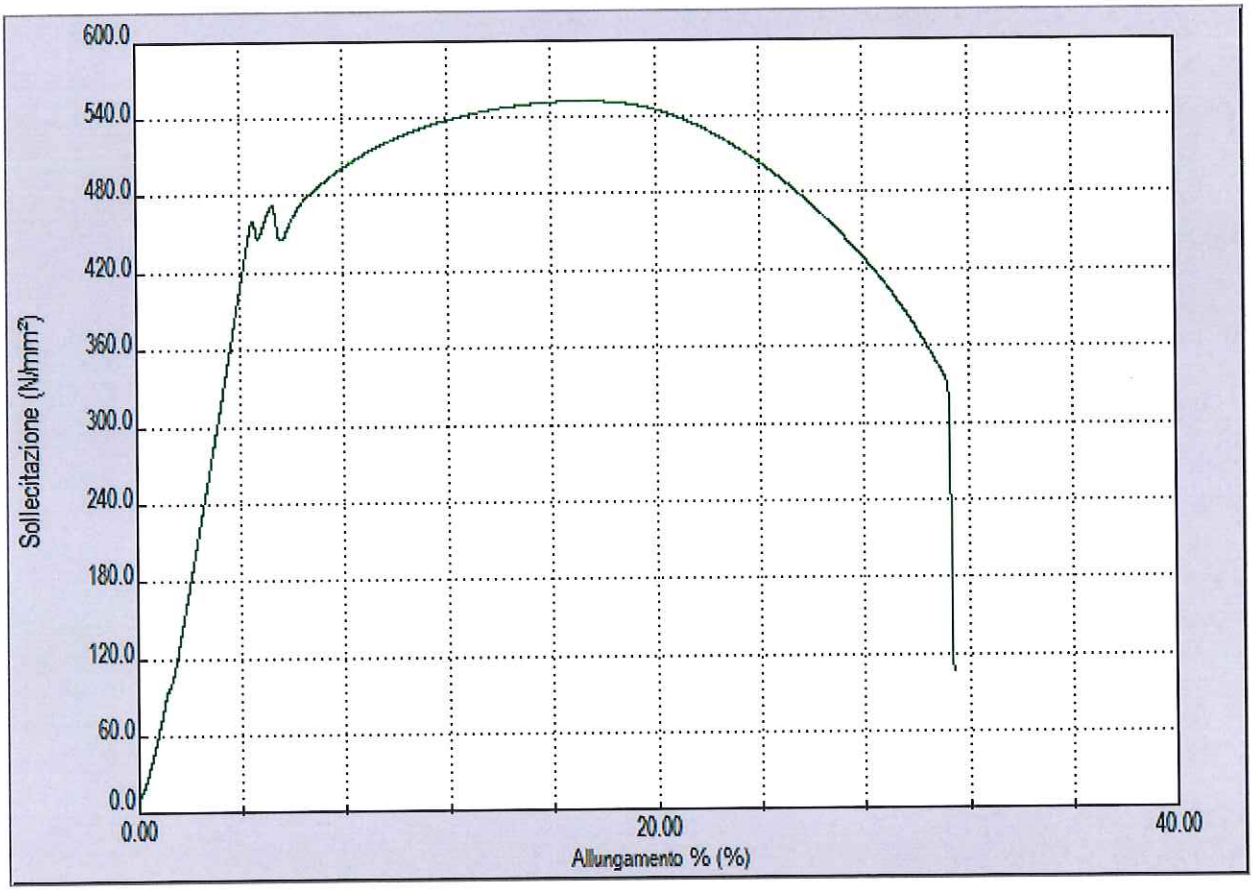
Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-17*
☐ *ASME IX QW-150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

Internal procedure *Procedura interna :* ***PP08 rev.03***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.							≥420			520÷680				
387/18 A TWT	**23,00x25,01**	**575,23**	**25°C**	//	//	/	**449**	/	**317'562**	**552**	/	//	//	**FOW**



Remarks / *Note:*

* **Prova non accreditata da ACCREDIA**

Legend / *Legenda*

TT = Transverse Tension*/Trazione.trasversale;*
TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;*
FOW = Failure Out of Weld*/Rottura fuori dalla saldatura*
FIW = Failure in Weld*/Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore terza parte*
- INSPECTA srl - Sig. Davide Chexia Laboratory Technician 12/09/18	- INSPECTA srl - Francesca Tesei Service Responsible 12/09/18	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Cinotti Davide 12/09/2018

TOTAL VICTOR WILSON Uniformbon

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

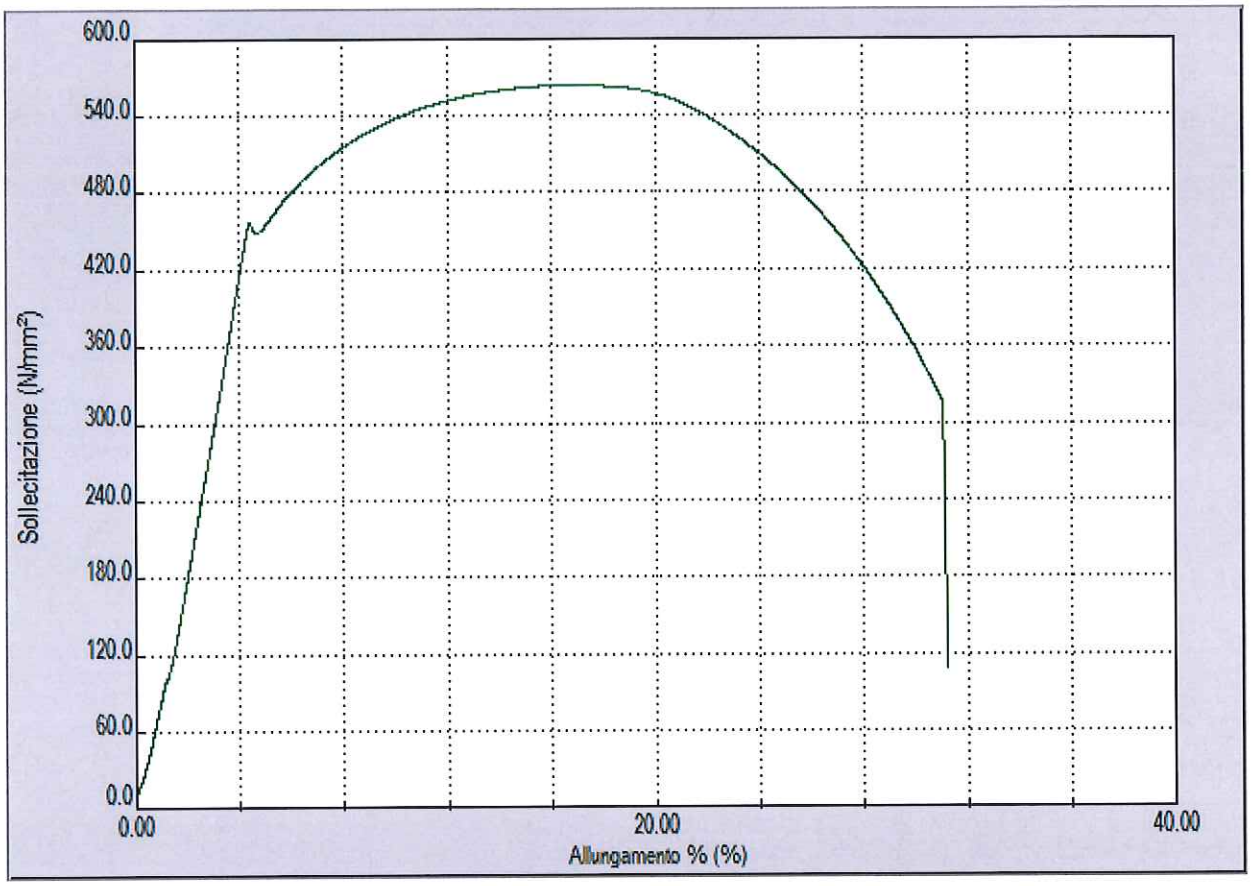
Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-17*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

Internal procedure *Procedura interna :* ***PP08 rev.03***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.							≥420			520÷680				
387/18 B TWT	**22,95x25,00**	**573,75**	**25°C**	//	//	/	**449**	/	**323'223**	**563**	/	//	//	**FOW**



Remarks */ Note:*

* **Prova non accreditata da ACCREDIA**

Legend */ Legenda*

TT = Transverse Tension*/Trazione.trasversale;* **FOW = Failure Out of Weld***/Rottura fuori dalla saldatura*

TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;* **FIW = Failure in Weld***/Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig.Davide Ciregia - INSPECTA srl - Laboratory Technician 12/09/18	- INSPECTA srl - Francesca Tesei Service Responsible 12/09/18	ROSETTI MARINO SpA Welding Dept D. Cenacchi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 12/09/2018 File Signature Cinotti Davide

TOTAL
VICTOR WILSON
Wilsonbon

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

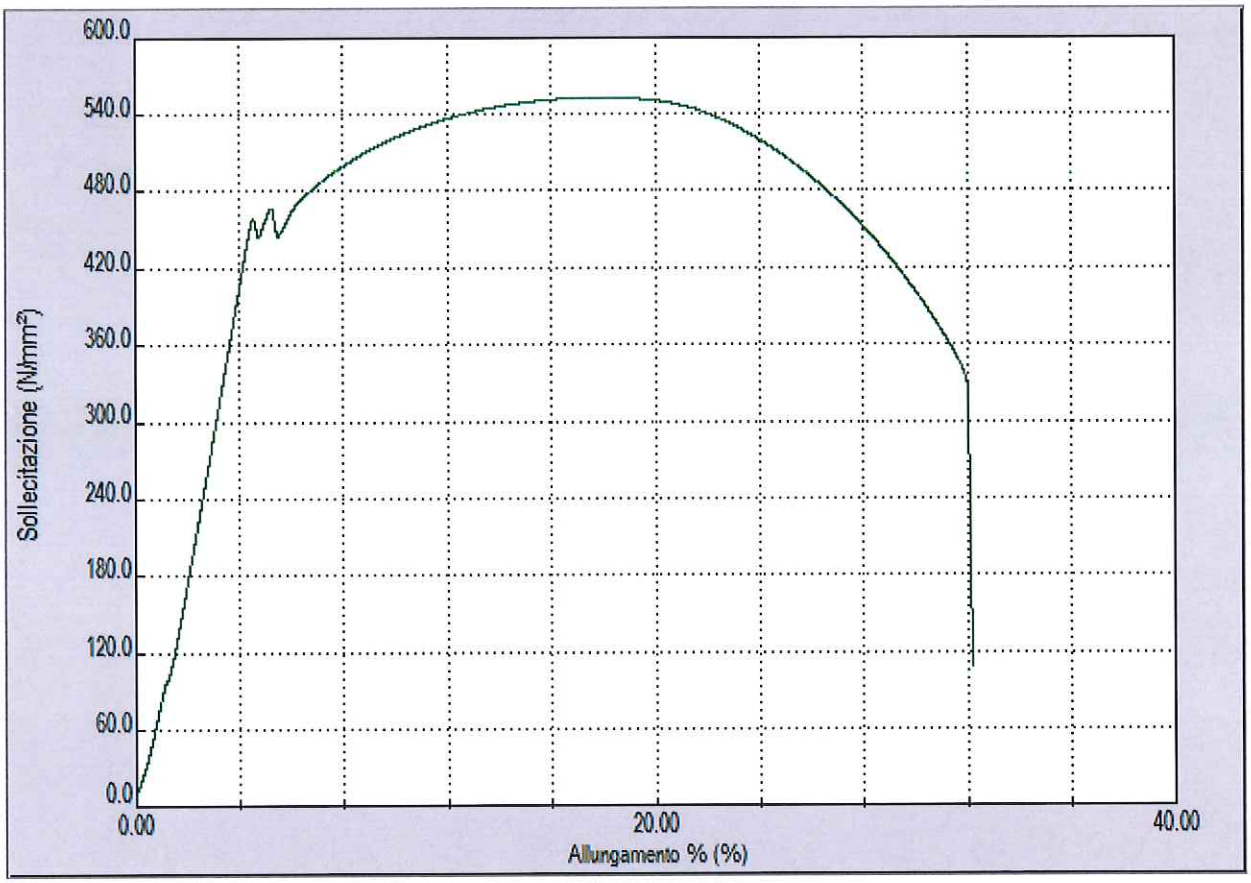
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Serial N. VAUP 01

Internal procedure *Procedura interna :* ***PP08 rev.03***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.							≥420			520÷680				
387/18 C TWT	**22,96x25,01**	**574,23**	**25°C**	//	//	/	**448**	/	**317'386**	**553**	/	//	//	**FOW**



Remarks */ Note:*

* **Prova non accreditata da ACCREDIA**

Legend */ Legenda*

TT = Transverse Tension*/Trazione.trasversale;* **FOW = Failure Out of Weld***/Rottura fuori dalla saldatura*

TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;* **FIW = Failure in Weld***/Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - Sig. Davide Grisgia Laboratory Technician 12/09/18	- INSPECTA srl - Francesca Tassi Service Responsible 12/09/18	ROSETTI MARINO SpA Welding Dept. D. Benacchi	RINA Services SpA Date 12/09/2018 No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File _____ Signature Cimatti Davide

TONAL VICTOR WILSON

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

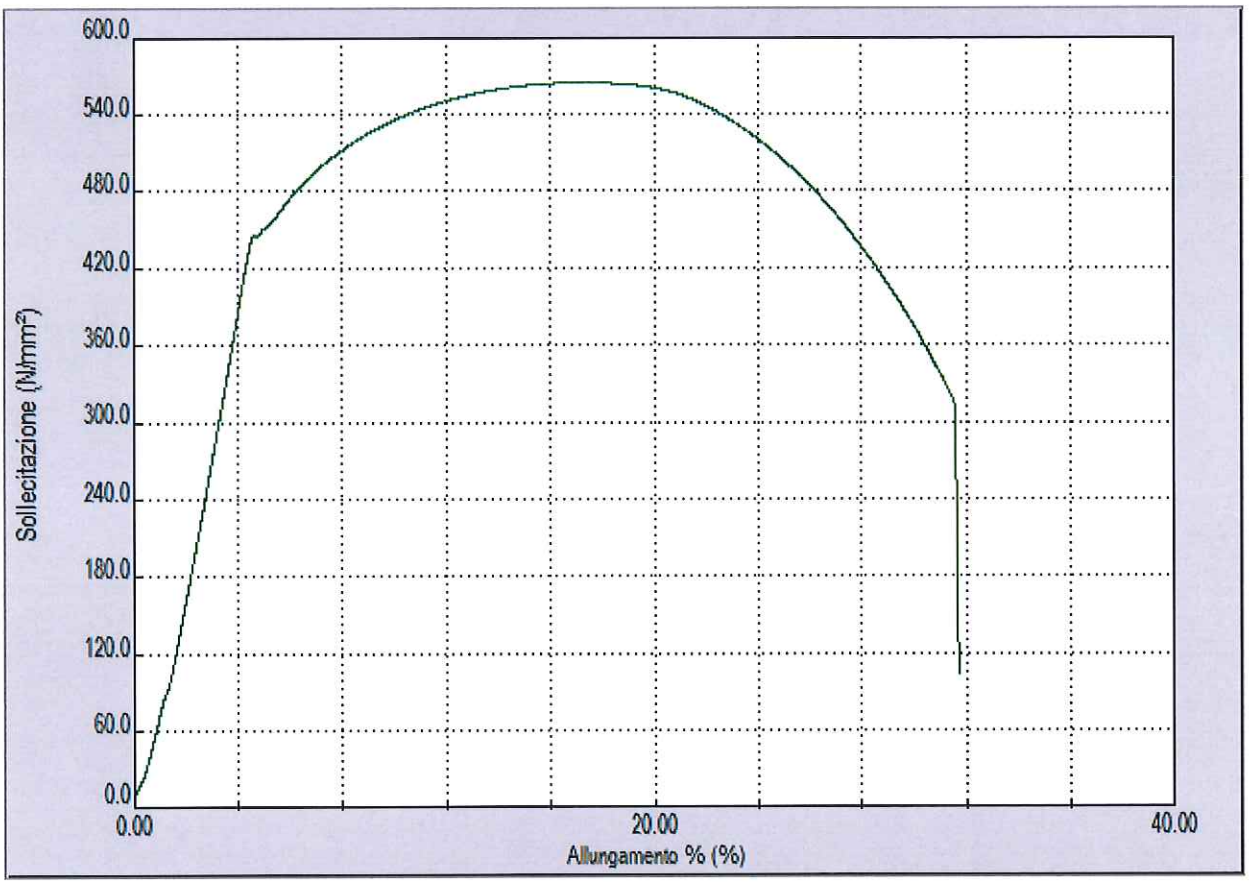
Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-17*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

Internal procedure *Procedura interna* : ***PP08 rev.03***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.							≥420			520÷680				
387/18 D TWT	**22,90x25,01**	**572,73**	**25°C**	//	//	/	**447**	/	**323'385**	**565**	/	//	//	**FOW**



Remarks / *Note:*

* **Prova non accreditata da ACCREDIA**

Legend / *Legenda*

TT = Transverse Tension/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura*

TWT = Transverse Weld Tension/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore terza parte*
INSPECTA Sig Davide Chegia' Laboratory Technician 12/09/18	INSPECTA srl Francesca Tesei Service Responsible 12/09/18	ROSETTI MARINO SpA Welding Dept. D. Genocchi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File _____ Signature Cimatti Davide 12/09/2018

TOTAL. VICAR WILSON Lluloncon

BEND TEST
Prova di piega

Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 5173: 2012* ☐ *ASME IX QW-160: 2017* ☐ _____

Serial N. VAUP / 01

Internal procedure *Procedura interna* : ***PP11 rev.02***

Specimen id. *Identificazione provino*		**Dimension** *Dimensioni (mm)*	**Test Temp.** *Temp.test °C*	**Bend Angle** *Angolo di piega*	**Ø Former** *Ø Mandrino (mm)*	**Distance between rollers** *Distanza appoggi (mm)*	**Remarks** *Note*
387/18 SBB	**A**	**40,00x10,00**	**25°C**	**180°**	**40**	**70**	**No open discontinuities have been found in weld metal and heat affected zone**
387/18 SBB	**B**	**40,00x10,00**	**25°C**	**180°**	**40**	**70**	**No open discontinuities have been found in weld metal and heat affected zone**
387/18 SBB	**C**	**40,00x10,00**	**25°C**	**180°**	**40**	**70**	**No open discontinuities have been found in weld metal and heat affected zone**
387/18 SBB	**D**	**40,00x10,00**	**25°C**	**180°**	**40**	**70**	**No open discontinuities have been found in weld metal and heat affected zone**

Remarks *Note:* //

*** Prova non accreditata da ACCREDIA**

Legend *Legenda*

SBB. = Transverse Side Bend/*Piega Trasversale laterale*
TRB. = Transverse Root Bend/*Piega Trasversale al rovescio*
TFB. = Transverse Face Bend/*Piega Trasversale al dritto*
LRB = Longitudinal Root Bend */ Piega Longitudinale al rovescio*
LFB. = Longitudinal Face Bend */ Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio* *Sig Davide Ciregia*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - Laboratory Technician 12/09/18	- INSPECTA srl - Francesca Tesei Service Responsible 12/09/18	ROSETTI MARINO SpA Welding Dept. D.Genacchi	RINA Services SpA No. Bo. 0474 Date 12/09/2018 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Cimatti Davide

TOTAL . VICTOR WILSON

IMPACT TEST
Prova di resilienza

Date of Testing:12/09/2018
Data esecuzione prova:

☐ *UNI EN ISO 148-1: 2016* ☒ *UNI EN ISO 9016: 2012* ☐ *ASTM E23: 16b* ☐ *ASME IX QW-170: 2017* ☐ *ASTM A923-14 Method B*

Serial N. VAUP / 02

Internal procedure *Procedura interna* :***PP09 rev.04***

Specimen id. *Identificazione provino*	Direction *Direzione*	Dimension *Dimensioni (mm)*	Test Temp. *Temp .test*	Notch Type *Intaglio*	Knife / *coltello*	Requirement / Requisiti: Energy absorbed/ / Energia assorbita – Individual *Individuale Joule ≥35J* 1	2	3	Average *Media Joule ≥50j*	U	Lateral Expansion *Espansione laterale (mm)* 1	2	3	Shear Area *Area fragile %* 1	2	3	Remarks *Note*
387/18 VWT 0/2	T	10x10x55	-40°C	V	2	78	79	76	78	//	//	//	//	//	//	//	CAP
387/18 VHT 0/2	T	10x10x55	-40°C	V	2	48	59	177	95	//	//	//	//	//	//	//	CAP
387/18 VHT 1/2	T	10x10x55	-40°C	V	2	256	261	269	262	//	//	//	//	//	//	//	CAP
387/18 VHT 2/2	T	10x10x55	-40°C	V	2	270	260	269	266	//	//	//	//	//	//	//	CAP
387/18 VHT 5/2	T	10x10x55	-40°C	V	2	266	288	229	261	//	//	//	//	//	//	//	CAP
387/18 VWT 0/28	T	10x10x55	-40°C	V	2	89	105	108	101	//	//	//	//	//	//	//	ROOT
387/18 VHT 0/28	T	10x10x55	-40°C	V	2	95	92	35	74	//	//	//	//	//	//	//	ROOT
387/18 VHT 1/28	T	10x10x55	-40°C	V	2	258	227	232	239	//	//	//	//	//	//	//	ROOT
387/18 VHT 2/28	T	10x10x55	-40°C	V	2	216	204	203	208	//	//	//	//	//	//	//	ROOT
387/18 VHT 5/28	T	10x10x55	-40°C	V	2	295	260	224	260	//	//	//	//	//	//	//	ROOT

Remarks *Note:*

*** Prova non accreditata da ACCREDIA**

Legend *Legenda*

L= Longitudinal / Longitudinale
T= Trasversal / Trasversale
VWT 0/2 = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
VHT 0/2 = Impact Test on Fusion Line */ Resilienza Trasversale in linea di fusione*
VHT 1/2 = Impact Test at 1mm from Fusion Line */ Resilienza trasversale a 1 mm dalla linea di fusione*
VHT 2/2 = Impact Test at 2 mm from Fusion Line */ Resilienza trasversale a 2 mm dalla linea di fusione*
VHT 5/2 = Impact Test at 5 mm from Fusion Line */ Resilienza trasversale a 5 mm dalla linea di fusione*
WM = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
HAZ = Impact Test on Heat Affected Zone */ Resilienza Trasversale in zona termicamente alterata*
BM = Impact Test on Base Metal */ Resilienza Trasversale in materiale base*
FL = Fusion Line/ *Linea di fusione*
FL+1 = Fusion Line + 1mm/ *Linea di fusione+1mm*
FL+2 = Fusion Line + 2mm/ *Linea di fusione+2mm*
FL +5= Fusion Line + 5mm/ *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Sig Matteo Galdieri			RINA Services SpA No. Bo. 0474
- INSPECTA srl - 12/09/18	- INSPECTA srl - Francesca Tesei 12/09/18	ROSETTI MARINO S.p.A. Welding Dept. D. Cenacchi	Date 14/09/18
Laboratory Technician	Service Responsible		File
			Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐
			Signature Cimatti Davide

TOTAL
VICTOR WILSON

MD 38 rev.10 data 08-06-2018

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing: *12/09/2018*
Data esecuzione prova:

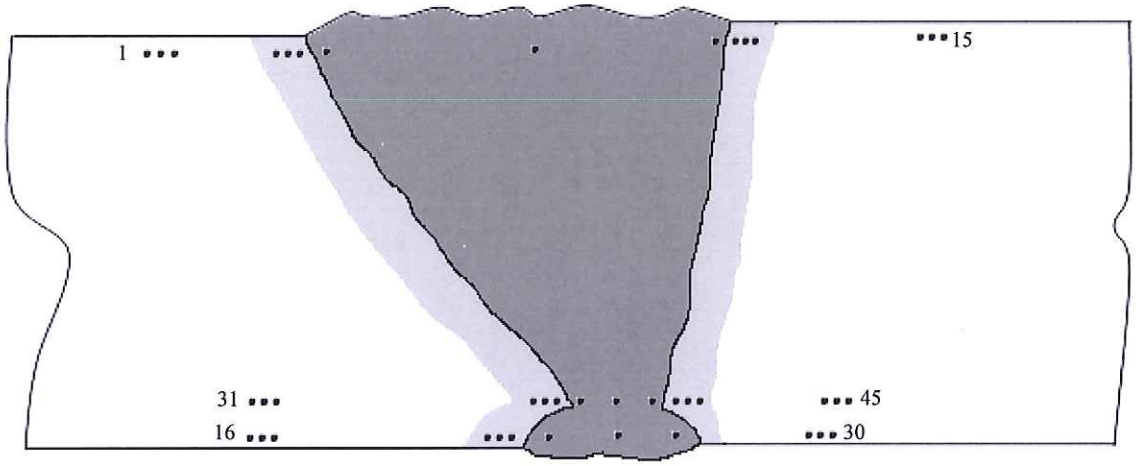
☐ *UNI EN ISO 6507-1: 2018* ☒ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

Serial N. 43030614C

Internal procedure *Procedura interna*	PP10 rev.02	Sample Identification *Identificazione provino*	387/18	Hardness test type *Tipo di durezza*	≤325 HV 10	Test Temp. *Temp.test*	25°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A:			Base Material Side B:	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
31 - 32 - 33	34 - 35 - 36	37 - 38 - 39	40 - 41 - 42	43 - 44 - 45
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**193-196-193**	//	16 – 17 - 18	**189-187-189**	//	31 – 32 - 33	**187-186-180**	//
4 - 5 - 6	**233-246-266**	//	19 - 20 - 21	**253-265-295**	//	34 - 35 - 36	**208-212-208**	//
7 – 8 - 9	**226-236-287**	//	22 – 23 - 24	**226-220-239**	//	37 – 38 - 39	**220-226-220**	//
10 - 11 - 12	**274-267-237**	//	25 - 26 - 27	**249-250-229**	//	40 - 41 - 42	**261-241-236**	//
13 – 14 - 15	**198-195-194**	//	28 – 29 - 30	**189-188-190**	//	43 – 44 - 45	**188-187-186**	//

Remarks/ *Note:* //

*** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third-part Inspector *Ispettore terza parte*
- INSPECTA srl - Ing. Davide Ciucci Laboratory Technician 12/09/18	- INSPECTA srl - Francesca Tesei Service Responsible 12/09/18	ROSETTI MARINO SpA Welding Dept. D. Conacchi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 12/09/2018 File Signature Cimatti Davide

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

Internal procedure *PP12 rev.00* *Procedura internal*		**Test temperatura** *Temperature Test*	**25°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**387/18**	**Magnification:** *Ingrandimento:*	**Photo at 1.6X** **Examination at 10X**
Designation: *Designazione:*	**ISO 17639-A-E-1.2-1.2/1.2/1.2 NITAL**		



Remarks / *Note:*	*//* *** Prova non accreditata da ACCREDIA**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio *Sig Matteo Galdieri* - INSPECTA srl - 12/09/18 *Laboratory Technician*	Responsabile Laboratorio - INSPECTA srl - Francesca Tesei *Service Responsible* 12/09/18	*Ispettore del cliente* ROSETTI MARINO S.p.A. Welding Dept. D. Cenacchi	*Ispettore Terza parte* RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ Date 12/09/2018 File Signature Cimatti Davide

TUNA
VICTOR WILSON
Uttombon.

INSPECTA S.R.L.	**TEST REPORT** ***RAPPORTO DI PROVA*** **N° 0320-00850-18** **Data: 12/09/2018**	ilac-MRA ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO **LAB N°1607**

Object: *Oggetto:*	**MECHANICAL TEST ON PQR 40/2018**			Pag. 1 di 9
Specimen: *Saggio:* **388/18**	**Base Material:** *Materiale Base:*	**Plate THK. 40,00 mm.**	**EN 10225:2009; S460 G2+M**	
Customer: ROSETTI MARINO SPA *Committente:* **Address: Via Trieste, 230 - 48122 Ravenna (RA)** *Indirizzo:*		**Witnessed by:** *Presenziato da:*	**ROSETTI S.p.A.** **RINA SERVICES S.p.A.** **TOTAL**	
Final customer:. *Cliente finale:*	**N.A.**			
Reference Yours bill of landing: *Vs. DDT di consegn*	**n°** // *n°*	**Date:** *Data:* //	**MD52** *MD 52* **88/18**	**Date:** *Data:* **06/09/2018**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **12/09/2018**	**End of activities:** *Fine prove:*	**Date:** *Data:* **12/09/2018**	

PROVE RICHIESTE

☒ **TENSILE TEST**/*Trazione*	☒ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*	
☒ **BEND TEST**/*Piega*	☒ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root */Dritto/Rovescio* ☒ Side/ *Laterale*	
☒ **IMPACT TEST**/*Resilienza*	☒ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*	
☒ **MACROEXAMINATION TEST /** *Macrografia*			
☒ **HARDNESS TEST**/ *Durezza*	☐ HV 5	☒ HV 10	
☐ **FRACTURE TEST**/ *Frattura*	☐ Plate on Plate/ *Piastra su Piastra*	☐ Pipe on Plate/*Tubo su Piastra*	
☐ **CHEMICAL ANALYSIS**/*Analisi Chimica*			
☐ **MICROEXAMINATION TEST /** *Micrografia*			
☐ **OTHER (Specify)**/*Altro/(Specificare)*			

Allegati /Attachments: *NONE*

NOTE/ Remarks:

REFERENCE CODE FROM CUSTOMER REQUEST:MOG-FP-MET-STD-0012 Rev.04 + UNI EN ISO 15614-1:2017

WELDING POSITION: 3G

*** Prova non accreditata da ACCREDIA**

Laboratory Responsible *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - Francesca Tesei Service Responsible 12/09/18	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RINA S.p.A. Date 12/09/2018 No. File Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Signature Cimatti Davide

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova.. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I campionamenti sono eseguiti dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%
The results in this test report refers only to the specimen that has been tested.The customer undertakes to print out /reproduce the test report. Any partial reproduction is prohibited.Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory.Sampling shall be performed by the custode.Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku = 2 equivalent to a level of confidence of 95 % .

TOTAL
VICTOR WILSON

Headquarter: Via Giolitti 10 – 48123 Ravenna (RA) Italy – Phone /Fax + 39 0544 451424
Registered Office: Via Ravegnana 379/A - 47122 Forlì (FC) Italy - Phone +39 0543 806128 - Phone/Fax +39 0543 724366
Mobile +39 393 9374013 - e-mail: inspectasrl@inspectasrl.com - www.inspectasrl.com - P.iva 03944480403
Capital Stock € 10.000 - Chamber of Commerce registration Forlì/Cesena No. 03944480403 - R.E.A. No. 323199

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

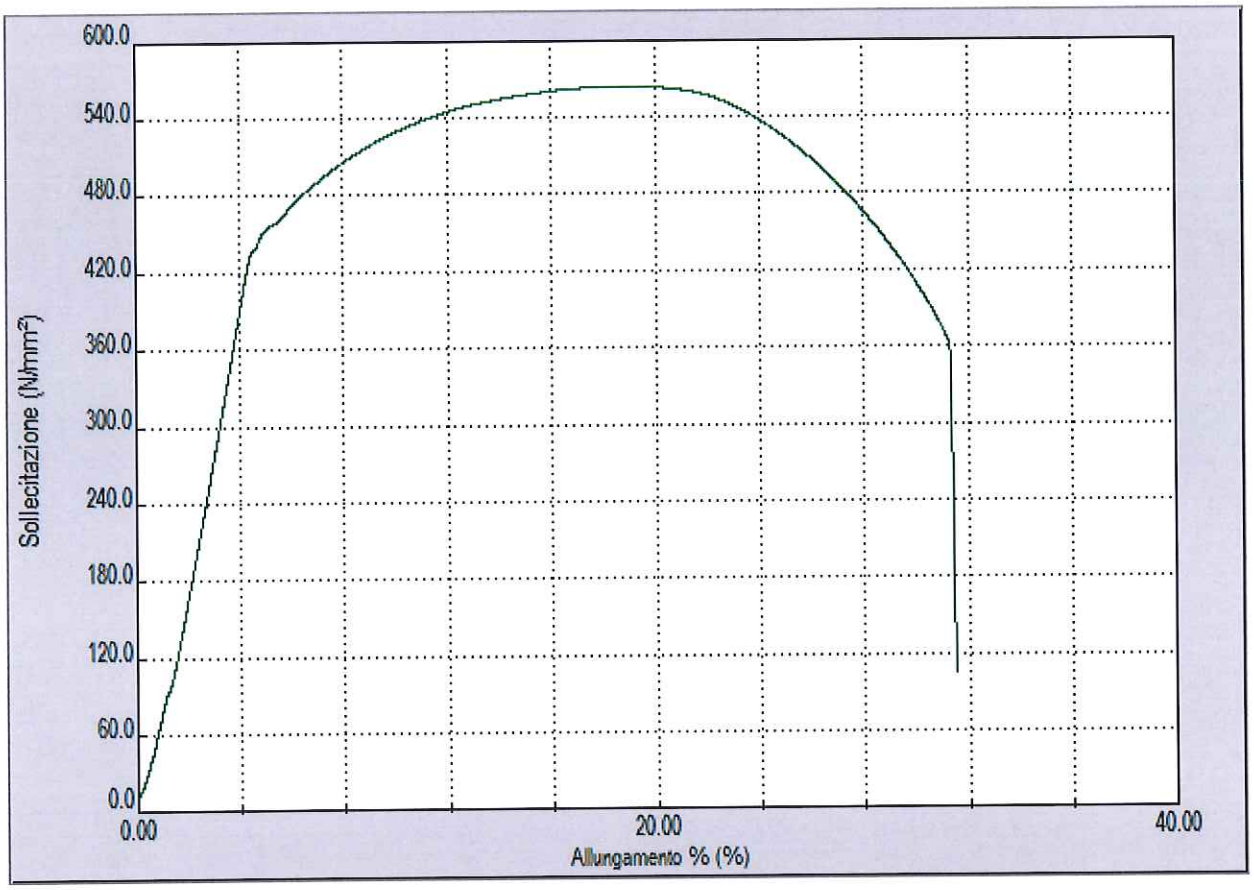
Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-17*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

Internal procedure *Procedura interna :* ***PP08 rev.03***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.							≥420			520÷680				
388/18 A TWT	**23,00x25,00**	**575,00**	**25°C**	//	//	/	**448**	/	**324'065**	**564**	/	//	//	**FOW**



Remarks */ Note:*

* **Prova non accreditata da ACCREDIA**

Legend */ Legenda*

TT = Transverse Tension*/Trazione.trasversale;* **FOW = Failure Out of Weld***/Rottura fuori dalla saldatura*

TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;* **FIW = Failure in Weld***/Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig Matteo Galimberti 12/09/18 Laboratory Technician	- INSPECTA srl - Francesca Tesei Service Responsible 12/09/18	ROSETTI MARINO SpA Welding Dept. D. Genaschi	RINA Services S.p.A. No. 8[illegible] Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 12/09/2018 File Signature Cimatti Davide

TOTAL.
VICTOR WILSON.
Uutonubon.

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

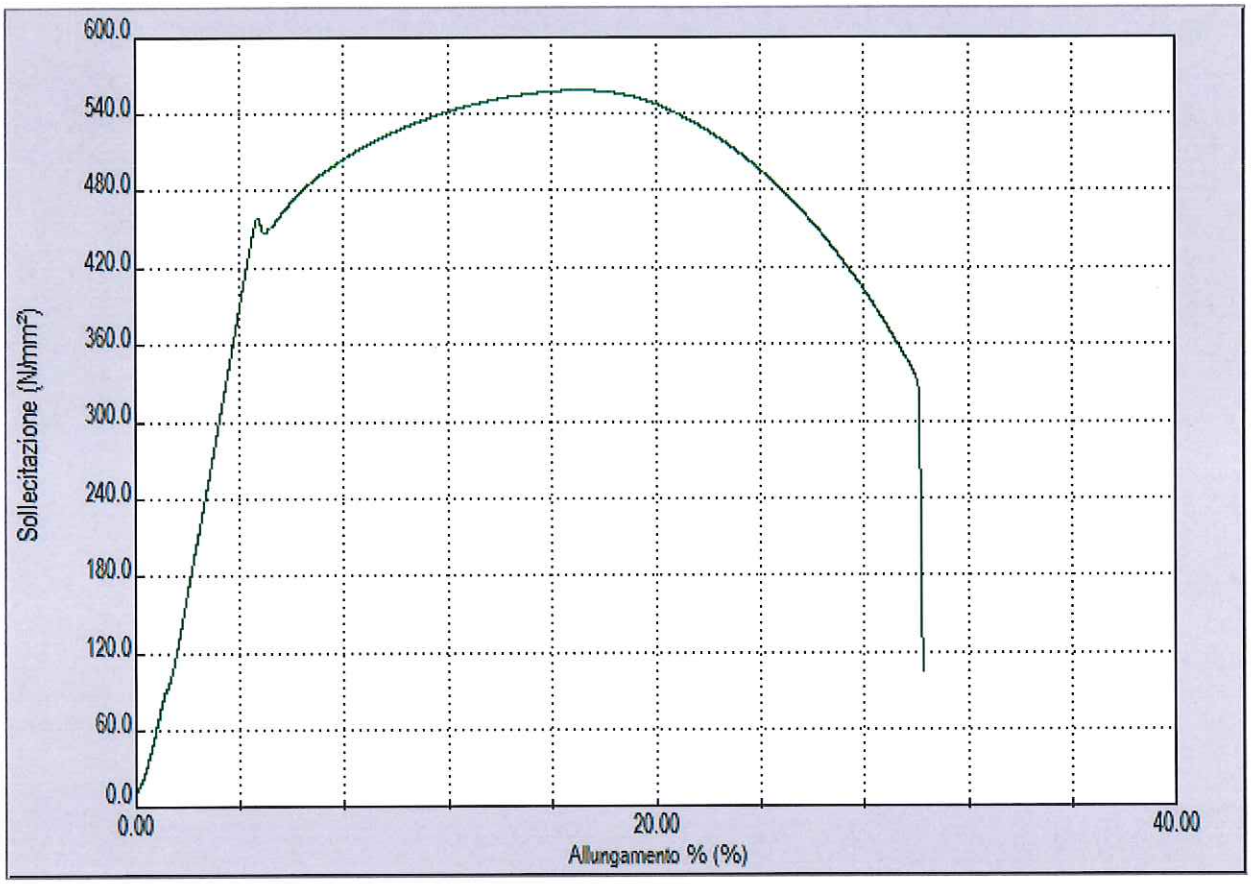
Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-17*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

Internal procedure *Procedura interna* : ***PP08 rev.03***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.							≥420			520÷680				
388/18 B TWT	**22,95x25,01**	**573,98**	**25°C**	//	//	/	**452**	/	**320'352**	**558**	/	//	//	**FOW**



Remarks / *Note:*

* **Prova non accreditata da ACCREDIA**

Legend / *Legenda*

TT = Transverse Tension/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura*

TWT = Transverse Weld Tension/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Stazza parte*
Sig.Matteo Caldieri - INSPECTA srl - 12/09/18 Laboratory Technician	- INSPECTA srl - Francesca Tosei Service Responsible 12/09/18	ROSETTI MARINO S.p.A. Welding Dept. D. Ceracchi	RINA Services S.p.A. No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ Date 12/09/2018 File Signature Cimatti Davide

TOTAL
VICTOR WILSON

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-17*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

Internal procedure *Procedura interna :* ***PP08 rev.03***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.							≥420			520÷680				
388/18 C TWT	**22,96x25,00**	**574,00**	**25°C**	//	//	/	**445**	/	**322'436**	**562**	/	//	//	**FOW**



Remarks */ Note:*

* **Prova non accreditata da ACCREDIA**

Legend / *Legenda*

TT = Transverse Tension*/Trazione.trasversale;* **FOW = Failure Out of Weld***/Rottura fuori dalla saldatura*

TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;* **FIW = Failure in Weld***/Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig Matteo Galdieri - INSPECTA srl - 12/09/18 Laboratory Technician	- INSPECTA srl - Francesca Tesei 12/09/18 Service Responsible	ROSETTI MARINO SpA Welding Dept D. Geraschi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ Date 12/09/2018 File _____ Signature Cimatti Davide

Tesla Victor Wilson Hutchinson

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

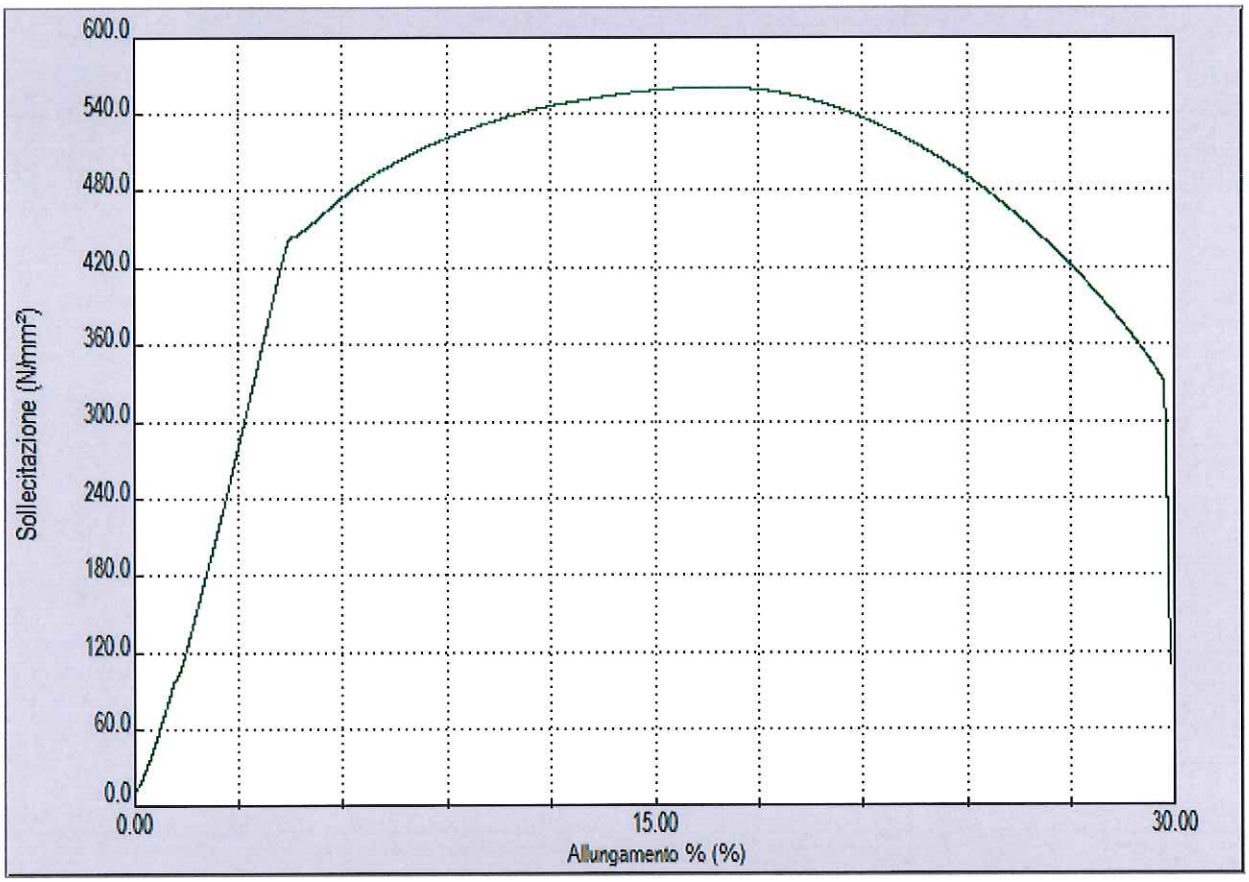
Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-17*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

Internal procedure *Procedura interna :* ***PP08 rev.03***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.							≥420			520÷680				
388/18 D TWT	**22,93x25,01**	**573,48**	**25°C**	//	//	/	**448**	/	**321˙449**	**561**	/	//	//	**FOW**



Remarks / *Note:*

* **Prova non accreditata da ACCREDIA**

Legend / *Legenda*

TT = Transverse Tension/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura*

TWT = Transverse Weld Tension/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore di parte*
- INSPECTA srl - Matteo Caldieri 12/09/18 *Laboratory Technician*	- INSPECTA srl - Francesca Tesei *Service Responsible* 12/09/18	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RINA Services SpA No. Bo. 0474 Date 12/09/2018 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Ciriaco Davide

Victor Wilson Nkutamben

BEND TEST
Prova di piega

☒ *UNI EN ISO 5173: 2012* ☐ *ASME IX QW-160: 2017* ☐ _____

Date of Testing: *12/09/2018*
Data esecuzione prova:

Serial N. VAUP / 01

Internal procedure *Procedura interna* : ***PP11 rev.02***

Specimen id. *Identificazione provino*		Dimension *Dimensioni (mm)*	Test Temp. *Temp.test °C*	Bend Angle *Angolo di piega*	Ø Former *Ø Mandrino (mm)*	Distance between rollers *Distanza appoggi (mm)*	Remarks *Note*
388/18 SBB	A	40,00x10,00	25°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone
388/18 SBB	B	40,00x10,00	25°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone
388/18 SBB	C	40,00x10,00	25°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone
388/18 SBB	D	40,00x10,00	25°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone

Remarks *Note:* //

*** Prova non accreditata da ACCREDIA**

Legend *Legenda*

SBB. = Transverse Side Bend/*Piega Trasversale laterale*
TRB. = Transverse Root Bend/*Piega Trasversale al rovescio*
TFB. = Transverse Face Bend/*Piega Trasversale al dritto*
LRB = Longitudinal Root Bend */ Piega Longitudinale al rovescio*
LFB. = Longitudinal Face Bend */ Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig Matteo Galdieri « INSPECTA srl » 12/09/18 *Laboratory Technician*	« INSPECTA srl » Francesca Tesei *Service Responsible* 12/09/18	ROSETTI MARINO SPA Welding Dept. D. Cenacchi	RINA Services SpA No. Bo. 0474 Date 12/09/2018 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File _____ Signature Cimatti Davide

IMPACT TEST
Prova di resilienza

Date of Testing:12/09/2018
Data esecuzione prova:

☐ *UNI EN ISO 148-1: 2016* ☒ *UNI EN ISO 9016: 2012* ☐ *ASTM E23: 16b* ☐ *ASME IX QW-170: 2017* ☐ *ASTM A923-14 Method B*

Serial N. VAUP / 02

Internal procedure *Procedura interna* :***PP09 rev.04***

Specimen id. *Identificazione provino*	Direction *Direzione*	Dimension *Dimensioni (mm)*	Test Temp. *Temp .test*	Notch Type *Intaglio*	Knife / *coltello*	Requirement / Requisiti: Energy absorbed/ / Energia assorbita – Individual *Individuale Joule ≥35J* 1	2	3	Average *Media Joule ≥50j*	U	Lateral Expansion *Espansione laterale (mm)* 1	2	3	Shear Area *Area fragile %* 1	2	3	Remarks *Note*
388/18 VWT 0/2	T	10x10x55	-40°C	V	2	68	97	85	83	//	//	//	//	//	//	//	CAP
388/18 VHT 0/2	T	10x10x55	-40°C	V	2	107	71	30	69	//	//	//	//	//	//	//	CAP
388/18 VHT 1/2	T	10x10x55	-40°C	V	2	290	250	260	267	//	//	//	//	//	//	//	CAP
388/18 VHT 2/2	T	10x10x55	-40°C	V	2	300	294	304	299	//	//	//	//	//	//	//	CAP
388/18 VHT 5/2	T	10x10x55	-40°C	V	2	280	268	290	279	//	//	//	//	//	//	//	CAP
388/18 VWT 0/28	T	10x10x55	-40°C	V	2	75	88	94	86	//	//	//	//	//	//	//	ROOT
388/18 VHT 0/28	T	10x10x55	-40°C	V	2	171	16	72	87	//	//	//	//	//	//	//	ROOT
388/18 VHT 1/28	T	10x10x55	-40°C	V	2	307	287	241	278	//	//	//	//	//	//	//	ROOT
388/18 VHT 2/28	T	10x10x55	-40°C	V	2	255	270	265	263	//	//	//	//	//	//	//	ROOT
388/18 VHT 5/28	T	10x10x55	-40°C	V	2	285	292	280	286	//	//	//	//	//	//	//	ROOT

Remarks *Note:*

*** Prova non accreditata da ACCREDIA**

Legend *Legenda*

L= Longitudinal / Longitudinale
T= Trasversal / Trasversale
VWT 0/2 = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
VHT 0/2 = Impact Test on Fusion Line */ Resilienza Trasversale in linea di fusione*
VHT 1/2 = Impact Test at 1mm from Fusion Line */ Resilienza trasversale a 1 mm dalla linea di fusione*
VHT 2/2 = Impact Test at 2 mm from Fusion Line */ Resilienza trasversale a 2 mm dalla linea di fusione*
VHT 5/2 = Impact Test at 5 mm from Fusion Line */ Resilienza trasversale a 5 mm dalla linea di fusione*
WM = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
HAZ = Impact Test on Heat Affected Zone */ Resilienza Trasversale in zona termicamente alterata*
BM = Impact Test on Base Metal */ Resilienza Trasversale in materiale base*
FL = Fusion Line/ *Linea di fusione*
FL+1 = Fusion Line + 1mm/ *Linea di fusione+1mm*
FL+2 = Fusion Line + 2mm/ *Linea di fusione+2mm*
FL +5= Fusion Line + 5mm/ *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Sig Matteo Galdieri	- INSPECTA srl -	ROSETTI MARINO SPA Welding Dept	RINA Services SpA No. Bo. 0474
- INSPECTA srl - 12/09/18	Francesca Tesei	D. Cenacchi	Date 12/09/2018
Laboratory Technician	Service Responsible 12/09/18		Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐
			File Signature Cinotti Davide

TOTAL
VICTOR WILSON

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing: *12/09/2018*
Data esecuzione prova:

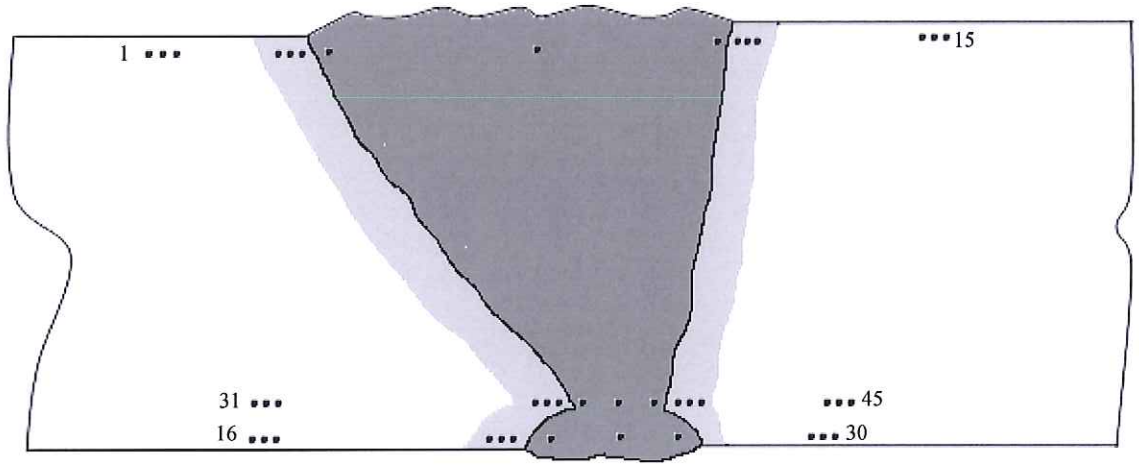
☐ *UNI EN ISO 6507-1: 2018* ☒ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

Serial N. 43030614C

Internal procedure *Procedura interna*	**PP10 rev.02**	**Sample Identification** *Identificazione provino*	**388/18**	**Hardness test type** *Tipo di durezza*	**≤325 HV 10**	**Test Temp.** *Temp.test*	**25°C**

Sketch for reference points
Schema punti di riferimento

Base Material Side A:				**Base Material Side B:**
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
31 - 32 - 33	34 - 35 - 36	37 - 38 - 39	40 - 41 - 42	43 - 44 - 45
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30



Reference points *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U
1 – 2 - 3	**185-189-190**	//	16 – 17 - 18	**182-184-191**	//	31 – 32 - 33	**183-183-190**	//
4 - 5 - 6	**213-247-250**	//	19 - 20 - 21	**245-258-269**	//	34 - 35 - 36	**231-238-230**	//
7 – 8 - 9	**250-228-241**	//	22 – 23 - 24	**230-233-228**	//	37 – 38 - 39	**213-216-223**	//
10 - 11 - 12	**269-247-224**	//	25 - 26 - 27	**274-265-251**	//	40 - 41 - 42	**209-204-217**	//
13 – 14 - 15	**192-194-197**	//	28 – 29 - 30	**186-186-182**	//	43 – 44 - 45	**186-195-188**	//

Remarks/ *Note:* //

*** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza Parte*
- INSPECTA srl - Sig.Matteo Galdieri 12/09/18 Laboratory Technician	- INSPECTA srl - Francesca Tesei 12/09/18 Service Responsible	ROSETTI MARINO SpA Welding Dept. D. Conicchi	RINA Services SpA Date 12/09/2018 No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ File Signature Cimatti Davide

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing: *12/09/2018*
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

Internal procedure *PP12 rev.00* *Procedura internal*		**Test temperatura** *Temperature Test*	**25°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**388/18**	**Magnification:** *Ingrandimento:*	**Photo at 1.6X** **Examination at 10X**
Designation: *Designazione:*	**ISO 17639-A-E-1.2-1.2/1.2/1.2 NITAL**		



Remarks / *Note:*	*//* *** Prova non accreditata da ACCREDIA**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio *Sig Matteo Galdieri* - INSPECTA srl - 12/09/18 *Laboratory Technician*	Responsabile Laboratorio - INSPECTA srl - Francesca Tesei *Service Responsible* 12/09/18	*Ispettore del cliente* ROSETTI MARINO SpA Welding Dept D. Cenacchi	*Ispettore Terza parte* RINA Services SpA No. Bo. 0474 Date 12/09/2018 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Cimato Davide

Tomm
Victor Wilson
Llutomh

INSPECTA S.R.L.	**TEST REPORT** ***RAPPORTO DI PROVA*** **N° 0330-00850-18** **Rev.00** **Data: 19/09/2018**	ilac-MRA ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO **LAB N°1607**

Object: *Oggetto:*	**INTEGRATION IMPACT TEST ON PQR 40/2018**			Pag. 1 di 2
Specimen: **388/18** *Saggio:*	**Base Material:** *Materiale Base:*	**Plate THK. 40,00 mm.**	**EN 10225:2009; S460 G2+M**	
Customer: ROSETTI MARINO SPA *Committente:* **Address: Via Trieste, 230 - 48122 Ravenna (RA)** *Indirizzo:*		**Witnessed by:** *Presenziato da:*	**ROSETTI S.p.A.** **RINA SERVICES S.p.A**	
Final customer:. *Cliente finale:*	**N.A.**			
Reference Yours bill of landing: **n°** // *Vs. DDT di consegn* *n°*	**Date:** // *Data:*	**MD52** **88/18** *MD 52*	**Date:** **06/09/2018** *Data:*	
Start of activities:: *Inizio prove :*	**Date:** **19/09/2018** *Data:*	**End of activities:** *Fine prove:*	**Date:** **19/09/2018** *Data:*	

PROVE RICHIESTE

☒ **TENSILE TEST/***Trazione*	☒ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*	
☒ **BEND TEST/***Piega*	☒ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root */Dritto/Rovescio* ☒ Side/ *Laterale*	
☒ **IMPACT TEST/***Resilienza*	☒ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*	
☒ **MACROEXAMINATION TEST /** *Macrografia*			
☒ **HARDNESS TEST/** *Durezza*	☐ HV 5	☒ HV 10	
☐ **FRACTURE TEST/** *Frattura*	☐ Plate on Plate/ *Piastra su Piastra*	☐ Pipe on Plate/*Tubo su Piastra*	
☐ **CHEMICAL ANALYSIS/***Analisi Chimica*			
☐ **MICROEXAMINATION TEST /** *Micrografia*			
☐ **OTHER (Specify)/***Altro/(Specificare)*			

Allegati /Attachments: NONE

NOTE/ Remarks:

REFERENCE CODE FROM CUSTOMER REQUEST:MOG-FP-MET-STD-0012 Rev.04 + UNI EN ISO 15614-1:2017

WELDING POSITION: 3G

*** Prova non accreditata da ACCREDIA**

Laboratory Responsible *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - Francesca Tosi Service Responsible 19/09/18	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RINA Services S.p.A. No. B 0170 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date File 19/09/2018 Signature Cimatti Davide

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova.. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I campionamenti sono eseguiti dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%
The results in this test report refers only to the specimen that has been tested.The customer undertakes to print out /reproduce the test report. Any partial reproduction is prohibited.Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory.Sampling shall be performed by the custode.Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku = 2 equivalent to a level of confidence of 95 % .

IMPACT TEST
Prova di resilienza

Date of Testing:19/09/2018
Data esecuzione prova:

☐ *UNI EN ISO 148-1: 2016* ☒ *UNI EN ISO 9016: 2012* ☐ *ASTM E23: 16b* ☐ *ASME IX QW-170: 2017* ☐ *ASTM A923-14 Method B*

Serial N. VAUP / 02

Internal procedure *Procedura interna* **:PP09 rev.04**

Specimen id. *Identificazione provino*	**Direction** *Direzione*	**Dimension** *Dimensioni (mm)*	**Test Temp.** *Temp .test*	**Notch Type** *Intaglio*	**Knife /** *coltello*	**Requirement / Requisiti**											**Remarks** *Note*
						Energy absorbed/ / Energia assorbita											
						Individual *Individuale Joule ≥35J*			**Average** *Media Joule ≥50j*	**U**	**Lateral Expansion** *Espansione laterale (mm)*			**Shear Area** *Area fragile %*			
						1	2	3			1	2	3	1	2	3	
388/18 VHT 0/2	**T**	**10x10x55**	**-40°C**	**V**	**2**	**280**	**262**	**201**	**248**	//	//	//	//	//	//	//	**CAP**
388/18 VHT 0/2	**T**	**10x10x55**	**-40°C**	**V**	**2**	**185**	**89**	**118**	**131**	//	//	//	//	//	//	//	**CAP**
388/18 VHT 0/28	**T**	**10x10x55**	**-40°C**	**V**	**2**	**52**	**65**	**73**	**63**	//	//	//	//	//	//	//	**ROOT**
388/18 VHT 0/28	**T**	**10x10x55**	**-40°C**	**V**	**2**	**136**	**59**	**48**	**81**	//	//	//	//	//	//	//	**ROOT**

Remarks *Note:*

*** Prova non accreditata da ACCREDIA**

Legend *Legenda*

L= Longitudinal / Longitudinale
T= Trasversal / Trasversale
VWT 0/2 = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
VHT 0/2 = Impact Test on Fusion Line / *Resilienza Trasversale in linea di fusione*
VHT 1/2 = Impact Test at 1mm from Fusion Line / *Resilienza trasversale a 1 mm dalla linea di fusione*
VHT 2/2 = Impact Test at 2 mm from Fusion Line / *Resilienza trasversale a 2 mm dalla linea di fusione*
VHT 5/2 = Impact Test at 5 mm from Fusion Line / *Resilienza trasversale a 5 mm dalla linea di fusione*
WM = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
HAZ = Impact Test on Heat Affected Zone / *Resilienza Trasversale in zona termicamente alterata*
BM = Impact Test on Base Metal / *Resilienza Trasversale in materiale base*

FL = Fusion Line/ *Linea di fusione*
FL+1 = Fusion Line + 1mm/ *Linea di fusione+1mm*
FL+2 = Fusion Line + 2mm/ *Linea di fusione+2mm*
FL +5= Fusion Line + 5mm/ *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig Matteo Galdieri - INSPECTA srl - 19/09/18 *Laboratory Technician*	- INSPECTA srl - Francesca Fesel *Service Responsible* 19/09/18	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 19/09/2018 File _____ Signature *Cimatti Davide*

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 40/18 Integration	Sheet/Foglio 1/2

Manufacturer's Welding Procedure. Ref. no.	40/18 Integration REV. 0			
Manufacturer	ROSETTI MARINO S.p.A.			
Address	VIA TRIESTE 230 - 48121 RAVENNA			
Code, Testing Standard	PremierOil Spec. AB-TO-WGP-TO-ST-BD-0001 Rev. B02 and AB-TO-WGP-TO-ST-SP-0002 Rev. B01; EEMUA 158:2014 (Third Edition)			
	Location of test specimen according to EEMUA 158:2014 (Third Edition) Section 4.4.4, Fig. 7 to 11 Essential variables according to EEMUA 158:2014, Section 4.5			
Date of welding	Start: December 17th , 2018 Complete: December 18th, 2018			
Examiner of examining body	Rina Services S.p.A.			
RANGE OF QUALIFICATION				
Welding process	136 - FCAW			
Type(s)	Semiautomatic			
Welding Equipment Type	HF inverter type			
Actual parent Material side A	Plate: EN 10225: S460G2+M Z35 (Heat: 882852)			
Actual parent Material side B	Plate: EN 10225: S460G2+M Z35 (Heat: 882852)			
Parent Material grade	Carbon steel with maximum strength of 515 MPa			
Supply condition	Thermomechanical rolled and accelerated cooled			
Carbon equivalent/Pcm/C	Heat Values: 0,41/0,17/ 0,052			
Groove design/configuration	Half Vee Butt Joint (both sides welding with back gouging), for groove dimension and details see page 4 of 5			
Parent material thickness (mm)	60 mm (obtained from parent material of 80 mm thk.)			
Weld metal thickness (mm)	136 - FCAW 60 mm			
Single or Multi-pass	136 - FCAW MULTIPLE			
Outside diameter	/			
Filler material Designation	**136 FCAW** EN ISO 17632-A: T 46 4 1Ni P M 21 2 H5 (AWS 5.36: E81T1-M21A4-Ni1)			
Filler material Maker	136 - Esab OK Tubrod 15.17			
Filler material Size	136 - FCAW ∅ 1,2 mm			
Shielding gas/Flux	N.A.			
Shielding gas flow rate	N.A.			
Backing gas (purging)	None			

Type of welding current & polarity	DC - RP	Heat input / Apporto termico (kJ/mm) ± 10%		Diameter mm	
			Pass		
			Root	∅ 1,2	1,79 to 2,19
			Hot	∅ 1,2	1,26 to 1,54
			Filll	∅ 1,2	1,23 to 2,06
			Cap	∅ 1,2	0,92 to 1,18

Welding position	PF		
Preheat (°C)	50	Interpass temperature / Temp. di interpass (°C)	250
Post-Weld Heat Treatment and/or ageing	NONE		
Weld bead width	Max. 15 mm		
Welder's detail	Crispino Antonio NC272		
Time lapse between root and hot pass	N.A.		
Other information / Altre informazioni	- Preheat performed by propane torch -Accelerate weld cooling not permitted; -Base material origin: plate		

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 40/18 Integration	Sheet/Foglio 2/2

Manufacturer's Welding Procedure. Ref. no.	40/18 Integration REV. 0		
Test result (WPQR) N°	40/18 Integration	Date/Data	10/01/2019
Manufacturer's WPS No.	pWPS 48/18 REV. 0	Date/Data	13/12/2018

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 48/18
Penetrant test	N.A.	/
Magnetic particle test	Acceptable	01-18307
Radiographic test	N.A.	/
Ultrasonic test	Acceptable	01-18307

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2]	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2]	A [%]	Z [%]	Fracture Location	Remarks
							/
AWM 1, Cylindrical ∅ 10 mm (*)	670	/	708	23,0	61,56	Weld metal	/

(*) Performed on 60 mm thickness Test Coupon to obtain values needed for CTOD Test

BEND TEST

Type & N.	Bend angle	Remarks	Results

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J]			Avarage value [J]	Remarks
								/
								/
								/
								/
								/

CTOD - FRACTURE MECHANICS TOUGHNESS TEST (SENB)

Specimen no.	Thickness B [mm]	Net Thickness B_N [mm]	Width W [mm]	Test Temp. (°C)	CTOD δ_{MAX} [mm] ≥0,25	Remarks
957 SB 1	54,75	54,75	55,01	-10	0,717	/
957 SB 2	54,74	54,74	55,02	-10	0,596	/
957 SB 3	54,74	54,74	55,01	-10	0,514	/

NOTE

For all other mechanical tests, except CTOD and relative AWM Tensile Test, make reference to ROSETTI MARINO S.p.A. PQR 40/18

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
1 Macro examination+Hardness test	Satisfactory-See Element Materials Technology Milan certificate No. RPR1545-1E1R0A18
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Element Materials Technology Milan S.r.l. - Crema (CR)
Laboratory report reference N.	Report No. RPR1545-1E1R0A18 dated JANUARY 10th 2019
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of PremierOil Spec. AB-TO-WGP-TO-ST-BD-0001 Rev. B02 and AB-TO-WGP-TO-ST-SP-0002 Rev. B01; EEMUA 158:2014 (Third Edition)

Date/Data
10-01-2019

ROSETTI MARINO S.p.A.

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

Examiner or Examination Body
RINA Services S.p.A.

Name and signature / Nome e firma

RINA Services S.p.A.

PremierOil | ROSETTI MARINO

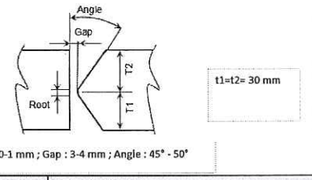
PQR - AS- RUN PARAMETER SHEET

pWPS 48/18	
PQR 48/18	
Coupon Nr. 48/18	
Date: 17-18/12/2018	Page: 1_ of _2

REFERENCE CODE AND PROJECT SPECIFICATIONS: **EEMUA 158 Third Edition (2014) and PremierOil Spec. AB-TO-WGP-TO-ST-BD-0001 Rev. B02 and AB-TO-WGP-TO-ST-SP-0002 Rev. B01**

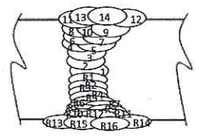
Welder Name(s):	CRISPINO ANTONIO	Welder Id No(s):	NC272
Welding Process(es):	136-FCAW	Type(s):	SEMIAUTOMATIC
Welding Position:	PF (3G)	Progression:	Vertical uphill
Base Materials:	EN 10225: S460 G2+M	Wall Thickness:	60 (*) — Diameter: /
Heat No(s):	882852	Joint Type:	SINGLE K BUTT JOINT; BOTH SIDES WELDED

WELD PREPARATION:



Root: 0-1 mm ; Gap : 3-4 mm ; Angle : 45° - 50°

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNS24006	ESAB OK TUBROD 15.17
Hot Pass	1,2	PNS24006	ESAB OK TUBROD 15.17
Filling Runs	1,2	PNS24006	ESAB OK TUBROD 15.17
Cap	1,2	PNS24006	ESAB OK TUBROD 15.17

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar+ 20%CO2
Flow:	20 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/8"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
15 mm	String and weave	Multiple (each side)	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature	Holding Time °c	Heating Rate °C	Cooling Rate °C
50°C PROPANE TORCH	250	CONTACT DIGITAL THERMOMETHER	NA	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
NA	1	FCAW	1	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	180	200	190,0	23	25	24,0	-	-	11	1,99	0,80	50	Welding unit: HELVI SE.0192
NA	2	FCAW	2	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	215	235	225,0	25	27	26,0	-	-	20	1,40	0,80	100	Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635
NA	3	FCAW	3	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	215	235	225,0	24	26	25,0	-	-	17	1,59	0,80	120	(*) machined from base metal thickness : 80 mm
NA	4	FCAW	4	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	215	235	225,0	24	26	25,0	-	-	16	1,69	0,80	150	Both side welded : side A passes from 1 to 14 (cap passes 11,12,13,14 , last bead pass in the center of the weld) Side B passes from R1 to R16 (cap passes R13,R14,R15,R16 , last bead pass in the center of the weld)
NA	4	FCAW	5	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	215	235	225,0	24	26	25,0	-	-	16	1,69	0,80	180	
NA	5	FCAW	6	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	210	230	220,0	24	26	25,0	-	-	18	1,47	0,80	180	
NA	5	FCAW	7	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	210	230	220,0	24	26	25,0	-	-	17	1,55	0,80	200	Grinding to sound metal performed by arcair tools
NA	6	FCAW	8	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	200	220	210,0	24	26	25,0	-	-	18	1,40	0,80	180	
NA	6	FCAW	9	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	200	220	210,0	24	26	25,0	-	-	18	1,40	0,80	200	
NA	6	FCAW	10	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	200	220	210,0	24	26	25,0	-	-	17	1,48	0,80	220	
NA	7	FCAW	11	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	165	185	175,0	22	24	23,0	-	-	19	1,02	0,80	250	
NA	7	FCAW	12	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	165	185	175,0	22	24	23,0	-	-	18	1,07	0,80	180	
NA	7	FCAW	13	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	165	185	175,0	22	24	23,0	-	-	19	1,02	0,80	200	
NA	7	FCAW	14	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	165	185	175,0	22	24	23,0	-	-	18	1,07	0,80	200	
NA	R1	FCAW	R1	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	210	230	220,0	25	27	26,0	-	-	20	1,37	0,80	100	
NA	R2	FCAW	R2	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	220	240	230,0	25	27	26,0	-	-	18	1,59	0,80	120	
NA	R3	FCAW	R3	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	220	240	230,0	25	27	26,0	-	-	17	1,69	0,80	150	
NA	R4	FCAW	R4	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	220	240	230,0	25	27	26,0	-	-	16	1,79	0,80	200	
NA	R5	FCAW	R5	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	220	240	230,0	25	27	26,0	-	-	16	1,79	0,80	180	
NA	R6	FCAW	R6	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	210	230	220,0	25	27	26,0	-	-	16	1,72	0,80	230	
NA	R6	FCAW	R7	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	230	250	240,0	25	27	26,0	-	-	17	1,76	0,80	160	
NA	R7	FCAW	R8	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	230	250	240,0	25	27	26,0	-	-	16	1,87	0,80	200	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name: ROSETTI MARINO SpA Welding Dept. D.Cenacchi	Name:	Name: RINA Services SpA No. Bo. 0474	Name:
Signature:	Signature:	Signature: Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature	Signature:
Date: 18/12/18	Date:	Date: 18/12/2018	Date:

PremierOil | ROSETTI MARINO

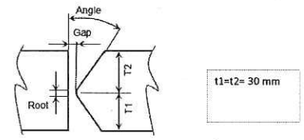
PQR - AS- RUN PARAMETER SHEET

pWPS 48/18	
PQR 48/18	
Coupon Nr. 48/18	
Date: 17-18/12/2018	Page: 2_ of _2

REFERENCE CODE AND PROJECT SPECIFICATIONS: **EEMUA 158 Third Edition (2014) and PremierOil Spec. AB-TO-WGP-TO-ST-BD-0001 Rev. B02 and AB-TO-WGP-TO-ST-SP-0002 Rev. B01**

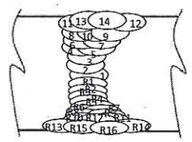
Welder Name(s):	CRISPINO ANTONIO	Welder Id No(s):	NC272
Welding Process(es):	136-FCAW	Type(s):	SEMIAUTOMATIC
Welding Position:	PF (3G)	Progression:	Vertical uphill
Base Materials:	EN 10225: S460 G2+M	Wall Thickness:	60 (*) — Diameter: /
Heat No(s):	882852	Joint Type:	SINGLE K BUTT JOINT; BOTH SIDES WELDED

WELD PREPARATION:



Root: 0-1 mm ; Gap : 3-4 mm ; Angle : 45° - 50°

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNS24006	ESAB OK TUBROD 15.17
Hot Pass	1,2	PNS24006	ESAB OK TUBROD 15.17
Filling Runs	1,2	PNS24006	ESAB OK TUBROD 15.17
Cap	1,2	PNS24006	ESAB OK TUBROD 15.17

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar+ 20%CO2
Flow:	20 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/8"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
15 mm	String and weave	Multiple (each side)	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature	Holding Time °c	Heating Rate °C	Cooling Rate °C
50°C PROPANE TORCH	250	CONTACT DIGITAL THERMOMETHER	NA	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
NA	R7	FCAW	R9	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	220	240	230,0	24	26	25,0	-	-	16	1,73	0,80	130	Welding unit: HELVI SE.0192
NA	R8	FCAW	R10	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	200	220	210,0	24	26	25,0	-	-	17	1,48	0,80	160	Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635
NA	R8	FCAW	R11	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	200	220	210,0	24	26	25,0	-	-	17	1,48	0,80	180	(*) machined from base metal thickness : 80 mm
NA	R8	FCAW	R12	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	200	220	210,0	24	26	25,0	-	-	16	1,58	0,80	200	Both side welded : side A passes from 1 to 14 (cap passes 11,12,13,14 , last bead pass in the center of the weld) Side B passes from R1 to R16 (cap passes R13,R14,R15,R16 , last bead pass in the center of the weld)
NA	R9	FCAW	R13	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	165	185	175,0	22	24	23,0	-	-	19	1,02	0,80	230	
NA	R9	FCAW	R14	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	165	185	175,0	22	24	23,0	-	-	18	1,07	0,80	220	
NA	R9	FCAW	R15	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	165	185	175,0	22	24	23,0	-	-	19	1,02	0,80	200	Grinding to sound metal performed by arcair tools
NA	R9	FCAW	R16	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	165	185	175,0	22	24	23,0	-	-	19	1,02	0,80	180	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO S.p.A. Welding Dept. D. Cenacchi	Signature:	Signature: RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Cimatti Davide	Signature:
Date: 18/12/18	Date:	Date: Date 18/12/2018	Date:

PQR attachments index:

Base material certificate (Plate EN 10225: S460 G2+M)

Consumables certificate

preliminary WPS

NDE certificate

Mechanical test report (CTOD)

Base material certificate
(Plate EN 10225: S460 G2+M)

Certificate Number:VNA 1700015 / 9
Page: 1 of 1

Inspection Certificate

Project: ——————
Client: voestalpine Grobblech GmbH
voestalpine-Straße 3, 4020 Linz, Austria

Office: Vienna

Clients Order Number: 6501364

Date: 15-02-2017

Order Status: incomplete

Inspection Dates
First: 10-02-2017

final: 17-02-2017

This certificate is issued to voestalpine Grobblech GmbH, Linz/Austria, to certify that the undersigned Surveyor attended their works Linz for the purpose of testing and inspecting the undernoted material with satisfactory results as stated below.

Purchaser: Rosetti Marino Spa
Via Trieste 230
I-48122 RAVENNA

Order No.: 1716002502 116B20A

Description:

48 piece(s) of steel plate(s) 384580 kg , as per attached inspection Certificate no.: A0357565

Specification

S460G2+M Z35 EN 10225 : 2009

Heat treatment/Delivery Condition: thermomechanical rolled + accelerated cooled

Scope of inspection:

witness mechanical testing: yes ☑
review manufacturer's declared analysis: yes ☑
witness / verify ultrasonic examination: yes ☑ n/a ☐
witness / verify microstructure examination: yes ☐ n/a ☑
witness /verify corrosion testing: yes ☐ n/a ☑
random visual and dimensional control and check of hard stamping: yes ☑

Identification:

Makers Brand voestalpine
Material Quality
Heat No.
Plate No.
Brand of LR

Lloyd's Register EMEA
Vienna Office
Lloyd's Register

24 FEB 2017

Kurt Huber
Surveyor to Lloyd's Register EMEA

A subsidiary of Lloyd's Register Group Limited

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Form 1123 (2015.08)

voestalpine Grobblech GmbH

A02
Inspection certificate
EN 10204 - 3.2

VNA1700015-9

Z02 Date 23-02-2017

voestalpine-Straße 3
4020 Linz, Austria
www.voestalpine.com/grobblech

A03 Document number	A0357565	A08 Order-No.:	6501364	A07 OrderDat. 13-12-2016

4F

A06 Customer	Rosetti Marino Spa Via Trieste 230 I-48122 RAVENNA	B01 Product	Plate		
		B02 Material	S460G2+M Z35	B03 Standard	EN 10225 : 2009
A07 OrderNo.	1716002502 116B20A	Supplementary requirements	Z35 - EN 10164		
A06 Consignee	Rosetti Marino Spa Via Trieste 230 I-48122 RAVENNA	B04 Delivery condition	thermomechanical rolled + accelerated cooled		

A10 - Supplementary Information

SOUTH PARS 13 - PILES

B03 - Supplementary requirements

MATERIAL IS FINE GRAINED, VACUUM DEGASSED AND FULLY KILLED, PRODUCED BY BOF.
MATERIAL IS ACCORDING TO SPECIFICATION SP13-P2-ST-SP-8028.
MATERIAL IS ACCORDING TO EN 10225, OPTIONS 2,6,7,9,10,12 AND 13.

Z01 - Visual Examination and dimensional checking: satisfactory. The results of tests performed are in compliance with the requirements.

Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	Ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
882852	186892/1	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
882852	186892/2	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
882852	186894/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186894/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186895/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186895/2	30	80,00	2640,0	4800	1		8.010	56321	15-02-2017	1PLATCS80007
882852	186896/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186896/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186897/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186897/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
882852	186898/1	30	80,00	2640,0	4800	1		8.020	56268	15-02-2017	1PLATCS80007
882852	186898/2	30	80,00	2640,0	4800	1		8.020	56268	15-02-2017	1PLATCS80007
882852	186899/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007

A04
Symbol of the manufacturer's work

voestalpine

Z03
Stamp of the inspection representative

LR
Lloyd's Register EMEA
Vienna Office
Initials: KH
24 FEB 2017

Z02
Inspection representative voestalpine Grobblech
Quality Department Heavy Plates
BERGER Alfred

voestalpine
ONE STEP AHEAD.

Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	Ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
882852	186899/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
882852	186900/2	30	80,00	2640,0	4800	1		8.020	56058	15-02-2017	1PLATCS80007
882852	186900/1	30	80,00	2640,0	4800	1		8.020	56058	15-02-2017	1PLATCS80007
882852	186901/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
882852	186901/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972090	186721/2	30	80,00	2640,0	4800	1		8.018	56010	10-02-2017	1PLATCS80007
972090	186723/2	30	80,00	2640,0	4800	1		8.012	56058	14-02-2017	1PLATCS80007
972090	186723/1	30	80,00	2640,0	4800	1		8.012	56058	14-02-2017	1PLATCS80007
972090	186724/1	30	80,00	2640,0	4800	1		8.010	56058	13-02-2017	1PLATCS80007
972090	186724/2	30	80,00	2640,0	4800	1		8.010	56321	13-02-2017	1PLATCS80007
972090	186725/1	30	80,00	2640,0	4800	1		8.010	56010	11-02-2017	1PLATCS80007
972090	186725/2	30	80,00	2640,0	4800	1		8.010	56010	11-02-2017	1PLATCS80007
972090	186726/2	30	80,00	2640,0	4800	1		8.022	56058	10-02-2017	1PLATCS80007
972090	186726/1	30	80,00	2640,0	4800	1		8.022	56010	10-02-2017	1PLATCS80007
972093	181846/2	30	80,00	2640,0	4800	1		8.005	56268	15-02-2017	1PLATCS80007
972093	181846/1	30	80,00	2640,0	4800	1		8.005	56268	15-02-2017	1PLATCS80007
972093	186842/1	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
972093	186842/2	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
972093	186843/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186843/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186844/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186844/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186846/2	30	80,00	2640,0	4800	1		8.007	56058	17-02-2017	1PLATCS80007
972093	186846/1	30	80,00	2640,0	4800	1		8.007	56058	17-02-2017	1PLATCS80007
972093	186902/2	30	80,00	2640,0	4800	1		8.010	56272	15-02-2017	1PLATCS80007
972093	186902/1	30	80,00	2640,0	4800	1		8.010	56272	15-02-2017	1PLATCS80007
972093	186903/2	30	80,00	2640,0	4800	1		8.010	56010	15-02-2017	1PLATCS80007
972093	186903/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186905/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186905/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972096	186841/1	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
972096	186841/2	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
972096	186845/1	30	80,00	2640,0	4800	1		8.010	56272	16-02-2017	1PLATCS80007
972096	186906/2	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007

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Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	Ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
972096	186906/1	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
		Sum				48		384.580			

C70 - Method of steelmaking: strand casted material: pure oxygen blown with vacuum treatment; steel is fully killed.

B14 - Supplementary information
Flatness acc. EN 10029/10 class N
Dimensional tolerances acc. EN 10029/10
EN10163-2: Class A3 - Repair-welding not permitted.
Thicknesstolerance acc. EN 10029/10 tab. 1 class A

Chemical composition (Heat analysis) - part 1 of 2

B07 Heat No.		C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %	Pb %	Cae %	Pcm %
	>=		.150				.015																
Set values	<=	.140	.550	1.650	.020	.0050	.055	.250	.700	.250	.300	.080	.040	.025	.0100	.0005	.0200	.0050	.0300	.0100	.010	.43	.22
882852		.052	.182	1.550	.009	.0009	.030	.182	.520	.123	.073	.004	.030	.012	.0051	.0002	.0020	.0003	.0020	.0020	.002	.41	.17
972090		.060	.176	1.520	.007	.0010	.022	.174	.520	.125	.046	.004	.027	.012	.0061	.0002	.0020	.0003	.0020	.0020	.002	.41	.17
972093		.052	.184	1.530	.008	.0011	.027	.172	.530	.125	.068	.004	.029	.012	.0042	.0003	.0020	.0003	.0030	.0020	.002	.41	.17
972096		.054	.177	1.530	.007	.0007	.026	.173	.530	.117	.054	.004	.027	.013	.0040	.0002	.0020	.0003	.0020	.0030	.002	.41	.17

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Chemical composition (Heat analysis) - part 2 of 2

B07 Heat. No.	LF01 %	LF02 %	LF03 %
>= Set values <=	.090	.110	.900
882852	.034	.046	.898
972090	.031	.043	.865
972093	.033	.045	.895
972096	.031	.044	.874

C99 - Supplementary information
BI <= 0,01%
C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF03: Cr+Ni+Cu+Mo
LF02: Nb+V+Ti
LF01: Nb+V

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Test results: C10-C29 Tensile Test acc. EN ISO 6892-1

B07 Heat No.	B06 Plate No	C41 Width	SpThickn mm	C01 loc.	PosTh.	C02 Dir	C11 Reh MPa	C11 Rp0,2 MPa	C12 Rm MPa	L0	C13 E %	C11 Reh/Rm %	C11 Rp0,2/Rm %	Sim.htm	WBH
>=							405	405	505		17.0				
Set values <=									665			90.00	90.00		
882852	186892	Ø	9.98	F	V	T	445	445	535	A5	32.0	83.07	83.09		
	186896	Ø	9.98	F	V	T	447	443	535	A5	30.9	83.47	82.69		
	186898	Ø	9.99	F	V	T	441	438	538	A5	31.2	81.97	81.41		
	186900	Ø	9.98	F	V	T	457	440	533	A5	30.3	85.65	82.52		
	186892	Ø	9.99	F	V	T		436	527	A5	30.0		82.78	001	1
	186896	Ø	9.99	F	V	T	468	443	524	A5	32.3	89.30	84.50	001	1
	186898	Ø	9.98	F	V	T	465	445	527	A5	32.4	88.24	84.44	001	1
	186900	Ø	9.99	F	V	T		437	524	A5	31.6		83.43	001	1
972090	184827	Ø	10.00	F	V	T	456	449	541	A5	29.3	84.28	82.93		
	184828	Ø	10.00	F	V	T	442	440	536	A5	30.8	82.41	82.00		
	186723	Ø	9.98	F	V	T		429	545	A5	27.5		78.81		
	184827	Ø	9.99	F	V	T		432	520	A5	28.5		83.09	001	1
	184828	Ø	9.99	F	V	T		440	529	A5	31.2		83.32	001	1
	186723	Ø	9.96	F	V	T	487	474	563	A5	28.1	86.53	84.17	001	1
972093	181846	Ø	9.95	F	V	T		415	564	A5	32.1		73.58		
	186842	Ø	9.98	F	V	T	456	449	540	A5	32.5	84.45	83.24		
	186843	Ø	9.99	F	V	T	461	452	544	A5	32.6	84.74	83.09		
	186902	Ø	9.98	F	V	T	456	448	532	A5	32.5	85.67	84.18		
	181846	Ø	9.98	F	V	T	460	424	524	A5	32.6	87.79	80.92	001	1
	186842	Ø	9.99	F	V	T	471	440	526	A5	32.4	89.49	83.56	001	1
	186843	Ø	9.98	F	V	T	470	443	532	A5	32.6	88.35	83.27	001	1
	186902	Ø	9.99	F	V	T	463	436	518	A5	32.9	89.37	84.16	001	1
972096	186841	Ø	9.98	F	V	T	459	429	529	A5	30.9	86.77	81.10		
	186906	Ø	9.98	F	V	T	466	436	524	A5	31.2	88.86	83.05		
	186841	Ø	9.98	F	V	T	470	441	525	A5	32.1	89.52	84.00	001	1
	186906	Ø	9.97	F	V	T		439	523	A5	32.7		83.96	001	1

SpThickn: specimen thickness
C01;loc.:
F: Bottom
PosTh.: Pos Thickness
V: ¼

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Test results: C10-C29 Tensile Test acc. EN ISO 6892-1

B07 Heat No.	B06 Plate No	C41 Width	SpThickn mm	C01 loc.	PosTh.	C02 Dir	C11 Reh MPa	C11 Rp0,2 MPa	C12 Rm MPa	L0	C13 E %	C11 Reh/Rm %	C11 Rp0,2/Rm %	Sim.htm	WBH

C02;Dir:
T: transverse
C12; Rm: Tensile Strength
L0: gauge
A5: Length = 5.65 * sqr (area) mm
C13;E: elongation
Sim.htm: sim. heat treatment
001: Sim.htm group #1
WBH: sim. heat treatment

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07	B06	C40	C01			C02	C03	C42	C42	C42	C43			
Heat No. samp.cond.	Plate No	shape	loc.	Pos.	PosTh.	Dir	temp	SV	SV	SV	AV		Sim.htm	WBH
							°C	J	J	J	J			
>=							-40	42	42	42	60			
Set values <=														

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>=							-40	42	42	42	60		
Set values <=													
882852	186892	CV 10x10	F		O	T	-40	340	328	325	331		
	186896	CV 10x10	F		O	T	-40	345	328	327	333		
	186898	CV 10x10	F		O	T	-40	352	332	322	335		
	186900	CV 10x10	F		O	T	-40	345	348	344	346		
	186892	CV 10x10	F		O	T	-40	307	310	303	307	001	1
	186896	CV 10x10	F		O	T	-40	314	321	315	317	001	1
	186898	CV 10x10	F		O	T	-40	323	311	317	317	001	1
	186900	CV 10x10	F		O	T	-40	334	324	325	328	001	1
	186892	CV 10x10	F		K	T	-40	348	364	385	366		
	186896	CV 10x10	F		K	T	-40	365	356	353	358		
	186898	CV 10x10	F		K	T	-40	352	365	345	354		
	186900	CV 10x10	F		K	T	-40	372	347	354	357		
	186892	CV 10x10	F		K	T	-40	345	329	324	333	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>=							-40	42	42	42	60		
Set values <=													
882852	186896	CV 10x10	F		K	T	-40	344	328	284	319	001	1
	186898	CV 10x10	F		K	T	-40	310	337	320	322	001	1
	186900	CV 10x10	F		K	T	-40	357	349	347	351	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	42	42	42	60		
972090	184827	CV 10x10	F		O	T	-40	321	320	314	318		
	184828	CV 10x10	F		O	T	-40	320	303	303	309		
	186723	CV 10x10	F		O	T	-40	323	327	322	324		
	184827	CV 10x10	F		O	T	-40	332	319	327	326	001	1
	184828	CV 10x10	F		O	T	-40	318	323	321	321	001	1
	186723	CV 10x10	F		O	T	-40	295	263	303	287	001	1
	184827	CV 10x10	F		K	T	-40	340	328	251	306		
	184828	CV 10x10	F		K	T	-40	346	336	317	333		
	186723	CV 10x10	F		K	T	-40	268	289	311	289		
	184827	CV 10x10	F		K	T	-40	321	331	357	336	001	1
	184828	CV 10x10	F		K	T	-40	326	353	89	256	001	1
	186723	CV 10x10	F		K	T	-40	284	266	276	275	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	42	42	42	60		
972093	181846	CV 10x10	F		O	T	-40	319	324	322	322		
	186842	CV 10x10	F		O	T	-40	345	347	334	342		
	186843	CV 10x10	F		O	T	-40	343	339	342	341		
	186902	CV 10x10	F		O	T	-40	349	344	335	342		
	181846	CV 10x10	F		O	T	-40	329	302	323	318	001	1
	186842	CV 10x10	F		O	T	-40	312	310	308	310	001	1
	186843	CV 10x10	F		O	T	-40	305	315	311	310	001	1
	186902	CV 10x10	F		O	T	-40	323	322	318	321	001	1
	181846	CV 10x10	F		K	T	-40	304	366	370	347		
	186842	CV 10x10	F		K	T	-40	362	369	351	361		
	186843	CV 10x10	F		K	T	-40	358	366	356	360		
	186902	CV 10x10	F		K	T	-40	357	366	377	366		
	181846	CV 10x10	F		K	T	-40	359	364	355	359	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	42	42	42	60		
972093	186842	CV 10x10	F		K	T	-40	323	298	331	317	001	1
	186843	CV 10x10	F		K	T	-40	313	304	301	306	001	1
	186902	CV 10x10	F		K	T	-40	361	363	364	362	001	1
972096	186841	CV 10x10	F		O	T	-40	345	333	341	339		
	186906	CV 10x10	F		O	T	-40	338	340	346	341		
	186841	CV 10x10	F		O	T	-40	324	316	313	318	001	1
	186906	CV 10x10	F		O	T	-40	317	321	323	320	001	1
	186841	CV 10x10	F		K	T	-40	337	342	353	344		
	186906	CV 10x10	F		K	T	-40	348	357	334	346		
	186841	CV 10x10	F		K	T	-40	309	332	343	328	001	1
	186906	CV 10x10	F		K	T	-40	347	338	278	321	001	1
>= Set values <=							-40	29	29	29	46		

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	29	29	29	46		
882852	186892	CV 10x10	F		ZB2	T	-40	320	310	312	314		strain aged 5%, 60 min. at 250°C
	186896	CV 10x10	F		ZB2	T	-40	305	297	314	305		strain aged 5%, 60 min. at 250°C
	186898	CV 10x10	F		ZB2	T	-40	311	303	309	307		strain aged 5%, 60 min. at 250°C
	186900	CV 10x10	F		ZB2	T	-40	305	317	306	309		strain aged 5%, 60 min. at 250°C
972090	184827	CV 10x10	F		ZB2	T	-40	341	317	326	328		strain aged 5%, 60 min. at 250°C
	186723	CV 10x10	F		ZB2	T	-40	259	299	299	286		strain aged 5%, 60 min. at 250°C
972093	181846	CV 10x10	F		ZB2	T	-40	306	302	323	310		strain aged 5%, 60 min. at 250°C
	186842	CV 10x10	F		ZB2	T	-40	316	299	319	311		strain aged 5%, 60 min. at 250°C
	186843	CV 10x10	F		ZB2	T	-40	322	309	315	315		strain aged 5%, 60 min. at 250°C
	186902	CV 10x10	F		ZB2	T	-40	306	302	323	310		strain aged 5%, 60 min. at 250°C
972096	186841	CV 10x10	F		ZB2	T	-40	311	302	314	309		strain aged 5%, 60 min. at 250°C
	186906	CV 10x10	F		ZB2	T	-40	305	310	313	309		strain aged 5%, 60 min. at 250°C

C40;shape:
CV 10x10: Test shape , Dimensions

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07	B06	C40	C01			C02	C03	C42	C42	C42	C43			
Heat No. samp.cond.	Plate No	shape	loc.	Pos.	PosTh.	Dir	temp	SV	SV	SV	AV		Sim.htm	WBH
							°C	J	J	J	J			

C01;loc.:
F: Bottom
Pos.: test specimen position
PosTh.: Pos Thickness
K: ½
O: surface
ZB2: 2mm below surface
C02;Dir:
T: transverse
C42;SV: single value
C43;AV: average value
Sim.htm: sim. heat treatment
001: Sim.htm group #1
WBH: sim. heat treatment
samp.cond.: sample condition

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Vienna Office
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24 FEB 2017

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Quality Department Heavy Plates
BERGER Alfred

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Test results: C10-C29 through Thickness Test acc. DIN / EN

B07 Heat No.	B06 Plate No	C40 Shape	SpThickn mm	C01 loc.	C02 Dir	C12 Rm MPa	C12 Rm MPa	C12 Rm MPa	Z (SV) %	Z (SV) %	Z (SV) %	Z (AV) %
>=						404	404	404	25	25	25	35
Set values <=												
882852	186892	Ø	10.01	F	S	531	531	531	72	78	60	70
	186896	Ø	10.00	F	S	539	530	532	78	78	70	75
	186900	Ø	10.00	F	S	526	521	530	77	79	78	78
972090	184827	Ø	10.03	F	S	528	528	525	60	67	58	62
	186723	Ø	9.96	F	S	539	544	525	73	74	79	75
972093	181846	Ø	10.00	F	S	522	520	520	75	74	77	75
	186842	Ø	10.00	F	S	535	533	536	78	75	72	75
	186902	Ø	10.01	F	S	515	520	517	77	71	74	74
972096	186906	Ø	9.87	F	S	527	525	539	77	79	70	75

SpThickn: specimen thickness
C01;loc.:
F: Bottom
C02;Dir:
S: through thickness direction
C12; Rm: Tensile Strength
Z(SV): reduction of area (single value)
Z(AV): reduction of area (average value)

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Chemical composition (Product analysis) - part 1 of 2

B07 Heat No.	B06 Plate No	C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %
>=			.150				.015													
Set values <=		.140	.550	1.650	.020	.0050	.055	.250	.700	.250	.300	.080	.040	.025	.0100	.0005	.0200	.0050	.0300	.0100
882852	186892	.052	.184	1.520	.008	.0010	.028	.181	.520	.123	.067	.004	.029	.012	.0058	.0002	.0020	.0002	.0030	.0020
	186896	.052	.185	1.530	.008	.0009	.030	.179	.520	.122	.071	.004	.029	.012	.0053	.0002	.0020	.0003	.0030	.0020
	186898	.052	.175	1.530	.007	.0009	.029	.180	.521	.123	.071	.003	.030	.012	.0051	.0001	.0020	.0002	.0010	.0010
	186900	.052	.184	1.530	.009	.0010	.029	.178	.520	.122	.072	.004	.030	.012	.0050	.0002	.0020	.0003	.0020	.0020
972090	184827	.054	.178	1.530	.007	.0007	.024	.176	.520	.127	.046	.004	.027	.013	.0056	.0002	.0020	.0002	.0030	.0020
	184828	.054	.176	1.530	.007	.0007	.024	.174	.520	.127	.045	.004	.027	.013	.0059	.0002	.0020	.0002	.0020	.0020
	186723	.055	.179	1.540	.007	.0010	.024	.174	.510	.126	.046	.004	.027	.013	.0061	.0002	.0020	.0002	.0030	.0020
972093	181846	.051	.180	1.520	.007	.0010	.029	.170	.520	.122	.060	.004	.029	.012	.0044	.0002	.0020	.0003	.0020	.0020
	186842	.052	.185	1.510	.007	.0012	.028	.168	.510	.124	.061	.004	.029	.013	.0042	.0002	.0020	.0003	.0020	.0020
	186843	.052	.177	1.500	.008	.0010	.027	.173	.531	.125	.066	.004	.029	.011	.0042	.0002	.0030	.0003	.0030	.0020
	186902	.048	.183	1.500	.007	.0010	.028	.168	.510	.122	.060	.004	.028	.012	.0045	.0002	.0020	.0003	.0020	.0020
972096	186841	.054	.175	1.530	.006	.0007	.024	.170	.527	.117	.055	.003	.027	.013	.0040	.0002	.0020	.0003	.0020	.0030
	186906	.053	.179	1.530	.007	.0010	.027	.174	.520	.121	.050	.004	.027	.013	.0040	.0002	.0020	.0002	.0020	.0020

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Chemical composition (Product analysis) - part 2 of 2

B07 Heat No.	B06 Plate No	Pb %	Cae %	Pcm %	LF01 %	LF02 %	LF03 %
>=							
Set values <=		.010	.43	.22	.090	.110	.900
882852	186892	.002	.41	.16	.033	.045	.891
	186896	.002	.41	.17	.033	.045	.892
	186898	.002	.41	.16	.033	.045	.895
	186900	.002	.41	.17	.034	.046	.892
972090	184827	.002	.41	.17	.031	.044	.869
	184828	.002	.41	.17	.031	.044	.866
	186723	.002	.41	.17	.031	.044	.856
972093	181846	.002	.40	.16	.033	.045	.872
	186842	.002	.40	.16	.033	.046	.863
	186843	.002	.40	.16	.033	.044	.895
	186902	.002	.39	.16	.032	.044	.860
972096	186841	.002	.41	.17	.030	.043	.869
	186906	.002	.41	.16	.031	.044	.865

C99 - Supplementary information
BI <= 0,01%
C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF03: Cr+Ni+Cu+Mo
LF02: Nb+V+Ti
LF01: Nb+V

Remarks

Simulated heat treatment of test coupons:

Pos 30:
001/1: 1 cycle(s) sim. PWHT: furnace charge temperature at max. 400 °C, heating with max. 55 °C/h up to 580 °C, +20 °C/-20 °C, holding time 240 minutes, cooling with max. 55 °C/h down to 400 °C, final cooling in calm air.

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A03 Document number A0357565 VNA1700015-9 A08 Order-No.: 6501364 Z02 Date 23-02-2017 Page 18 of 19

Remarks

We confirm that the above-mentioned delivery corresponds to the order (and standard).

Reduction of area on tensile test specimens in the through-thickness direction in accordance with EN 10164:2004, class Z35.

The signature of the inspection representative from voestalpine Grobblech GmbH is substituted by a electronic Signature, because the certificates of voestalpine Grobblech GmbH are prepared by a suitable data processing system (EN 10204, Pt.5).

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ULTRASONIC EXAMINATION

SPECIFICATION
Ultrasonic examination acc. to EN 10160, EN 10160 class S1/Body, Grid 200 mm, EN 10160 class E2/Edge Zone, Edge zone 75 mm

VALID TEST EQUIPMENT
mechanized ultrasonic "In-Line testing system" (Manufacturer: NDT-Systems & Services) and
mechanized ultrasonic "off-line - testing system" (manufacturer: Windhoff Bahn- und Anlagentechnik GmbH) and
MUT (optional): Sonatest D20 no. 90006523 or Sonatest D20 no. 90007346 or Sonatest Masterscan 380 no. 90007347 or Sonatest Masterscan 380 no. 90006522 or Sonatest D50 no. 90010231 or GE - USM 36 no. 90010775

PROBE
(in-line AUT): 3STSE 18.3/8 P5, SEZ5R10RS, SE3 18.3/10 5A, (5MHz)
(off-line AUT): S140 (4MHz) 3T/1R
(MUT): SEB4E (4MHz), SEB4E0° (4MHz), MSEB4E (4MHz), B2SO (2MHz)
watergapcoupling

RESULT
Plate(s) comply with the specification.

INSPECTION OPERATOR
Operators Level 1 or 2: qualified and certified according ÖNORM EN 473 or EN ISO 9712 (since 01.01.2013) respectively according the Written Practice „NDT-WP" (in accordance to Recommended Practice SNT-TC-1A). Operators Level 2 for ASME/ASTM.

INSPECTION SUPERVISOR
Responsible Level 3: Bindreiter Erich

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Consumables certificate

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2018-07-27

Numero certificato/Cert no: EC25251151 rev. 0

Nostro ordine/Our order:	2013780	Vostro ordine/Your order:	1718000897
Nostro riferimento/Our ref:	Web user - Movex CMP020 ITB	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB00060	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20180727	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address
ESAB SALDATURA S.P.A. (6155)
STRADA PROVINCIALE 34, N. 7
IT-20010 OSSONA MI
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
ROSETTI MARINO SPA
.
VIA TRIESTE 230
48100 RAVENNA RA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PNS24006 Quantità/Quantity: 20 CT

PRODOTTO/PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK Tubrod 15.17 1.2mm 16kg
Codice/Item no:	**1517127730**

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.36: E81T1-M21A4-Ni1
EN ISO 17632-A: T 46 3 1Ni P C1 2 H5
EN ISO 17632-A: T 46 4 1Ni P M21 2 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:	M21 (EN ISO 14175)
C	0.05%
Si	0.39%
Mn	1.15%
P	0.01%
S	0.02%
Cr	0.03%
Ni	1.0%
Mo	0.03%
Nb	0.02%
Cu	0.06%
V	0.02%

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:	EN
Altro/Auxiliary:	M21 (EN ISO 14175)
Condizione/Condition:	As welded

TRAZIONE/TENSILE

ReL	Rm	A5
544 MPa	613 MPa	26 %

RESILIENZA/IMPACT

Temp	-40 °C
KV	124 J

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis		Validazione - altro/Validation - Others	
Piotr Grela	Quality Assurance Manager	Neil Farrow	Product Manager

ROSETTI MARINO

PQR 40/18 Integration

preliminary WPS

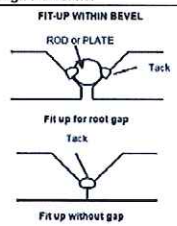
PQR ref.:	TBQ (40/18 Integration)	pWPS EEMUA 158	48/18	REV.: 0	Data /date 13/12/2018
Procedimento di saldatura: Welding process:	136-FCAW	Tipo : Type:	SEMIAUTOMATIC		

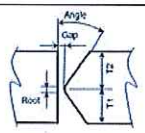
GIUNTO - JOINT

Tipo di giunto: Joint Design: K | Supporto: Backing: ☐ Si / Yes ☒ No

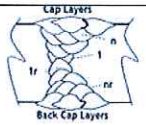
Materiale di supporto (tipo): Backing material (type). ☐ Metallico / Metal ☐ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:





Angle: 45°
Root: 2 mm
Gap: 3 mm
T1=T2



Note: 1.Surfaces cleaned from moisture, oil, grease, paint before welding (by grinding)/ *Pulire le superfici da liquidi, oli, grasso e vernici con molatura prima di saldare.*
2.Minimum tack weld lengths shall be 4 times the thk or 50 mm, whichever is less/ I tacchetti devono essere lunghi almeno 50 mm o 4 volte lo spessore (il più piccolo dei due);
3.Welding shall not be discontinued before 25% of the weld thickness or 3 passes are completed, whichever gives adequate cross section to prevent craking/ *La saldatura non può essere interrotta prima di aver completato almeno 3 passate o il 25% dello spessore da saldare*
4.The whole length of the joint to be welded, and 75 mm each side, shall be preheated to the required temperature. Preheat shall be performed by electrical resistance, induction equipment or with gas burners. Hand held oxy-propane torches shall only be used for weld shorter than 300 mm. Cutting torches shall not be permitted. *L'intera lunghezza del giunto e 75 mm su ogni lato deve essere preriscaldata alla temperatura richiesta. Il preriscaldo può essere eseguito con resitenze, induzione o torcia. La torcia a mano può essere usata solo per saldature fino a 300 mm . Non può essere utilizzato l'ossitaglio.*

MATERIALE BASE - BASE MATERIAL

Da / from P-N°: /	Group N° 5	A / to P-N°: /	Group N° 5

DA Tipo e grado / From type and grade: S460 G2+M

A Tipo e grado / To type and grade: S460 G2+M

Gamma spessori / Thickness range: ▶ Materiale base / Base material: Piena penetrazione / Groove 60 mm

▶ Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove N.A.

METALLO D'APPORTO - FILLER METAL

	GS FCAW	
Spec. N° (SFA)	5.29/5.36	
AWS N° (CLASS)	E81T1-1/E81T1-Ni1	
F-N°	6	
A-N°	1	
Diametro mat. D'apporto / Size of filler metal	1,2	
Gamma spessori /Thick. Range (mm)	Up to filling	
Accoppiamento filo-flusso / Electrode-flux (CLASS)	NA	
Denom. Comm. Flusso / FLUX trade name	NA	
Inserto consumabile / Consumable insert	NA	
Altro / other	OK Tubrod 15.17	

POSIZIONI - POSITION

giunto / Joint: Cianfrino / groove | Posizione / position PF (3G) | Progressione / weld progression: Ascendente / UP hill

PRERISCALDO - PRE-HEAT

Temp.preriscaldo minima: Min. pre-heat temp: 50 °C | Max temp. Di interpass : Max interpass temp.: 250 °C | Mantenimento interpass : Interpass maintenance : N.A. | Tempo di mantenimento prerisc.: Maintenance timing: N.A.

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT

Riscaldamento Heating rate (°C/Hrs): N.A. | Temperatura di stasi : Holding temperature °C: N.A. | Tempo di stasi : Holding time (min.): N.A. | Velocità di raffreddamento: Cooling rate (°C/Hrs): N.A.

GAS DI PROTEZIONE - GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar+CO2	80%+20%	16-24 lt/min
Protezione al seguito / Trailing:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current : DC | Polarità / Polarity RP

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: N.A.

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: N.A.

Velocità alimentazione filo / Electr. Wire feed speed range: Self regulated

TECNICA - TECHNIQUE

Passata : Bead: Tirata/String | Dimensione bocchello gas: Orifice of gas cup size: 1/2" | Pulizia iniziale e fra le passate: Initial and interpass cleaning: Spazzolatura/Brushing

Metodo di solcatura a rovescio: Method of back gouging: Scriccatura + molatura/ Arcair + grinding | Oscillazione: Oscillation: N.A. | Distanza zona di contatto e pezzo: Contact zone to work distance: N.A.

N°Passate : Passes nr.: Multipla/Multiple | Elettrodo multiplo o singolo: Multiple or single electrodes: Singolo/Single | Martellatura: Peening: N.A.

Altro / Other: All arc/air gouged surface shall be dressed to bright clean metal by grinding at an additional depth of minimum 2 mm/ *Molare per una profondità minima di 2 mm dopo scriccatura.*

N° Passate Weld layers nr.	Processo Process	Materiale d'apporto Filler metal		Corrente Current		Voltaggio Volt range		Vel. Avanzamento Travel speed range (mm/min)		Apporto termic Heat input (KJ/mm)	
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. Range						
Tack-1	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	175 200	26	28	143	151	1,45	1,88
2	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	196 245	26	28	175	250	0,98	1,88
3-n	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	210 264	26	28	193	275	0,95	1,84
Cap layers	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	205 250	26	28	176	310	0,83	1,91
Back gouging (minimum back gouging layers shall be 2 /Le passate di ripresa devono essere minimo 2)											
1r	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	185 247	26	28	165	236	0,98	2,01
2r-3r	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	198 245	26	28	178	260	0,95	1,85
4r-nr Back Cap	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	210 270	26	28	190	315	0,83	1,91

Preparato da / prepared by:	Client/Third part signature:	Client/Third part signature:
D.Cenacchi	*Premier Oil*	*DNV*

NDE certificate

ROSETTI MARINO	**VERBALE DI CONTROLLO VISIVO/DIMENSIONALE** **visual/dimensional inspection report**	VDR N° **48-18** data: **18-12-2018**

progetto / project: **TOLMOUNT REDEVELOPMENT PROJECT**	cliente / client: **PREMIER OIL**	ordine / PO: **/**	commessa / job: **118A50**
disegno / dwg: **/**	ITP N°: **AB-TO-ROS-PM-QA-PL-0002 REV.C01**	fase / step: **8.1**	

SI CERTIFICA CHE :

gli item di seguito indicati sono stati sottoposti a controllo dimensionale ed accettati in accordo alla procedura / specifica sotto indicata ed ai criteri di accettabilita' in essa definiti.

WE CERTIFY THAT:

items below indicated have undergone a dimensional inspection and have been accepted according to the specific / procedure mentioned hereunder and to acceptance criteria defined in it.

oggetto – item

COUPON	STAMP	POS	THK	LENGHT	WPS	Date of examination
48/18 PF	NC272	PF	60mm	600mm	pWPS 48/18	18/12/2018

RINA Services SpA No. Bo. 0474	Date 20/12/2018
Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐	File Signature Cinotti Davide

note - remarks

Acceptance criteria: EEMUA 158 TABLE 14

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

AB-TO-ROS-PM-QA-PR-0006 Rev.01

Operatore - Operator	Controllo Qualita' - Quality Control	Cliente - Client
CSWIP D.CENACCHI 305250 WI 3.1		

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 18-12-2018	FOGLIO – Sheet 1/1
RAPPORTO D'ESAME CON ULTRASUONI *Ultrasonic examination report*		UT N° : 01	Ns. Rif./Our Ref. 18307

CLIENTE – Client	ORDINE – Order	PROGETTO – Project		COMMESSA – Job
ROSETTI MARINO	/	TULMONT DEVELOPMENT PROJECT		118A50
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
PremierOil TULMOUNT	PQR	/	/	8.1

CODICE / Code	PROCEDURA / Procedure	ACCETTABILITA' / Acceptance level
UNI EN 17640	AB-TO-ROS-PM-QA-PR-0011_C01	AB-TO-ROS-PM-QA-PR-0011_C01
MATERIALE Material	DIMENSIONI Dimension	SPESSORE NOMINALE / Thk
S460 G2+M	SEE TABLE	SEE TABLE

STATO DELLA SUPERFICIE – Surface condition

☑ COME SALDATO As welded	☑ SPAZZOLATO - Brushed	☐ LAVORATO DI MACCHINA - Machined
☐ MOLATO - Ground	☐ LAMINATO - Rolled	☐ GREZZO - Forged

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG 600	No. SERIE Serial Number	I001871

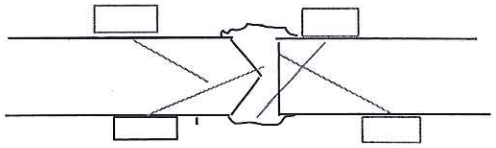
TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	AMPLIFICAZIONE dB value	ONDE Waves
PF4-R	4	10	0	53	L
SWB 2P	2	10x14	45	48	T
SWB 2P	2	10x14	60	51	T
SWB 2P	2	10x14	70	53	T

BLOCCO DI CALIBRAZIONE Calibration block	IIW V1	BLOCCO DI RIFERIMENTO Reference block	QT BLOCK No. 02
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity	DAC ON SDH Ø 3mm

MATERIALE CONTROLLATE / Material Verified

ITEM	THICKNESS	STAMP	LENGHT	PROCESS
PQR 48/18 PF	60	NC272	600	FCAW

PIANO DI SCANSIONE / Scanning Plan



RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Póli Stefano II° LIVELLO SNT - TC - 1A/ISO 9712	ROSETTI MARINO SpA Welding Dept D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 20/12/2018 File Signature Cimatti Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items esamine*

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 18/12/2018	FOGLIO – Sheet 1
RAPPORTO D'ESAME MAGNETOSCOPICO ***MAGNETIC PARTICLE TEST***		MT N° : 01	Ns. Rif./Our Ref. 18307

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	TOULMONT DEVELOPMENT	118A50	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
PremierOil / TOULMOUNT	PQR	/	/	8.1

CODICE / code	PROCEDURA/Procedure	ACCETTABILITA - Acceptance level
UNI EN ISO 23278	AB-TO-ROS-PM-QA-PR-0007_C01	AB-TO-ROS-PM-QA-PR-0007_C01

MATERIALE Material	TEMPERATURA DELLE SUPERFICI Surface temperature	INTENSITA' LUMINOSA / Light intensity	
		LUCE BIANCA	LUCE NERA
S460 G2+M	INTERVALLO 5÷52°C	☑ > 1000 LUX	☐ 1000 µW/cm².

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined
☐ MOLATO – Ground	☐ LAMINATO – Rolled	☐ GREZZO – Forged

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics

☐ PUNTALI/Prods ☑ GIOGO/Yoke ☐ SOLENOIDE/Solenoid ☐ CONDUTTORE CENTRALE/Central conduttor

TIPO APPARECCHIO/Type of equipment	SILVER YOKE HR230 S.No. 03.230-16	DISTANZA PUNTALI/Pole spacing mm	180mm
TIPO DI CORRENTE/Type current	C.A	INTENSITÀ/Intesity (Amp)	4,5 kg

MEZZO DI ISPEZIONE / Examination medium		☑ UMIDO/Wet	☐ SECCO/Dry
PARTICELLE UTILIZZATE/Particle Type			
POLVERE NERA/Black powder	☑	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	NDT BW2	MARCA TIPO/Mark Type	NDT FW1
LOTTO/BACH	7241s	LOTTO/BACH	
VERNICE DI CONTRASTO/Contrast Paint		☑ NDT WBL5	☐ CGM VECOPLAST
LOTTO/BACH		U180327s	X

SALDATURE CONTROLLATE / Welds Verified

THE CONTROL HAS BEEN CARRIED OUT ON 100% OF FOLLOWING WELDS:

ITEM	THICKNESS	STAMP	LENGHT	PROCESS
PQR 48/18 PF	60	NC272	600	FCAW

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Poli Stefano II° LIVELLO SNT - TC - IAISO 9712	ROSETTI MARINO SpA Welding Dept. D. Cenacchi		RINA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 20/12/2018 File Signature Cimatti Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items esamine*

Mechanical test report (CTOD)

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element.com

TEST REPORT

Client
Cod. 1737

ROSETTI MARINO S.P.A
VIA TRIESTE, 230
48122 RAVENNA (RA)
Italia

Your ref. :	Document :	Ddt n. 1YPB180545	Date:	19/12/2018
Our ref. :	Report :	RPR1545-1E1R0A18	Date:	10/01/2019
	Job :	ADC1545-1E1R0A18	Date:	20/12/2018

Remarks: PQR 40/18 INTEGRATION (WPS 48/18)
DIMENSION : 60mm
CLIENT : PREMIEROIL

Project: TOLMOUNT DEVELOPMENT PROJECT

Doc. reference: EEMUA 158 ed.2014 + AB-TO-WGP-TO-ST-BD-0001 Rev. B02 & AB-TO-WGP-TO-ST-SP-0002 Rev. B01

Test standard: EEMUA 158 ed.2014 - AB-TO-WGP-TO-ST-SP-0002 - UNI EN ISO 6892-1:2016

This Report (RPR) contains tests results on the following materials

Ref:	Identification	Material	Dn (mm)	Thk (mm)	Remarks
4957A18	PQR 40/18 INTEGRATION (WPS 48/18)	EN 10225 S460 G2+M			

Report signatories and approval

☐ Third party	☐ Third party	☐ Third party	Client
☐ Witness	☐ Witness	☐ Witness	

Digitally signed by Cantoni Luca
Element Materials Technology Milan S.r.l.

Issue approved

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA No. Bo. 0474	Date 10/01/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimatti Davide
Approved ☐	

General conditions:
1. The Customer accepts general conditions and prices fixed by the laboratory to perform the tests.
2. Test results will be communicated only by means of test report except for different contractual agreement.
3. Tests sample will be destroyed 30 days after test except for different written Client request.
4. The spare will be destroyed 90 days after date of receipt for different written Client request.
5. The test results described in the following test report are referring only to the sample mentioned in it.
6. The date of material receivement is the same as the date of job opening. The date of testing is the same as the date of test report, except for different info.
7. The laboratory has examined the material sampled an supplied by the Client in compliance with standard request.
8. This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.
9. Unless otherwise agreed, sales terms and conditions (MOD20-1E1R0) will be apply.

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TEST REPORT

Test	Page	Technician
Fracture mechanics toughness test (SENB)	Pag. 3..11	**Mirko Piloni**
Tensile test	Pag. 12..13	**Luigi Vailati**

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA No. Bo. 0474	Date 10/01/2019
Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐	File Signature Cimadori Davide

Technician signatories

Digitally signed by
Mirko Piloni
Element Materials
Technology Milan S.r.l.

Digitally signed by
Luigi Vailati
Element Materials
Technology Milan S.r.l.

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TEST REPORT

FRACTURE MECHANICS TOUGHNESS TEST (SENB)

General info

Test start - Test finish	10/01/2019 - 10/01/2019
MIF reference (Lab)	4957A18
Client reference	PQR 40/18 INTEGRATION (WPS 48/18)
Identification of specimen (Lab)	957 SB 1
Material	EN 10225 S460 G2+M
Position	T WM Full thk
Test standard	EEMUA 158 ed.2014 + AB-TO-WGP-TO-ST-SP-0002

Equipments

(Inv.N°221) FATIGUE MACHINE - (Inv.N°340) UNIVERSAL TEST MACHINE CTM 100 - (Inv.N°630) CALIPER - (Inv.N°1124) PROFILOMETER - (Inv.N°1507) THERMOMETER - (Inv.N°1512) EXTENSOMETER

Specimen informations

Thickness B (mm)	54.75
Net thickness B_N (mm)	54.75
Width W (mm)	55.01
Span S (mm)	220.00
Notch length M (mm)	24
Notch position/orientation	WM/NP
Knifes thickness Z (mm)	0

Test parameters

Temperature (°C)	-10.0
K Rate (MPa·m$^{1/2}$/s)	1.5

Material properties

Yield strength at test temperature (MPa)	624
Tensile strength at test temperature (MPa)	727
Modulo di Young at test temperature (MPa)	205000
Rapporto di Poisson at test temperature (MPa)	0.3

Precracking at room temperature		**Required**
Precompression (%)	0.5	
Maximum force P_{max} (N)	25000	
Minimum force P_{min} (N)	2500	
Maximum stress intensity factor (MPa·m$^{1/2}$)	20	
Check envelope	OK	60°

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA
No. Bo. 0474
Date 10/01/2019
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Reviewed ☐
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Signature
Cimatti Davide

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TEST REPORT

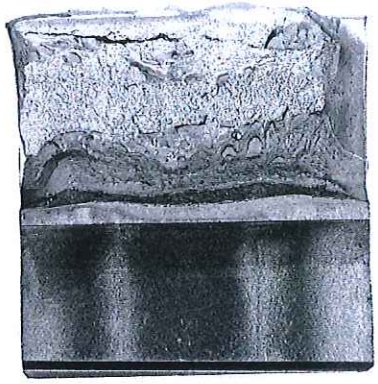
FRACTURE MECHANICS TOUGHNESS TEST (SENB)

General info

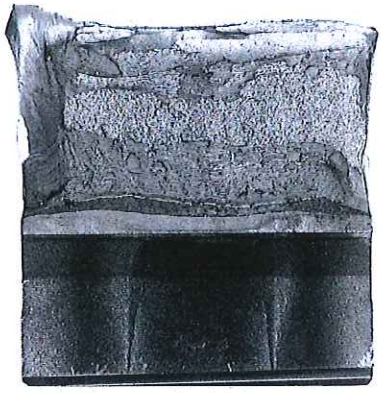
Test start - Test finish	10/01/2019 - 10/01/2019
MIF reference (Lab)	4957A18
Client reference	PQR 40/18 INTEGRATION (WPS 48/18)
Identification of specimen (Lab)	957 SB 1
Material	EN 10225 S460 G2+M
Position	T WM Full thk
Test standard	EEMUA 158 ed.2014 + AB-TO-WGP-TO-ST-SP-0002

Post test measurements		**Required**
Plastic crack opening displacement V_p (mm)	2.18	
Crack size mean a_0 (measured) (mm)	26.80	
Final crack size a_f (measured) (mm)	27.00	
Δa_p measured (mm)	1.83	
a_0/ W	0.49	
b_0 (mm)	28.21	
a_{min} (mm)	26.257	
a_{max} (mm)	27.396	
$(a_{max} - a_{min}) / a_0$ (%)	4.25	Weld < 20 BM < 10
a_{min} - M (mm)	2.26	> 1.3
$(a_{min} - M) / W$ (%)	4.10	> 2.5
Fracture type	m	

Results		**Required**
P_{max} (N)	177285	
CTOD δ_{max}(mm)	0.717	>=0.25



Face A -



Face B -

Validity check list

Number of invalidities :0

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

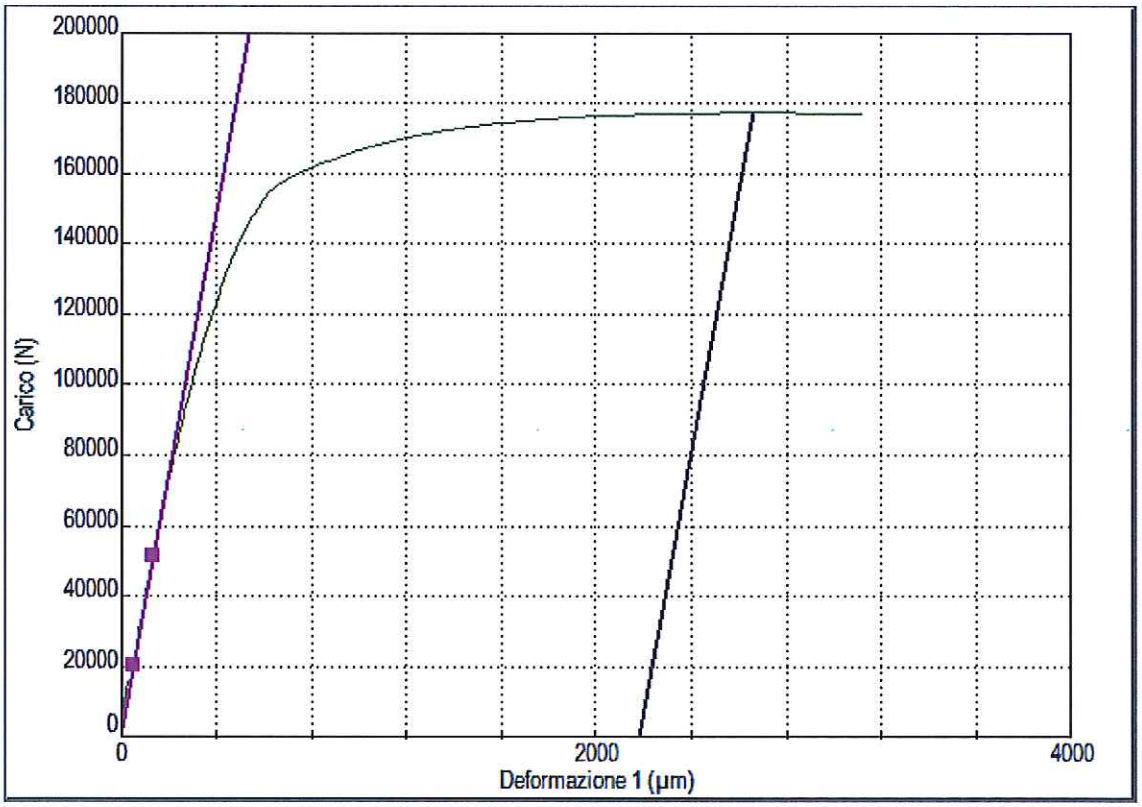
RINA Services SpA No. Bo. 0474	Date 10/01/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimatti Davide
Approved ☐	

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TEST REPORT

General Info

Test start - Test finish	10/01/2019 - 10/01/2019
MIF reference (Lab)	4957A18
Client reference	PQR 40/18 INTEGRATION (WPS 48/18)
Identification of specimen (Lab)	957 SB 1
Material	EN 10225 S460 G2+M
Position	T WM Full thk
Test standard	EEMUA 158 ed.2014 + AB-TO-WGP-TO-ST-SP-0002



BOSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA
No. Bo. 0474
Date 10/01/2019
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Reviewed ☐
Witnessed ☑
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File
Signature
Cimatti Davide

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TEST REPORT

FRACTURE MECHANICS TOUGHNESS TEST (SENB)

General Info

Test start - Test finish	10/01/2019 - 10/01/2019
MIF reference (Lab)	4957A18
Client reference	PQR 40/18 INTEGRATION (WPS 48/18)
Identification of specimen (Lab)	957 SB 2
Material	EN 10225 S460 G2+M
Position	T WM Full thk
Test standard	EEMUA 158 ed.2014 + AB-TO-WGP-TO-ST-SP-0002

Equipments

(Inv.N°221) FATIGUE MACHINE - (Inv.N°340) UNIVERSAL TEST MACHINE CTM 100 - (Inv.N°630) CALIPER - (Inv.N°1124) PROFILOMETER - (Inv.N°1507) THERMOMETER - (Inv.N°1512) EXTENSOMETER

Specimen informations

Thickness B (mm)	54.74
Net thickness B_N (mm)	54.74
Width W (mm)	55.02
Span S (mm)	220.00
Notch length M (mm)	24
Notch position/orientation	WM/NP
Knifes thickness Z (mm)	0

Test parameters

Temperature (°C)	-10.0
K Rate (MPa·m$^{1/2}$/s)	1.5

Material properties

Yield strength at test temperature (MPa)	624
Tensile strength at test temperature (MPa)	727
Modulo di Young at test temperature (MPa)	205000
Rapporto di Poisson at test temperature (MPa)	0.3

Precracking at room temperature		**Required**
Precompression (%)	0.5	
Maximum force P_{max} (N)	25000	
Minimum force P_{min} (N)	2500	
Maximum stress intensity factor (MPa·m$^{1/2}$)	21	
Check envelope	OK	60°

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA No. Bo. 0474	Date 10/01/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimatti Davide
Approved ☐	

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TEST REPORT

FRACTURE MECHANICS TOUGHNESS TEST (SENB)

General info

Test start - Test finish	10/01/2019 - 10/01/2019
MIF reference (Lab)	4957A18
Client reference	PQR 40/18 INTEGRATION (WPS 48/18)
Identification of specimen (Lab)	957 SB 2
Material	EN 10225 S460 G2+M
Position	T WM Full thk
Test standard	EEMUA 158 ed.2014 + AB-TO-WGP-TO-ST-SP-0002

Post test measurements		**Required**
Plastic crack opening displacement V_p (mm)	1.83	
Crack size mean a_0 (measured) (mm)	27.35	
Final crack size a_f (measured) (mm)	28.96	
Δa_p measured (mm)	1.61	
a_0/ W	0.50	
b_0 (mm)	27.67	
a_{min} (mm)	26.235	
a_{max} (mm)	27.677	
$(a_{max} - a_{min}) / a_0$ (%)	5.27	Weld < 20 BM < 10
a_{min} - M (mm)	2.23	> 1.3
$(a_{min} - M) / W$ (%)	4.06	> 2.5
Fracture type	m	

Results		**Required**
P_{max} (N)	168785	
CTOD δ_{max}(mm)	0.596	>=0.25



Face A -



Face B -

Validity check list

Number of invalidities :0

ROSETTI MARINO SpA
Welding Dept.
D.Cenacchi

RINA Services SpA No. Bo. 0474	Date 10/01/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimatti Davide
Approved ☐	

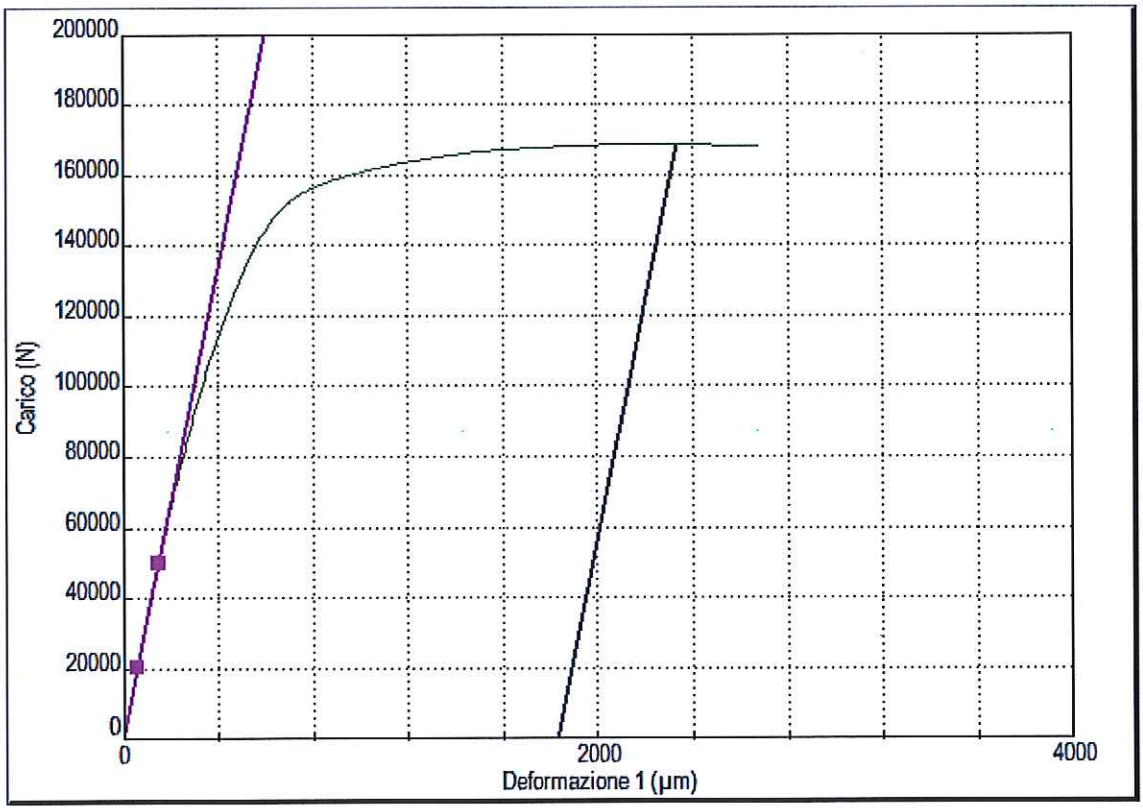
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TEST REPORT

FRACTURE MECHANICS TOUGHNESS TEST (SENB)

General Info

Test start - Test finish	10/01/2019 - 10/01/2019
MIF reference (Lab)	4957A18
Client reference	PQR 40/18 INTEGRATION (WPS 48/18)
Identification of specimen (Lab)	957 SB 2
Material	EN 10225 S460 G2+M
Position	T WM Full thk
Test standard	EEMUA 158 ed.2014 + AB-TO-WGP-TO-ST-SP-0002



ROSETTI MARINO SpA
Welding Dept
D. Genacchi

RINA Services SpA
No. Bo. 0474
Date 10/01/2019
File
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Signature
Cimatti Davide

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TEST REPORT

FRACTURE MECHANICS TOUGHNESS TEST (SENB)

General info

Test start - Test finish	10/01/2019 - 10/01/2019
MIF reference (Lab)	4957A18
Client reference	PQR 40/18 INTEGRATION (WPS 48/18)
Identification of specimen (Lab)	957 SB 3
Material	EN 10225 S460 G2+M
Position	T WM Full thk
Test standard	EEMUA 158 ed.2014 + AB-TO-WGP-TO-ST-SP-0002

Equipments

(Inv.N°221) FATIGUE MACHINE - (Inv.N°340) UNIVERSAL TEST MACHINE CTM 100 - (Inv.N°630) CALIPER - (Inv.N°1124) PROFILOMETER - (Inv.N°1507) THERMOMETER - (Inv.N°1512) EXTENSOMETER

Specimen informations

Thickness B (mm)	54.74
Net thickness B_N (mm)	54.74
Width W (mm)	55.01
Span S (mm)	220.00
Notch length M (mm)	24
Notch position/orientation	WM/NP
Knifes thickness Z (mm)	0

Test parameters

Temperature (°C)	-10.0
K Rate (MPa·m$^{1/2}$/s)	1.5

Material properties

Yield strength at test temperature (MPa)	624
Tensile strength at test temperature (MPa)	727
Modulo di Young at test temperature (MPa)	205000
Rapporto di Poisson at test temperature (MPa)	0.3

Precracking at room temperature		**Required**
Precompression (%)	0.5	
Maximum force P_{max} (N)	25000	
Minimum force P_{min} (N)	2500	
Maximum stress intensity factor (MPa·m$^{1/2}$)	21	
Check envelope	OK	60°

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA No. Bo. 0474	Date 10/01/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimatti Davide
Approved ☐	

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TEST REPORT

FRACTURE MECHANICS TOUGHNESS TEST (SENB)

General Info

Test start - Test finish	10/01/2019 - 10/01/2019
MIF reference (Lab)	4957A18
Client reference	PQR 40/18 INTEGRATION (WPS 48/18)
Identification of specimen (Lab)	957 SB 3
Material	EN 10225 S460 G2+M
Position	T WM Full thk
Test standard	EEMUA 158 ed.2014 + AB-TO-WGP-TO-ST-SP-0002

Post test measurements		**Required**
Plastic crack opening displacement V_p (mm)	1.56	
Crack size mean a_0 (measured) (mm)	27.56	
Final crack size a_f (measured) (mm)	29.30	
Δa_p measured (mm)	1.75	
a_0/ W	0.50	
b_0 (mm)	27.45	
a_{min} (mm)	26.526	
a_{max} (mm)	28.053	
$(a_{max} - a_{min}) / a_0$ (%)	5.54	Weld < 20 BM < 10
a_{min} - M (mm)	2.53	> 1.3
$(a_{min} - M) / W$ (%)	4.59	> 2.5
Fracture type	m	

Results		**Required**
P_{max} (N)	167415	
CTOD δ_{max}(mm)	0.514	>=0.25



Face A -



Face B -

Validity check list

Number of invalidities :0

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

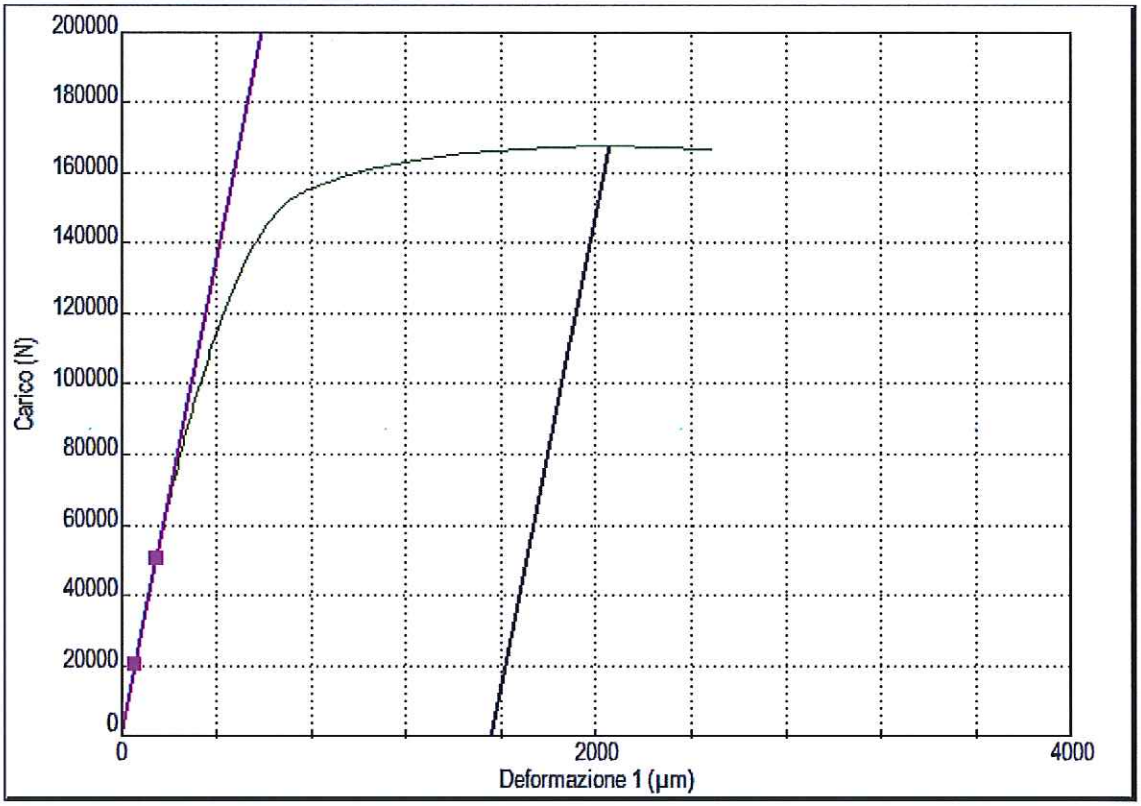
RINA Services SpA
No. Bo. 0474
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Reviewed ☐
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TEST REPORT

General Info

Test start - Test finish	10/01/2019 - 10/01/2019
MIF reference (Lab)	4957A18
Client reference	PQR 40/18 INTEGRATION (WPS 48/18)
Identification of specimen (Lab)	957 SB 3
Material	EN 10225 S460 G2+M
Position	T WM Full thk
Test standard	EEMUA 158 ed.2014 + AB-TO-WGP-TO-ST-SP-0002



ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA
No. Bo. 0474
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Reviewed ☐
Witnessed ☑
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TEST REPORT

TENSILE TEST

General info

Test start - Test finish	09/01/2019 - 09/01/2019
MIF reference (Lab)	4957A18
Client reference	PQR 40/18 INTEGRATION (WPS 48/18)
Identification of specimen (Lab)	957 TR 1
Material	EN 10225 S460 G2+M
Position	L AWM ½ thk
Test standard	UNI EN ISO 6892-1:2016

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1153) UNIVERSAL MACHINE QUASAR 600 - (Inv.N°1161) EXTENSOMETER

Specimen informations

Type	Cylindrical
Diameter (mm)	10.00
Section (mm²)	78.54

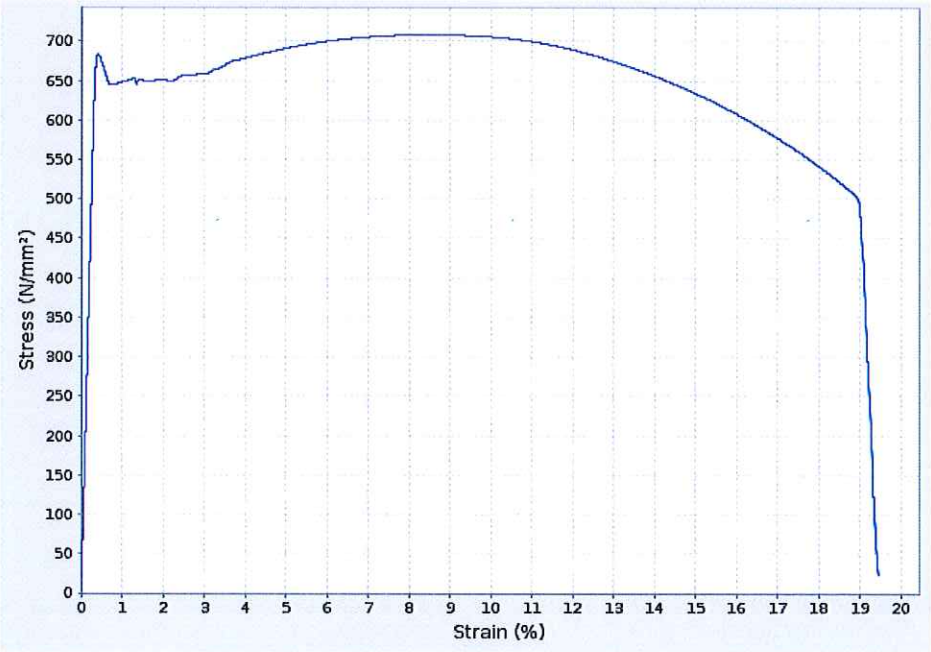
Test parameters

Temperature (°C)	20.0

Results		**Required**
Rp0.2% (N/mm²)	670.0	≥415
Rm (N/mm²)	708.0	≥515
A%	23.0	≥17
Z%	61.56	

Note

Speed of testing during yielding ref. method B PAR.10.3.3.2.1 - after yielding according to PAR.10.3.3.3



ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA No. Bo. 0474	Date 10/01/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimatti Davide

Element Materials Technology Milan S.r.l.
Via della Pierina 9/11
26013 Crema (CR)
Italy

P: +39 0373 89721
F: +39 0373 897200
info.milan@element.com
element.com

TEST REPORT

TENSILE TEST

General info

Test start - Test finish	09/01/2019 - 09/01/2019
MIF reference (Lab)	4957A18
Client reference	PQR 40/18 INTEGRATION (WPS 48/18)
Identification of specimen (Lab)	957 TR 2
Material	EN 10225 S460 G2+M
Position	T WM Cap
Test standard	UNI EN ISO 6892-1:2016

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1153) UNIVERSAL MACHINE QUASAR 600 - (Inv.N°1515) EXTENSOMETER

Specimen informations

Type	Cylindrical
Diameter (mm)	6.00
Section (mm²)	28.27

Test parameters

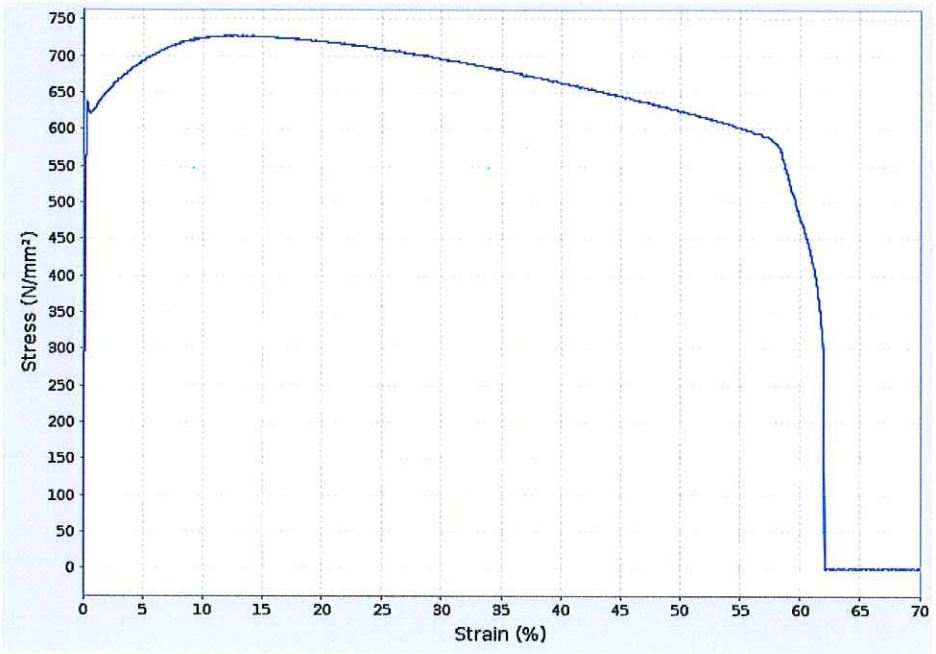
Temperature (°C)	-10.0
Soaking time (min)	21

Results

Rp0.2% (N/mm²)	624.0
Rm (N/mm²)	727.0
Z%	51.0

Note

Speed of testing during yielding ref. method B PAR.10.4.2.1 - after yielding according to PAR.10.4.3
Elongation was monitored from the extensometer output during the test and was shown to be >18% before removed from the specimen,thus showing compliance with DNV-OS-F101 Appendix C F304 (2013)



ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA No. Bo. 0474	Date 30/03/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimatti Davide
Approved ☐	

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 42/18	Sheet/Foglio 1/3

Manufacturer's Welding Procedure. Ref. no.	42/18 REV. 0					
Manufacturer	ROSETTI MARINO S.p.A.					
Address	VIA TRIESTE 230 - 48121 RAVENNA					
Code, Testing Standard	MAERSK OIL Specification MOG-FP-MET-STD-0012 Rev. 4.0; EN ISO 15614-1:2017 Lev. 2					
	Location of test specimen according to EN ISO 15614-1:2017 Section 7.2, Fig. 5 Essential variables according to EN ISO 15614-1:2017, Chapter 8 and MAERSK OIL Specification MOG-FP-MET-STD-0012 Rev. 4.0 par. 6.4					
Date of welding	Start: November 14th , 2018 Complete: November 14th, 2018					
Examiner of examining body	Rina Services S.p.A.					
RANGE OF QUALIFICATION						
Welding process	111 - SMAW					
Type(s)	Manual					
Welding Equipment Type	HF inverter type					
Actual parent Material side A	Plate: EN 10225: S460G2+M Z35 (Heat: 882852)					
Actual parent Material side B	Plate: EN 10225: S460G2+M Z35 (Heat: 882852)					
Parent Material grade	Carbon steel with maximum strength of 530 MPa					
Supply condition	Thermomechanical rolled and accelerated cooled					
Carbon equivalent/Pcm/C	Max:0,44/0,19 (Heat Values: 0,41/0,17/ C for information only: 0,052)					
Groove design/configuration	Single Vee Butt Joint (one side welding without backing), for groove dimension and details see page 4 of 5					
Parent material thickness (mm)	20 mm (obtained from parent material of 80 mm thk.)					
Weld metal thickness (mm)	111 - SMAW 20 mm					
Single or Multi-pass	111 - SMAW MULTIPLE					
Outside diameter	/					
Filler material Designation	111 SMAW EN ISO 2560-A: E50 6 Mn1Ni B12 H5 (AWS 5.5: E8016-G)					
Filler material Maker	111 - Esab Filarc 88S					
Filler material Size	111 - SMAW ∅ 3,2 mm ; 4,0 mm					
Shielding gas/Flux	N.A.					
Shielding gas flow rate	N.A.					
Backing gas (purging)	None					
Type of welding current & polarity	DC - RP	Heat input / Apporto termico (kJ/mm) ± 25%	Pass	Diameter mm	2G	3G
			Root	∅ 3,2	0,83 to 1,39	1,18 to 1,98
			Hot	∅ 3,2	0,74 to 1,24	1,25 to 2,08
			Filll	∅ 4,0	0,81 to 1,35	1,50 to 2,50
			Cap	∅ 3,2 (3G); ∅ 4,0 (2G);	0,73 to 1,21	0,71 to 1,18
Welding position	All, vertical down progression excluded					
Preheat (°C)	50	Interpass temperature / Temp. di interpass (°C)	250			
Post-Weld Heat Treatment and/or ageing	NONE					
Weld bead width	10 mm (ø3,2) ; 12 mm (ø4,0) for 2G position ; 12 mm (ø3,2) ; 14 mm (ø4,0) for 3G position					
Welder's detail	Siringo Massimo AX82 (2G Test Coupon) Giulianini Dario AX21 (3G Test Coupon)					
Time lapse between root and hot pass	N.A.					
Other information / Altre informazioni	- Preheat performed by propane torch -Accelerate weld cooling not permitted; -Base material origin: plate					

Manufacturer's Welding Procedure. Ref. no.	42/18 REV. 0		
Test result (WPQR) N°	42/18	Date/Data	04/12/2018
Manufacturer's WPS No.	pWPS 42/18 REV. 1	Date/Data	06/11/2018

TESTS CARRIED OUT ON SAMPLE 42/18 WELDED IN 2G POSITION (PC)

NON DESTRUCTIVE EXAMINATIONS

	Judgemen	Report No.
Visual examinations	Acceptable	VDR 42/18 2G
Penetrant test	N.A.	/
Magnetic particle test	Acceptable	08-18205 ; 09-18205
Radiographic test	N.A.	/
Ultrasonic test	Acceptable	08-18205 ; 09-18205

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2]	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 530	A [%]	Z [%]	Fracture Location	Remarks
TRANSVERSE 1	/	/	555	/	/	Base metal	/
TRANSVERSE 2	/	/	553	/	/	Base metal	/

BEND TEST

Type & N.	Bend angle	Remarks	Results
4 Side bend	180°	Former Ø 40 mm	Satisfactory

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] ≥ 35J			Avarage value [J] ≥ 50J	Remarks
10x10x55	Weld metal cap	KV	-40°C	96	126	149	124	/
10x10x55	FL cap	KV	-40°C	65	83	40	63	/
10x10x55	FL+1 cap	KV	-40°C	315	351	341	336	/
10x10x55	FL+2 cap	KV	-40°C	322	319	301	314	/
10x10x55	FL+5 cap	KV	-40°C	284	295	284	288	/

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
1 Macro examination+Hardness test	Satisfactory-See Inspecta Certificate No. 0415-00850-18
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Inspecta S.r.l. - Ravenna
Laboratory report reference N.	Report No. 0415-00850-18 dated DECEMBER 4th 2018
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of MOG-FP-MET-STD-0012 Rev. 4.0 Specification; EN ISO 15614-1:2017 Lev. 2

Date/Data
04-12-2018
ROSETTI MARINO S.p.A.

Examiner or Examination Body
RINA Services S.p.A.
Name and signature / Nome e firma
RINA Services S.p.A.

Test result (WPQR) N°	42/18	Date/Data	04/12/2018
Manufacturer's WPS No.	pWPS 42/18 REV. 1	Date/Data	06/11/2018

TESTS CARRIED OUT ON SAMPLE 42/18 WELDED IN 3G POSITION (PF)

NON DESTRUCTIVE EXAMINATIONS

	Judgemen	Report No.
Visual examinations	Acceptable	VDR 42/18 3G
Penetrant test	N.A.	/
Magnetic particle test	Acceptable	08-18205 ; 09-18205
Radiographic test	N.A.	/
Ultrasonic test	Acceptable	08-18205 ; 09-18205

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2]	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 530	A [%]	Z [%]	Fracture Location	Remarks
TRANSVERSE 1	/	/	555	/	/	Base metal	/
TRANSVERSE 2	/	/	554	/	/	Base metal	/

BEND TEST

Type & N.	Bend angle	Remarks	Results
4 Side bend	180°	Former Ø 40 mm	Satisfactory

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] ≥ 35J			Avarage value [J] ≥ 50J	Remarks
10x10x55	Weld metal cap	KV	-40°C	72	60	69	67	/
10x10x55	FL cap	KV	-40°C	49	173	83	102	/
10x10x55	FL+1 cap	KV	-40°C	201	292	311	268	/
10x10x55	FL+2 cap	KV	-40°C	261	299	288	283	/
10x10x55	FL+5 cap	KV	-40°C	292	269	289	283	/

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
1 Macro examination+Hardness test	Satisfactory-See Inspecta Certificate No. 0416-00850-18
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Inspecta S.r.l. - Ravenna
Laboratory report reference N.	Report No. 0416-00850-18 dated DECEMBER 4th 2018
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of MOG-FP-MET-STD-0012 Rev. 4.0 Specification; EN ISO 15614-1:2017 Lev. 2

Date/Data
04-12-2018
ROSETTI MARINO S.p.A.

Examiner or Examination Body
RINA Services S.p.A.
Name and signature / Nome e firma
RINA Services S.p.A.

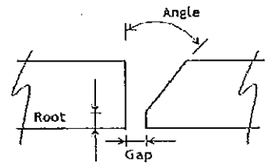
PQR - AS- RUN PARAMETER SHEET

pWPS 42/18			
PQR 42/18			
Coupon Nr. 42/18 PC			
Date:	14/11/2018	Page:	1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: EN 15614-1 Ed.2017+MOTS 12 Rev. 4.0

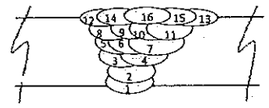
Welder Name(s):	SIRINGO MASSIMO	Welder Id No(s):	AX82		
Welding Process(es):	111-SMAW	Type(s):	MANUAL		
Welding Position:	2G	Progression:	N.A.		
Base Materials:	EN 10225: S460 G2+M	Wall Thickness:	20	Diameter:	NA
Heat No(s):	882852	Joint Type:	1/2V		

WELD PREPARATION:



Root gap: 3-4 mm ; angle: 45° ; Root face : 1 mm

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER	DIA:	BATCH NO.	SUPPLIER & TYPE
Root	3,2	SBR41145	FILARC 88S
Hot Pass	3,2	SBR41145	FILARC 88S
Filling Runs	4,0	SB109120	FILARC 88S
Filling Runs	4,0	SB109120	FILARC 88S
Cap	3,2	SBR41145	FILARC 88S

GAS:

Shielding Gas:	NA
Composition:	NA
Flow:	NA
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	NA
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
10 mm (ø3,2) ; 12 mm (ø4,0)	String and weave	Multiple (each process)	Single (each process)

Preheat °C:	Preheat Method:	Max Interpass Temperature:	Check / Control Method	Heat Treatment Required	Holding Temperature	Holding Time °c	Heating Rate °C	Cooling Rate °C
50°C	PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER	NA	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficiency Factor As per EN 1011-1 (KJ/mm)	Interpass Temperature °C	REMARKS
NA	1	SMAW	1	-	E8016-G E50 6 Mn1Ni B12 H5	3,2	DC EP	90	100	95,0	21	23	22,0	-	-	9	1,11	0,80	50	Welding unit: AXO 509
NA	2	SMAW	2	-	E8016-G E50 6 Mn1Ni B12 H5	3,2	DCEP	94	104	99,0	22	24	23,0	-	-	11	0,99	0,80	70	Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635
NA	3	SMAW	3	-	E8016-G E50 6 Mn1Ni B12 H5	4,0	DCEP	150	160	155,0	23	25	24,0	-	-	17	1,05	0,80	85	Cap passes from 12th to 17th
NA	3	SMAW	4	-	E8016-G E50 6 Mn1Ni B12 H5	4,0	DCEP	150	160	155,0	23	25	24,0	-	-	16	1,12	0,80	97	Heat input mean value for fill: 1,08
NA	4	SMAW	5	-	E8016-G E50 6 Mn1Ni B12 H5	4,0	DCEP	150	160	155,0	23	25	24,0	-	-	17	1,05	0,80	110	Heat input mean value for cap: 0,97
NA	4	SMAW	6	-	E8016-G E50 6 Mn1Ni B12 H5	4,0	DCEP	150	160	155,0	23	25	24,0	-	-	17	1,05	0,80	125	
NA	4	SMAW	7	-	E8016-G E50 6 Mn1Ni B12 H5	4,0	DCEP	150	160	155,0	23	25	24,0	-	-	16	1,12	0,80	135	
NA	5	SMAW	8	-	E8016-G E50 6 Mn1Ni B12 H5	4,0	DCEP	150	160	155,0	23	25	24,0	-	-	16	1,12	0,80	160	
NA	5	SMAW	9	-	E8016-G E50 6 Mn1Ni B12 H5	4,0	DCEP	145	156	150,5	23	25	24,0	-	-	17	1,02	0,80	200	
NA	5	SMAW	10	-	E8016-G E50 6 Mn1Ni B12 H5	4,0	DCEP	145	156	150,5	23	25	24,0	-	-	16	1,08	0,80	130	
NA	5	SMAW	11	-	E8016-G E50 6 Mn1Ni B12 H5	4,0	DCEP	145	156	150,5	23	25	24,0	-	-	15	1,16	0,80	150	
NA	6	SMAW	12	-	E8016-G E50 6 Mn1Ni B12 H5	4,0	DCEP	147	158	152,5	23	25	24,0	-	-	16	1,10	0,80	180	
NA	6	SMAW	13	-	E8016-G E50 6 Mn1Ni B12 H5	4,0	DCEP	147	158	152,5	23	25	24,0	-	-	19	0,92	0,80	220	
NA	6	SMAW	14	-	E8016-G E50 6 Mn1Ni B12 H5	4,0	DCEP	147	158	152,5	23	25	24,0	-	-	18	0,98	0,80	250	
NA	6	SMAW	15	-	E8016-G E50 6 Mn1Ni B12 H5	4,0	DCEP	147	158	152,5	23	25	24,0	-	-	18	0,98	0,80	200	
NA	6	SMAW	16	-	E8016-G E50 6 Mn1Ni B12 H5	4,0	DCEP	147	158	152,5	23	25	24,0	-	-	19	0,92	0,80	210	
NA	6	SMAW	17	-	E8016-G E50 6 Mn1Ni B12 H5	4,0	DCEP	147	158	152,5	23	25	24,0	-	-	19	0,92	0,80	200	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE: RINA Services SpA No. Bo. 0474	Date 14/11/2018	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	File	Name:
Signature:	Signature:	Signature:	Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	Signature:
Date:	Date:	Date:	Signature Cimatti Davide	Date:

TOTAL | ROSETTI MARINO

PQR - AS- RUN PARAMETER SHEET

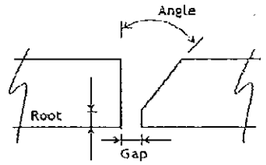
pWPS 42/18
PQR 42/18
Coupon Nr. 42/18 PF
Date: 14/11/2018 | Page: 1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: EN 15614-1 Ed.2017+MOTS 12 Rev. 4.0

Welder Name(s):	GIULIANINI DARIO	Welder Id No(s):	AX 21
Welding Process(es):	111-SMAW	Type(s):	MANUAL
Welding Position:	3G UP	Progression:	N.A.
Base Materials:	EN 10225: S460 G2+M	Wall Thickness:	20
Heat No(s):	882852	Joint Type:	1/2V

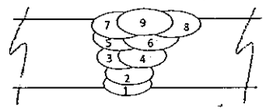
Diameter: NA

WELD PREPARATION:



Root gap: 3-4 mm ; angle: 45° ; Root face : 1 mm

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	3,2	SBR41145	FILARC 88S
Hot Pass	3,2	SBR41145	FILARC 88S
Filing Runs	4,0	SB109120	FILARC 88S
Filing Runs	4,0	SB109120	FILARC 88S
Cap	3,2	SBR41145	FILARC 88S

GAS:

Shielding Gas:	NA
Composition:	NA
Flow:	NA
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	NA
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
12 mm (ø3,2) ; 14 mm (ø4,0)	String and weave	Multiple (each process)	Single (each process)

Preheat °C:	Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature	Holding Time °C	Heating Rate °C	Cooling Rate °C
50°C	PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER	NA	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficiency Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
NA	1	SMAW	1	-	E8016-G E50 6 Mn1Ni B12 H5	3,2	DC EP	85	95	90,0	21	23	22,0	-	-	6	1,58	0,80	50	Welding unit: AXO 509
NA	2	SMAW	2	-	E8016-G E50 6 Mn1Ni B12 H5	3,2	DCEP	100	110	105,0	22	24	23,0	-	-	7	1,66	0,80	70	Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635
NA	3	SMAW	3	-	E8016-G E50 6 Mn1Ni B12 H5	4,0	DCEP	130	145	137,5	23	25	24,0	-	-	7	2,26	0,80	120	Cap passes from 7th to 9th
NA	3	SMAW	4	-	E8016-G E50 6 Mn1Ni B12 H5	4,0	DCEP	130	145	137,5	23	25	24,0	-	-	8	1,98	0,80	150	Heat input mean value for fill: 2,00
NA	4	SMAW	5	-	E8016-G E50 6 Mn1Ni B12 H5	4,0	DCEP	130	145	137,5	23	25	24,0	-	-	9	1,76	0,80	200	Heat input mean value for cap: 0,94
NA	4	SMAW	6	-	E8016-G E50 6 Mn1Ni B12 H5	4,0	DCEP	130	145	137,5	23	25	24,0	-	-	8	1,98	0,80	220	
NA	5	SMAW	7	-	E8016-G E50 6 Mn1Ni B12 H5	3,2	DCEP	95	105	100,0	23	25	24,0	-	-	12	0,96	0,80	250	
NA	5	SMAW	8	-	E8016-G E50 6 Mn1Ni B12 H5	3,2	DCEP	95	105	100,0	23	25	24,0	-	-	13	0,89	0,80	180	
NA	5	SMAW	9	-	E8016-G E50 6 Mn1Ni B12 H5	3,2	DCEP	95	105	100,0	23	25	24,0	-	-	12	0,96	0,80	200	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name: RINA Services SpA No. Ro 0474	Name:
Signature:	Signature:	Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	Signature:
Date:	Date:	Date 14/11/2018 File Signature Cimato Davide	Date:

RAPPORTO PROVA DI QUALIFICA DI PROCEDIMENTO DI SALDATURA/BRASATURA

N° PRATICA	N° SAGGIO	NORMA
2018 VE 319 PO	42/18 2G, 42/18 3G	EN ISO 15614-1:2017 Lev.2 and MOTS Spec. 12 Rev. 4.0

Società ROSETTI MARINO SPA Località RAVENNA (RA)

Processo SMAW (111) Tipo MANUAL Spessore (mm)

Posizione Diametro (mm)

Saldatore/ Brasatore Stamp WPS/BPS 42/18

Materiale base:		*Materiale d'apporto o flusso:*	
Gruppo/i	Norma e designazione / tipo backing	Nome commerciale	Norma / designazione
Backing			

Gas al dritto:			*Gas al rovescio:*		
Composizione	L/min	Ø ugello (mm)	Composizione	L/min	

Ø Elettrodo Tungsteno (mm) e tipo Temperatura preriscaldo (°C)

PWHT (temperatura, tempo e rampe) Temperatura interpass max (°C)

Molatura fra le passate Molatura al rovescio Ripresa al rovescio

Passate	Processo	Materiale d'apporto Ø [mm]	Corrente [A]	Tensione [V]	Tipo corrente	Velocità [cm/min]

Preparazione giunto e sequenza saldatura
Per processi multipli indicare spessore depositato (mm/processo)

For all details See As Run Sheets attached

Esito esame visivo: ☒ Positivo ☐ Negativo

Prove di qualifica effettuate a: Marina di Ravenna (RA) Data 14/11/2018 Firma

Esito prove laboratorio: ☒ Positivo ☐ Negativo

Rapporti laboratorio allegati n° e data: INSPECTA certificate nr. 0415-00850-18; 0416-00850-18

A seguito dell'esito positivo delle prove di laboratorio, si propone il rilascio del certificato di qualifica n° ROSETTI FORM PQR 42/18 Data 04/12/2018 Firma

Decisione DM– Con riferimento al documento RINA IS-CRT-SAL-01, si autorizza il rilascio dei certificati di qualifica Data Firma DM

PQR attachments index:

Base material certificate (Plate EN 10225: S460G2+M)

Consumables certificate

preliminary WPS

NDE certificate

Mechanical test report

ROSETTI MARINO

PQR 42/18

Base material certificate
(Plate EN 10225: S460G2+M)

Certificate Number:**VNA 1700015 / 9**
Page: 1 of 1

Inspection Certificate

Project: ————
Client: **voestalpine Grobblech GmbH**
voestalpine-Straße 3, 4020 Linz, Austria
Office: **Vienna**

Clients Order Number: **6501364**
Date: **15-02-2017**

Order Status: **incomplete**

Inspection Dates
First: **10-02-2017**
final: **17-02-2017**

This certificate is issued to voestalpine Grobblech GmbH, Linz/Austria, to certify that the undersigned Surveyor attended their works Linz for the purpose of testing and inspecting the undemoted material with satisfactory results as stated below.

Purchaser: **Rosetti Marino Spa**
Via Trieste 230
I-48122 RAVENNA

Order No.: **1716002502 116B20A**

Description:

48 piece(s) of steel plate(s) 384580 kg , as per attached inspection Certificate no.: **A0357565**

Specification

S460G2+M Z35 EN 10225 : 2009

Heat treatment/Delivery Condition: thermomechanical rolled + accelerated cooled

Scope of inspection:

witness mechanical testing: yes ☑
review manufacturer's declared analysis: yes ☑
witness / verify ultrasonic examination: yes ☑ n/a ☐
witness / verify microstructure examination: yes ☐ n/a ☑
witness /verify corrosion testing: yes ☐ n/a ☑
random visual and dimensional control and check of hard stamping: yes ☑

Identification:

Makers Brand voestalpine
Material Quality
Heat No.
Plate No.
Brand of LR

Lloyd's Register EMEA
Vienna Office
Lloyd's Register

24 FEB 2017

Kurt Huber
Surveyor to Lloyd's Register EMEA

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Form 1123 (2015.08)

voestalpine Grobblech GmbH

A02
Inspection certificate

EN 10204 - 3.2

VNA1700015-9

Z02 Date 23-02-2017

voestalpine-Straße 3
4020 Linz, Austria
www.voestalpine.com/grobblech

A03 Document number	A0357565	A08 Order-No.:	6501364	A07 OrderDat.	13-12-2016

4F

A06 Customer	Rosetti Marino Spa Via Trieste 230 I-48122 RAVENNA	B01 Product	Plate		
		B02 Material	S460G2+M Z35	B03 Standard	EN 10225 : 2009
A07 OrderNo.	1716002502 116B20A	Supplementary requirements	Z35 - EN 10164		
A06 Consignee	Rosetti Marino Spa Via Trieste 230 I-48122 RAVENNA	B04 Delivery condition	thermomechanical rolled + accelerated cooled		

A10 - Supplementary Information

SOUTH PARS 13 - PILES

B03 - Supplementary requirements

MATERIAL IS FINE GRAINED, VACUUM DEGASSED AND FULLY KILLED, PRODUCED BY BOF.
MATERIAL IS ACCORDING TO SPECIFICATION SP13-P2-ST-SP-8028.
MATERIAL IS ACCORDING TO EN 10225, OPTIONS 2,6,7,9,10,12 AND 13.

Z01 - Visual Examination and dimensional checking: satisfactory. The results of tests performed are in compliance with the requirements.

Detail of supply

	B07 Heat No.	B06 Plate No	Dimensions B09 Item	Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	Ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
a	882852	186892/1	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
b	882852	186892/2	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
a	882852	186894/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
a	882852	186894/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
c	882852	186895/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
	882852	186895/2	30	80,00	2640,0	4800	1		8.010	56321	15-02-2017	1PLATCS80007
b	882852	186896/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
a	882852	186896/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
a	882852	186897/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
a	882852	186897/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
	882852	186898/1	30	80,00	2640,0	4800	1		8.020	56268	15-02-2017	1PLATCS80007
	882852	186898/2	30	80,00	2640,0	4800	1		8.020	56268	15-02-2017	1PLATCS80007
a	882852	186899/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007

A04
Symbol of the manufacturer's work

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Quality Department Heavy Plates
BERGER Alfred

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Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	Ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
882852	186899/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
882852	186900/2	30	80,00	2640,0	4800	1		8.020	56058	15-02-2017	1PLATCS80007
882852	186900/1	30	80,00	2640,0	4800	1		8.020	56058	15-02-2017	1PLATCS80007
882852	186901/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
882852	186901/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972090	186721/2	30	80,00	2640,0	4800	1		8.018	56010	10-02-2017	1PLATCS80007
972090	186723/2	30	80,00	2640,0	4800	1		8.012	56058	14-02-2017	1PLATCS80007
972090	186723/1	30	80,00	2640,0	4800	1		8.012	56058	14-02-2017	1PLATCS80007
972090	186724/1	30	80,00	2640,0	4800	1		8.010	56058	13-02-2017	1PLATCS80007
972090	186724/2	30	80,00	2640,0	4800	1		8.010	56321	13-02-2017	1PLATCS80007
972090	186725/1	30	80,00	2640,0	4800	1		8.010	56010	11-02-2017	1PLATCS80007
972090	186725/2	30	80,00	2640,0	4800	1		8.010	56010	11-02-2017	1PLATCS80007
972090	186726/2	30	80,00	2640,0	4800	1		8.022	56058	10-02-2017	1PLATCS80007
972090	186726/1	30	80,00	2640,0	4800	1		8.022	56010	10-02-2017	1PLATCS80007
972093	181846/2	30	80,00	2640,0	4800	1		8.005	56268	15-02-2017	1PLATCS80007
972093	181846/1	30	80,00	2640,0	4800	1		8.005	56268	15-02-2017	1PLATCS80007
972093	186842/1	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
972093	186842/2	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
972093	186843/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186843/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186844/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186844/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186846/2	30	80,00	2640,0	4800	1		8.007	56058	17-02-2017	1PLATCS80007
972093	186846/1	30	80,00	2640,0	4800	1		8.007	56058	17-02-2017	1PLATCS80007
972093	186902/2	30	80,00	2640,0	4800	1		8.010	56272	15-02-2017	1PLATCS80007
972093	186902/1	30	80,00	2640,0	4800	1		8.010	56272	15-02-2017	1PLATCS80007
972093	186903/2	30	80,00	2640,0	4800	1		8.010	56010	15-02-2017	1PLATCS80007
972093	186903/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186905/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186905/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972096	186841/1	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
972096	186841/2	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
972096	186845/1	30	80,00	2640,0	4800	1		8.010	56272	16-02-2017	1PLATCS80007
972096	186906/2	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007

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BERGER Alfred

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Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	Ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
972096	186906/1	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
	Sum					48		384.580			

C70 - Method of steelmaking: strand casted material: pure oxygen blown with vacuum treatment; steel is fully killed.

B14 - Supplementary information

Flatness acc. EN 10029/10 class N
Dimensional tolerances acc. EN 10029/10
EN10163-2: Class A3 - Repair-welding not permitted.
Thicknesstolerance acc. EN 10029/10 tab. 1 class A

Chemical composition (Heat analysis) - part 1 of 2

B07 Heat No.	C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %	Pb %	Cae %	Pcm %
>=		.150				.015																
Set values <=	.140	.550	1.650	.020	.0050	.055	.250	.700	.250	.300	.080	.040	.025	.0100	.0005	.0200	.0050	.0300	.0100	.010	.43	.22
882852	.052	.182	1.550	.009	.0009	.030	.182	.520	.123	.073	.004	.030	.012	.0051	.0002	.0020	.0003	.0020	.0020	.002	.41	.17
972090	.060	.176	1.520	.007	.0010	.022	.174	.520	.125	.046	.004	.027	.012	.0061	.0002	.0020	.0003	.0020	.0020	.002	.41	.17
972093	.052	.184	1.530	.008	.0011	.027	.172	.530	.125	.068	.004	.029	.012	.0042	.0003	.0020	.0003	.0030	.0020	.002	.41	.17
972096	.054	.177	1.530	.007	.0007	.026	.173	.530	.117	.054	.004	.027	.013	.0040	.0002	.0020	.0003	.0020	.0030	.002	.41	.17

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Chemical composition (Heat analysis) - part 2 of 2

B07 Heat No.	LF01 %	LF02 %	LF03 %
Set values >= <=	.090	.110	.900
882852	.034	.046	.898
972090	.031	.043	.865
972093	.033	.045	.895
972096	.031	.044	.874

C99 - Supplementary information
BI <= 0,01%
C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF03: Cr+Ni+Cu+Mo
LF02: Nb+V+Ti
LF01: Nb+V

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Test results: C10-C29 Tensile Test acc. EN ISO 6892-1

B07 Heat No.	B06 Plate No	C41 Width	SpThickn mm	C01 loc.	PosTh.	C02 Dir	C11 Reh MPa	C11 Rp0,2 MPa	C12 Rm MPa	L0	C13 E %	C11 Reh/Rm %	C11 Rp0,2/Rm %	Sim.htm	WBH
>=							405	405	505		17.0				
Set values <=									665			90.00	90.00		
882852	186892	Ø	9.98	F	V	T	445	445	535	A5	32.0	83.07	83.09		
	186896	Ø	9.98	F	V	T	447	443	535	A5	30.9	83.47	82.69		
	186898	Ø	9.99	F	V	T	441	438	538	A5	31.2	81.97	81.41		
	186900	Ø	9.98	F	V	T	457	440	533	A5	30.3	85.65	82.52		
	186892	Ø	9.99	F	V	T		436	527	A5	30.0		82.78	001	1
	186896	Ø	9.99	F	V	T	468	443	524	A5	32.3	89.30	84.50	001	1
	186898	Ø	9.98	F	V	T	465	445	527	A5	32.4	88.24	84.44	001	1
	186900	Ø	9.99	F	V	T		437	524	A5	31.6		83.43	001	1
972090	184827	Ø	10.00	F	V	T	456	449	541	A5	29.3	84.28	82.93		
	184828	Ø	10.00	F	V	T	442	440	536	A5	30.8	82.41	82.00		
	186723	Ø	9.98	F	V	T		429	545	A5	27.5		78.81		
	184827	Ø	9.99	F	V	T		432	520	A5	28.5		83.09	001	1
	184828	Ø	9.99	F	V	T		440	529	A5	31.2		83.32	001	1
	186723	Ø	9.96	F	V	T	487	474	563	A5	28.1	86.53	84.17	001	1
972093	181846	Ø	9.95	F	V	T		415	564	A5	32.1		73.58		
	186842	Ø	9.98	F	V	T	456	449	540	A5	32.5	84.45	83.24		
	186843	Ø	9.99	F	V	T	461	452	544	A5	32.6	84.74	83.09		
	186902	Ø	9.98	F	V	T	456	448	532	A5	32.5	85.67	84.18		
	181846	Ø	9.98	F	V	T	460	424	524	A5	32.6	87.79	80.92	001	1
	186842	Ø	9.99	F	V	T	471	440	526	A5	32.4	89.49	83.56	001	1
	186843	Ø	9.98	F	V	T	470	443	532	A5	32.6	88.35	83.27	001	1
	186902	Ø	9.99	F	V	T	463	436	518	A5	32.9	89.37	84.16	001	1
972096	186841	Ø	9.98	F	V	T	459	429	529	A5	30.9	86.77	81.10		
	186906	Ø	9.98	F	V	T	466	436	524	A5	31.2	88.86	83.05		
	186841	Ø	9.98	F	V	T	470	441	525	A5	32.1	89.52	84.00	001	1
	186906	Ø	9.97	F	V	T		439	523	A5	32.7		83.96	001	1

SpThickn: specimen thickness
C01;loc.:
F: Bottom
PosTh.: Pos Thickness
V: ¼

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Quality Department Heavy Plates
BERGER Alfred

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Test results: C10-C29 Tensile Test acc. EN ISO 6892-1

B07 Heat No.	B06 Plate No	C41 Width mm	SpThickn	C01 loc.	PosTh.	C02 Dir	C11 Reh MPa	C11 Rp0,2 MPa	C12 Rm MPa	L0	C13 E %	C11 Reh/Rm %	C11 Rp0,2/Rm %	Sim.htm	WBH

C02;Dir:
  T: transverse
C12; Rm: Tensile Strength
L0: gauge
  A5: Length = 5.65 * sqr (area) mm
C13;E: elongation
Sim.htm: sim. heat treatment
  001: Sim.htm group #1
WBH: sim. heat treatment

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07	B06	C40	C01			C02	C03	C42	C42	C42	C43		
Heat No. samp.cond.	Plate No	shape	loc.	Pos.	PosTh.	Dir	temp	SV	SV	SV	AV	Sim.htm	WBH
							°C	J	J	J	J		
>=							-40	42	42	42	60		
Set values <=													

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No, samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>=							-40	42	42	42	60		
Set values <=													
882852	186892	CV 10x10	F	O		T	-40	340	328	325	331		
	186896	CV 10x10	F	O		T	-40	345	328	327	333		
	186898	CV 10x10	F	O		T	-40	352	332	322	335		
	186900	CV 10x10	F	O		T	-40	345	348	344	346		
	186892	CV 10x10	F	O		T	-40	307	310	303	307	001	1
	186896	CV 10x10	F	O		T	-40	314	321	315	317	001	1
	186898	CV 10x10	F	O		T	-40	323	311	317	317	001	1
	186900	CV 10x10	F	O		T	-40	334	324	325	328	001	1
	186892	CV 10x10	F	K		T	-40	348	364	385	366		
	186896	CV 10x10	F	K		T	-40	365	356	353	358		
	186898	CV 10x10	F	K		T	-40	352	365	345	354		
	186900	CV 10x10	F	K		T	-40	372	347	354	357		
	186892	CV 10x10	F	K		T	-40	345	329	324	333	001	1

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Quality Department Heavy Plates
BERGER Alfred

voestalpine
ONE STEP AHEAD.

Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	42	42	42	60		
882852	186896	CV 10x10	F		K	T	-40	344	328	284	319	001	1
	186898	CV 10x10	F		K	T	-40	310	337	320	322	001	1
	186900	CV 10x10	F		K	T	-40	357	349	347	351	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>=							-40	42	42	42	60		
Set values <=													
972090	184827	CV 10x10	F		O	T	-40	321	320	314	318		
	184828	CV 10x10	F		O	T	-40	320	303	303	309		
	186723	CV 10x10	F		O	T	-40	323	327	322	324		
	184827	CV 10x10	F		O	T	-40	332	319	327	326	001	1
	184828	CV 10x10	F		O	T	-40	318	323	321	321	001	1
	186723	CV 10x10	F		O	T	-40	295	263	303	287	001	1
	184827	CV 10x10	F		K	T	-40	340	328	251	306		
	184828	CV 10x10	F		K	T	-40	346	336	317	333		
	186723	CV 10x10	F		K	T	-40	268	289	311	289		
	184827	CV 10x10	F		K	T	-40	321	331	357	336	001	1
	184828	CV 10x10	F		K	T	-40	326	353	89	256	001	1
	186723	CV 10x10	F		K	T	-40	284	266	276	275	001	1

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Vienna Office
Initials: KH
24 FEB 2017

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Quality Department Heavy Plates
BERGER Alfred

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	42	42	42	60		
972093	181846	CV 10x10	F		O	T	-40	319	324	322	322		
	186842	CV 10x10	F		O	T	-40	345	347	334	342		
	186843	CV 10x10	F		O	T	-40	343	339	342	341		
	186902	CV 10x10	F		O	T	-40	349	344	335	342		
	181846	CV 10x10	F		O	T	-40	329	302	323	318	001	1
	186842	CV 10x10	F		O	T	-40	312	310	308	310	001	1
	186843	CV 10x10	F		O	T	-40	305	315	311	310	001	1
	186902	CV 10x10	F		O	T	-40	323	322	318	321	001	1
	181846	CV 10x10	F		K	T	-40	304	366	370	347		
	186842	CV 10x10	F		K	T	-40	362	369	351	361		
	186843	CV 10x10	F		K	T	-40	358	366	356	360		
	186902	CV 10x10	F		K	T	-40	357	366	377	366		
	181846	CV 10x10	F		K	T	-40	359	364	355	359	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	42	42	42	60		
972093	186842	CV 10x10	F	K		T	-40	323	298	331	317	001	1
	186843	CV 10x10	F	K		T	-40	313	304	301	306	001	1
	186902	CV 10x10	F	K		T	-40	361	363	364	362	001	1
972096	186841	CV 10x10	F	O		T	-40	345	333	341	339		
	186906	CV 10x10	F	O		T	-40	338	340	346	341		
	186841	CV 10x10	F	O		T	-40	324	316	313	318	001	1
	186906	CV 10x10	F	O		T	-40	317	321	323	320	001	1
	186841	CV 10x10	F	K		T	-40	337	342	353	344		
	186906	CV 10x10	F	K		T	-40	348	357	334	346		
	186841	CV 10x10	F	K		T	-40	309	332	343	328	001	1
	186906	CV 10x10	F	K		T	-40	347	338	278	321	001	1
>= Set values <=							-40	29	29	29	46		

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	C02 PosTh.	C03 Dir	C42 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
	>=						-40	29	29	29	46		
Set values <=													
882852	186892	CV 10x10	F		ZB2	T	-40	320	310	312	314		strain aged 5%, 60 min. at 250°C
	186896	CV 10x10	F		ZB2	T	-40	305	297	314	305		strain aged 5%, 60 min. at 250°C
	186898	CV 10x10	F		ZB2	T	-40	311	303	309	307		strain aged 5%, 60 min. at 250°C
	186900	CV 10x10	F		ZB2	T	-40	305	317	306	309		strain aged 5%, 60 min. at 250°C
972090	184827	CV 10x10	F		ZB2	T	-40	341	317	326	328		strain aged 5%, 60 min. at 250°C
	186723	CV 10x10	F		ZB2	T	-40	259	299	299	286		strain aged 5%, 60 min. at 250°C
972093	181846	CV 10x10	F		ZB2	T	-40	306	302	323	310		strain aged 5%, 60 min. at 250°C
	186842	CV 10x10	F		ZB2	T	-40	316	299	319	311		strain aged 5%, 60 min. at 250°C
	186843	CV 10x10	F		ZB2	T	-40	322	309	315	315		strain aged 5%, 60 min. at 250°C
	186902	CV 10x10	F		ZB2	T	-40	306	302	323	310		strain aged 5%, 60 min. at 250°C
972096	186841	CV 10x10	F		ZB2	T	-40	311	302	314	309		strain aged 5%, 60 min. at 250°C
	186906	CV 10x10	F		ZB2	T	-40	305	310	313	309		strain aged 5%, 60 min. at 250°C

C40;shape:
CV 10x10: Test shape , Dimensions

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07	B06	C40	C01			C02	C03	C42	C42	C42	C43			
Heat No. samp.cond.	Plate No	shape	loc.	Pos.	PosTh.	Dir	temp	SV	SV	SV	AV		Sim.htm	WBH
							°C	J	J	J	J			

C01;loc.:
F: Bottom
Pos.: test specimen position
PosTh.: Pos Thickness
K: ½
O: surface
ZB2: 2mm below surface
C02;Dir:
T: transverse
C42;SV: single value
C43;AV: average value
Sim.htm: sim. heat treatment
001: Sim.htm group #1
WBH: sim. heat treatment
samp.cond.: sample condition

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Test results: C10-C29 through Thickness Test acc. DIN / EN

B07 Heat No.	B06 Plate No	C40 Shape	SpThickn mm	C01 loc.	C02 Dir	C12 Rm MPa	C12 Rm MPa	C12 Rm MPa	Z(SV) %	Z(SV) %	Z(SV) %	Z(AV) %
Set values >=						404	404	404	25	25	25	35
882852	186892	Ø	10.01	F	S	531	531	531	72	78	60	70
	186896	Ø	10.00	F	S	539	530	532	78	78	70	75
	186900	Ø	10.00	F	S	526	521	530	77	79	78	78
972090	184827	Ø	10.03	F	S	528	528	525	60	67	58	62
	186723	Ø	9.96	F	S	539	544	525	73	74	79	75
972093	181846	Ø	10.00	F	S	522	520	520	75	74	77	75
	186842	Ø	10.00	F	S	535	533	536	78	75	72	75
	186902	Ø	10.01	F	S	515	520	517	77	71	74	74
972096	186906	Ø	9.87	F	S	527	525	539	77	79	70	75

SpThickn: specimen thickness
C01;loc.:
F: Bottom
C02;Dir:
S: through thickness direction
C12; Rm: Tensile Strength
Z(SV): reduction of area (single value)
Z(AV): reduction of area (average value)

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Chemical composition (Product analysis) - part 1 of 2

B07 Heat No.	B06 Plate No	C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %
	>=		.150				.015													
Set values	<=	.140	.550	1.650	.020	.0050	.055	.250	.700	.250	.300	.080	.040	.025	.0100	.0005	.0200	.0050	.0300	.0100
882852	186892	.052	.184	1.520	.008	.0010	.028	.181	.520	.123	.067	.004	.029	.012	.0058	.0002	.0020	.0002	.0030	.0020
	186896	.052	.185	1.530	.008	.0009	.030	.179	.520	.122	.071	.004	.029	.012	.0053	.0002	.0020	.0003	.0030	.0020
	186898	.052	.175	1.530	.007	.0009	.029	.180	.521	.123	.071	.003	.030	.012	.0051	.0001	.0020	.0002	.0010	.0010
	186900	.052	.184	1.530	.009	.0010	.029	.178	.520	.122	.072	.004	.030	.012	.0050	.0002	.0020	.0003	.0020	.0020
972090	184827	.054	.178	1.530	.007	.0007	.024	.176	.520	.127	.046	.004	.027	.013	.0056	.0002	.0020	.0002	.0030	.0020
	184828	.054	.176	1.530	.007	.0007	.024	.174	.520	.127	.045	.004	.027	.013	.0059	.0002	.0020	.0002	.0020	.0020
	186723	.055	.179	1.540	.007	.0010	.024	.174	.510	.126	.046	.004	.027	.013	.0061	.0002	.0020	.0002	.0030	.0020
972093	181846	.051	.180	1.520	.007	.0010	.029	.170	.520	.122	.060	.004	.029	.012	.0044	.0002	.0020	.0003	.0020	.0020
	186842	.052	.185	1.510	.007	.0012	.028	.168	.510	.124	.061	.004	.029	.013	.0042	.0002	.0020	.0003	.0020	.0020
	186843	.052	.177	1.500	.008	.0010	.027	.173	.531	.125	.066	.004	.029	.011	.0042	.0002	.0030	.0003	.0030	.0020
	186902	.048	.183	1.500	.007	.0010	.028	.168	.510	.122	.060	.004	.028	.012	.0045	.0002	.0020	.0003	.0020	.0020
972096	186841	.054	.175	1.530	.006	.0007	.024	.170	.527	.117	.055	.003	.027	.013	.0040	.0002	.0020	.0003	.0020	.0030
	186906	.053	.179	1.530	.007	.0010	.027	.174	.520	.121	.050	.004	.027	.013	.0040	.0002	.0020	.0002	.0020	.0020

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Chemical composition (Product analysis) - part 2 of 2

B07 Heat No.	B06 Plate No	Pb %	Cae %	Pcm %	LF01 %	LF02 %	LF03 %
Set values >=							
Set values <=		.010	.43	.22	.090	.110	.900
882852	186892	.002	.41	.16	.033	.045	.891
	186896	.002	.41	.17	.033	.045	.892
	186898	.002	.41	.16	.033	.045	.895
	186900	.002	.41	.17	.034	.046	.892
972090	184827	.002	.41	.17	.031	.044	.869
	184828	.002	.41	.17	.031	.044	.866
	186723	.002	.41	.17	.031	.044	.856
972093	181846	.002	.40	.16	.033	.045	.872
	186842	.002	.40	.16	.033	.046	.863
	186843	.002	.40	.16	.033	.044	.895
	186902	.002	.39	.16	.032	.044	.860
972096	186841	.002	.41	.17	.030	.043	.869
	186906	.002	.41	.16	.031	.044	.865

C99 - Supplementary information
BI <= 0,01%

C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF03: Cr+Ni+Cu+Mo
LF02: Nb+V+Ti
LF01: Nb+V

Remarks

Simulated heat treatment of test coupons:

Pos 30:
001/1: 1 cycle(s) sim. PWHT: furnace charge temperature at max. 400 °C, heating with max. 55 °C/h up to 580 °C, +20 °C/-20 °C, holding time 240 minutes, cooling with max. 55 °C/h down to 400 °C, final cooling in calm air.

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Remarks

We confirm that the above-mentioned delivery corresponds to the order (and standard).

Reduction of area on tensile test specimens in the through-thickness direction in accordance with EN 10164:2004, class Z35.

The signature of the inspection representative from voestalpine Grobblech GmbH is substituted by a electronic Signature, because the certificates of voestalpine Grobblech GmbH are prepared by a suitable data processing system (EN 10204, Pt.5).

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ULTRASONIC EXAMINATION

SPECIFICATION
Ultrasonic examination acc. to EN 10160, EN 10160 class S1/Body, Grid 200 mm, EN 10160 class E2/Edge Zone, Edge zone 75 mm

VALID TEST EQUIPMENT
mechanized ultrasonic "In-Line testing system" (Manufacturer: NDT-Systems & Services) and
mechanized ultrasonic "off-line - testing system" (manufacturer: Windhoff Bahn- und Anlagentechnik GmbH) and
MUT (optional): Sonatest D20 no. 90006523 or Sonatest D20 no. 90007346 or Sonatest Masterscan 380 no. 90007347 or Sonatest Masterscan 380 no. 90006522 or Sonatest D50 no. 90010231 or GE - USM 36 no. 90010775

PROBE
(in-line AUT): 3STSE 18.3/8 P5, SEZ5R10RS, SE3 18.3/10 5A, (5MHz)
(off-line AUT): S140 (4MHz) 3T/1R
(MUT): SEB4E (4MHz), SEB4E0° (4MHz), MSEB4E (4MHz), B2SO (2MHz)
watergapcoupling

RESULT
Plate(s) comply with the specification.

INSPECTION OPERATOR
Operators Level 1 or 2: qualified and certified according ÖNORM EN 473 or EN ISO 9712 (since 01.01.2013) respectively according the Written Practice „NDT-WP" (in accordance to Recommended Practice SNT-TC-1A). Operators Level 2 for ASME/ASTM.

INSPECTION SUPERVISOR
Responsible Level 3: Bindreiter Erich

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Consumables certificate

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2018-01-22 Numero certificato/Cert no: EC25021325 rev. 0

Nostro ordine/Our order:	1849085	Vostro ordine/Your order:	Verb. Sig. Dal Prete
Nostro riferimento/Our ref:	Web user - Movex CMP020 ITB	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB00060	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20180122	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address
ESAB SALDATURA S.P.A. (6155)
VIA ROSA LUXEMBURG, 49
IT-20085 LOCATE TRIULZI MI
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
ROSETTI MARINO SPA
.
VIA TRIESTE 230
48100 RAVENNA RA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: SBR41145 Quantità/Quantity: 28 CT

PRODOTTO/PRODUCT

Marchio/Brand:	Filarc
Descrizione/Desc:	FILARC 88S 3.2x350mm 1/2 VP
Codice/Item no:	**77693239G3**

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.5: E8016-G
EN ISO 2560-A: E 50 6 Mn1Ni B 12 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:

C		0.05%
Si		0.24%
Mn		1.87%
P		0.018%
S		0.007%
Cr		0.03%
Ni		0.91%
Mo	<	0.01%
Nb	<	0.01%
Cu		0.02%
V		0.01%

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:
Altro/Auxiliary:
Condizione/Condition:

TRAZIONE/TENSILE

Rp0.2	Rm	A5
560 MPa	640 MPa	27 %

RESILIENZA/IMPACT

Temp	-40 °C	-60 °C
KV	115 J	100 J

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis
Ellen Björgan Quality Manager

Validazione - altro/Validation - Others
J-P Ernoult Product Manager

CERTIFICATO DI COLLAUDO/
INSPECTION CERTIFICATE

in accordo a/acc to EN 10204 - 3.1

Data/Date: 2011-02-14

Numero certificato/Cert no: **EC21879243 rev. 0**

Nostro ordine/Our order:	265676	Vostro ordine/Your order:	
Nostro riferimento/Our ref:	Customer Service Desk	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	00016620	Vostro numero fax/Your fax:	
Data ordine Cliente/Your date:	20101230	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address
ROSETTI MARINO SPA
VIA TRIESTE 230
48100 RAVENNA RA
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
ROSETTI MARINO SPA
VIA TRIESTE 230
48100 RAVENNA RA
Italy

PRODOTTO CONSEGNATO/DELIVERED PRODUCT

Marchio/Brand:	Filarc
Descrizione/Desc:	FILARC 88S 4.0x450mm 1/2 VP
Codice/Item no:	**77694049G3**
Numero di lotto/Lot no:	**SB109120**
Quantità/Quantity:	138 KG

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.5	E8016-G
EN ISO 2560-A	E 50 6 Mn1Ni B 12 H5

ANALISI CHIMICA/ CHEMICAL ANALYSIS

All weld metal

Altro/Auxiliary: N/A

C	0.06%
Si	0.31%
Mn	1.87%
P	0.015%
S	0.006%
Cr	0.02%
Ni	0.87%
Mo	< 0.01%
Nb	< 0.01%
Cu	0.01%
Pb	< 0.01%
Ti	0.01%
V	0.01%
Al	< 0.001%
As	< 0.01%
Sb	< 0.01%
Sn	< 0.01%

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:
ESAB Saldatura Spa Via Novara 57/59, I-20010 Bareggio (MI), +39 02 97968.1
Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione/Validation
Joakim Rohdén Quality Director

ROSETTI MARINO

PQR 42/18

preliminary WPS

PQR ref.:	To be qualified	pWPS (ISO 15614-1 Ed.2017+MOTS-12 Rev 4.0)	42/18	REV.:	1	Data /date	06/11/2018

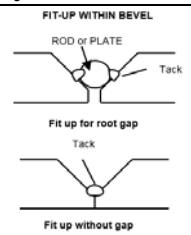
Procedimento di saldatura / Welding process: **111-SMAW** — Tipo / Type: **MANUAL**

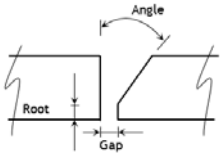
GIUNTO - JOINT

Tipo di giunto / Joint Design: **1/2V** — Supporto / Backing: ☐ Si / Yes ☒ No

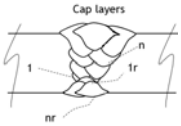
Materiale di supporto (tipo) / Backing material (type). ☐ Metallico / Metal ☐ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:





Angle: 40°-50° - Root: 0-2 mm - Gap: 0-6 mm



Note: **1.Surfaces cleaned from moisture, oil, grease, paint before welding (by grinding)/** *Pulire le superfici da liquidi, oli, grasso e vernici con molatura prima di saldare.*
2.Minimum tack weld lengths shall be 4 times the thk or 50 mm, whichever is less/ I tacchetti devono essere lunghi almeno 50 mm o 4 volte lo spessore (il più piccolo dei due);
3.Welding shall not be discontinued before 25% of the weld thickness or 3 passes are completed, whichever gives adequate cross section to prevent craking/ *La saldatura non può essere interrotta prima di aver completato almeno 3 passate o il 25% dello spessore da saldare*
4.Preheat shall be performed by electrical resistance, induction equiomenter or with gas burners. Cutting torches shall not be permitted. *Il preriscaldo può essere eseguito con resitenze, induzione o torcia. Non può essere utilizzato l'ossitaglio.*
5. Last cap layers bead needs to be in the center of the weld. *L'ultima passata di finitura deve essere al centro della saldatura*

MATERIALE BASE - BASE MATERIAL

Da / from P-N°:	/	Group N°	S4	A / to P-N°:	/	Group N°	S4

DA Tipo e grado / From type and grade: **ISO EN 10225 S460 G8+M**

A Tipo e grado / To type and grade: **ISO EN 10225 S460 G8+M**

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove **20 mm**

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove **N.A.**

METALLO D'APPORTO - FILLER METAL

	SMAW	
Spec. N° (SFA)	5.5	
AWS N° (CLASS)	E8016-G	
F-N°	4	
A-N°	10	
Diametro mat. D'apporto / Size of filler metal	2,5/3,2/4,0	
Gamma spessori /Thick. Range (mm)	Up to filling	
Accoppiamento filo-flusso / Electrode-flux (CLASS)	NA	
Denom. Comm. Flusso / FLUX trade name	NA	
Inserto consumabile / Consumable insert	NA	
Altro / other	FILARC 88S	

POSIZIONI - POSITION

giunto / Joint: **Cianfrino / groove** — Posizione / position **PC-PF** — Progressione / weld progression: **Orizzontale-HORIZONTAL (PC) Ascendente-UP Hill (PF)**

PRERISCALDO - PRE-HEAT

Temp.preriscaldo minima / Min. pre-heat temp: **50 °C** — Max temp. Di interpass / Max interpass temp.: **250 °C** — Mantenimento interpass / Interpass maintenance: **N.A.** — Tempo di mantenimento prerisc. / Maintenance timing: **N.A.**

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs): **N.A.** — Temperatura di stasi / Holding temperature °C: **N.A.** — Tempo di stasi / Holding time (min.): **N.A.** — Velocità di raffreddamento / Cooling rate (°C/Hrs): **N.A.**

GAS DI PROTEZIONE - GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	N.A.	N.A.	N.A.
Protezione al seguito / Trailing:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current: **DC** — Polarità / Polarity **RP**

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: **N.A.**

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: **N.A.**

Velocità alimentazione filo / Electr. Wire feed speed range: **N.A.**

TECNICA - TECHNIQUE

Passata / Bead: **Tirata/String** — Dimensione bocchello gas / Orifice of gas cup size: **N.A.** — Pulizia iniziale e fra le passate / Initial and interpass cleaning: **Spazzolatura/Brushing**

Metodo di solcatura a rovescio / Method of back gouging: **N.A.** — Oscillazione / Oscillation: **N.A.** — Distanza zona di contatto e pezzo / Contact zone to work distance: **N.A.**

N°Passate / Passes nr.: **Multipla/Multiple** — Elettrodo multiplo o singolo / Multiple or single electrodes: **Singolo/Single** — Martellatura / Peening: **N.A.**

Altro / Other:

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range		Vel. Avanzamento / Travel speed range (mm/min)		Apporto termico / Heat input (KJ/mm)	
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. Range						
Tack	SMAW	E8016-G	3,2	RP	90 104	21	23	50	107	0,84	2,30
1	SMAW	E8016-G	2,5	RP	90 110	20	23	50	120	0,72	2,42
2	SMAW	E8016-G	3,2	RP	91 110	21	23	60	106	0,86	2,00
3-n	SMAW	E8016-G	4,0	RP	140 165	22	23	80	185	0,80	2,28
CAP	SMAW	E8016-G	3,2/4,0	RP	84 118	21	23	90	140	0,60	1,45

Preparato da / prepared by:	Client/Third part signature:	Client/Third part signature:
D.Cenacchi	*TOTAL*	*DNV*

NDE certificate

ROSETTI MARINO	**VERBALE DI CONTROLLO VISIVO/DIMENSIONALE** **visual/dimensional inspection report**	VDR N° 42-18 data: 14-11-2018

progetto project	TYRA REDEVELOPMENT PROJECT	cliente TOTAL client	ordine / PO	commessa 118A10 job

disegno dwg	/	ITP N°	fase step	/

SI CERTIFICA CHE :

gli item di seguito indicati sono stati sottoposti a controllo dimensionale ed accettati in accordo alla procedura / specifica sotto indicata ed ai criteri di accettabilita' in essa definiti.

WE CERTIFY THAT:

items below indicated have undergone a dimensional inspection and have been accepted according to the specific / procedure mentioned hereunder and to acceptance criteria defined in it.

oggetto – item

COUPON	STAMP	POS	THK	LENGHT	WPS	Date of examination
42/18 2G	AX82	2G	20mm	800mm	pWPS 42/18	14/11/2018
42/18 3G	AX21	3G	20mm	800mm	pWPS 42/18	14/11/2018

RINA Services SpA No. Bo. 0474	Date 16/11/2018
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimatti Davide

note - remarks

Acceptance criteria: EN-ISO 5817-2014 LEV. B

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

UNI EN ISO 17637 REV. 2017

Operatore - Operator	Controllo Qualita' - Quality Control	Cliente - Client
CSWIP D.CENACCHI 305250 WI 3.1		

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 15/09/2018	FOGLIO – Sheet 1
RAPPORTO D'ESAME CON ULTRASUONI ***Ultrasonic examination report***		UT N° : 08	Ns. Rif./Our Ref. 18205

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTIMARINO	/	TYRA FUTURE	118A10	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
MAERSK OIL	PQR	/	-	-

CODICE / Code	PROCEDURA / Procedure	ACCETTABILITA' / Acceptance level			
/	DK-TEHY-MET-PRO-000-10004	Quality Level ISO 5817	☑ B	☐ C	☐ D
		Acceptance level ISO 11666	☑ 2	☐ 3	☐ 3b

MATERIALE Material	DIMENSIONI Dimension	SPESSORE NOMINALE / Thk
S460 G2+M	L=800 mm	Butt weld 1\2V 20 mm

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO - Brushed	☐ LAVORATO DI MACCHINA - Machined
☐ MOLATO - Ground	☐ LAMINATO - Rolled	☐ GREZZO - Forged

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG	No. SERIE Serial Number	II03937

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	ONDE Waves
PANAMETRICS	PF4MR	4	10	0°	LONG.
PANAMETRICS	AMR	4	8X9	45°-60° 70°	SHEAR

BLOCCO DI CALIBRAZIONE Calibration block	IIW V2	BLOCCO DI RIFERIMENTO Reference block	QT-REF-BLOCK 5
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity	DAC ON SDH 3 mm

SALDATURE CONTROLLATE / Welds Verified	PIANO DI SCANSIONE / Scanning plan
PQR 42/18 PF AX21	The Scanning plan used is in accordance with the requirements of IDL-QCI-UT-0215

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Salvatore Randazzo II° Livello SNT - TC - 1A / ISO 9712	ROSETTI MARINO S.p.A. Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 27/11/2018 File Signature Ciminari Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items esamine*

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 15/11/2018	FOGLIO – Sheet 1
RAPPORTO D'ESAME MAGNETOSCOPICO ***MAGNETIC PARTICLE TEST***		MT N° : 08	Ns. Rif./Our Ref. 18205

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	TYRA FUTURE	118A10	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
MAERSK OIL	PQR	/	/	/

CODICE / code	PROCEDURA/Procedure	ACCETTABILITA - Acceptance level	
/	DK-TEHY-MET-PRO-000-10006	Quality Level ISO 5817 ☑ B ☐ C ☐ D Acceptance level ISO 23278 ☑ 2x ☐ 2x ☐ 3x	
MATERIALE Material	TEMPERATURA DELLE SUPERFICI Surface temperature	INTENSITA' LUMINOSA / Light intensity LUCE BIANCA	LUCE NERA
S460 G2+M	RANGE 5÷52°C	☑ > 500 LUX	☐ 500 µW/cm².

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined
☐ MOLATO – Ground	☐ LAMINATO – Rolled	☐ GREZZO – Forged

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☐ PUNTALI/Prods	☑ GIOGO/Yoke	☐ SOLENOIDE/Solenoid	☐ CONDUTTORE CENTRALE/Central conduttor

TIPO APPARECCHIO/Type of equipment	SILVER YOKE/S.No.04 230-15	DISTANZA PUNTALI/Pole spacing mm	180mm
TIPO DI CORRENTE/Type current	C.A	INTENSITÀ/Intesity (Amp)	4,5 kg

MEZZO DI ISPEZIONE / Examination medium		☑ UMIDO/Wet	☐ ASCIUTTO/Dry
PARTICELLE UTILIZZATE/Particle Type			
POLVERE NERA/Black powder	☑	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	NDT BW2	MARCA TIPO/Mark Type	NDT FW1
LOTTO / Batck No.	7241s	LOTTO / Batck No.	
VERNICE DI CONTRASTO/Contrast Paint		☑ NDT WBL5	☐ CGM VECOPLAST
LOTTO / Batck No.		U171010c	

SALDATURE CONTROLLATE / Welds Verified

PQR 42/18 PF AX21

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Salvatore Randazzo II° Livello SNT - TC - 1A / ISO 9712	ROSETTI MARINO SpA Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 29/11/2018 File Signature Cimadi Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items esamine*

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 15/09/2018	FOGLIO – Sheet 1
RAPPORTO D'ESAME CON ULTRASUONI ***Ultrasonic examination report***		UT N° : 09	Ns. Rif./Our Ref. 18205

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	TYRA FUTURE	118A10	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
MAERSK OIL	PQR	/	-	-

CODICE / Code	PROCEDURA / Procedure	ACCETTABILITA' / Acceptance level			
/	DK-TEHY-MET-PRO-000-10004	Quality Level ISO 5817	☑ B	☐ C	☐ D
		Acceptance level ISO 11666	☑ 2	☐ 3	☐ 3b

MATERIALE Material	DIMENSIONI Dimension	SPESSORE NOMINALE / Thk
S460 G2+M	L=800 mm	Butt weld 1\2V 20 mm

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO - Brushed	☐ LAVORATO DI MACCHINA - Machined
☐ MOLATO - Ground	☐ LAMINATO - Rolled	☐ GREZZO - Forged

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG	No. SERIE Serial Number	II03937

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	ONDE Waves
PANAMETRICS	PF4MR	4	10	0°	LONG.
PANAMETRICS	AMR	4	8X9	45°-60° 70°	SHEAR

BLOCCO DI CALIBRAZIONE Calibration block	IIW V2	BLOCCO DI RIFERIMENTO Reference block	QT-REF-BLOCK 5
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity	DAC ON SDH 3 mm

SALDATURE CONTROLLATE / Welds Verified	PIANO DI SCANSIONE / Scanning plan
PQR 42/18 PC AX82	The Scanning plan used is in accordance with the requirements of IDL-QCI-UT-0215

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Salvatore Randazzo II° Livello SNT - TC - 1A / ISO 9712	ROSETTI MARINO S.p.A. Welding Dept. C.D. Gonicchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 29/11/2018 File Signature Ciraffi Davide

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QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 15/11/2018	FOGLIO – Sheet 1
RAPPORTO D'ESAME MAGNETOSCOPICO ***MAGNETIC PARTICLE TEST***		MT N° : 09	Ns. Rif./Our Ref. 18205

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	TYRA FUTURE	118A10	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
MAERSK OIL	PQR	/	/	/

CODICE / code	PROCEDURA/Procedure	ACCETTABILITA - Acceptance level	
/	DK-TEHY-MET-PRO-000-10006	Quality Level ISO 5817 ☑ B ☐ C ☐ D Acceptance level ISO 23278 ☑ 2x ☐ 2x ☐ 3x	
MATERIALE Material	TEMPERATURA DELLE SUPERFICI Surface temperature	INTENSITA' LUMINOSA / Light intensity LUCE BIANCA	LUCE NERA
S460 G2+M	RANGE 5÷52°C	☑ > 500 LUX	☐ 500 µW/cm².

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined
☐ MOLATO – Ground	☐ LAMINATO – Rolled	☐ GREZZO – Forged

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☐ PUNTALI/Prods	☑ GIOGO/Yoke	☐ SOLENOIDE/Solenoid	☐ CONDUTTORE CENTRALE/Central conduttor

TIPO APPARECCHIO/Type of equipment	SILVER YOKE/S.No.04 230-15	DISTANZA PUNTALI/Pole spacing mm	180mm
TIPO DI CORRENTE/Type current	C.A	INTENSITÀ/Intesity (Amp)	4,5 kg

MEZZO DI ISPEZIONE / Examination medium		☑ UMIDO/Wet	☐ ASCIUTTO/Dry
PARTICELLE UTILIZZATE/Particle Type			
POLVERE NERA/Black powder	☑	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	NDT BW2	MARCA TIPO/Mark Type	NDT FW1
LOTTO / Batck No.	7241s	LOTTO / Batck No.	
VERNICE DI CONTRASTO/Contrast Paint		☑ NDT WBL5	☐ CGM VECOPLAST
LOTTO / Batck No.		U171010c	

SALDATURE CONTROLLATE / Welds Verified

PQR 42/18 PC AX82

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Salvatore Randazzo II° Livello SNT - TC - 1A / ISO 9712	ROSETTI MARINO S.p.A. Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 29/11/2018 File Signature Cimatti Davide

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ROSETTI MARINO

PQR 42/18

Mechanical test report

INSPECTA S.R.L.

TEST REPORT
RAPPORTO DI PROVA
N° 0415-00850-18 **Rev.00**
Data: 04/12/2018

ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO
LAB N°1607

Object: *Oggetto:*	**MECHANICAL TEST ON PQR 42/2018**			Pag. 1 di 7
Specimen: *Saggio:* **504/18**	**Base Material:** *Materiale Base:*	**Plate 20,00 mm**		**ISO EN 10225 S460 G2+M**
Customer: ROSETTI MARINO SPA *Committente:* **Address: Via Trieste, 230 - 48122 Ravenna (RA)** *Indirizzo:*		**Witnessed by:** *Presenziato da:*		**ROSETTI S.p.A.** **RINA SERVICES S.p.A** **TOTAL S.p.A.**
Final customer:. *Cliente finale:*	**N.A.**			
Reference Yours bill of landing: *Vs. DDT di consegn*	**n°** // *n°* //	**Date:** *Data:* //	**MD52** *MD 52* **131/18**	**Date:** *Data:* **15/11/2018**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **04/12/2018**	**End of activities:** *Fine prove:*		**Date:** *Data:* **04/12/2018**

PROVE RICHIESTE

☒ **TENSILE TEST**/*Trazione*	☒ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*	
☒ **BEND TEST**/*Piega*	☒ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root */Dritto/Rovescio* ☒ Side/ *Laterale*	
☒ **IMPACT TEST**/*Resilienza*	☒ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*	
☒ **MACROEXAMINATION TEST /** *Macrografia*			
☒ **HARDNESS TEST**/ *Durezza*	☐ HV 5	☒ HV 10	
☐ **FRACTURE TEST**/ *Frattura*	☐ Plate on Plate/ *Piastra su Piastra*	☐ Pipe on Plate/*Tubo su Piastra*	
☐ **CHEMICAL ANALYSIS**/*Analisi Chimica*			
☐ **MICROEXAMINATION TEST /** *Micrografia*			
☐ **OTHER (Specify)**/*Altro/(Specificare)*			

Allegati /Attachments: *NONE*

NOTE/ Remarks:

REFERENCE CODE FROM CUSTOMER REQUEST:MOG-FP-MET-STD-0012 Rev.04 + UNI EN ISO 15614-1:2017

WELDING POSITION: PC
JOB ROSETTI 118A10

*** Prova non accreditata da ACCREDIA**

Laboratory Responsible *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig. Claudio Pettinato 04-12-2018	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RINA Services S.p.A. Date 04/12/2018 No. Bo. 6474
		Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File ___ Signature Cimatti Davide

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova.. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I campionamenti sono eseguiti dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%
The results in this test report refers only to the specimen that has been tested.The customer undertakes to print out /reproduce the test report. Any partial reproduction is prohibited.Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory.Sampling shall be performed by the custode.Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku = 2 equivalent to a level of confidence of 95 % .

TOTAL E&P Denmark A/S D HODGSON 4 Dec 18 ☑ Witnessed ☐ Reviewed

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

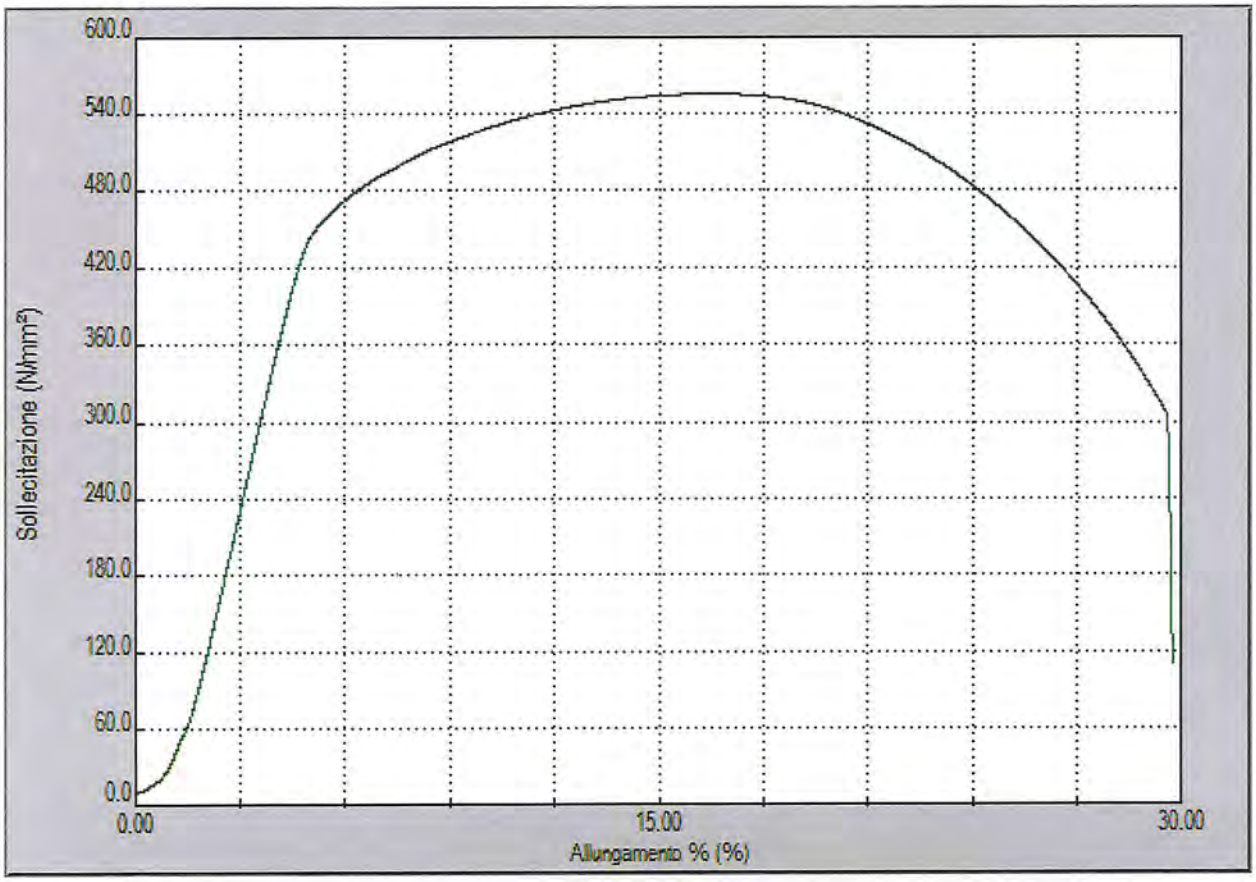
Date of Testing: *04/12/2018*
Data esecuzione prova:

Serial N. VAUP 01

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-17*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Internal procedure *Procedura interna :* ***PP08 rev.03***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ **Standards** ☐ **Client Spec.**							//			530÷690				
504/18 A TWT	**19.63X24,99**	**490,55**	**21°C**	//	//	/	//	/	**272'333**	**555**	/	//	//	**FOW**



Remarks / *Note:*

* **Prova non accreditata da ACCREDIA**

Legend / *Legenda*

TT = Transverse Tension/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura*

TWT = Transverse Weld Tension/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio* Sig. Davide Ciregia	**Laboratory Responsible** *Responsabile Laboratorio* Sig. Claudio Pettinato	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - 04/12/18 Laboratory Technician	INSPECTA srl 04-12-2018 Via Ravegnana, 379/a 47122 Forlì (FC) P. IVA 03944480403		RINA Services S.p.A. No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 04/12/2018 File Signature Cimatti Davide

TOTAL E&P Danmark A/S
4 DEC 18
☑ Witnessed ☐ Reviewed

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

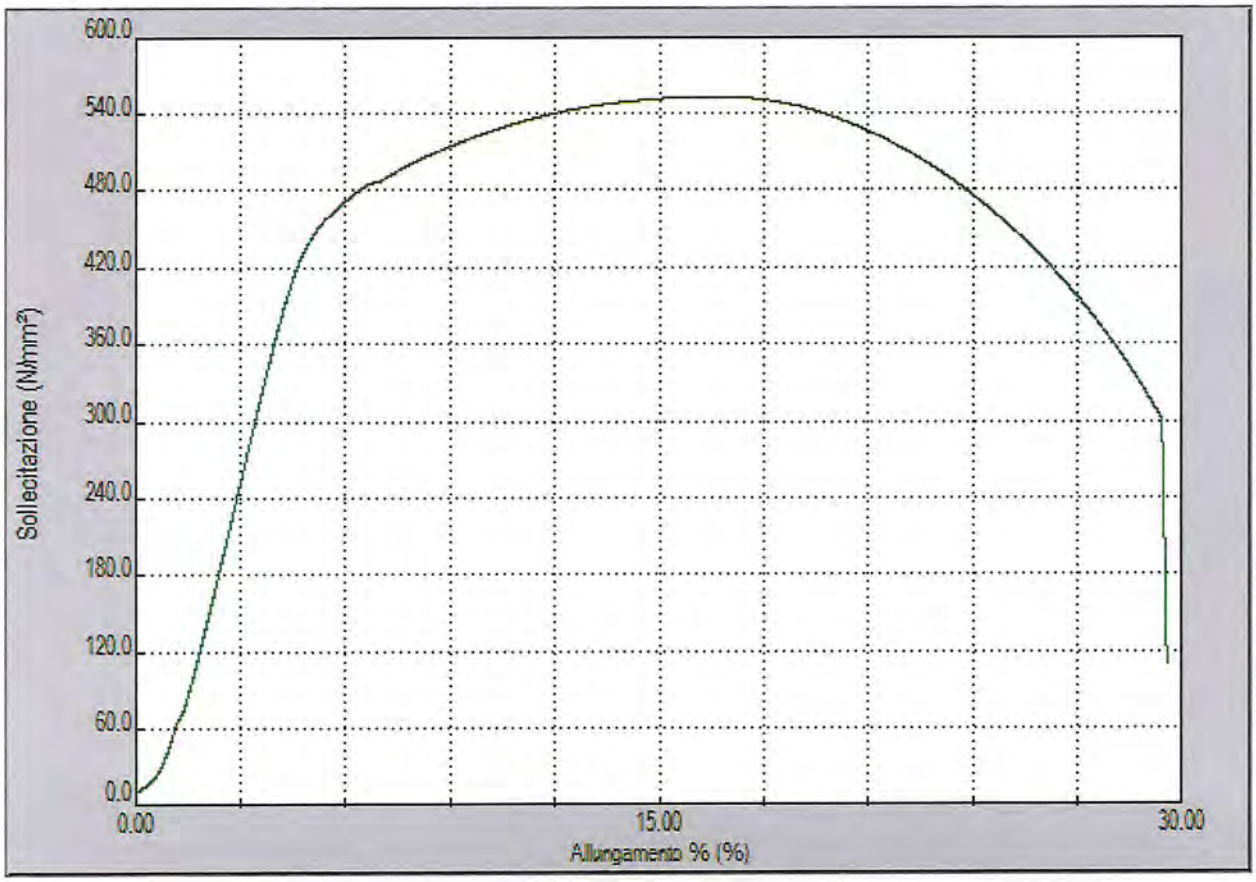
Date of Testing:*04/12/2018*
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-17*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

Internal procedure *Procedura interna :* ***PP08 rev.03***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ **Standards** ☐ **Client Spec.**				//	//	/	//	/	//	530÷690	/	//	//	//
504/18 B TWT	**19,68X24,99**	**491,80**	**21°C**	//	//	/	//	/	**271914**	**553**	/	//	//	**FOW**



Remarks */ Note:*

* **Prova non accreditata da ACCREDIA**

Legend */ Legenda*

TT = Transverse Tension*/Trazione.trasversale;* **FOW = Failure Out of Weld***/Rottura fuori dalla saldatura*

TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;* **FIW = Failure in Weld***/Rottura in saldatura*

Laboratory Technician
Tecnico di Laboratorio
Sig Davide Ciregia
- INSPECTA srl -
04/12/18
Laboratory Technician

Laboratory Responsible
Responsabile Laboratorio
Sig. Claudio Pettinato
04-12-2018

Customer Inspector
Ispettore del cliente
ROSETTI MARINO SpA
D. Sensoni

Third part Inspector
Ispettore terza parte
RINA Services SpA
No. Bo. 0474
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
Date 04/12/18
File
Signature
Cimatti Davide

TOTAL E&P Danmark A/S
DHOGSON
4 DEC 18
☑ Witnessed ☐ Reviewed

BEND TEST
Prova di piega

Date of Testing:*04/12/2018*
Data esecuzione prova:

☒ *UNI EN ISO 5173: 2012* | ☐ *ASME IX QW-160: 2017* | ☐ _____

Serial N. VAUP / 01

Internal procedure *Procedura interna* **:PP11 rev.02**

Specimen id. *Identificazione provino*		Dimension *Dimensioni (mm)*	Test Temp. *Temp.test °C*	Bend Angle *Angolo di piega*	Ø Former *Ø Mandrino (mm)*	Distance between rollers *Distanza appoggi (mm)*	Remarks *Note*
504/18 SBB	A	20,00x10,00	21°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone
504/18 SBB	B	20,00x10,00	21°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone
504/18 SBB	C	20,00x10,00	21°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone
504/18 SBB	D	20,00x10,00	21°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone

Remarks *Note:* *//*

*** Prova non accreditata da ACCREDIA**

Legend *Legenda*

SBB. = Transverse Side Bend/*Piega Trasversale laterale*
TRB. = Transverse Root Bend/*Piega Trasversale al rovescio*
TFB. = Transverse Face Bend/*Piega Trasversale al dritto*
LRB = Longitudinal Root Bend / *Piega Longitudinale al rovescio*
LFB. = Longitudinal Face Bend / *Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Sig Davide Ciregia	*Sig. Claudio Pettinato*		RINA Services SpA No. Bo. 0474
- INSPECTA srl - Laboratory Technician 04/12/18	INSPECTA srl 04-12-2018 Via Ravegnana, 379/a 47122 Forlì (FC)	ROSETTI MARINO SpA	Date 04/12/2018
			Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐
			File
			Signature Cimatti Davide

TOTAL E&P Danmark A/S D Hogsson Dhog 14 DEC 18 ☑ Witnessed ☐ Reviewed

IMPACT TEST
Prova di resilienza

Date of Testing:*04/12/2018*
Data esecuzione prova:

☐ *UNI EN ISO 148-1: 2016* | ☒ *UNI EN ISO 9016: 2012* | ☐ *ASTM E23: 16b* | ☐ *ASME IX QW-170: 2017* | ☐ *ASTM A923-14 Method B* | *Serial N. VAUP / 02*

Internal procedure *Procedura interna* : ***PP09 rev.04***

Specimen id. *Identificazione provino*	**Direction** *Direzione*	**Dimension** *Dimensioni (mm)*	**Test Temp.** *Temp .test*	**Notch Type** *Intaglio*	**Knife /** *coltello*	**Requirement** / Requisiti: **Energy absorbed/ / Energia assorbita** — **Individual** *Individuale Joule ≥35J*			**Average** *Media Joule ≥50J*	**U**	**Lateral Expansion** *Espansione laterale (mm)*			**Shear Area** *Area fragile %*			**Remarks** *Note*
						1	2	3			1	2	3	1	2	3	
504/18 VWT 0/2	**T**	**10x10x55**	**-40°C**	**V**	**2**	**96**	**126**	**149**	**124**	//	//	//	//	//	//	//	**CAP**
504/18 VHT 0/2	**T**	**10x10x55**	**-40°C**	**V**	**2**	**65**	**83**	**40**	**63**	//	//	//	//	//	//	//	**CAP**
504/18 VHT 1/2	**T**	**10x10x55**	**-40°C**	**V**	**2**	**315**	**351**	**341**	**336**	//	//	//	//	//	//	//	**CAP**
504/18 VHT 2/2	**T**	**10x10x55**	**-40°C**	**V**	**2**	**322**	**319**	**301**	**314**	//	//	//	//	//	//	//	**CAP**
504/18 VHT 5/2	**T**	**10x10x55**	**-40°C**	**V**	**2**	**284**	**295**	**284**	**288**	//	//	//	//	//	//	//	**CAP**

Remarks *Note:*

*** Prova non accreditata da ACCREDIA**

Legend *Legenda*

L= Longitudinal / Longitudinale
T= Trasversal / Trasversale
VWT 0/2 = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
VHT 0/2 = Impact Test on Fusion Line / *Resilienza Trasversale in linea di fusione*
VHT 1/2 = Impact Test at 1mm from Fusion Line / *Resilienza trasversale a 1 mm dalla linea di fusione*
VHT 2/2 = Impact Test at 2 mm from Fusion Line / *Resilienza trasversale a 2 mm dalla linea di fusione*
VHT 5/2 = Impact Test at 5 mm from Fusion Line / *Resilienza trasversale a 5 mm dalla linea di fusione*
WM = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
HAZ = Impact Test on Heat Affected Zone / *Resilienza Trasversale in zona termicamente alterata*
BM = Impact Test on Base Metal / *Resilienza Trasversale in materiale base*

FL = Fusion Line/ *Linea di fusione*
FL+1 = Fusion Line + 1mm/ *Linea di fusione+1mm*
FL+2 = Fusion Line + 2mm/ *Linea di fusione+2mm*
FL +5= Fusion Line + 5mm/ *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig Matteo Galdieri	*Sig. Claudio Pettinato*		RINA Services SpA No. Bo. 0474
INSPECTA srl 04/12/18 Laboratory Technician	INSPECTA srl 04-12-2018 Via Ravegnana, 379/a	ROSETTI MARINO S.r.l.	Date 04/12/2018
			File
			Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐
			Signature Cimatti Davide

TOTAL E&P Danmark A/S
D Hodgson
4 DEC 18
☐ Witnessed ☐ Reviewed

VICKERS HARDNESS TEST METHOD

Prova di durezza Vickers

Date of Testing: *04/12/2018*
Data esecuzione prova:

☒ *UNI EN ISO 6507-1: 2018* | ☒ *UNI EN ISO 9015-1: 2011* | ☐ *ASTM E 92-17* | ☐ _____

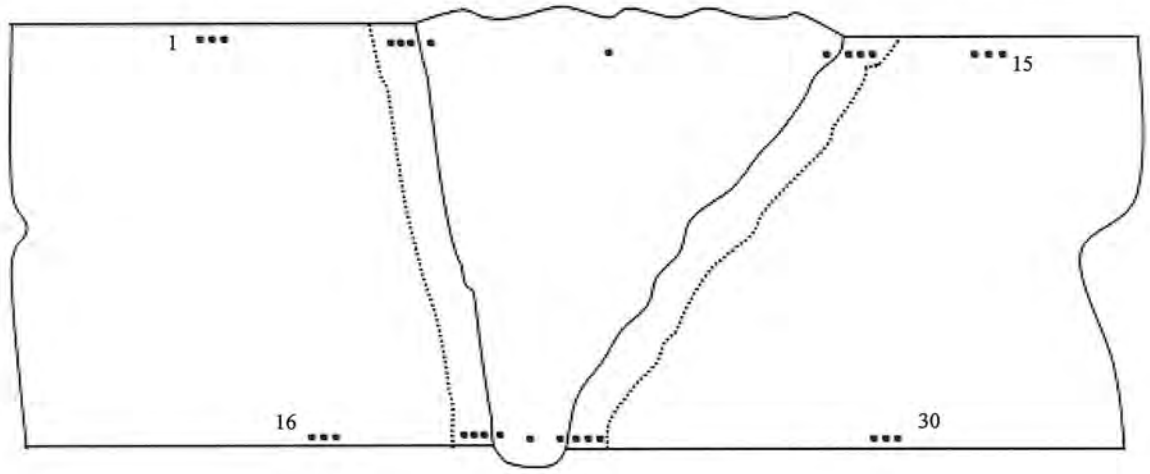
Serial N. 43030614C

Internal procedure *Procedura interna*	PP10 rev.02	**Sample Identification** *Identificazione provino*	504/18	**Hardness test type** *Tipo di durezza*	≤325 HV 10	**Test Temp.** *Temp.test*	21°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: **Base Material Side B:**

BM	HAZ	WM	HAZ	BM
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30



Reference points *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U
1 – 2 - 3	**172-173-177**	//	16 – 17 - 18	**191-196-191**	//	31 – 32 - 33	//	//
4 - 5 - 6	**232-238-238**	//	19 - 20 - 21	**208-225-227**	//	34 - 35 - 36	//	//
7 – 8 - 9	**216-208-217**	//	22 – 23 - 24	**229-224-215**	//	37 – 38 - 39	//	//
10 - 11 - 12	**243-243-235**	//	25 - 26 - 27	**211-211-205**	//	40 - 41 - 42	//	//
13 – 14 - 15	**185-184-181**	//	28 – 29 - 30	**196-198-197**	//	43 – 44 - 45	//	//

Remarks/ *Note:* //
*** Prova non accreditata da ACCREDIA**

Laboratory Technician
Tecnico di Laboratorio
Sig Matteo Galdieri
INSPECTA srl 04/12/18
Laboratory Technician

Laboratory Responsible
Responsabile Laboratorio
Sig. Claudio Pettinato
INSPECTA srl 06-12-2018 Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403

Customer Inspector
Ispettore del cliente
ROSETTI MARINO SpA

Third part Inspector
Ispettore parte terza
RINA Services SpA Date 06/12/18
No. Bo. 0474
Noted ☐
Reviewed ☐
Witnessed ☒
Approved ☐
File _____
Signature
Cimatti Davide

TOTAL E&P Danmark A/S
Witnessed ☐ Reviewed ☐

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing: *04/12/2018*
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

Internal procedure *PP12 rev.00* *Procedura internal*		**Test temperatura** *Temperature Test*	**21°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**504/18**	**Magnification:** *Ingrandimento:*	**Photo at 2.8X** **Examination at 10X**
Designation: *Designazione:*	**ISO 17639-A-E-2.1-2.1/2.1/2.1 NITAL**		



Remarks / *Note:*	// *** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio* *Sig Matteo Galdieri*	**Laboratory Responsible** *Responsabile Laboratorio* *Sig. Claudio Pettinato*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
• INSPECTA srl • 04/12/18 Laboratory Technician	INSPECTA srl 04-12-2018 Via Ravegnana, 379/a 47122 Forlì (FC) P. IVA 03944480403	ROSETTI MARINO SpA Welding Technology E. Cattacchi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ Date 04/12/2018 File Signature Cimarti Davide

TOTAL E&P Denmark A/S
DHODGSON
Date 14 DEC 18
☑ Witnessed ☐ Reviewed

Object: *Oggetto:*	**MECHANICAL TEST ON PQR 42/2018**		Pag. 1 di 7
Specimen: *Saggio:* **505/18**	**Base Material:** *Materiale Base:* **Plate 20,00 mm**	**ISO EN 10225 S460 G2+M**	
Customer: ROSETTI MARINO SPA *Committente:* **Address: Via Trieste, 230 - 48122 Ravenna (RA)** *Indirizzo:*		**Witnessed by:** *Presenziato da:*	**ROSETTI S.p.A.** **RINA SERVICES S.p.A** **TOTAL S.p.A.**
Final customer:. *Cliente finale:*	**N.A.**		
Reference Yours bill of landing: *Vs. DDT di consegn*	**n°** // *n°* //	**Date:** *Data:* //	**MD52** *MD 52* **131/18** **Date:** *Data:* **15/11/2018**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **04/12/2018**	**End of activities:** *Fine prove:*	**Date:** *Data:* **04/12/2018**

PROVE RICHIESTE

☒ **TENSILE TEST/***Trazione*	☒ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*	
☒ **BEND TEST/***Piega*	☒ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root */Dritto/Rovescio* ☒ Side/ *Laterale*	
☒ **IMPACT TEST/***Resilienza*	☒ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*	
☒ **MACROEXAMINATION TEST /** *Macrografia*			
☒ **HARDNESS TEST/** *Durezza*	☐ HV 5	☒ HV 10	
☐ **FRACTURE TEST/** *Frattura*	☐ Plate on Plate/ *Piastra su Piastra*	☐ Pipe on Plate/*Tubo su Piastra*	
☐ **CHEMICAL ANALYSIS/***Analisi Chimica*			
☐ **MICROEXAMINATION TEST /** *Micrografia*			
☐ **OTHER (Specify)/***Altro/(Specificare)*			

Allegati /Attachments: NONE

NOTE/ Remarks:

REFERENCE CODE FROM CUSTOMER REQUEST:MOG-FP-MET-STD-0012 Rev.04 + UNI EN ISO 15614-1:2017

WELDING POSITION: PH
JOB ROSETTI 118A10

*** Prova non accreditata da ACCREDIA**

Laboratory Responsible *Responsabile Laboratorio* *Sig. Claudio Pettinato*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
04-12-2018	ROSETTI MARINO S.p.A.	RINA Services SpA No. Bo. 0474 — 04/12/2018
		Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ — File — Signature — Cimatti Davide

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova.. Il committente si impegna a riprodurre integralmente il rapporto di prova E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I campionamenti sono eseguiti dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%
The results in this test report refers only to the specimen that has been tested.The customer undertakes to print out /reproduce the test report. Any partial reproduction is prohibited.Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory.Sampling shall be performed by the custode.Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku = 2 equivalent to a level of confidence of 95 % .

TOTAL E&P Danmark A/S D Hansson Dilo 4 DEC 18 ☑ Witnessed ☐ Reviewed

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

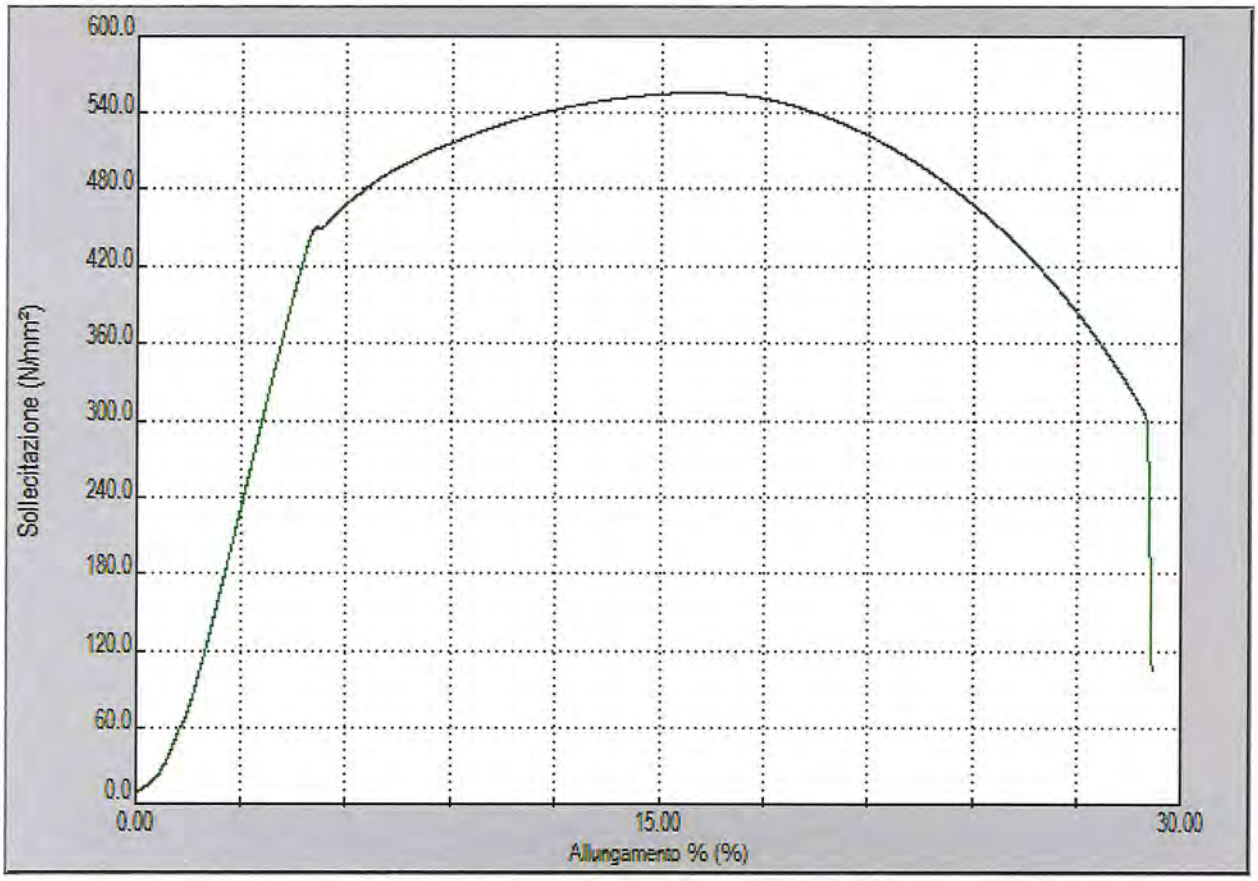
Date of Testing:*04/12/2018*
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-17*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

Internal procedure *Procedura interna :* ***PP08 rev.03***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ **Standards** ☐ **Client Spec.**				//	//	/	//	/	//	530÷690	/	//	//	//
505/18 A TWT	**19,69X24,99**	**492,05**	**21°C**	//	//	/	//	/	**273˙228**	**555**	/	//	//	**FOW**



Remarks */ Note:*

*** Prova non accreditata da ACCREDIA**

Legend */ Legenda*

TT = Transverse Tension/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura*

TWT = Transverse Weld Tension/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore di Terza parte*
Sig. Davide Diregia - INSPECTA srl - 04/12/18 *Laboratory Technician*	*Sig. Claudio Pattinatori* 04-12-2018 Via Ravegnana, 379/a 47122 Forlì (FC) P. IVA 03944480403	ROCCHETTA MARINO S.p.A. Welding Dept. D. Cenacchi	RINA Services S.p.A. No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ Date 04/12/2018 File _____ Signature Cimatti Davide

TOTAL E&P Danmark A/S D Hoggan Date 4 DEC 18 ☒ Witnessed ☐ Reviewed

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

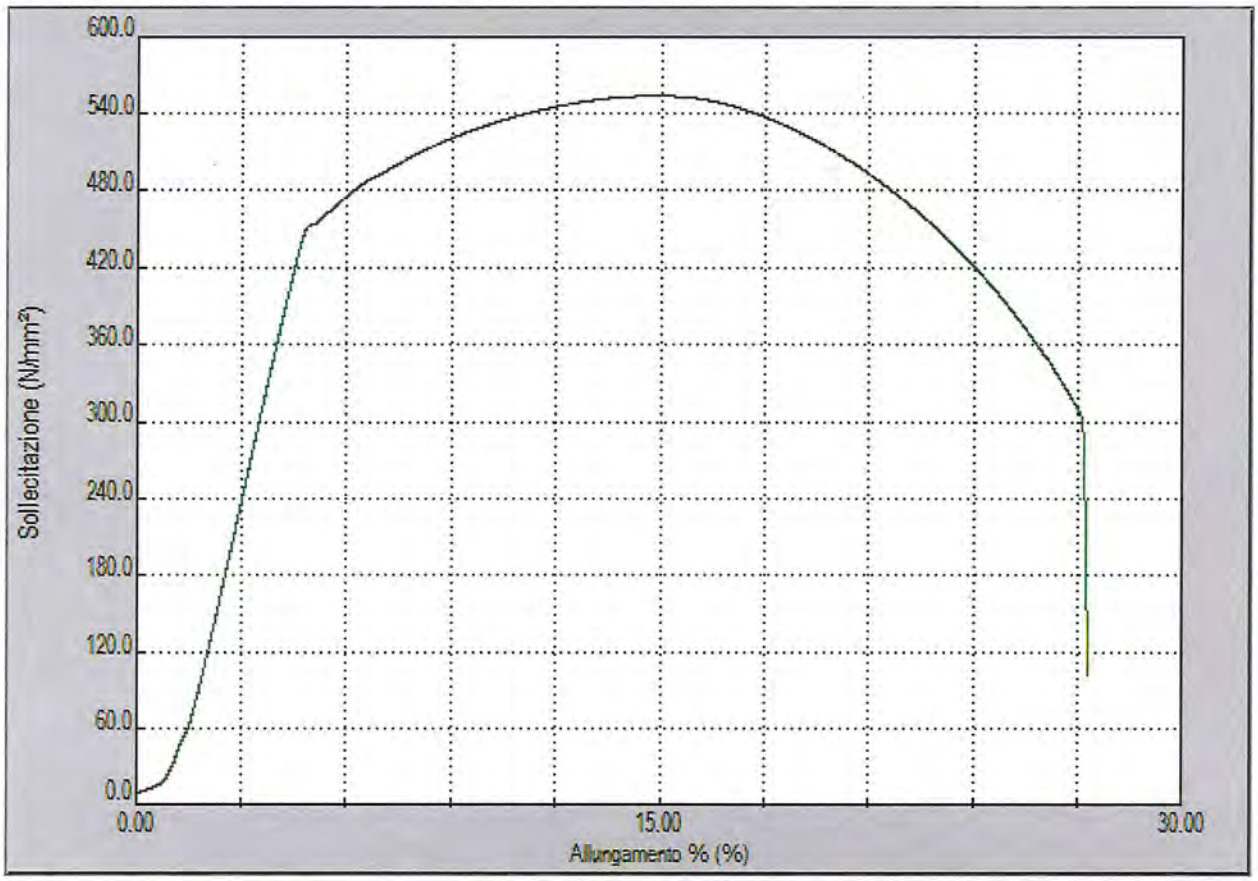
Date of Testing: *04/12/2018*
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-17*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

Internal procedure *Procedura interna :* ***PP08 rev.03***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ **Standards** ☐ **Client Spec.**				//	//	/	//	/	//	530÷690	/	//	//	//
505/18 B TWT	**19,55X24,98**	**488,36**	**21°C**	//	//	/	//	/	**270˙345**	**554**	/	//	//	**FOW**



Remarks */ Note:*

*** Prova non accreditata da ACCREDIA**

Legend */ Legenda*

TT = Transverse Tension/*Trazione.trasversale;* **FOW = Failure Out of Weld**/*Rottura fuori dalla saldatura*

TWT = Transverse Weld Tension/*Trazione.trasversale saldatura;* **FIW = Failure in Weld**/*Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig.Davide Ciregia	Sig.Claudio Pettinato	ROSETTI MARINO SpA D. Cenacchi	RINA Services S.p.A. No. Bo. 0474
04/12/18	04-12-2018		Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐
			Date 04/12/2018 File _____ Signature Ciregia Davide

TOTAL E&P Denmark A/S
4 DEC 18
☒ Witnessed ☐ Reviewed

BEND TEST
Prova di piega

Date of Testing:*04/12/2018*
Data esecuzione prova:

☒ *UNI EN ISO 5173: 2012* ☐ *ASME IX QW-160: 2017* ☐ _____

Serial N. VAUP / 01

Internal procedure *Procedura interna* : ***PP11 rev.02***

Specimen id. *Identificazione provino*		**Dimension** *Dimensioni (mm)*	**Test Temp.** *Temp.test °C*	**Bend Angle** *Angolo di piega*	**Ø Former** *Ø Mandrino (mm)*	**Distance between rollers** *Distanza appoggi (mm)*	**Remarks** *Note*
505/18 SBB	A	20,00x10,00	21°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone
505/18 SBB	B	20,00x10,00	21°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone
505/18 SBB	C	20,00x10,00	21°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone
505/18 SBB	D	20,00x10,00	21°C	180°	40	70	No open discontinuities have been found in weld metal and heat affected zone

Remarks *Note:*	//
	*** Prova non accreditata da ACCREDIA**

Legend *Legenda*

SBB. = Transverse Side Bend/*Piega Trasversale laterale*
TRB. = Transverse Root Bend/*Piega Trasversale al rovescio*
TFB. = Transverse Face Bend/*Piega Trasversale al dritto*
LRB = Longitudinal Root Bend / *Piega Longitudinale al rovescio*
LFB. = Longitudinal Face Bend / *Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig Davide Ciregia	*Sig. Claudio Pettinato*		RINA Services SpA No. Bo. 0474 Date 04/12/2018
- INSPECTA srl - 04/12/18 Laboratory Technician	INSPECTA srl 04-12-2018 Via Ravegnana, 379/a 47122 Forlì (FC)	ROSETTI MARINO SpA	Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File _____ Signature Cimatti Davide

TOTAL E&P Danmark A/S
4 DEC 18
☐ Witnessed ☐ Reviewed

IMPACT TEST
Prova di resilienza

Date of Testing:*04/12/2018*
Data esecuzione prova:

☐ *UNI EN ISO 148-1: 2016* | ☒ *UNI EN ISO 9016: 2012* | ☐ *ASTM E23: 16b* | ☐ *ASME IX QW-170: 2017* | ☐ *ASTM A923-14 Method B* | *Serial N. VAUP / 02*

Internal procedure *Procedura interna* :***PP09 rev.04***

Specimen id. *Identificazione provino*	**Direction** *Direzione*	**Dimension** *Dimensioni (mm)*	**Test Temp.** *Temp .test*	**Notch Type** *Intaglio*	**Knife / coltello**	**Requirement / Requisiti**											**Remarks** *Note*
						Energy absorbed/ / Energia assorbita											
						Individual *Individuale Joule ≥35J*			**Average** *Media Joule ≥50J*	**U**	**Lateral Expansion** *Espansione laterale (mm)*			**Shear Area** *Area fragile %*			
						1	2	3			1	2	3	1	2	3	
505/18 VWT 0/2	**T**	**10x10x55**	**-40°C**	**V**	**2**	**72**	**60**	**69**	**67**	//	//	//	//	//	//	//	**CAP**
505/18 VHT 0/2	**T**	**10x10x55**	**-40°C**	**V**	**2**	**49**	**173**	**83**	**102**	//	//	//	//	//	//	//	**CAP**
505/18 VHT 1/2	**T**	**10x10x55**	**-40°C**	**V**	**2**	**201**	**292**	**311**	**268**	//	//	//	//	//	//	//	**CAP**
505/18 VHT 2/2	**T**	**10x10x55**	**-40°C**	**V**	**2**	**261**	**299**	**288**	**283**	//	//	//	//	//	//	//	**CAP**
505/18 VHT 5/2	**T**	**10x10x55**	**-40°C**	**V**	**2**	**292**	**269**	**289**	**283**	//	//	//	//	//	//	//	**CAP**

Remarks *Note:*

*** Prova non accreditata da ACCREDIA**

Legend *Legenda*

L= Longitudinal / Longitudinale
T= Trasversal / Trasversale
VWT 0/2 = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
VHT 0/2 = Impact Test on Fusion Line */ Resilienza Trasversale in linea di fusione*
VHT 1/2 = Impact Test at 1mm from Fusion Line */ Resilienza trasversale a 1 mm dalla linea di fusione*
VHT 2/2 = Impact Test at 2 mm from Fusion Line */ Resilienza trasversale a 2 mm dalla linea di fusione*
VHT 5/2 = Impact Test at 5 mm from Fusion Line */ Resilienza trasversale a 5 mm dalla linea di fusione*
WM = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
HAZ = Impact Test on Heat Affected Zone */ Resilienza Trasversale in zona termicamente alterata*
BM = Impact Test on Base Metal */ Resilienza Trasversale in materiale base*

FL = Fusion Line/ *Linea di fusione*
FL+1 = Fusion Line + 1mm/ *Linea di fusione+1mm*
FL+2 = Fusion Line + 2mm/ *Linea di fusione+2mm*
FL +5= Fusion Line + 5mm/ *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig Matteo Galdieri	*Sig. Claudio Pettinato*	ROSETTI MARINO SpA	RINA Services SpA No. Bo. 0474 Date 04/12/2018
- INSPECTA srl - 04/12/18 Laboratory Technician	INSPECTA srl 04-12-2018		Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Cimatti Davide

TOTAL E&P Danmark A/S D Hodgson Diver 4 DEC 18 ☑ Witnessed ☐ Reviewed

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing: *04/12/2018*
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* ☒ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

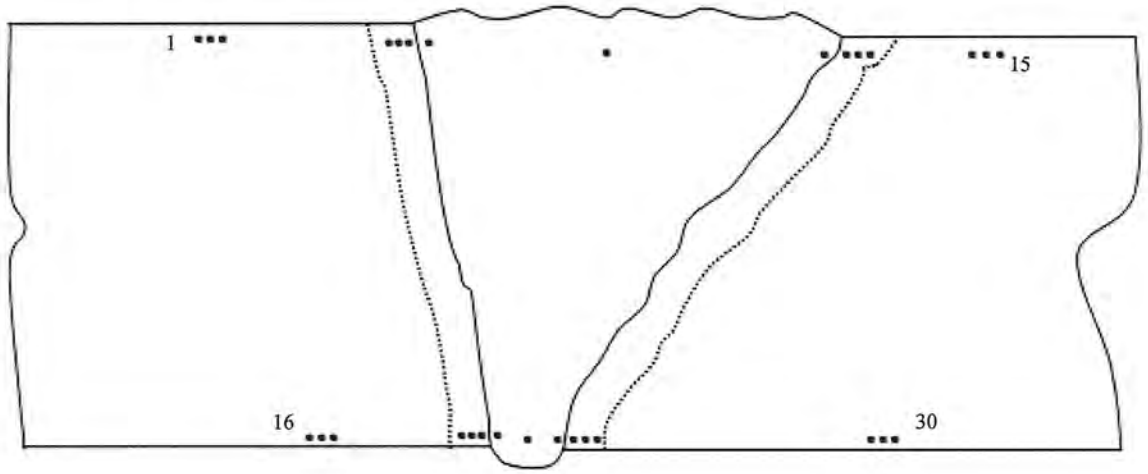
Serial N. 43030614C

Internal procedure *Procedura interna*	PP10 rev.02	**Sample Identification** *Identificazione provino*	505/18	**Hardness test type** *Tipo di durezza*	≤325 HV 10	**Test Temp.** *Temp.test*	21°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: **Base Material Side B:**

BM	HAZ	WM	HAZ	BM
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30



Reference points *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U
1 – 2 - 3	**196-192-192**	//	16 – 17 - 18	**186-180-175**	//	31 – 32 - 33	//	//
4 - 5 - 6	**197-205-219**	//	19 - 20 - 21	**186-186-181**	//	34 - 35 - 36	//	//
7 – 8 - 9	**232-220-236**	//	22 – 23 - 24	**198-207-206**	//	37 – 38 - 39	//	//
10 - 11 - 12	**232-228-211**	//	25 - 26 - 27	**207-206-202**	//	40 - 41 - 42	//	//
13 – 14 - 15	**188-186-184**	//	28 – 29 - 30	**191-196-197**	//	43 – 44 - 45	//	//

Remarks/ *Note:* //
*** Prova non accreditata da ACCREDIA**

Laboratory Technician
Tecnico di Laboratorio
Sig Matteo Galdieri
- INSPECTA srl -
04/12/18
Laboratory Technician

Laboratory Responsible
Responsabile Laboratorio
Sig. Claudio Pettinato
04-12-2018

Customer Inspector
Ispettore del cliente

Third part Inspector
Ispettore Terza parte 04/12/2018

RINA Services S.p.A.
No. Bo. 0474
Noted ☐
Reviewed ☐
Witnessed ☒
Approved ☐
File
Signature
Cimatti Davide

TOTAL E&P Danmark A/S
4 DEC 18
☑ Witnessed ☐ Reviewed

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing:*04/12/2018*
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

Internal procedure *PP12 rev.00* *Procedura internal*		**Test temperatura** *Temperature Test*	**21°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**505/18**	**Magnification:** *Ingrandimento:*	**Photo at 2.9X** **Examination at 10X**
Designation: *Designazione:*	**ISO 17639-A-E-2.1-2.1/2.1/2.1 NITAL**		



Remarks / *Note:*	// *** Prova non accreditata da ACCREDIA**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio *Sig Matteo Galdieri* - INSPECTA srl - 04/12/18 *Laboratory Technician*	*Responsabile Laboratorio* *Sig. Claudio Pettinato* INSPECTA srl 04-12-2018 Via Ravegnana, 379/a P. IVA 03944480403	*Ispettore del cliente* ROSETTI MARINI SpA Welding Dept. P. Cenacchi	*Ispettore Terza parte* RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ Date 04/12/2018 File Signature Cinatti Davide

TOTAL E&P Danmark A/S
Witnessed ☐ Reviewed
4 DEC 18

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 45/18	Sheet/Foglio 1/3

Manufacturer's Welding Procedure. Ref. no.	45/18 REV. 0		
Manufacturer	ROSETTI MARINO S.p.A.		
Address	VIA TRIESTE 230 - 48121 RAVENNA		
Code, Testing Standard	MAERSK OIL Specification MOG-FP-MET-STD-0012 Rev. 4.0; EN ISO 15614-1:2017 Lev. 2		
	Location of test specimen according to EN ISO 15614-1:2017 Section 7.2, Fig. 5 Essential variables according to EN ISO 15614-1:2017, Chapter 8 and MAERSK OIL Specification MOG-FP-MET-STD-0012 Rev. 4.0 par. 6.4		
Date of welding	Start: November 16th , 2018 Complete: November 16th, 2018		
Examiner of examining body	Rina Services S.p.A.		
RANGE OF QUALIFICATION			
Welding process	111 - SMAW	136 - FCAW	
Type(s)	Manual	Semiautomatic	
Welding Equipment Type	HF inverter type		
Actual parent Material side A	Pipe: API 5L Gr. X65Q (L450) (Heat: 115705)		
Actual parent Material side B	Plate: EN 10225: S460G2+M Z35 (Heat: 882852)		
Parent Material grade	Carbon steel with maximum strength of 535 MPa (Pipe); Carbon steel with maximum strength of 530 MPa (Plate)		
Supply condition	Quenched and tempered (Pipe); Thermomechanical rolled and accelerated cooled (Plate)		
Carbon equivalent/Pcm/C	Max:0,40/0,24 (Heat Values: 0,37/0,22/ C for information only: 0,14) (Pipe) Max:0,44/0,19 (Heat Values: 0,41/0,17/ C for information only: 0,052) (Plate)		
Groove design/configuration	T-K-Y Butt Joint, for groove dimension and details see page 4 of 5		
Parent material thickness (mm)	21,95 mm (Pipe) ; 25 mm (Plate)		
Weld metal thickness (mm)	111 - SMAW 5 mm	136 - FCAW 16,95 mm	
Single or Multi-pass	111 - SMAW MULTIPLE	136 - FCAW MULTIPLE	
Outside diameter	84,15 mm and over		
Filler material Designation	**111 SMAW** EN ISO 2560-A: E50 6 Mn1Ni B12 H5 (AWS 5.5: E8016-G) **136 FCAW** EN ISO 17632-A: T 46 4 1Ni P M 21 2 H5 (AWS 5.36: E81T1-M21A4-Ni1)		
Filler material Maker	111 - Esab FILARC 88S	136 - Esab ESAB OK TUBROD 15.17	
Filler material Size	111 - SMAW ∅ 3,2 mm 136 - FCAW ∅ 1,2 mm		
Shielding gas/Flux	ISO 14175 :2008 M21 (80% Ar + 20% CO_2) for FCAW		
Shielding gas flow rate	20 l/min.		
Backing gas (purging)	None		

Type of welding current & polarity	DC - RP	Heat input / Apporto termico (kJ/mm) ± 25%		Diameter	2G	5G
			Pass	Mm		
			Root (SMAW)	∅ 3,2	1,24 to 2,08	1,55 to 2,58
			Hot (SMAW)	∅ 3,2	0,86 to 1,43	1,53 to 2,55
			Filll (FCAW)	∅ 1,2	0,81 to 1,35	1,08 to 1,80
			Cap (FCAW)	∅ 1,2	0,67 to 1,11	0,94 to 1,56

Welding position	All, vertical down progression excluded		
Preheat (°C)	50	Interpass temperature / Temp. di interpass (°C)	250
Post-Weld Heat Treatment and/or ageing	NONE		
Weld bead width	12 mm for 2G position , 15 mm for 3G position		
Welder's detail	Siringo Massimo AX82 (2G Test Coupon) Giulianini Dario AX21 (5G Test Coupon)		
Time lapse between root and hot pass	N.A.		
Other information / Altre informazioni	- Preheat performed by propane torch -Accelerate weld cooling not permitted; -Base material origin: pipe and plate		

Manufacturer's Welding Procedure. Ref. no.	45/18 REV. 0		
Test result (WPQR) N°	45/18	Date/Data	04/12/2018
Manufacturer's WPS No.	pWPS 45/18 REV. 3	Date/Data	15/11/2018

TESTS CARRIED OUT ON SAMPLE 45/18 WELDED IN 2G POSITION (PC)

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 45/18 2G
Penetrant test	N.A.	/
Magnetic particle test	Acceptable	12-18205
Radiographic test	N.A.	/
Ultrasonic test	Acceptable	12-18205

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2]	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2]	A [%]	Z [%]	Fracture Location	Remarks
	/		≥ 535	/	/	/	/

BEND TEST

Type & N.	Bend angle	Remarks	Results

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J]			Avarage value [J]	Remarks

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
1 Macro examination+Hardness test	Satisfactory-See Inspecta Certificate No. 0413-00850-18
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Inspecta S.r.l. - Ravenna
Laboratory report reference N.	Report No. 0413-00850-18 dated DECEMBER 4th 2018
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of MOG-FP-MET-STD-0012 Rev. 4.0 Specification; EN ISO 15614-1:2017 Lev. 2

Date/Data	Examiner or Examination Body
04-12-2018	RINA Services S.p.A.
ROSETTI MARINO S.p.A.	Name and signature / Nome e firma

ROSETTI MARINO SpA Welding Dept

RINA Services S.p.A.

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 45/18	Sheet/Foglio 3/3

Test result (WPQR) N°	45/18	Date/Data	04/12/2018
Manufacturer's WPS No.	pWPS 45/18 REV. 3	Date/Data	15/11/2018

TESTS CARRIED OUT ON SAMPLE 45/18 WELDED IN 5G POSITION (PH)

NON DESTRUCTIVE EXAMINATIONS

	Judgemen	Report No.
Visual examinations	Acceptable	VDR 45/18 5G
Penetrant test	N.A.	/
Magnetic particle test	Acceptable	12-18205
Radiographic test	N.A.	/
Ultrasonic test	Acceptable	12-18205

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2]	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2]	A [%]	Z [%]	Fracture Location	Remarks

BEND TEST

Type & N.	Bend angle	Remarks	Results

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J]			Avarage value [J]	Remarks

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
1 Macro examination+Hardness test	Satisfactory-See Inspecta Certificate No. 0413-00850-18
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Inspecta S.r.l. - Ravenna
Laboratory report reference N.	Report No. 0413-00850-18 dated DECEMBER 4th 2018
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of MOG-FP-MET-STD-0012 Rev. 4.0 Specification; EN ISO 15614-1:2017 Lev. 2

Date/Data	Examiner or Examination Body
04.12.2018	RINA Services S.p.A.
ROSETTI MARINO S.p.A.	Name and signature / Nome e firma

TOTAL | ROSETTI MARINO

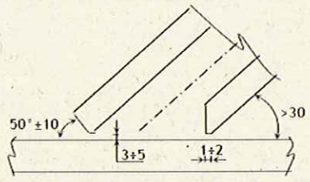
PQR - AS- RUN PARAMETER SHEET

pWPS 45/18			
PQR 45/18			
Coupon Nr. 45/18 PC			
Date:	16/11/2018	Page:	1_ of _1

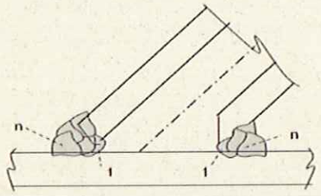
REFERENCE CODE AND PROJECT SPECIFICATIONS: **EN 15614-1 Ed.2017+MOTS 12 Rev. 4.0**

Welder Name(s):	SIRINGO MASSIMO	Welder Id No(s):	AX 82		
Welding Process(es):	111-SMAW; 136-FCAW	Type(s):	MANUAL; SEMIAUTOMATIC		
Welding Position:	2G (PC)	Progression:	N.A.		
Base Materials:	API 5L Gr. X65 (L450) to EN 10225: S460 G2+M (*)	Wall Thickness:	21,9 to 25	Diameter:	168,3 to 600
Heat No(s):	115705 & 882852	Joint Type:	1/2V		

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	3,2	SBR41145	FILARC 88S
Hot Pass	3,2	SBR41145	FILARC 88S
Filling Runs	1,2	PNS24006	OK TUBROD 15.17
Filling Runs	1,2	PNS24006	OK TUBROD 15.17
Cap	1,2	PNS24006	OK TUBROD 15.17

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar+ 20%CO2
Flow:	20 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/8"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
15 mm	String and weave		Multiple (each process)	Single (each process)

Preheat °C :	Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required		Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
50°C	PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER	NA		NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
NA	1	SMAW	1	-	E8016-G E50 6 Mn1Ni B12 H5	3,2	DC EP	115	125	120,0	22	24	23,0	-	-	8,0	1,66	0,80	50	Welding unit: AXO 509
NA	2	SMAW	2	-	E8016-G E50 6 Mn1Ni B12 H5	3,2	DCEP	110	120	115,0	22	24	23,0	-	-	11,0	1,15	0,80	80	Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635
NA	3	FCAW	3	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	230	250	240,0	26	28	27,0	-	-	29,0	1,07	0,80	90	Cap passes from 10th to 13h
NA	3	FCAW	4	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	230	250	240,0	26	28	27,0	-	-	28,0	1,11	0,80	120	Heat input mean value for fill: 1,08
NA	4	FCAW	5	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	240	260	250,0	26	28	27,0	-	-	28,0	1,16	0,80	110	Heat input mean value for cap: 0,89
NA	4	FCAW	6	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	240	260	250,0	26	28	27,0	-	-	29,0	1,12	0,80	135	(*) Formed to diameter 600
NA	4	FCAW	7	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	240	260	250,0	26	28	27,0	-	-	30,0	1,08	0,80	160	
NA	5	FCAW	8	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	240	260	250,0	26	28	27,0	-	-	32,0	1,01	0,80	180	
NA	5	FCAW	9	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	240	260	250,0	26	28	27,0	-	-	31,0	1,05	0,80	200	
NA	5	FCAW	10	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	240	260	250,0	26	28	27,0	-	-	30,0	1,08	0,80	220	
NA	5	FCAW	11	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	240	260	250,0	26	28	27,0	-	-	30,0	1,08	0,80	250	
NA	6	FCAW	12	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	230	250	240,0	24	27	25,5	-	-	32,0	0,92	0,80	180	
NA	6	FCAW	13	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	230	250	240,0	24	27	25,5	-	-	33,0	0,89	0,80	200	
NA	6	FCAW	14	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	230	250	240,0	24	27	25,5	-	-	33,0	0,89	0,80	200	
NA	6	FCAW	15	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	230	250	240,0	24	27	25,5	-	-	32,0	0,92	0,80	210	
NA	6	FCAW	16	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	230	250	240,0	24	27	25,5	-	-	36,0	0,82	0,80	200	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA Welding Dept. D. Cenacchi	Signature:	Signature:	Signature:
Date: 16/11/18	Date:	RINA Services SpA No. Re. 0471 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 16/11/2018 File Signature Cinalli Davide	Date:

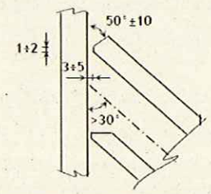
PQR - AS- RUN PARAMETER SHEET

pWPS 45/18			
PQR 45/18			
Coupon Nr. 45/18 PH			
Date:	16/11/2018	Page:	1_ of _1

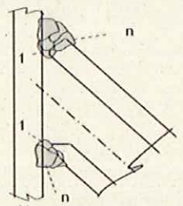
REFERENCE CODE AND PROJECT SPECIFICATIONS: **EN 15614-1 Ed.2017+MOTS 12 Rev. 4.0**

Welder Name(s):	GIULIANINI DARIO	Welder Id No(s):	AX 21		
Welding Process(es):	111-SMAW; 136-FCAW	Type(s):	MANUAL; SEMIAUTOMATIC		
Welding Position:	PH (5G UP)	Progression:	N.A.		
Base Materials:	API 5L Gr. X65 (L450) to EN 10225: S460 G2+M (*)	Wall Thickness:	21,9 to 25	Diameter:	168,3 to 600
Heat No(s):	115705 & 882852	Joint Type:	1/2V		

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	3,2	SBR41145	FILARC 88S
Hot Pass	3,2	SBR41145	FILARC 88S
Filling Runs	1,2	PNS24006	OK TUBROD 15.17
Filling Runs	1,2	PNS24006	OK TUBROD 15.17
Cap	1,2	PNS24006	OK TUBROD 15.17

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar+ 20%CO2
Flow:	20 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/8"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
15 mm	String and weave		Multiple (each process)	Single (each process)

Preheat °C :	Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required		Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
50°C	PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER	NA		NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
NA	1	SMAW	1	-	E8016-G E50 6 Mn1Ni B12 H5	3,2	DC EP	108	116	112,0	22	24	23,0	-	-	6,0	2,06	0,80	50	Welding unit: AXO 509
NA	2	SMAW	2	-	E8016-G E50 6 Mn1Ni B12 H5	3,2	DCEP	110	120	115,0	23	25	24,0	-	-	6,5	2,04	0,80	80	Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635
NA	3	FCAW	3	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	200	220	210,0	23	25	24,0	-	-	14,0	1,73	0,80	90	Cap passes from 9th to 12th
NA	4	FCAW	4	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	204	222	213,0	23	25	24,0	-	-	18,0	1,36	0,80	115	Heat input mean value for fill: 1,44
NA	4	FCAW	5	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	204	222	213,0	23	25	24,0	-	-	17,0	1,44	0,80	140	Heat input mean value for cap: 1,25
NA	5	FCAW	6	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	204	222	213,0	23	25	24,0	-	-	18,0	1,36	0,80	150	(*) Formed to diameter 600
NA	5	FCAW	7	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	205	215	210,0	23	25	24,0	-	-	16,0	1,51	0,80	200	
NA	5	FCAW	8	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	205	215	210,0	23	25	24,0	-	-	20,0	1,21	0,80	250	
NA	6	FCAW	9	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	195	205	200,0	23	25	24,0	-	-	19,0	1,21	0,80	200	
NA	6	FCAW	10	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	195	205	200,0	23	25	24,0	-	-	18,0	1,28	0,80	210	
NA	6	FCAW	11	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	195	205	200,0	23	25	24,0	-	-	18,0	1,28	0,80	200	
NA	6	FCAW	12	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	195	205	200,0	23	25	24,0	-	-	19,0	1,21	0,80	190	

SIGNED BY [redacted] REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY [redacted] THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA Welding Dept D. Cenacchi	Signature:	Signature:	Signature:
Date: 16/11/18	Date:	Noted ☐ Reviewed ☐ Witnessed ☐ Approved ☐ Date 16/11/2018 File Signature Cimatti Davide	Date:

RAPPORTO PROVA DI QUALIFICA DI PROCEDIMENTO DI SALDATURA/BRASATURA

N° PRATICA	N° SAGGIO	NORMA
2018 VE 319 PO	45/18 2G, 45/18 3G	EN ISO 15614-1:2017 Lev.2 and MOTS Spec. 12 Rev. 4.0

Società ROSETTI MARINO SPA Località RAVENNA (RA)

Processo SMAW (111) - FCAW (136) Tipo MANUAL- SEMIAUTOMATIC

Posizione Saldatore/ Brasatore _____ Spessore (mm) _____ Diametro (mm) _____

_____ Stamp _____ WPS/BPS 45/18

_____ _____ _____

Materiale base: Gruppo/i	Norma e designazione / tipo backing	*Materiale d'apporto o flusso:* Nome commerciale	Norma / designazione
_____	_____	_____	_____
_____	_____	_____	_____
Backing _____		_____	_____

Gas al dritto:	*Gas al rovescio:*
Composizione _____ L/min _____ Ø ugello (mm) _____	Composizione _____ L/min _____

Ø Elettrodo Tungsteno (mm) e tipo _____ Temperatura preriscaldo (°C) _____

PWHT (temperatura, tempo e rampe) _____ Temperatura interpass max (°C) _____

Molatura fra le passate _____ Molatura al rovescio _____ Ripresa al rovescio _____

Passate	Processo	Materiale d'apporto Ø [mm]	Corrente [A]	Tensione [V]	Tipo corrente	Velocità [cm/min]

Preparazione giunto e sequenza saldatura
Per processi multipli indicare spessore depositato (mm/processo)

For all details See As Run Sheets attached

Esito esame visivo: ☒ Positivo ☐ Negativo

Prove di qualifica effettuate a: Marina di Ravenna (RA) Data 16/11/2018 Firma _____

Esito prove laboratorio: ☒ Positivo ☐ Negativo Rapporti laboratorio allegati n° e data: INSPECTA certificate nr. 0413-00850-18

A seguito dell'esito positivo delle prove di laboratorio, si propone il rilascio del certificato di qualifica n° ROSETTI FORM PQR 45/18 Data 04/12/2018 Firma _____

Decisione DM– Con riferimento al documento RINA IS-CRT-SAL-01, si autorizza il rilascio dei certificati di qualifica Data _____ Firma DM _____

PQR attachments index:

Base material certificate (Pipe API 5L X65 L450)

Base material certificate (Plate EN 10225: S460G2+M)

Consumables certificate

preliminary WPS

NDE certificate

Mechanical test report

ROSETTI MARINO

PQR 45/18

Base material certificate
(Pipe API 5L X65 L450)

ROSETTI MARINO S.P.A. P.O. 1715001400 112A070H TAL JOB N°3015001895
N° 2 MT 15,8 HEAT 115705 DIMENSIONS 168,3 x 21,95 ITEM 10

TUBOS REUNIDOS INDUSTRIAL, S.L.U

Barrio Sagarribai, 2 - 01470 AMURRIO (Spain)

AENOR ER Empresa Registrada ER-0027/1992

IQNet CERTIFIED QUALITY SYSTEM

EN 10204:2004 / 3.1

CERTIFICADO DE CALIDAD
MILL TEST CERTIFICATE
ABNAHMEPRÜFZEUGNIS NACH
CERTIFIÉ DE QUALITÉ

N° 0000327447/1 Rev. 000

CLIENTE: CUSTOMER BESTELLER CLIENT	T.A.L. S.p.A. TUBI ACCIAIO LOMBARDA CON SOCIO UNICO	PEDIDO / PARTIDA: P.ORDER / ITEM BESTELLER NR / POS. N° COMMANDE / POSTE	OF-140354 15.
PRODUCTO: ARTICLE PRÜFGEGENSTAND FOURNITURE	TUBERÍA SIN SOLDADURA LAMINADA EN CALIENTE HOT FINISHED SEAMLESS TUBES	REF. FABRICA: WORK ORDER WERKS NR. N° INTERNE	300016402 000150
EXTREMOS: ENDS ENDEN EXTRÉMITÉ	BISELADOS BEVELLED ENDS	PROTECCIÓN SUPERF: EXT. COATING ROSTSCHUTZ PROT. SUPERFICIEL	LACA SECA EXTERIOR EXTERNALLY DRY LACQUERED
NORMA / GRADO: APL STANDARD AND GRADE SPECIFICATION / STAHL NORME ET QUALITÉ	API 5L 2012 45TH ED. PSL2 X60/X65Q L415/L450Q	PROCESO FUSION: MELTING PROCESS ERSCHMELZUNGSART PROCEDE FUSION	HORNO ELECTRICO ACERO TOTALMENTE CALMADO ELECTRIC FURNACE // FULLY KILLED FINE GRAIN PRACTICE
ESPEC. ADICIONALES: ADITIONAL SPECS. ANFORDERUNGEN SPECIFIC. ADITIONNELLES	TS 06. REV. 00. (10/04/2012) NACE MR0175/ISO 15156.PUB.2009 NACE MR0103.2012	FAB. DE PALANQUILLA: BILLETS MANUFACTURE KNÜPPEL FERTIGUNG FABRICATION D E LA BILLETE	COLADA CONTINUA CONTINUOUS CASTING STRANGGUSS VERFAHREN COULÉE CONTINUE
DIMENSIONES: DIMENSIONS ABMESSUNGEN DIMENSIONS	168,3 X 21,95 MM. X 7,5-11,8 M.		
MARCAS: MARKING KENNZEICHNUNG MARQUAGE	ESTAMPADO: DIE STAMPING POINÇONAGE POINÇONNÉ	HN (HEAT) X60/X65Q L415/L450Q	
	PINTADO: STENCILLED STEMPELUNG MARQUAGE	TRI API SPEC 5L 5L-0011 (SELLO API) (MM/AA) 168,30 X 21,950 MM X60/X65 Q L415/L450Q PSL2 SMLS (LENGTH IN METERS) M (WEIGHT IN KGS) KG HN (HEA T) 3000,0 PSI	
	CODIGO COLOR: COLOUR CODE FARBE KENNZEICHNUNG CODE DE COULEUR		
TRAT. TERMICO: HEAT TREATMENT WÄRMEBEHANDLUNG TRAITEMENT THERMIQUE	TEMPLADO Y REVENIDO / QUENCHED & TEMPERED. 905 °C 22 MIN 650 °C 97 MIN		
Albaran/Delivery note/Lieferschein/ Bon de livraison	80207432		

TUBOS REUNIDOS INDUSTRIAL GARANTIZA QUE TODOS LOS TUBOS CUBIERTOS POR ESTE CERTIFICADO CUMPLEN LOS REQUISITOS DEL PEDIDO Y CON LAS ESPECIFICACIONES ARRIBA MENCIONADAS.
TUBOS REUNIDOS INDUSTRIAL CERTIFY THAT ALL THE TUBES COVERED BY THIS CERTIFICATE COMPLY WITH ORDER REQUIREMENTS AND ABOVE MENTIONED SPECIFICATIONS.
TUBOS REUNIDOS INDUSTRIAL GARANTIERT DASS ALLE ROHRE DIE BESTELLTEN ANFORDERUNGEN UND SPEZIFIKATIONEN IN DIESEM ZEUGNIS ERFÜLLEN.
TUBOS REUNIDOS INDUSTRIAL GARANTIT QUE TOUS LES TUBES OBJECT DU PRESENT CERTIFICAT, SONT CONFORMES AUX STIPULATIONS DE LA COMMANDE ET AUX SPECIFICATIONS DESSUS MENTIONÉS

AMURRIO 13.02.2015

CONTROL DE CALIDAD DE TUBOS REUNIDOS INDUSTRIAL
TUBOS REUNIDOS INDUSTRIAL QUALITY CONTROL)
Alex Villamayor
P.O.: :

Approved by AAIMI on 18/02/15

TAL SPA - THIS DOCUMENT IS REPRODUCED BY A COMPUTERIZED SYSTEM AND IS CONFORM TO THE ORIGINAL

ROSETTI MARINO S.P.A. P.O. 1715001400 112A070H TAL JOB N°3015001895
N° 2 MT 15,8 HEAT 115705 DIMENSIONS 168,3 x 21,95 ITEM 10

TUBOS REUNIDOS INDUSTRIAL, S.L.U

Barrio Sagarribai, 2 - 01470 AMURRIO (Spain)

EN 10204:2004 / 3.1

CERTIFICADO DE CALIDAD
MILL TEST CERTIFICATE
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CERTIFIÉ DE QUALITÉ

N° 0000327447/1 Rev. 000

DESCRIPCION SUMINISTRO / DESCRIPTION OF DELIVERY / LIEFERUNGSBESCHREIBUNG / DESCRIPTION DE LA LIVRAISON (1)

ITEM FAB. T.R. ITEM WERKS POS. POSITION INTERNE	ITEM CLI. CLIENTS ITEM BESTELLER POS. POSTE DU CLIENT	LONG.INDIV (M) INDIVIDUAL LENGTH LANGE INDIVIDUELL LONGITUDE UNITAIRE	COLADA CAST NR. SCHME. NR. N° COULÈE	N° TUBOS QUANTITY STUCKZAHL NOMBRE	LONG. TOTAL (M) LENGTH LÄNGE LONGITUDE	PESO(KG) WEIGHT MASSE POIDS
000150	15.	7,500 - 11,800	115705	14	110,370	8.757
TOTAL				14	110,370	8.757

ENSAYOS NO DESTRUCTIVOS / N.D.T. / ZERSTÖRUNGSFREIE WERKSTOFFPRÜFUNG / CONTROLES NON DESTRUCTIFS

ENSAYO / TEST / PRÜFUNG / ESSAI	%CONTROL / TEST RATE(%) %KONTROL / %COONTROLE	REQUISITOS / REQUIREMENTS ANFORDERUNGEN / SPÉCIFICATION	RESULTADO / RESULT ERGEBNIS / RESULTAT
VISUAL Y DIMENSIONAL/ VISUAL & DIMENSIONAL INSP. /BESICHTIGUNG UND AUSMESSUNG /ASPECT ET DIMENSIONS	100%		O.K.
P.HIDROSTATICA/ HYDROTEST /WASSERDRUCK VERSUCH /EPREUVE HYDRAULIQUE	100%	3.000,0 PSI 5 SEC.	O.K.
CORRIENTES INDUCIDAS/ EDDY CURRENTS /WIRBELSTROMPRÜFUNG /COURANTES DE FOUCAULT	100%	ASTM E 309. N12.5/HS 3.2 MM	O.K.
U.S. (LONGITUDINAL)/ ULTRASONIC TEST (LONG) /ULTRASCHALLPRÜFUNG /ULTRASONS	100%	ASTM E 213 5%W.T.NOTCH	O.K.
U.S. (TRANSV.)/ ULTRASONIC TEST (TRANSV) /ULTRASCHALLPRÜFUNG /ULTRASONS	100%	ASTM E 213 5%W.T.NOTCH	O.K.
INSP. POR PASO DE ANILLO/ RING GAUGE INSPECTION /RINGPRÜFUNG /CONTROL D'ANNEAU	100%	ACC. TO API 5L	O.K.

ANALISIS DE COLADA / CAST ANALYSYS / SCHMELZANALYSE / ANALYSE DE COULÉE

	C	Mn	Si	P	S	Cr	Ni	Mo	Cu	V	Al	Ti	Nb	B	N	C.E.
MIN.											0,0200					
MAX.	0,16	1,60	0,45	0,020	0,0080	0,300	0,300	0,1500	0,3000	0,1000	0,0600	0,0400	0,0500	0,0005	0,0120	0,41
115705	0,14	1,20	0,22	0,006	0,0030	0,057	0,089	0,0192	0,2277	0,0008	0,0250	0,0226	0,0011	0,0001	0,0103	0,37

ANALISIS DE PRODUCTO / PRODUCT ANALYSIS / STUCKANALYSE / ANALYSE DE PRODUIT

	C	Mn	Si	P	S	Cr	Ni	Mo	Cu	V	Al	Ti	Nb	B	N	C.E.
MIN.											0,0200					
MAX.	0,16	1,60	0,45	0,020	0,0080	0,300	0,300	0,1500	0,3000	0,1000	0,0600	0,0400	0,0500	0,0005	0,0120	0,41
115705	0,12	1,20	0,23	0,006	0,0023	0,060	0,080	0,0200	0,2000	0,0040	0,0250	0,0250	0,0020	0,0002	0,0104	0,35
115705	0,12	1,20	0,22	0,006	0,0022	0,060	0,080	0,0200	0,2100	0,0040	0,0250	0,0240	0,0010	0,0002	0,0106	0,35

AMURRIO 13.02.2015

CONTROL DE CALIDAD DE TUBOS REUNIDOS INDUSTRIAL
TUBOS REUNIDOS INDUSTRIAL (QUALITY CONTROL)
Alex Villamuelas
P.O.: :

Approved by AAIMI on 18/02/15

TAL SPA - THIS DOCUMENT IS REPRODUCED BY A COMPUTERIZED SYSTEM AND IS CONFORM TO THE ORIGINAL

TUBOS REUNIDOS INDUSTRIAL, S.L.U

Barrio Sagarribai, 2 - 01470 AMURRIO (Spain)

EN 10204:2004 / 3.1

CERTIFICADO DE CALIDAD
MILL TEST CERTIFICATE
ABNAHMEPRÜFZEUGNIS NACH
CERTIFIÉ DE QUALITÉ

N° 0000327447/1 Rev. 000

FORMULAS

	(01)	(02)	(03)	(04)
MIN.				
MAX.	0,150	0,250	0,060	0,600
115705	0,031	0,180	0,006	0,360
115705	0,029	0,180	0,005	0,370

(01) Nb + Ti + V
(02) Pcm: C +Si/30 + (Cr + Mn + Cu)/20 +Ni/60 + Mo/15 + V/10 + 5*B
(03) Nb + V
(04) Cr + Mo + Ni + Cu

ENSAYOS DE TRACCIÓN / TENSILE TEST / ZUGVERSUCH / ESSAI DE TRACTION

COLADA CAST	N°	L/T (1)	T/P (2)	DIMENSION (mm)	L.ELAST. YIELD POINT STRECKGR L.ELASTIQ. (Mpa) (3)	R.TRACC. T.STRENGTH ZUGFESTIG. RESISTANCE (Mpa)	ALARG. ELONG. DEHNUNG ALLONG. (%) (4)	Estricción Reduction of Area (%)	DUREZA HARDNESS HÄRTE DURETÉ (HRB)	E / R
MIN.					450	535				
MAX.					565	760			99	0,00
115705	0001	L	P	25,30 x 22,300	480	552	42		82	0,87
115705	0002	L	P	25,20 x 22,600	482	560	42		83	0,86

(1) : L = LONGITUDINAL // T = TRANSVERSAL
(2) : T = Full size tube // P = Strip specimen
(3) : yield point (0.5%)
(4) : Lo = 2" (50,8 mm)

ENSAYOS DE IMPACTO - CHARPY V / IMPACT TEST / KERBSCHLAGZÄHIGK / ESSAI DE RESILENCE

COLADA CAST	N°	L/T (1)	DIMENS (mm)		Tª (°C)	RESILIENCIA IMPACT TEST KERBSCHLAGZÄHIGK RESILENCE (J)		
			10	10,00	-50	30		
						40		
115705	0001	L	10	10,00	-50	279	308	279
115705	0002	T	10	10,00	-50	165	179	208

(1) : L = LONGITUDINAL // T = TRANSVERSAL

ANEXOS / ANNEX

Magnetismo Remanente < 30 Gauss
Residual Magnetism < 30 Gauss

- MATERIAL IS FULLY KILLED AND MADE BY A FINE GRAIN PRACTICE
- STEEL WITH GRAIN SIZE >= 8 ACCORDING TO ASTM E112
- PIPES ARE FREE FROM RADIOACTIVE CONTAMINATION.

AMURRIO 13.02.2015

CONTROL DE CALIDAD DE TUBOS REUNIDOS INDUSTRIAL
TUBOS REUNIDOS INDUSTRIAL QUALITY CONTROL
Alex Villarreyo
P.O.: .

Approved by AAIMI on 18/02/15

TAL SPA - THIS DOCUMENT IS REPRODUCED BY A COMPUTERIZED SYSTEM AND IS CONFORM TO THE ORIGINAL

ROSETTI MARINO S.P.A. P.O. 1715001400 112A070H TAL JOB N°3015001895
N° 2 MT 15,8 HEAT 115705 DIMENSIONS 168,3 x 21,95 ITEM 10

TUBOS REUNIDOS INDUSTRIAL, S.L.U

Barrio Sagarribai, 2 - 01470 AMURRIO (Spain)

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CERTIFIÉ DE QUALITÉ

N° 0000327447/1 Rev. 000

ANEXOS / ANNEX

- " T.R.I, S.L.U. HAS A QUALITY MANAGEMENT SYSTEM APPROVED BY AENOR IN AGREEMENT WITH POINT 4.3 AND 7.5 ANNEX I OF THE PED 97/23/EC."

AMURRIO 13.02.2015

CONTROL DE CALIDAD DE TUBOS REUNIDOS INDUSTRIAL
TUBOS REUNIDOS INDUSTRIAL (QUALITY CONTROL)
Alex Villasuso
P.O.: :

Approved by AAIMI on 18/02/15

TAL SPA - THIS DOCUMENT IS REPRODUCED BY A COMPUTERIZED SYSTEM AND IS CONFORM TO THE ORIGINAL

ROSETTI MARINO

PQR 45/18

Base material certificate
(Plate EN 10225: S460G2+M)

Certificate Number:**VNA 1700015 / 9**
Page: 1 of 1

Inspection Certificate

Project: ————
Client: **voestalpine Grobblech GmbH**
voestalpine-Straße 3, 4020 Linz, Austria
Office: **Vienna**

Clients Order Number: **6501364**
Date: **15-02-2017**

Order Status: **incomplete**

Inspection Dates
First: **10-02-2017**
final: **17-02-2017**

This certificate is issued to voestalpine Grobblech GmbH, Linz/Austria, to certify that the undersigned Surveyor attended their works Linz for the purpose of testing and inspecting the undemoted material with satisfactory results as stated below.

Purchaser: **Rosetti Marino Spa**
Via Trieste 230
I-48122 RAVENNA

Order No.: **1716002502 116B20A**

Description:

48 piece(s) of steel plate(s) 384580 kg , as per attached inspection Certificate no.: **A0357565**

Specification

S460G2+M Z35 EN 10225 : 2009

Heat treatment/Delivery Condition: thermomechanical rolled + accelerated cooled

Scope of inspection:

witness mechanical testing: yes ☑
review manufacturer's declared analysis: yes ☑
witness / verify ultrasonic examination: yes ☑ n/a ☐
witness / verify microstructure examination: yes ☐ n/a ☑
witness /verify corrosion testing: yes ☐ n/a ☑
random visual and dimensional control and check of hard stamping: yes ☑

Identification:

Makers Brand voestalpine
Material Quality
Heat No.
Plate No.
Brand of LR

Lloyd's Register EMEA
Vienna Office
Lloyd's Register

24 FEB 2017

Kurt Huber
Surveyor to Lloyd's Register EMEA

A subsidiary of Lloyd's Register Group Limited

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Form 1123 (2015.08)

voestalpine Grobblech GmbH

A02
Inspection certificate

EN 10204 - 3.2

VNA1700015-9

Z02 Date 23-02-2017

voestalpine-Straße 3
4020 Linz, Austria
www.voestalpine.com/grobblech

A03 Document number	A0357565	A08 Order-No.:	6501364	A07 OrderDat.	13-12-2016

4F

A06 Customer	Rosetti Marino Spa Via Trieste 230 I-48122 RAVENNA	B01 Product	Plate		
		B02 Material	S460G2+M Z35	B03 Standard	EN 10225 : 2009
A07 OrderNo.	1716002502 116B20A	Supplementary requirements	Z35 - EN 10164		
A06 Consignee	Rosetti Marino Spa Via Trieste 230 I-48122 RAVENNA	B04 Delivery condition	thermomechanical rolled + accelerated cooled		

A10 - Supplementary Information

SOUTH PARS 13 - PILES

B03 - Supplementary requirements

MATERIAL IS FINE GRAINED, VACUUM DEGASSED AND FULLY KILLED, PRODUCED BY BOF.
MATERIAL IS ACCORDING TO SPECIFICATION SP13-P2-ST-SP-8028.
MATERIAL IS ACCORDING TO EN 10225, OPTIONS 2,6,7,9,10,12 AND 13.

Z01 - Visual Examination and dimensional checking: satisfactory. The results of tests performed are in compliance with the requirements.

Detail of supply

	B07 Heat No.	B06 Plate No	Dimensions B09 Item	Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
a	882852	186892/1	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
b	882852	186892/2	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
a	882852	186894/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
a	882852	186894/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
c	882852	186895/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
	882852	186895/2	30	80,00	2640,0	4800	1		8.010	56321	15-02-2017	1PLATCS80007
b	882852	186896/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
a	882852	186896/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
a	882852	186897/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
a	882852	186897/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
	882852	186898/1	30	80,00	2640,0	4800	1		8.020	56268	15-02-2017	1PLATCS80007
	882852	186898/2	30	80,00	2640,0	4800	1		8.020	56268	15-02-2017	1PLATCS80007
a	882852	186899/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007

A04
Symbol of the manufacturer's work

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Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	Ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
882852	186899/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
882852	186900/2	30	80,00	2640,0	4800	1		8.020	56058	15-02-2017	1PLATCS80007
882852	186900/1	30	80,00	2640,0	4800	1		8.020	56058	15-02-2017	1PLATCS80007
882852	186901/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
882852	186901/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972090	186721/2	30	80,00	2640,0	4800	1		8.018	56010	10-02-2017	1PLATCS80007
972090	186723/2	30	80,00	2640,0	4800	1		8.012	56058	14-02-2017	1PLATCS80007
972090	186723/1	30	80,00	2640,0	4800	1		8.012	56058	14-02-2017	1PLATCS80007
972090	186724/1	30	80,00	2640,0	4800	1		8.010	56058	13-02-2017	1PLATCS80007
972090	186724/2	30	80,00	2640,0	4800	1		8.010	56321	13-02-2017	1PLATCS80007
972090	186725/1	30	80,00	2640,0	4800	1		8.010	56010	11-02-2017	1PLATCS80007
972090	186725/2	30	80,00	2640,0	4800	1		8.010	56010	11-02-2017	1PLATCS80007
972090	186726/2	30	80,00	2640,0	4800	1		8.022	56058	10-02-2017	1PLATCS80007
972090	186726/1	30	80,00	2640,0	4800	1		8.022	56010	10-02-2017	1PLATCS80007
972093	181846/2	30	80,00	2640,0	4800	1		8.005	56268	15-02-2017	1PLATCS80007
972093	181846/1	30	80,00	2640,0	4800	1		8.005	56268	15-02-2017	1PLATCS80007
972093	186842/1	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
972093	186842/2	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
972093	186843/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186843/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186844/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186844/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186846/2	30	80,00	2640,0	4800	1		8.007	56058	17-02-2017	1PLATCS80007
972093	186846/1	30	80,00	2640,0	4800	1		8.007	56058	17-02-2017	1PLATCS80007
972093	186902/2	30	80,00	2640,0	4800	1		8.010	56272	15-02-2017	1PLATCS80007
972093	186902/1	30	80,00	2640,0	4800	1		8.010	56272	15-02-2017	1PLATCS80007
972093	186903/2	30	80,00	2640,0	4800	1		8.010	56010	15-02-2017	1PLATCS80007
972093	186903/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186905/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186905/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972096	186841/1	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
972096	186841/2	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
972096	186845/1	30	80,00	2640,0	4800	1		8.010	56272	16-02-2017	1PLATCS80007
972096	186906/2	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007

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Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	Ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
972096	186906/1	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
	Sum					48		384.580			

C70 - Method of steelmaking: strand casted material: pure oxygen blown with vacuum treatment; steel is fully killed.

B14 - Supplementary information

Flatness acc. EN 10029/10 class N
Dimensional tolerances acc. EN 10029/10
EN10163-2: Class A3 - Repair-welding not permitted.
Thicknesstolerance acc. EN 10029/10 tab. 1 class A

Chemical composition (Heat analysis) - part 1 of 2

B07 Heat No.	C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %	Pb %	Cae %	Pcm %
>=		.150				.015																
Set values <=	.140	.550	1.650	.020	.0050	.055	.250	.700	.250	.300	.080	.040	.025	.0100	.0005	.0200	.0050	.0300	.0100	.010	.43	.22
882852	.052	.182	1.550	.009	.0009	.030	.182	.520	.123	.073	.004	.030	.012	.0051	.0002	.0020	.0003	.0020	.0020	.002	.41	.17
972090	.060	.176	1.520	.007	.0010	.022	.174	.520	.125	.046	.004	.027	.012	.0061	.0002	.0020	.0003	.0020	.0020	.002	.41	.17
972093	.052	.184	1.530	.008	.0011	.027	.172	.530	.125	.068	.004	.029	.012	.0042	.0003	.0020	.0003	.0030	.0020	.002	.41	.17
972096	.054	.177	1.530	.007	.0007	.026	.173	.530	.117	.054	.004	.027	.013	.0040	.0002	.0020	.0003	.0020	.0030	.002	.41	.17

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Chemical composition (Heat analysis) - part 2 of 2

B07 Heat No.	LF01 %	LF02 %	LF03 %
Set values >= <=	.090	.110	.900
882852	.034	.046	.898
972090	.031	.043	.865
972093	.033	.045	.895
972096	.031	.044	.874

C99 - Supplementary information
BI <= 0,01%
C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF03: Cr+Ni+Cu+Mo
LF02: Nb+V+Ti
LF01: Nb+V

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Test results: C10-C29 Tensile Test acc. EN ISO 6892-1

B07 Heat No.	B06 Plate No	C41 Width	SpThickn mm	C01 loc.	PosTh.	C02 Dir	C11 Reh MPa	C11 Rp0,2 MPa	C12 Rm MPa	L0	C13 E %	C11 Reh/Rm %	C11 Rp0,2/Rm %	Sim.htm	WBH
>=							405	405	505		17.0				
Set values <=									665			90.00	90.00		
882852	186892	Ø	9.98	F	V	T	445	445	535	A5	32.0	83.07	83.09		
	186896	Ø	9.98	F	V	T	447	443	535	A5	30.9	83.47	82.69		
	186898	Ø	9.99	F	V	T	441	438	538	A5	31.2	81.97	81.41		
	186900	Ø	9.98	F	V	T	457	440	533	A5	30.3	85.65	82.52		
	186892	Ø	9.99	F	V	T		436	527	A5	30.0		82.78	001	1
	186896	Ø	9.99	F	V	T	468	443	524	A5	32.3	89.30	84.50	001	1
	186898	Ø	9.98	F	V	T	465	445	527	A5	32.4	88.24	84.44	001	1
	186900	Ø	9.99	F	V	T		437	524	A5	31.6		83.43	001	1
972090	184827	Ø	10.00	F	V	T	456	449	541	A5	29.3	84.28	82.93		
	184828	Ø	10.00	F	V	T	442	440	536	A5	30.8	82.41	82.00		
	186723	Ø	9.98	F	V	T		429	545	A5	27.5		78.81		
	184827	Ø	9.99	F	V	T		432	520	A5	28.5		83.09	001	1
	184828	Ø	9.99	F	V	T		440	529	A5	31.2		83.32	001	1
	186723	Ø	9.96	F	V	T	487	474	563	A5	28.1	86.53	84.17	001	1
972093	181846	Ø	9.95	F	V	T		415	564	A5	32.1		73.58		
	186842	Ø	9.98	F	V	T	456	449	540	A5	32.5	84.45	83.24		
	186843	Ø	9.99	F	V	T	461	452	544	A5	32.6	84.74	83.09		
	186902	Ø	9.98	F	V	T	456	448	532	A5	32.5	85.67	84.18		
	181846	Ø	9.98	F	V	T	460	424	524	A5	32.6	87.79	80.92	001	1
	186842	Ø	9.99	F	V	T	471	440	526	A5	32.4	89.49	83.56	001	1
	186843	Ø	9.98	F	V	T	470	443	532	A5	32.6	88.35	83.27	001	1
	186902	Ø	9.99	F	V	T	463	436	518	A5	32.9	89.37	84.16	001	1
972096	186841	Ø	9.98	F	V	T	459	429	529	A5	30.9	86.77	81.10		
	186906	Ø	9.98	F	V	T	466	436	524	A5	31.2	88.86	83.05		
	186841	Ø	9.98	F	V	T	470	441	525	A5	32.1	89.52	84.00	001	1
	186906	Ø	9.97	F	V	T		439	523	A5	32.7		83.96	001	1

SpThickn: specimen thickness
C01;loc.:
F: Bottom
PosTh.: Pos Thickness
V: ¼

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Test results: C10-C29 Tensile Test acc. EN ISO 6892-1

B07 Heat No.	B06 Plate No	C41 Width mm	SpThickn	C01 loc.	PosTh.	C02 Dir	C11 Reh MPa	C11 Rp0,2 MPa	C12 Rm MPa	L0	C13 E %	C11 Reh/Rm %	C11 Rp0,2/Rm %	Sim.htm	WBH

C02;Dir:
  T: transverse
C12; Rm: Tensile Strength
L0: gauge
  A5: Length = 5.65 * sqr (area) mm
C13;E: elongation
Sim.htm: sim. heat treatment
  001: Sim.htm group #1
WBH: sim. heat treatment

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07	B06	C40	C01			C02	C03	C42	C42	C42	C43		
Heat No. samp.cond.	Plate No	shape	loc.	Pos.	PosTh.	Dir	temp	SV	SV	SV	AV	Sim.htm	WBH
							°C	J	J	J	J		
>=							-40	42	42	42	60		
Set values <=													

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No, samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>=							-40	42	42	42	60		
Set values <=													
882852	186892	CV 10x10	F	O		T	-40	340	328	325	331		
	186896	CV 10x10	F	O		T	-40	345	328	327	333		
	186898	CV 10x10	F	O		T	-40	352	332	322	335		
	186900	CV 10x10	F	O		T	-40	345	348	344	346		
	186892	CV 10x10	F	O		T	-40	307	310	303	307	001	1
	186896	CV 10x10	F	O		T	-40	314	321	315	317	001	1
	186898	CV 10x10	F	O		T	-40	323	311	317	317	001	1
	186900	CV 10x10	F	O		T	-40	334	324	325	328	001	1
	186892	CV 10x10	F	K		T	-40	348	364	385	366		
	186896	CV 10x10	F	K		T	-40	365	356	353	358		
	186898	CV 10x10	F	K		T	-40	352	365	345	354		
	186900	CV 10x10	F	K		T	-40	372	347	354	357		
	186892	CV 10x10	F	K		T	-40	345	329	324	333	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	42	42	42	60		
882852	186896	CV 10x10	F		K	T	-40	344	328	284	319	001	1
	186898	CV 10x10	F		K	T	-40	310	337	320	322	001	1
	186900	CV 10x10	F		K	T	-40	357	349	347	351	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>=							-40	42	42	42	60		
Set values <=													
972090	184827	CV 10x10	F		O	T	-40	321	320	314	318		
	184828	CV 10x10	F		O	T	-40	320	303	303	309		
	186723	CV 10x10	F		O	T	-40	323	327	322	324		
	184827	CV 10x10	F		O	T	-40	332	319	327	326	001	1
	184828	CV 10x10	F		O	T	-40	318	323	321	321	001	1
	186723	CV 10x10	F		O	T	-40	295	263	303	287	001	1
	184827	CV 10x10	F		K	T	-40	340	328	251	306		
	184828	CV 10x10	F		K	T	-40	346	336	317	333		
	186723	CV 10x10	F		K	T	-40	268	289	311	289		
	184827	CV 10x10	F		K	T	-40	321	331	357	336	001	1
	184828	CV 10x10	F		K	T	-40	326	353	89	256	001	1
	186723	CV 10x10	F		K	T	-40	284	266	276	275	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	42	42	42	60		
972093	181846	CV 10x10	F	O		T	-40	319	324	322	322		
	186842	CV 10x10	F	O		T	-40	345	347	334	342		
	186843	CV 10x10	F	O		T	-40	343	339	342	341		
	186902	CV 10x10	F	O		T	-40	349	344	335	342		
	181846	CV 10x10	F	O		T	-40	329	302	323	318	001	1
	186842	CV 10x10	F	O		T	-40	312	310	308	310	001	1
	186843	CV 10x10	F	O		T	-40	305	315	311	310	001	1
	186902	CV 10x10	F	O		T	-40	323	322	318	321	001	1
	181846	CV 10x10	F	K		T	-40	304	366	370	347		
	186842	CV 10x10	F	K		T	-40	362	369	351	361		
	186843	CV 10x10	F	K		T	-40	358	366	356	360		
	186902	CV 10x10	F	K		T	-40	357	366	377	366		
	181846	CV 10x10	F	K		T	-40	359	364	355	359	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	42	42	42	60		
972093	186842	CV 10x10	F		K	T	-40	323	298	331	317	001	1
	186843	CV 10x10	F		K	T	-40	313	304	301	306	001	1
	186902	CV 10x10	F		K	T	-40	361	363	364	362	001	1
972096	186841	CV 10x10	F		O	T	-40	345	333	341	339		
	186906	CV 10x10	F		O	T	-40	338	340	346	341		
	186841	CV 10x10	F		O	T	-40	324	316	313	318	001	1
	186906	CV 10x10	F		O	T	-40	317	321	323	320	001	1
	186841	CV 10x10	F		K	T	-40	337	342	353	344		
	186906	CV 10x10	F		K	T	-40	348	357	334	346		
	186841	CV 10x10	F		K	T	-40	309	332	343	328	001	1
	186906	CV 10x10	F		K	T	-40	347	338	278	321	001	1
>= Set values <=							-40	29	29	29	46		

Z03
Stamp of the inspection representative

LR
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Vienna Office
Initials: KH
24 FEB 2017

Z02
Inspection representative voestalpine
Grobtech
Quality Department Heavy Plates
BERGER Alfred

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>=							-40	29	29	29	46		
Set values <=													
882852	186892	CV 10x10	F		ZB2	T	-40	320	310	312	314		strain aged 5%, 60 min. at 250°C
	186896	CV 10x10	F		ZB2	T	-40	305	297	314	305		strain aged 5%, 60 min. at 250°C
	186898	CV 10x10	F		ZB2	T	-40	311	303	309	307		strain aged 5%, 60 min. at 250°C
	186900	CV 10x10	F		ZB2	T	-40	305	317	306	309		strain aged 5%, 60 min. at 250°C
972090	184827	CV 10x10	F		ZB2	T	-40	341	317	326	328		strain aged 5%, 60 min. at 250°C
	186723	CV 10x10	F		ZB2	T	-40	259	299	299	286		strain aged 5%, 60 min. at 250°C
972093	181846	CV 10x10	F		ZB2	T	-40	306	302	323	310		strain aged 5%, 60 min. at 250°C
	186842	CV 10x10	F		ZB2	T	-40	316	299	319	311		strain aged 5%, 60 min. at 250°C
	186843	CV 10x10	F		ZB2	T	-40	322	309	315	315		strain aged 5%, 60 min. at 250°C
	186902	CV 10x10	F		ZB2	T	-40	306	302	323	310		strain aged 5%, 60 min. at 250°C
972096	186841	CV 10x10	F		ZB2	T	-40	311	302	314	309		strain aged 5%, 60 min. at 250°C
	186906	CV 10x10	F		ZB2	T	-40	305	310	313	309		strain aged 5%, 60 min. at 250°C

C40;shape:
CV 10x10: Test shape , Dimensions

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07	B06	C40	C01			C02	C03	C42	C42	C42	C43			
Heat No. samp.cond.	Plate No	shape	loc.	Pos.	PosTh.	Dir	temp	SV	SV	SV	AV		Sim.htm	WBH
							°C	J	J	J	J			

C01;loc.:
F: Bottom
Pos.: test specimen position
PosTh.: Pos Thickness
K: ½
O: surface
ZB2: 2mm below surface
C02;Dir:
T: transverse
C42;SV: single value
C43;AV: average value
Sim.htm: sim. heat treatment
001: Sim.htm group #1
WBH: sim. heat treatment
samp.cond.: sample condition

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Test results: C10-C29 through Thickness Test acc. DIN / EN

B07 Heat No.	B06 Plate No	C40 Shape	SpThickn mm	C01 loc.	C02 Dir	C12 Rm MPa	C12 Rm MPa	C12 Rm MPa	Z(SV) %	Z(SV) %	Z(SV) %	Z(AV) %
Set values >=						404	404	404	25	25	25	35
882852	186892	Ø	10.01	F	S	531	531	531	72	78	60	70
	186896	Ø	10.00	F	S	539	530	532	78	78	70	75
	186900	Ø	10.00	F	S	526	521	530	77	79	78	78
972090	184827	Ø	10.03	F	S	528	528	525	60	67	58	62
	186723	Ø	9.96	F	S	539	544	525	73	74	79	75
972093	181846	Ø	10.00	F	S	522	520	520	75	74	77	75
	186842	Ø	10.00	F	S	535	533	536	78	75	72	75
	186902	Ø	10.01	F	S	515	520	517	77	71	74	74
972096	186906	Ø	9.87	F	S	527	525	539	77	79	70	75

SpThickn: specimen thickness
C01;loc.:
F: Bottom
C02;Dir:
S: through thickness direction
C12; Rm: Tensile Strength
Z(SV): reduction of area (single value)
Z(AV): reduction of area (average value)

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Chemical composition (Product analysis) - part 1 of 2

B07 Heat No.	B06 Plate No	C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %
>=			.150				.015													
Set values <=		.140	.550	1.650	.020	.0050	.055	.250	.700	.250	.300	.080	.040	.025	.0100	.0005	.0200	.0050	.0300	.0100
882852	186892	.052	.184	1.520	.008	.0010	.028	.181	.520	.123	.067	.004	.029	.012	.0058	.0002	.0020	.0002	.0030	.0020
	186896	.052	.185	1.530	.008	.0009	.030	.179	.520	.122	.071	.004	.029	.012	.0053	.0002	.0020	.0003	.0030	.0020
	186898	.052	.175	1.530	.007	.0009	.029	.180	.521	.123	.071	.003	.030	.012	.0051	.0001	.0020	.0002	.0010	.0010
	186900	.052	.184	1.530	.009	.0010	.029	.178	.520	.122	.072	.004	.030	.012	.0050	.0002	.0020	.0003	.0020	.0020
972090	184827	.054	.178	1.530	.007	.0007	.024	.176	.520	.127	.046	.004	.027	.013	.0056	.0002	.0020	.0002	.0030	.0020
	184828	.054	.176	1.530	.007	.0007	.024	.174	.520	.127	.045	.004	.027	.013	.0059	.0002	.0020	.0002	.0020	.0020
	186723	.055	.179	1.540	.007	.0010	.024	.174	.510	.126	.046	.004	.027	.013	.0061	.0002	.0020	.0002	.0030	.0020
972093	181846	.051	.180	1.520	.007	.0010	.029	.170	.520	.122	.060	.004	.029	.012	.0044	.0002	.0020	.0003	.0020	.0020
	186842	.052	.185	1.510	.007	.0012	.028	.168	.510	.124	.061	.004	.029	.013	.0042	.0002	.0020	.0003	.0020	.0020
	186843	.052	.177	1.500	.008	.0010	.027	.173	.531	.125	.066	.004	.029	.011	.0042	.0002	.0030	.0003	.0030	.0020
	186902	.048	.183	1.500	.007	.0010	.028	.168	.510	.122	.060	.004	.028	.012	.0045	.0002	.0020	.0003	.0020	.0020
972096	186841	.054	.175	1.530	.006	.0007	.024	.170	.527	.117	.055	.003	.027	.013	.0040	.0002	.0020	.0003	.0020	.0030
	186906	.053	.179	1.530	.007	.0010	.027	.174	.520	.121	.050	.004	.027	.013	.0040	.0002	.0020	.0002	.0020	.0020

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Quality Department Heavy Plates
BERGER Alfred

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Chemical composition (Product analysis) - part 2 of 2

B07 Heat No.	B06 Plate No	Pb %	Cae %	Pcm %	LF01 %	LF02 %	LF03 %
Set values >=							
Set values <=		.010	.43	.22	.090	.110	.900
882852	186892	.002	.41	.16	.033	.045	.891
	186896	.002	.41	.17	.033	.045	.892
	186898	.002	.41	.16	.033	.045	.895
	186900	.002	.41	.17	.034	.046	.892
972090	184827	.002	.41	.17	.031	.044	.869
	184828	.002	.41	.17	.031	.044	.866
	186723	.002	.41	.17	.031	.044	.856
972093	181846	.002	.40	.16	.033	.045	.872
	186842	.002	.40	.16	.033	.046	.863
	186843	.002	.40	.16	.033	.044	.895
	186902	.002	.39	.16	.032	.044	.860
972096	186841	.002	.41	.17	.030	.043	.869
	186906	.002	.41	.16	.031	.044	.865

C99 - Supplementary information
BI <= 0,01%

C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF03: Cr+Ni+Cu+Mo
LF02: Nb+V+Ti
LF01: Nb+V

Remarks

Simulated heat treatment of test coupons:

Pos 30:
001/1: 1 cycle(s) sim. PWHT: furnace charge temperature at max. 400 °C, heating with max. 55 °C/h up to 580 °C, +20 °C/-20 °C, holding time 240 minutes, cooling with max. 55 °C/h down to 400 °C, final cooling in calm air.

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Remarks

We confirm that the above-mentioned delivery corresponds to the order (and standard).

Reduction of area on tensile test specimens in the through-thickness direction in accordance with EN 10164:2004, class Z35.

The signature of the inspection representative from voestalpine Grobblech GmbH is substituted by a electronic Signature, because the certificates of voestalpine Grobblech GmbH are prepared by a suitable data processing system (EN 10204, Pt.5).

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ULTRASONIC EXAMINATION

SPECIFICATION
Ultrasonic examination acc. to EN 10160, EN 10160 class S1/Body, Grid 200 mm, EN 10160 class E2/Edge Zone, Edge zone 75 mm

VALID TEST EQUIPMENT
mechanized ultrasonic "In-Line testing system" (Manufacturer: NDT-Systems & Services) and
mechanized ultrasonic "off-line - testing system" (manufacturer: Windhoff Bahn- und Anlagentechnik GmbH) and
MUT (optional): Sonatest D20 no. 90006523 or Sonatest D20 no. 90007346 or Sonatest Masterscan 380 no. 90007347 or Sonatest Masterscan 380 no. 90006522 or Sonatest D50 no. 90010231 or GE - USM 36 no. 90010775

PROBE
(in-line AUT): 3STSE 18.3/8 P5, SEZ5R10RS, SE3 18.3/10 5A, (5MHz)
(off-line AUT): S140 (4MHz) 3T/1R
(MUT): SEB4E (4MHz), SEB4E0° (4MHz), MSEB4E (4MHz), B2SO (2MHz)
watergapcoupling

RESULT
Plate(s) comply with the specification.

INSPECTION OPERATOR
Operators Level 1 or 2: qualified and certified according ÖNORM EN 473 or EN ISO 9712 (since 01.01.2013) respectively according the Written Practice „NDT-WP" (in accordance to Recommended Practice SNT-TC-1A). Operators Level 2 for ASME/ASTM.

INSPECTION SUPERVISOR
Responsible Level 3: Bindreiter Erich

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ROSETTI MARINO

PQR 45/18

Consumables certificate

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2018-01-22 Numero certificato/Cert no: EC25021325 rev. 0

Nostro ordine/Our order:	1849085	Vostro ordine/Your order:	Verb. Sig. Dal Prete
Nostro riferimento/Our ref:	Web user - Movex CMP020 ITB	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB00060	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20180122	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address	Destinatario del certificato/Cert receiver	Indirizzo di spedizione/Delivery address
ESAB SALDATURA S.P.A. (6155) VIA ROSA LUXEMBURG, 49 IT-20085 LOCATE TRIULZI MI Italy		ROSETTI MARINO SPA . VIA TRIESTE 230 48100 RAVENNA RA Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: SBR41145 Quantità/Quantity: 28 CT

PRODOTTO/PRODUCT

Marchio/Brand: Filarc
Descrizione/Desc: FILARC 88S 3.2x350mm 1/2 VP
Codice/Item no: **77693239G3**

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.5: E8016-G
EN ISO 2560-A: E 50 6 Mn1Ni B 12 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:

C		0.05%
Si		0.24%
Mn		1.87%
P		0.018%
S		0.007%
Cr		0.03%
Ni		0.91%
Mo	<	0.01%
Nb	<	0.01%
Cu		0.02%
V		0.01%

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:
Altro/Auxiliary:
Condizione/Condition:

TRAZIONE/TENSILE

Rp0.2	Rm	A5
560 MPa	640 MPa	27 %

RESILIENZA/IMPACT

Temp	-40 °C	-60 °C
KV	115 J	100 J

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis Validazione - altro/Validation - Others

Ellen Björgan Quality Manager J-P Ernoult Product Manager

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2018-07-27

Numero certificato/Cert no: EC25251151 rev. 0

Nostro ordine/Our order:	2013780	Vostro ordine/Your order:	1718000897
Nostro riferimento/Our ref:	Web user - Movex CMP020 ITB	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB00060	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20180727	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address

ESAB SALDATURA S.P.A. (6155)
STRADA PROVINCIALE 34, N. 7
IT-20010 OSSONA MI
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address

ROSETTI MARINO SPA
.
VIA TRIESTE 230
48100 RAVENNA RA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PNS24006 Quantità/Quantity: 20 CT

PRODOTTO/PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK Tubrod 15.17 1.2mm 16kg
Codice/Item no:	**1517127730**

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.36: E81T1-M21A4-Ni1
EN ISO 17632-A: T 46 3 1Ni P C1 2 H5
EN ISO 17632-A: T 46 4 1Ni P M21 2 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:	M21 (EN ISO 14175)
C	0.05%
Si	0.39%
Mn	1.15%
P	0.01%
S	0.02%
Cr	0.03%
Ni	1.0%
Mo	0.03%
Nb	0.02%
Cu	0.06%
V	0.02%

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:	EN
Altro/Auxiliary:	M21 (EN ISO 14175)
Condizione/Condition:	As welded

TRAZIONE/TENSILE

ReL	Rm	A5
544 MPa	613 MPa	26 %

RESILIENZA/IMPACT

Temp	-40 °C
KV	124 J

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis

Piotr Grela Quality Assurance Manager

Validazione - altro/Validation - Others

Neil Farrow Product Manager

ROSETTI MARINO

PQR 45/18

preliminary WPS

PQR ref.:	To be qualified	pWPS (ISO 15614-1 ed. 2017+ MOTS-12 Rev 4.0)	45-18	REV.:	3	Data /date	15/11/2018

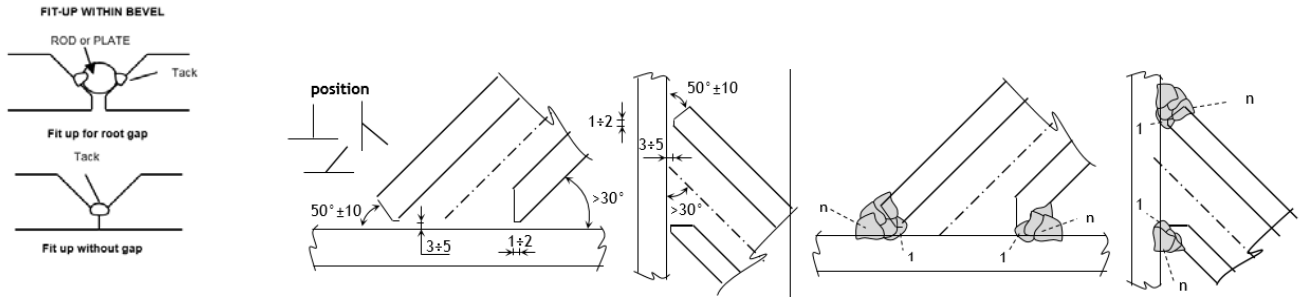
Procedimento di saldatura / Welding process: **SMAW +GS FCAW** — Tipo / Type: **MANUAL+SEMIAUTOMATIC**

GIUNTO - JOINT (QW-402)

Tipo di giunto / Joint Design: **TKY** — Supporto / Backing: ☒ Si / Yes **(Base Material)** ☐ No

Materiale di supporto (tipo) / Backing material (type). ☒ Metallico / Metal ☐ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:



Note:

1. **Surfaces cleaned from moisture, oil, grease, paint before welding (by grinding)/** *Pulire le superfici da liquidi, oli, grasso e vernici con molatura prima di saldare.*
2. **Minimum tack weld lengths shall be 4 times the thk or 50 mm, whichever is less/** I tacchetti devono essere lunghi almeno 50 mm o 4 volte lo spessore (il più piccolo dei due);
3. **Welding shall not be discontinued before 25% of the weld thickness or 3 passes are completed, whichever gives adequate cross section to prevent craking**/La saldatura non può essere interrotta prima di aver completato almeno 3 passate o il 25% dello spessore da saldare.
4. **Preheat shall be performed by electrical reistance, induction equioment or with gas burners. Cutting torches shall not be permitted/** Il preriscaldo può essere eseguito con resitenze, induzione o torcia. Non può essere utilizzato l'ossitaglio.
5. **Angle of branch between 40° and 90°/** Inclinazione tubo fra 40° e 90°.

MATERIALE BASE - BASE MATERIAL (QW-403)

Da / from P-N°: **/** — Group N° **S4** — A / to P-N°: **/** — Group N' **S4**

DA Tipo e grado / From type and grade: **EN 10225 S460 G8+M**

A Tipo e grado / To type and grade: **API 5L Gr. X65 L450**

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove: **21,9 (Branch member) 25 mm (Main member)**

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove: **168,5 mm (Branch member) 600 mm (Main member)**

METALLO D'APPORTO - FILLER METAL (QW-404)

	SMAW	GS FCAW
Spec. N° (SFA)	5.5	5.29/5.36
AWS N° (CLASS)	E8016-G	E81T1-1/E81T1-Ni1
F-N°	4	6
A-N°	10	1
Diametro mat. D'apporto / Size of filler metal	2,5/3,2	1,2
Gamma spessori /Thick. Range (mm)	Up 5 mm	Up to filling
Accoppiamento filo-flusso / Electrode-flux (CLASS)	NA	NA
Denom. Comm. Flusso / FLUX trade name	NA	NA
Inserto consumabile / Consumable insert	NA	NA
Altro / other	Filarc 88S	OK Tubrod 15.17

POSIZIONI - POSITION (QW 405)

giunto / Joint: **Cianfrino / groove** — Posizione / position **PC-PF** — Progressione / weld progression: **Ascendente / UP hill**

PRERISCALDO - PRE-HEAT (QW406)

Temp.preriscaldo minima / Min. pre-heat temp: **50°C** — Max temp. Di interpass / Max interpass temp.: **200 °C** — Mantenimento interpass / Interpass maintenance: **N.A.** — Tempo di mantenimento prerisc. / Maintenance timing: **N.A.**

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT(QW 407)

Riscaldamento / Heating rate (°C/Hrs): **N.A.** — Temperatura di stasi / Holding temperature °C: **N.A.** — Tempo di stasi / Holding time (min.): **N.A.** — Velocità di raffreddamento / Cooling rate (°C/Hrs): **N.A.**

GAS DI PROTEZIONE - GAS (QW 408)

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar+CO2	80%+20%	16-24 lt/min
Protezione al seguito / Trailing:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS (QW -409)

Corrente / Current: **DC** — Polarità / Polarity **RP**

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: **N.A.**

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: **N.A.**

Velocità alimentazione filo / Electr. Wire feed speed range: **N.A.**

TECNICA - TECHNIQUE (QW-410)

Passata / Bead: **Tirata/String** — Dimensione bocchello gas / Orifice of gas cup size: **N.A.** — Pulizia iniziale e fra le passate / Initial and interpass cleaning: **Spazzolatura/Brushing**

Metodo di solcatura a rovescio / Method of back gouging: **N.A.** — Oscillazione / Oscillation: **N.A.** — Distanza zona di contatto e pezzo / Contact zone to work distance: **N.A.**

N°Passate / Passes nr.: **Multipla/Multiple** — Elettrodo multiplo o singolo / Multiple or single electrodes: **Singolo/Single** — Martellatura / Peening: **N.A.**

Altro / Other:

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range		Vel. Avanzamento / Travel speed range (mm/min)		Apporto termico / Heat input (KJ/mm)	
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. Range						
Tack	SMAW	E8016-G	3,2	RP	90 110	22	24	67	75	1,6	2,4
1	SMAW	E8016-G	3,2	RP	90 110	20	23	50	120	0,72	2,42
2	SMAW	E8016-G	3,2	RP	90 110	20	23	50	120	0,72	2,42
3-n; Cap layers	FCAW	E81T1-Ni1	1,2	RP	190 230	26	27	207	280	1,0	1,8

Preparato da / prepared by:	Client/Third part signature:	Client/Third part signature:
D.Cenacchi	*TOTAL*	*DNV*

NDE certificate

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 19/11/2018	FOGLIO – Sheet 1
RAPPORTO D'ESAME CON ULTRASUONI ***Ultrasonic examination report***		UT N° : 12	Ns. Rif./Our Ref. 18205

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	TYRA FUTURE	118A10	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
MAERSK OIL	PQR	/	-	-

CODICE / Code	PROCEDURA / Procedure	ACCETTABILITA' / Acceptance level			
/	DK-TEHY-MET-PRO-000-10004	Quality Level ISO 5817	☑ B	☐ C	☐ D
		Acceptance level ISO 11666	☑ 2	☐ 3	☐ 3b

MATERIALE Material	DIMENSIONI Dimension	SPESSORE NOMINALE / Thk
API 5L Gr.X65 S460 G8+M	6"	Butt weld 1\2V 21,9 mm

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO - Brushed	☐ LAVORATO DI MACCHINA - Machined
☐ MOLATO - Ground	☐ LAMINATO - Rolled	☐ GREZZO - Forged

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG	No. SERIE Serial Number	II03937

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	ONDE Waves
PANAMETRICS	PF4MR	4	10	0°	LONG.
PANAMETRICS	AMR	4	8X9	45°-60° 70°	SHEAR

BLOCCO DI CALIBRAZIONE Calibration block	IIW V2	BLOCCO DI RIFERIMENTO Reference block	QT-REF-BLOCK 5
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity	DAC ON SDH 3 mm

SALDATURE CONTROLLATE / Welds Verified	PIANO DI SCANSIONE / Scanning plan
PQR 45/18 PC AX82 **PQR 45/18 PF AX21**	The Scanning plan used is in accordance with the requirements of IDL-QCI-UT-0235

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 29/11/2018 File Signature Cimutti Davide
Salvatore Randazzo II° Livello SNT-TC-1A / ISO 9712	ROSETTI MARINO S.p.A. Welding Dept. D. Genaccini		

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items esamine*

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 19/11/2018	FOGLIO – Sheet 1
RAPPORTO D'ESAME MAGNETOSCOPICO ***MAGNETIC PARTICLE TEST***		MT N° : 12	Ns. Rif./Our Ref. 18205

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	TYRA FUTURE	118A10	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
MAERSK OIL	PQR	/	/	/

CODICE / code	PROCEDURA/Procedure	ACCETTABILITA - Acceptance level	
/	DK-TEHY-MET-PRO-000-10006	Quality Level ISO 5817 ☑ B ☐ C ☐ D Acceptance level ISO 23278 ☑ 2x ☐ 2x ☐ 3x	
MATERIALE Material	TEMPERATURA DELLE SUPERFICI Surface temperature	INTENSITA' LUMINOSA / Light intensity LUCE BIANCA	LUCE NERA
API 5L Gr.X65 S460 G8+M	RANGE 5÷52°C	☑ > 500 LUX	☐ 500 µW/cm².

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined
☐ MOLATO – Ground	☐ LAMINATO – Rolled	☐ GREZZO – Forged

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☐ PUNTALI/Prods	☑ GIOGO/Yoke	☐ SOLENOIDE/Solenoid	☐ CONDUTTORE CENTRALE/Central conduttor

TIPO APPARECCHIO/Type of equipment	SILVER YOKE/S.No.04 230-15	DISTANZA PUNTALI/Pole spacing mm	180mm
TIPO DI CORRENTE/Type current	C.A	INTENSITÀ/Intesity (Amp)	4,5 kg

MEZZO DI ISPEZIONE / Examination medium		☑ UMIDO/Wet	☐ ASCIUTTO/Dry
PARTICELLE UTILIZZATE/Particle Type			
POLVERE NERA/Black powder	☑	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	NDT BW2	MARCA TIPO/Mark Type	NDT FW1
LOTTO / Batck No.	7241s	LOTTO / Batck No.	
VERNICE DI CONTRASTO/Contrast Paint		☑ NDT WBL5	☐ CGM VECOPLAST
LOTTO / Batck No.		U171010c	

SALDATURE CONTROLLATE / Welds Verified

PQR 45/18 PC AX82

PQR 45/18 PF AX21

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Salvatore Randazzo II° Livello SNT - TC - 1A / ISO 9712	ROSETTI MARINO SpA Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 29/11/2018 File Signature Ciriatti Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items esamine*

ROSETTI MARINO

PQR 45/18

Mechanical test report

INSPECTA S.R.L.	TEST REPORT *RAPPORTO DI PROVA* N° 0413-00850-18 Rev.00 Data: 04/12/2018	ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO LAB N°1607

Object: *Oggetto:*	**MECHANICAL TEST ON PQR 45/2018**			Pag. 1 di 13
Specimen: *Saggio:*	**521/18PF** **522/18PC**	**Base Material:** *Materiale Base:*	**Pipe Ø 6" THK 21,90 mm WITH PLATE FORMED Ø 600 mm Thk 25,00 mm**	**API 5L Gr.X65 WITH ISO EN 10225 S460 G2+M**
Customer: ROSETTI MARINO SPA *Committente:* **Address: Via Trieste, 230 - 48122 Ravenna (RA)** *Indirizzo:*		**Witnessed by:** *Presenziato da:*	**ROSETTI S.p.A.** **RINA SERVICES S.p.A** **TOTAL S.p.A.**	
Final customer:. *Cliente finale:*	**N.A.**			
Reference Yours bill of landing: *Vs. DDT di consegn*	**n°** // *n°*	**Date:** *Data:* //	**MD52** *MD 52* **134/18**	**Date:** *Data:* **20/11/2018**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **04/12/2018**	**End of activities:** *Fine prove:*		**Date:** *Data:* **04/12/2018**

PROVE RICHIESTE

☐ **TENSILE TEST**/*Trazione*	☐ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*	
☐ **BEND TEST**/*Piega*	☐ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root /*Dritto/Rovescio* ☐ Side/ *Laterale*	
☐ **IMPACT TEST**/*Resilienza*	☐ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*	
☒ **MACROEXAMINATION TEST** / *Macrografia*			
☒ **HARDNESS TEST**/ *Durezza*	☐ HV 5	☒ HV 10	
☐ **FRACTURE TEST**/ *Frattura*	☐ Plate on Plate/ *Piastra su Piastra*	☐ Pipe on Plate/*Tubo su Piastra*	
☐ **CHEMICAL ANALYSIS**/*Analisi Chimica*			
☐ **MICROEXAMINATION TEST** / *Micrografia*			
☐ **OTHER (Specify)**/*Altro/(Specificare)*			

Allegati /Attachments: NONE

NOTE/ Remarks:
REFERENCE CODE FROM CUSTOMER REQUEST:MOG-FP-MET-STD-0012 Rev.04 + UNI EN ISO 15614-1:2017

Specimen *521/18 WELDING POSITION:* PF
Specimen *522/18 WELDING POSITION:* PC

JOB ROSETTI 118A10

*** Prova non accreditata da ACCREDIA**

Laboratory Responsible *Responsabile Laboratorio* *Sig. Claudio Pettinato*	**Customer Inspector** *Ispettore del cliente*	**Third Part Inspector** *Ispettore Terza parte*
04-12-2018	ROSETTI MARINO S.p.A. Welding Inspector D. Canacchi	RINA Services S.p.A. No. Bo. Date 04/12/2018 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Cimatti Davide

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova.. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I campionamenti sono eseguiti dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%
The results in this test report refers only to the specimen that has been tested.The customer undertakes to print out /reproduce the test report. Any partial reproduction is prohibited.Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory.Sampling shall be performed by the custode.Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku = 2 equivalent to a level of confidence of 95 % .

TOTAL E&P Danmark A/S
D HODGSON
4 DEC 18.
☑ Witnessed ☐ Reviewed

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing: *04/12/2018*
Data esecuzione prova:

☒ *UNI EN ISO 6507-1: 2018* | ☒ *UNI EN ISO 9015-1: 2011* | ☐ *ASTM E 92-17* | ☐ _____

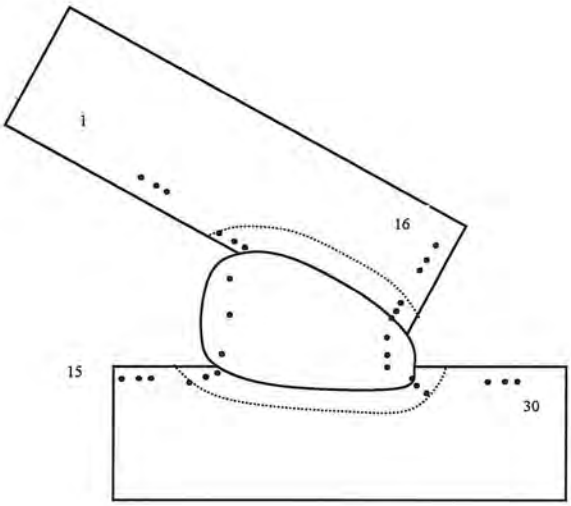
Serial N. 43030614C

Internal procedure *Procedura interna*	PP10 rev.02	**Sample Identification** *Identificazione provino*	521-18 H6	**Hardness test type** *Tipo di durezza*	≤325 HV 10	**Test Temp.** *Temp.test*	22°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: **Base Material Side B:**

BM	HAZ	WM	HAZ	BM
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30



Reference points *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U
1 – 2 - 3	**216-214-215**	//	16 – 17 - 18	**157-164-166**	//	31 – 32 - 33	//	//
4 - 5 - 6	**185-182-213**	//	19 - 20 - 21	**207-200-215**	//	34 - 35 - 36	//	//
7 – 8 - 9	**249-276-234**	//	22 – 23 - 24	**221-230-231**	//	37 – 38 - 39	//	//
10 - 11 - 12	**257-232-205**	//	25 - 26 - 27	**233-207-206**	//	40 - 41 - 42	//	//
13 – 14 - 15	**208-200-196**	//	28 – 29 - 30	**202-205-207**	//	43 – 44 - 45	//	//

Remarks/ *Note:* //

*** Prova non accreditata da ACCREDIA**

Laboratory Technician
Tecnico di Laboratorio
Sig. Matteo Galdieri
INSPECTA Srl
04/12/18
Laboratory Technician

Laboratory Responsible
Responsabile Laboratorio
Sig. Claudio Pettinato
INSPECTA srl
04-12-2018

Customer Inspector
Ispettore del cliente
ROSETTI MARINO SpA

Third part Inspector
Ispettore Terza parte
RINA Services SpA No. Bo. 0474
Date 04/12/2018
Noted ☐
Reviewed ☐
Witnessed ☒
Approved ☐
File
Signature
Cimatti Davide

TOTAL E&P Danmark A/S
D HODGSON
4 DEC 18
☑ Witnessed ☐ Reviewed

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing: *04/12/2018*
Data esecuzione prova:

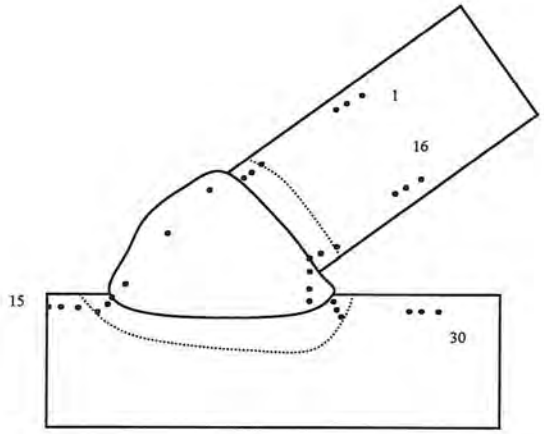
☒ *UNI EN ISO 6507-1: 2018* ☒ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

Serial N. 43030614C

Internal procedure *Procedura interna*	PP10 rev.02	**Sample Identification** *Identificazione provino*	521-18 H12	**Hardness test type** *Tipo di durezza*	≤325 HV 10	**Test Temp.** *Temp.test*	22°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A:				**Base Material Side B:**
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30



Reference points *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U
1 – 2 - 3	**214-212-206**	//	16 – 17 - 18	**163-163-160**	//	31 – 32 - 33	//	//
4 - 5 - 6	**182-196-213**	//	19 - 20 - 21	**178-181-183**	//	34 - 35 - 36	//	//
7 – 8 - 9	**215-240-257**	//	22 – 23 - 24	**233-239-227**	//	37 – 38 - 39	//	//
10 - 11 - 12	**286-240-221**	//	25 - 26 - 27	**217-202-197**	//	40 - 41 - 42	//	//
13 – 14 - 15	**210-208-209**	//	28 – 29 - 30	**211-220-214**	//	43 – 44 - 45	//	//

Remarks/ *Note:*	//
	*** Prova non accreditata da ACCREDIA**

Laboratory Technician
Tecnico di Laboratorio
Sig Matteo Galdieri
INSPECTA srl
04/12/18
Laboratory Technician

Laboratory Responsible
Responsabile Laboratorio
Sig. Claudio Pettinato
INSPECTA srl
04-12-2018

Customer Inspector
Ispettore del cliente
ROSETTI MARINO S.p.A.
Welding Dept.
P. Cenacchi

Third part Inspector
Ispettore Terza parte
RINA Services SpA
No. Bo. 0474
Date 04/12/2018
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
File
Signature
Cimatti Davide

TOTAL E&P Danmark A/S
D HODGSON
4 DEC 18
☑ Witnessed ☐ Reviewed

VICKERS HARDNESS TEST METHOD

Prova di durezza Vickers

Date of Testing: *04/12/2018*
Data esecuzione prova:

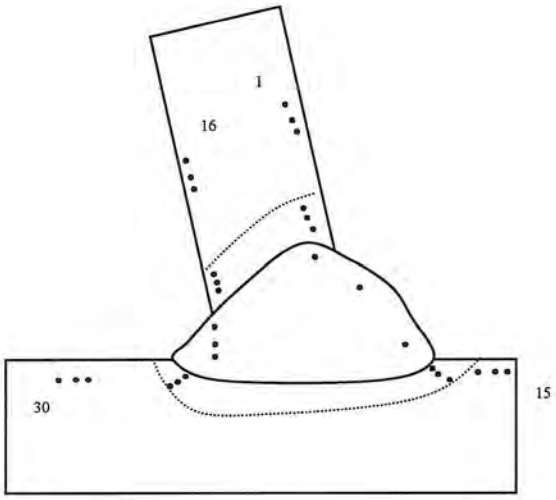
☒ *UNI EN ISO 6507-1: 2018* | ☒ *UNI EN ISO 9015-1: 2011* | ☐ *ASTM E 92-17* | ☐ _____

Serial N. 43030614C

Internal procedure *Procedura interna*	PP10 rev.02	**Sample Identification** *Identificazione provino*	521-18 H9	**Hardness test type** *Tipo di durezza*	≤325 HV 10	**Test Temp.** *Temp.test*	22°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A:				**Base Material Side B:**
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30



Reference points *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U
1 – 2 - 3	**219-219-221**	//	16 – 17 - 18	**165-162-162**	//	31 – 32 - 33	//	//
4 - 5 - 6	**184-191-202**	//	19 - 20 - 21	**175-169-191**	//	34 - 35 - 36	//	//
7 – 8 - 9	**247-251-246**	//	22 – 23 - 24	**210-222-218**	//	37 – 38 - 39	//	//
10 - 11 - 12	**276-254-226**	//	25 - 26 - 27	**210-194-185**	//	40 - 41 - 42	//	//
13 – 14 - 15	**208-213-215**	//	28 – 29 - 30	**220-215-214**	//	43 – 44 - 45	//	//

Remarks/ *Note:*	//
	*** Prova non accreditata da ACCREDIA**

Laboratory Technician
Tecnico di Laboratorio
Sig.Matteo Galdieri
- INSPECTA srl -
04/12/18
Laboratory Technician

Laboratory Responsible
Responsabile Laboratorio
Sig. Claudio Pettinato
INSPECTA srl
04-12-2018
Via Ravegnana, 379/a
47122 Forlì (FC)
P. IVA 03944480403

Customer Inspector
Ispettore del cliente
ROSETTI MARINO SpA
Eng. Dept.
D. Censoni

Third part Inspector
Ispettore parte terza
RINA Services SpA
No. Bo. 0474
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
Date 04/12/18
File
Signature
Ciriatti Davide

TOTAL E&P Denmark A/S
D Hagson
4 DEC 18
☑ Witnessed ☐ Reviewed

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing: *04/12/2018*
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

Internal procedure *PP12 rev.00* *Procedura internal*		**Test temperatura** *Temperature Test*	**22°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**521/18 H6**	**Magnification:** *Ingrandimento:*	**Photo at 1.3X** **Examination at 10X**
Designation: *Designazione:*	**ISO 17639-A-E-2.1-2.1/2.1/2.1 NITAL**		



Remarks / *Note:*	**INDICATION: 301 h<2,00 mm** *** Prova non accreditata da ACCREDIA**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio *Sig Matteo Galdieri*	*Responsabile Laboratorio* *Sig. Claudio Pettinato*	*Ispettore del cliente*	*Ispettore Terza parte*
- INSPECTA srl - 04/12/18 Laboratory Technician	INSPECTA srl 04-12-2018 Via Ravegnana, 379/a 47122 Forlì (FC) P. IVA 03944480403	ROSETTI MARINO S.p.A. Welding Dept. D. Ceracchi	RINA Services SpA No. Bo. 0474 Date 04/12/2018 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Cimatti Davide

TOTAL E&P Danmark A/S
D HODGSON
4 DEC 18
☑ Witnessed ☐ Reviewed

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing:*04/12/2018*
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

Internal procedure *PP12 rev.00* *Procedura internal*		**Test temperatura** *Temperature Test*	**22°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**521/18 H12**	**Magnification:** *Ingrandimento:*	**Photo at 1.3X** **Examination at 10X**
Designation: *Designazione:*	**ISO 17639-A-E-2.1-2.1/2.1/2.1 NITAL**		



Remarks / *Note:*	/ *** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio* *Sig Matteo Galdieri*	**Laboratory Responsible** *Responsabile Laboratorio* *Sig. Claudio Pettinato*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - 4/12/18 Laboratory Technician	INSPECTA srl 04-12-2018 Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403	ROSETTI MARINO SpA D. Genaccini	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ Date 04/12/2018 File _____ Signature Cimatti Davide

TOTAL E&P Danmark A/S
D HOGSON
4 DEC 18
☑ Witnessed ☐ Reviewed

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing:*04/12/2018*
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

Internal procedure *PP12 rev.00* *Procedura internal*		**Test temperatura** *Temperature Test*	**22°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**521/18 H9**	**Magnification:** *Ingrandimento:*	**Photo at 1.3X** **Examination at 10X**
Designation: *Designazione:*	**ISO 17639-A-E-2.1-2.1/2.1/2.1 NITAL**		



Remarks / *Note:*	/ *** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio* *Sig Matteo Galdieri*	**Laboratory Responsible** *Responsabile Laboratorio* *Sig. Claudio Pettinato*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - 04/12/18 Laboratory Technician	INSPECTA srl 04-12-2018 Via Ravegnana 379/A 47122 Forlì (FC) P. IVA 03944480403	ROSETTI MARINO S.A. Welding Dept. D. Canazzoni	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 04/12/2018 File Signature Cimatti Davide

TOTAL E&P Denmark A/S
D HOGSON
4 DEC 18
☑ Witnessed ☐ Reviewed

VICKERS HARDNESS TEST METHOD

Prova di durezza Vickers

Date of Testing: *04/12/2018*
Data esecuzione prova:

☒ *UNI EN ISO 6507-1: 2018* ☒ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

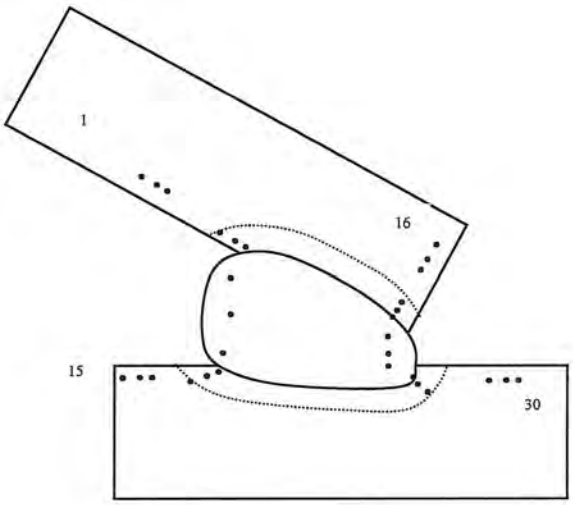
Serial N. 43030614C

Internal procedure *Procedura interna*	PP10 rev.02	**Sample Identification** *Identificazione provino*	522-18 H6	**Hardness test type** *Tipo di durezza*	≤325 HV 10	**Test Temp.** *Temp.test*	22°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: **Base Material Side B:**

BM	HAZ	WM	HAZ	BM
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30



Reference points *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U
1 – 2 - 3	**223-226-219**	//	16 – 17 - 18	**163-162-163**	//	31 – 32 - 33	//	//
4 - 5 - 6	**196-228-240**	//	19 - 20 - 21	**220-222-207**	//	34 - 35 - 36	//	//
7 – 8 - 9	**252-236-262**	//	22 – 23 - 24	**245-236-241**	//	37 – 38 - 39	//	//
10 - 11 - 12	**255-256-228**	//	25 - 26 - 27	**226-246-209**	//	40 - 41 - 42	//	//
13 – 14 - 15	**200-197-195**	//	28 – 29 - 30	**205-195-198**	//	43 – 44 - 45	//	//

Remarks/ *Note:* //

*** Prova non accreditata da ACCREDIA**

Laboratory Technician
Tecnico di Laboratorio
Sig.Matteo Galdieri
INSPECTA SRL
04/12/18
Laboratory Technician

Laboratory Responsible
Responsabile Laboratorio
Sig. Claudio Pettinato
04-12-2018

Customer Inspector
Ispettore del cliente
BOSETTI MARINO S.p.A.
D. Cenacchi

Third part Inspector
Ispettore Terza parte
RINA Services SpA
No. Bo. 0474
Date 04/12/2018
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
File
Signature
Cimatti Davide

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4 DEC 18
☑ Witnessed ☐ Reviewed

VICKERS HARDNESS TEST METHOD

Prova di durezza Vickers

Date of Testing:*04/12/2018*
Data esecuzione prova:

☒ *UNI EN ISO 6507-1: 2018* | ☒ *UNI EN ISO 9015-1: 2011* | ☐ *ASTM E 92-17* | ☐ _____

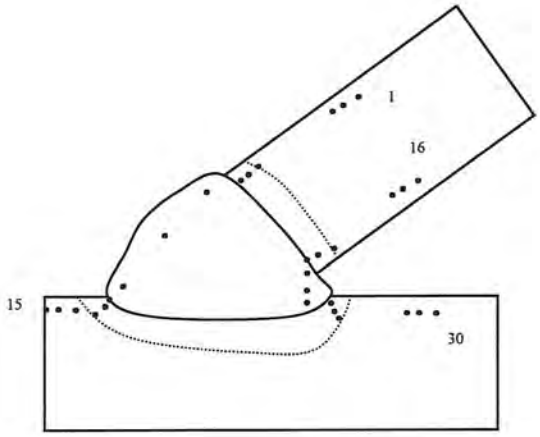
Serial N. 43030614C

Internal procedure *Procedura interna*	PP10 rev.02	**Sample Identification** *Identificazione provino*	522-18 H12	**Hardness test type** *Tipo di durezza*	≤325 HV 10	**Test Temp.** *Temp.test*	22°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: **Base Material Side B:**

BM	HAZ	WM	HAZ	BM
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30



Reference points *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U
1 – 2 - 3	**187-198-190**	//	16 – 17 - 18	**161-159-158**	//	31 – 32 - 33	//	//
4 - 5 - 6	**235-263-276**	//	19 - 20 - 21	**184-187-188**	//	34 - 35 - 36	//	//
7 – 8 - 9	**244-222-241**	//	22 – 23 - 24	**231-226-235**	//	37 – 38 - 39	//	//
10 - 11 - 12	**230-211-191**	//	25 - 26 - 27	**235-228-214**	//	40 - 41 - 42	//	//
13 – 14 - 15	**193-194-196**	//	28 – 29 - 30	**201-207-197**	//	43 – 44 - 45	//	//

Remarks/ *Note:* //

*** Prova non accreditata da ACCREDIA**

Laboratory Technician
Tecnico di Laboratorio
Sig Matteo Galdieri
INSPECTA srl
04/12/18
Laboratory Technician

Laboratory Responsible
Responsabile Laboratorio
Sig. Claudio Pettinato
04-12-2018
Via Ravegnana, 379/a

Customer Inspector
Ispettore del cliente
ROSETTI MARINO S.p.A.
D. Deriacchi

Third part Inspector
Ispettore terza parte
RINA Services SpA
No. Bo. 0474
Noted ☐
Reviewed ☐
Witnessed ☒
Approved ☐
Date 4/12/2018
File
Signature
Ghiatti Davide

TOTAL E&P Denmark A/S
D Hoggson
4 DEC 18
☑ Witnessed ☐ Reviewed

VICKERS HARDNESS TEST METHOD

Prova di durezza Vickers

Date of Testing: *04/12/2018*
Data esecuzione prova:

☒ *UNI EN ISO 6507-1: 2018* | ☒ *UNI EN ISO 9015-1: 2011* | ☐ *ASTM E 92-17* | ☐ _____

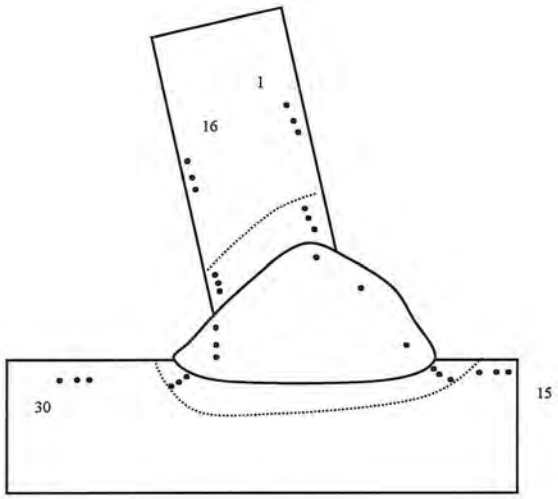
Serial N. 43030614C

Internal procedure *Procedura interna*	PP10 rev.02	**Sample Identification** *Identificazione provino*	522-18 H9	**Hardness test type** *Tipo di durezza*	≤325 HV 10	**Test Temp.** *Temp.test*	22°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: **Base Material Side B:**

BM	HAZ	WM	HAZ	BM
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30



Reference points *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U
1 – 2 - 3	**197-198-199**	//	16 – 17 - 18	**163-164-167**	//	31 – 32 - 33	//	//
4 - 5 - 6	**218-244-262**	//	19 - 20 - 21	**165-165-181**	//	34 - 35 - 36	//	//
7 – 8 - 9	**241-241-245**	//	22 – 23 - 24	**211-215-223**	//	37 – 38 - 39	//	//
10 - 11 - 12	**258-247-233**	//	25 - 26 - 27	**223-213-201**	//	40 - 41 - 42	//	//
13 – 14 - 15	**223-225-225**	//	28 – 29 - 30	**204-198-207**	//	43 – 44 - 45	//	//

Remarks/ *Note:* *** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig. Matteo Galdieri	Sig. Claudio Pettinato	ROSETTI MARINO SpA	RINA Services SpA No. Bo. 0474
04/12/18	04-12-2018		Date 04/12/2018
Laboratory Technician			Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐
			File _____ Signature Cimatti Davide

TOTAL E&P Danmark A/S
D HOGSON
Date 4 DEC 18
☑ Witnessed ☐ Reviewed

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing:*04/12/2018*
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

Internal procedure *PP12 rev.00* *Procedura internal*		**Test temperatura** *Temperature Test*	**22°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**522/18 H6**	**Magnification:** *Ingrandimento:*	**Photo at 1.4X** **Examination at 10X**
Designation: *Designazione:*	**ISO 17639-A-E-2.1-2.1/2.1/2.1 NITAL**		



Remarks / *Note:*	**INDICATION: 301 h<2,00 mm** *** Prova non accreditata da ACCREDIA**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio *Sig.Matteo Galdieri*	*Responsabile Laboratorio* *Sig. Claudio Pettinato*	*Ispettore del cliente*	*Ispettore Terza parte*
INSPECTA srl 04/12/18 Laboratory Technician	INSPECTA srl 04-12-2018 Via Ravegnana, 379/a 47122 Forlì (FC) P. IVA 03944480403	ROSETTI MARINO SPA D. Cenacchi	RINA Services SpA No. Bo. 0474 Date 04/12/2018 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Cimatti Davide

TOTAL E&P Denmark A/S
D HODGSON
4 DEC 18
☑ Witnessed ☐ Reviewed

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing: *04/12/2018*
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

Internal procedure *PP12 rev.00* *Procedura internal*		**Test temperatura** *Temperature Test*	**22°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**522/18 H12**	**Magnification:** *Ingrandimento:*	**Photo at 1.4X** **Examination at 10X**
Designation: *Designazione:*	**ISO 17639-A-E-2.1-2.1/2.1/2.1 NITAL**		



Remarks / *Note:*	/ *** Prova non accreditata da ACCREDIA**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio *Sig Matteo Galdieri* - INSPECTA srl - 04/12/18 Laboratory Technician	*Responsabile Laboratorio* *Sig. Claudio Pettinato* INSPECTA srl 04-12-2018 Via Ravegnana, 379/A 47121 Forlì (FC) P. IVA 03944480403	*Ispettore del cliente*	*Ispettore Terza parte* RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 04/12/2018 File Signature Cimatti Davide

TOTAL E&P Denmark A/S
Dir.
4 DEC 18
☑ Witnessed ☐ Reviewed

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing:*04/12/2018*
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

Internal procedure *PP12 rev.00* *Procedura internal*		**Test temperatura** *Temperature Test*	**22°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**522/18 H9**	**Magnification:** *Ingrandimento:*	**Photo at 1.4X** **Examination at 10X**
Designation: *Designazione:*	**ISO 17639-A-E-2.1-2.1/2.1/2.1 NITAL**		



Remarks / *Note:*	/ *** Prova non accreditata da ACCREDIA**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio *Sig Matteo Galdieri* - INSPECTA srl - Laboratory Technician	*Responsabile Laboratorio* *Sig. Claudio Pettinato* INSPECTA srl 04-12-2018 Via Ravegnana, 379/a 47122 Forlì (FC) P. IVA 03944480403	*Ispettore del cliente* ROSETTI MARINO S.p.A. Welding Dept. D. Cavacchi	*Ispettore terza parte* RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 04/12/2018 File Signature Cimatti Davide

TOTAL E&P Denmark A/S
D HODGSON
4 DEC 18
☑ Witnessed ☐ Reviewed

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 47/18	Sheet/Foglio 1/3

Manufacturer's Welding Procedure. Ref. no.	47/18 REV. 0		
Manufacturer	ROSETTI MARINO S.p.A.		
Address	VIA TRIESTE 230 - 48121 RAVENNA		
Code, Testing Standard	PremierOil Spec. AB-TO-WGP-TO-ST-BD-0001 Rev. B02 and AB-TO-WGP-TO-ST-SP-0002 Rev. B01; EEMUA 158:2014 (Third Edition)		
	Location of test specimen according to EEMUA 158:2014 (Third Edition) Section 4.4.4, Fig. 7 to 11 Essential variables according to EEMUA 158:2014, Section 4.5		
Date of welding	Start: December 18th , 2018 Complete: December 19th, 2018		
Examiner of examining body	Rina Services S.p.A.		
RANGE OF QUALIFICATION			
Welding process	136 - FCAW		
Type(s)	Semiautomatic		
Welding Equipment Type	HF inverter type		
Actual parent Material side A	Plate: EN 10225: S460G2+M Z35 (Heat: 882852)		
Actual parent Material side B	Plate: EN 10225: S460G2+M Z35 (Heat: 882852)		
Parent Material grade	Carbon steel with maximum strength of 540 MPa		
Supply condition	Thermomechanical rolled and accelerated cooled		
Carbon equivalent/Pcm/C	Heat Values: 0,41/0,17/ 0,052		
Groove design/configuration	Half Vee Butt Joint (both sides welding with back gouging), for groove dimension and details see page 4 of 5		
Parent material thickness (mm)	13,5 mm (obtained from parent material of 80 mm thk.)		
Weld metal thickness (mm)	136 - FCAW 13,5 mm		
Single or Multi-pass	136 - FCAW MULTIPLE		
Outside diameter	/		
Filler material Designation	136 FCAW EN ISO 17632-A: T 46 4 1Ni P M 21 2 H5 (AWS 5.36: E81T1-M21A4-Ni1)		
Filler material Maker	136 - Esab OK Tubrod 15.17		
Filler material Size	136 - FCAW ∅ 1,2 mm		
Shielding gas/Flux	ISO 14175 :2008 M21 (80% Ar + 20% CO_2)		
Shielding gas flow rate	20 l/min.		
Backing gas (purging)	None		

Type of welding current & polarity	DC - RP	Heat input / Apporto termico (kJ/mm) ± 10%		Diameter	2G (PC)	3G (PF)
			Pass	mm		
			Root	∅ 1,2	1,18 to 1,44	1,78 to 2,18
			Hot	∅ 1,2	0,72 to 0,88	1,40 to 1,72
			Filll	∅ 1,2	0,63 to 0,81	1,40 to 1,72
			Cap	∅ 1,2	0,50 to 0,67	1,03 to 1,42

Welding position	All, vertical down progression excluded		
Preheat (°C)	50	Interpass temperature / Temp. di interpass (°C)	250
Post-Weld Heat Treatment and/or ageing	NONE		
Weld bead width	Max. 12 mm for 2G position ; Max. 15 mm for 3G position		
Welder's detail	Crispino Antonio NC272 (2G Test Coupon) Ciocan Vasile NC219 (3G Test Coupon)		
Time lapse between root and hot pass	N.A.		
Other information / Altre informazioni	- Preheat performed by propane torch -Accelerate weld cooling not permitted; -Base material origin: plate		

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 47/18	Sheet/Foglio 2/3

Manufacturer's Welding Procedure. Ref. no.	47/18 REV. 0		
Test result (WPQR) N°	47/18	Date/Data	16/01/2019
Manufacturer's WPS No.	pWPS 47/18 REV. 0	Date/Data	13/12/2018

TESTS CARRIED OUT ON SAMPLE 47/18 WELDED IN 2G POSITION (PC)

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 47/18 2G
Penetrant test	N.A.	/
Magnetic particle test	Acceptable	06-18307
Radiographic test	N.A.	/
Ultrasonic test	Acceptable	06-18307

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2] ≥ 460	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 540	A [%]	Z [%]	Fracture Location	Remarks
TRANSVERSE 1	464	/	575	/	/	Base metal	/
TRANSVERSE 2	464	/	592	/	/	Base metal	/

BEND TEST

Type & N.	Bend angle	Remarks	Results
4 Side bend	180°	Former Ø 40 mm	Satisfactory

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] ≥ 35J			Avarage value [J] ≥ 46J	Remarks
10x10x55	Weld metal 2 mm from Cap	KV2	-40°C	118	82	61	87	/
10x10x55	FL 2 mm from Cap	KV2	-40°C	114	174	71	120	/
10x10x55	FL+2 2mm from Cap	KV2	-40°C	298	312	125	245	/
10x10x55	FL+5 2mm from Cap	KV2	-40°C	273	285	241	266	/

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
1 Macro examination+Hardness test	Satisfactory-See Element Materials Technology Milan Certificate No. RPR1550-1E1R0A18
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Element Materials Technology Milan S.r.l. - Crema (CR)
Laboratory report reference N.	Report No. RPR1550-1E1R0A18 dated JANUARY 16th 2018
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of PremierOil Spec. AB-TO-WGP-TO-ST-BD-0001 Rev. B02 and AB-TO-WGP-TO-ST-SP-0002 Rev. B01; EEMUA 158:2014 (Third Edition)

Date/Data
16-01-2019

ROSETTI MARINO S.p.A.
Welding Dept.
ROSETTI MARINO S.p.A.

Examiner or Examination Body
RINA Services S.p.A.

RINA
F. Lago
RINA Services S.p.A.
Name and signature / Nome e firma

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 47/18	Sheet/Foglio 3/3

Test result (WPQR) N°	47/18	Date/Data	16/01/2019
Manufacturer's WPS No.	pWPS 47/18 REV. 0	Date/Data	13/12/2018

TESTS CARRIED OUT ON SAMPLE 47/18 WELDED IN 3G POSITION (PF)

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 47/18 3G
Penetrant test	N.A.	/
Magnetic particle test	Acceptable	06-18307
Radiographic test	N.A.	/
Ultrasonic test	Acceptable	06-18307

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2] ≥ 460	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 540	A [%]	Z [%]	Fracture Location	Remarks
TRANSVERSE 1	488	/	585	/	/	Base metal	/
TRANSVERSE 2	464	/	582	/	/	Base metal	/

BEND TEST

Type & N.	Bend angle	Remarks	Results
4 Side bend	180°	Former Ø 40 mm	Satisfactory

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] ≥ 35J			Avarage value [J] ≥ 46J	Remarks
10x10x55	Weld metal 2 mm from Cap	KV2	-40°C	128	44	99	90	/
10x10x55	FL 2 mm from Cap	KV2	-40°C	65	85	88	79	/
10x10x55	FL+2 2mm from Cap	KV2	-40°C	354	279	296	310	/
10x10x55	FL+5 2mm from Cap	KV2	-40°C	256	274	330	287	/

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
1 Macro examination+Hardness test	Satisfactory-See Element Materials Technology Milan Certificate No. RPR1550-2E1R0A18
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Element Materials Technology Milan S.r.l. - Crema (CR)
Laboratory report reference N.	Report No. RPR1550-2E1R0A18 dated JANUARY 16th 2018
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of PremierOil Spec. AB-TO-WGP-TO-ST-BD-0001 Rev. B02 and AB-TO-WGP-TO-ST-SP-0002 Rev. B01; EEMUA 158:2014 (Third Edition)

Date/Data
16-01-2019
ROSETTI MARINO S.p.A.
ROSETTI MARINO S.p.A.

Examiner or Examination Body
RINA Services S.p.A.
Name and signature / Nome e firma
RINA Services S.p.A.

RAPPORTO PROVA DI QUALIFICA DI PROCEDIMENTO DI SALDATURA/BRASATURA

N° PRATICA	N° SAGGIO	NORMA
2018 VE 319 PO	47/18 PC, 47/18 PF	EEMUA 158:2014, Spec. AB-TO-WGP-TO-ST-BD-0001 Rev. B02 and AB-TO-WGP-TO-ST-SP-0002 Rev. B01

Società ROSETTI MARINO SPA Localit RAVENNA (RA)

Processo FCAW (136) à Tipo SEMIAUTOMATIC

Posizione Saldatore/ Brasatore _____ Spessore (mm) _____ Diametro (mm) _____

_____ Stamp _____ WPS/BPS 55/18

_____ _____ _____

Materiale base:		*Materiale d'apporto o flusso:*	
Gruppo/i	Norma e designazione / tipo backing	Nome commerciale	Norma / designazione
_____	_____	_____	_____
_____	_____	_____	_____
Backing	_____	_____	_____

Gas al dritto:			*Gas al rovescio:*		
Composizione	_____	L/min _____ Ø ugello (mm) _____	Composizione	_____	L/min _____

Ø Elettrodo Tungsteno (mm) e tipo _____ Temperatura preriscaldo (°C) _____

PWHT (temperatura, tempo e rampe) _____ Temperatura interpass max (°C) _____

Molatura fra le passate _____ Molatura al rovescio _____ Ripresa al rovescio _____

Passate	Processo	Materiale d'apporto Ø [mm]	Corrente [A]	Tensione [V]	Tipo corrente	Velocità [cm/min]

Preparazione giunto e sequenza saldatura
Per processi multipli indicare spessore depositato (mm/processo)

For all details See As Run Sheets attached

Esito esame visivo: ☒ Positivo ☐ Negativo

Prove di qualifica effettuate a: Marina di Ravenna (RA) Data 18-19/12/2018 Firma _____

Esito prove laboratorio: ☒ Positivo ☐ Negativo

Rapporti laboratorio allegati n° e data: ELEMENT certificate nr. RPR1550-1E1R0A18 & RPR1550-4E1R0A18

A seguito dell'esito positivo delle prove di laboratorio, si propone il rilascio del certificato di qualifica n° ROSETTI FORM PQR 47/18 Data 17/01/2019 Firma _____

Decisione DM– Con riferimento al documento RINA IS-CRT-SAL-01, si autorizza il rilascio dei certificati di qualifica Data _____ Firma DM _____

PremierOil ROSETTI MARINO

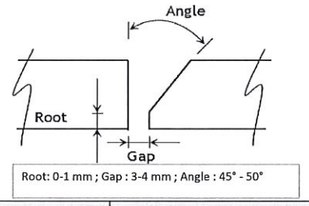
PQR - AS- RUN PARAMETER SHEET

pWPS 47/18	
PQR 47/18	
Coupon Nr. 47/18 PF	
Date: 18/12/2018	Page: 1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: **EEMUA 158 Third Edition (2014) and PremierOil Spec. AB-TO-WGP-TO-ST-BD-0001 Rev. B02 and AB-TO-WGP-TO-ST-SP-0002 Rev. B01**

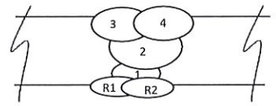
Welder Name(s):	CIOCAN VASILE	Welder Id No(s):	NC219		
Welding Process(es):	136-FCAW	Type(s):	SEMIAUTOMATIC		
Welding Position:	PF (3G)	Progression:	Vertical uphill		
Base Materials:	EN 10225: S460 G2+M	Wall Thickness:	13,5 (*)	Diameter:	/
Heat No(s):	882852	Joint Type:	HALF VEE BUTT JOINT; BOTH SIDES WELDED		

WELD PREPARATION:



Root: 0-1 mm ; Gap : 3-4 mm ; Angle : 45° - 50°

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNS24006	ESAB OK TUBROD 15.17
Hot Pass	1,2	PNS24006	ESAB OK TUBROD 15.17
Filling Runs	1,2	PNS24006	ESAB OK TUBROD 15.17
Cap	1,2	PNS24006	ESAB OK TUBROD 15.17

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar+ 20%CO2
Flow:	20 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/8"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
15 mm	String and weave		Multiple (each side)	Single

	Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required		Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
50°C	PROPANE TORCH	250	CONTACT DIGITAL THERMOMETHER	NA		NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
NA	1	FCAW	1	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	140	160	150,0	21	23	22,0	-	-	8	1,98	0,80	50	Welding unit: HELVI SE.0192
NA	2	FCAW	2	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	160	180	170,0	22	24	23,0	-	-	12	1,56	0,80	120	Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635
NA	3	FCAW	3	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	165	185	175,0	22	24	23,0	-	-	17	1,14	0,80	250	(*) machined from base metal thickness : 80 mm
NA	3	FCAW	4	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	165	185	175,0	22	24	23,0	-	-	16	1,21	0,80	180	Both side welded : side A passes from 1 to 4 (cap passes 3,4)
																				Side B passes from R1 to R2 (cap passes R1 and R2)
NA	R1	FCAW	R1	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	165	185	175,0	22	24	23,0	-	-	15	1,29	0,80	120	Grinding to sound metal before performing reverse passes
NA	R1	FCAW	R2	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	165	185	175,0	22	24	23,0	-	-	16	1,21	0,80	190	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO S.p.A. Matteo Del Frete Welding Dept.	Signature:	Signature:	Signature:
Date: 18/12/18	Date:	Date:	Date:

RINA SERVICES S.p.A. No. Bo 0474 — Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ — Date 18/12/2018 — File — Signature Cimatti Davide

PremierOil ROSETTI MARINO

PQR - AS- RUN PARAMETER SHEET

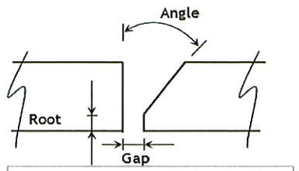
pWPS 47/18	
PQR 47/18	
Coupon Nr. 47/18 PC	
Date: 18-19/12/2018	Page: 1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: **EEMUA 158 Third Edition (2014) and PremierOil Spec. AB-TO-WGP-TO-ST-BD-0001 Rev. B02 and AB-TO-WGP-TO-ST-SP-0002 Rev. B01**

Welder Name(s):	CRISPINO ANTONIO	Welder Id No(s):	NC272
Welding Process(es):	136-FCAW	Type(s):	SEMIAUTOMATIC
Welding Position:	PC (2G)	Progression:	N.A.
Base Materials:	EN 10225: S460 G2+M	Wall Thickness:	13,5 (*)
Heat No(s):	882852	Joint Type:	HALF VEE BUTT JOINT; BOTH SIDES WELDED

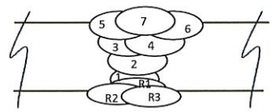
Diameter: /

WELD PREPARATION:



Root: 0-1 mm ; Gap : 3-4 mm ; Angle : 45° - 50°

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNS24006	ESAB OK TUBROD 15.17
Hot Pass	1,2	PNS24006	ESAB OK TUBROD 15.17
Filling Runs	1,2	PNS24006	ESAB OK TUBROD 15.17
Cap	1,2	PNS24006	ESAB OK TUBROD 15.17

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar+ 20%CO2
Flow:	20 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/8"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
12 mm	String		Multiple (each side)	Single

	Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required		Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
50°C	PROPANE TORCH	250	CONTACT DIGITAL THERMOMETHER	NA		NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
NA	1	FCAW	1	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	175	195	185,0	24	26	25,0	-	-	17	1,31	0,80	50	Welding unit: HELVI SE.0236
NA	2	FCAW	2	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	220	240	230,0	25	27	26,0	-	-	36	0,80	0,80	100	Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635
NA	3	FCAW	3	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	215	235	225,0	25	27	26,0	-	-	40	0,70	0,80	120	(*) machined from base metal thickness : 80 mm
NA	3	FCAW	4	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	215	235	225,0	25	27	26,0	-	-	38	0,74	0,80	140	Both side welded : side A passes from 1 to 7 (cap passes 5,6,7 ; last bead pass in the center of the weld)
NA	4	FCAW	5	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	180	200	190,0	23	25	24,0	-	-	36	0,61	0,80	200	Side B passes from R1 to R3 (cap passes R2 and R3)
NA	4	FCAW	6	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	180	200	190,0	23	25	24,0	-	-	37	0,59	0,80	250	Grinding to sound metal before performing reverse passes
NA	4	FCAW	7	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	180	200	190,0	23	25	24,0	-	-	37	0,59	0,80	200	
NA	1	FCAW	R1	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	190	210	200,0	23	25	24,0	-	-	33	0,70	0,80	150	
NA	2	FCAW	R2	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	185	205	195,0	23	25	24,0	-	-	40	0,56	0,80	200	
NA	2	FCAW	R3	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	185	205	195,0	23	25	24,0	-	-	40	0,56	0,80	180	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:		SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	RINA Services SpA No. Bo. 0474	Name:
Signature: ROSETTI MARINO S.p.A. Matteo Del Prete Welding Dept.	Signature:	Signature:	Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	Signature:
Date: 19/12/18	Date:	Date:	Date 19/12/2018 File Signature Cimatti Davide	Date:

PQR attachments index:

Base material certificate (Plate EN 10225: S460 G2+M)

Consumables certificate

preliminary WPS

NDE certificate

Mechanical test report

ROSETTI MARINO

PQR 47/18

Base material certificate
(Plate EN 10225: S460 G2+M)

Certificate Number:**VNA 1700015 / 9**
Page: 1 of 1

Inspection Certificate

Project: ————
Client: **voestalpine Grobblech GmbH**
voestalpine-Straße 3, 4020 Linz, Austria

Office: **Vienna**

Clients Order Number: **6501364**

Date: **15-02-2017**

Order Status: **incomplete**

Inspection Dates
First: **10-02-2017**

final: **17-02-2017**

This certificate is issued to voestalpine Grobblech GmbH, Linz/Austria, to certify that the undersigned Surveyor attended their works Linz for the purpose of testing and inspecting the undemoted material with satisfactory results as stated below.

Purchaser: **Rosetti Marino Spa**
Via Trieste 230
I-48122 RAVENNA

Order No.: **1716002502 116B20A**

Description:

48 piece(s) of steel plate(s) 384580 kg , as per attached inspection Certificate no.: **A0357565**

Specification

S460G2+M Z35 EN 10225 : 2009

Heat treatment/Delivery Condition: thermomechanical rolled + accelerated cooled

Scope of inspection:

witness mechanical testing: yes ☑
review manufacturer's declared analysis: yes ☑
witness / verify ultrasonic examination: yes ☑ n/a ☐
witness / verify microstructure examination: yes ☐ n/a ☑
witness /verify corrosion testing: yes ☐ n/a ☑
random visual and dimensional control and check of hard stamping: yes ☑

Identification:

Makers Brand voestalpine
Material Quality
Heat No.
Plate No.
Brand of LR

Lloyd's Register EMEA
Vienna Office
Lloyd's Register

24 FEB 2017

Kurt Huber
Surveyor to Lloyd's Register EMEA

A subsidiary of Lloyd's Register Group Limited

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Form 1123 (2015.08)

voestalpine Grobblech GmbH

A02
Inspection certificate

EN 10204 - 3.2

VNA1700015-9

Z02 Date 23-02-2017

voestalpine-Straße 3
4020 Linz, Austria
www.voestalpine.com/grobblech

A03 Document number	A0357565	A08 Order-No.:	6501364	A07 OrderDat.	13-12-2016

4F

A06 Customer	Rosetti Marino Spa Via Trieste 230 I-48122 RAVENNA	B01 Product	Plate		
		B02 Material	S460G2+M Z35	B03 Standard	EN 10225 : 2009
A07 OrderNo.	1716002502 116B20A	Supplementary requirements	Z35 - EN 10164		
A06 Consignee	Rosetti Marino Spa Via Trieste 230 I-48122 RAVENNA	B04 Delivery condition	thermomechanical rolled + accelerated cooled		

A10 - Supplementary Information

SOUTH PARS 13 - PILES

B03 - Supplementary requirements

MATERIAL IS FINE GRAINED, VACUUM DEGASSED AND FULLY KILLED, PRODUCED BY BOF.
MATERIAL IS ACCORDING TO SPECIFICATION SP13-P2-ST-SP-8028.
MATERIAL IS ACCORDING TO EN 10225, OPTIONS 2,6,7,9,10,12 AND 13.

Z01 - Visual Examination and dimensional checking: satisfactory. The results of tests performed are in compliance with the requirements.

Detail of supply

	B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	Ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
a	882852	186892/1	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
b	882852	186892/2	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
b	882852	186894/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
c	882852	186894/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
c	882852	186895/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
	882852	186895/2	30	80,00	2640,0	4800	1		8.010	56321	15-02-2017	1PLATCS80007
d	882852	186896/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
d	882852	186896/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
e	882852	186897/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
e	882852	186897/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
	882852	186898/1	30	80,00	2640,0	4800	1		8.020	56268	15-02-2017	1PLATCS80007
	882852	186898/2	30	80,00	2640,0	4800	1		8.020	56268	15-02-2017	1PLATCS80007
a	882852	186899/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007

A04
Symbol of the manufacturer's work

voestalpine

Z03
Stamp of the inspection representative

LR

Lloyd's Register EMEA
Vienna Office
Initials: KH
24 FEB 2017

Z02
Inspection representative voestalpine Grobblech
Quality Department Heavy Plates
BERGER Alfred

voestalpine
ONE STEP AHEAD.

Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	Ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
882852	186899/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
882852	186900/2	30	80,00	2640,0	4800	1		8.020	56058	15-02-2017	1PLATCS80007
882852	186900/1	30	80,00	2640,0	4800	1		8.020	56058	15-02-2017	1PLATCS80007
882852	186901/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
882852	186901/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972090	186721/2	30	80,00	2640,0	4800	1		8.018	56010	10-02-2017	1PLATCS80007
972090	186723/2	30	80,00	2640,0	4800	1		8.012	56058	14-02-2017	1PLATCS80007
972090	186723/1	30	80,00	2640,0	4800	1		8.012	56058	14-02-2017	1PLATCS80007
972090	186724/1	30	80,00	2640,0	4800	1		8.010	56058	13-02-2017	1PLATCS80007
972090	186724/2	30	80,00	2640,0	4800	1		8.010	56321	13-02-2017	1PLATCS80007
972090	186725/1	30	80,00	2640,0	4800	1		8.010	56010	11-02-2017	1PLATCS80007
972090	186725/2	30	80,00	2640,0	4800	1		8.010	56010	11-02-2017	1PLATCS80007
972090	186726/2	30	80,00	2640,0	4800	1		8.022	56058	10-02-2017	1PLATCS80007
972090	186726/1	30	80,00	2640,0	4800	1		8.022	56010	10-02-2017	1PLATCS80007
972093	181846/2	30	80,00	2640,0	4800	1		8.005	56268	15-02-2017	1PLATCS80007
972093	181846/1	30	80,00	2640,0	4800	1		8.005	56268	15-02-2017	1PLATCS80007
972093	186842/1	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
972093	186842/2	30	80,00	2640,0	4800	1		8.020	56058	17-02-2017	1PLATCS80007
972093	186843/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186843/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186844/2	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186844/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186846/2	30	80,00	2640,0	4800	1		8.007	56058	17-02-2017	1PLATCS80007
972093	186846/1	30	80,00	2640,0	4800	1		8.007	56058	17-02-2017	1PLATCS80007
972093	186902/2	30	80,00	2640,0	4800	1		8.010	56272	15-02-2017	1PLATCS80007
972093	186902/1	30	80,00	2640,0	4800	1		8.010	56272	15-02-2017	1PLATCS80007
972093	186903/2	30	80,00	2640,0	4800	1		8.010	56010	15-02-2017	1PLATCS80007
972093	186903/1	30	80,00	2640,0	4800	1		8.010	56058	15-02-2017	1PLATCS80007
972093	186905/2	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972093	186905/1	30	80,00	2640,0	4800	1		8.010	56058	17-02-2017	1PLATCS80007
972096	186841/1	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
972096	186841/2	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
972096	186845/1	30	80,00	2640,0	4800	1		8.010	56272	16-02-2017	1PLATCS80007
972096	186906/2	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007

Z03
Stamp of the inspection representative

LR
Lloyd's Register EMEA
Vienna Office
Initials: KH
24 FEB 2017

Z02
Inspection representative voestalpine Grobblech
Quality Department Heavy Plates
BERGER Alfred

voestalpine

voestalpine
ONE STEP AHEAD.

Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	Ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Abnahmedatum	reference no.
972096	186906/1	30	80,00	2640,0	4800	1		8.010	56058	14-02-2017	1PLATCS80007
	Sum					48		384.580			

C70 - Method of steelmaking: strand casted material: pure oxygen blown with vacuum treatment; steel is fully killed.

B14 - Supplementary information

Flatness acc. EN 10029/10 class N
Dimensional tolerances acc. EN 10029/10
EN10163-2: Class A3 - Repair-welding not permitted.
Thicknesstolerance acc. EN 10029/10 tab. 1 class A

Chemical composition (Heat analysis) - part 1 of 2

B07 Heat No.	C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %	Pb %	Cae %	Pcm %
>=		.150				.015																
Set values <=	.140	.550	1.650	.020	.0050	.055	.250	.700	.250	.300	.080	.040	.025	.0100	.0005	.0200	.0050	.0300	.0100	.010	.43	.22
882852	.052	.182	1.550	.009	.0009	.030	.182	.520	.123	.073	.004	.030	.012	.0051	.0002	.0020	.0003	.0020	.0020	.002	.41	.17
972090	.060	.176	1.520	.007	.0010	.022	.174	.520	.125	.046	.004	.027	.012	.0061	.0002	.0020	.0003	.0020	.0020	.002	.41	.17
972093	.052	.184	1.530	.008	.0011	.027	.172	.530	.125	.068	.004	.029	.012	.0042	.0003	.0020	.0003	.0030	.0020	.002	.41	.17
972096	.054	.177	1.530	.007	.0007	.026	.173	.530	.117	.054	.004	.027	.013	.0040	.0002	.0020	.0003	.0020	.0030	.002	.41	.17

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Chemical composition (Heat analysis) - part 2 of 2

B07 Heat No.	LF01 %	LF02 %	LF03 %
Set values >= <=	.090	.110	.900
882852	.034	.046	.898
972090	.031	.043	.865
972093	.033	.045	.895
972096	.031	.044	.874

C99 - Supplementary information
BI <= 0,01%
C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF03: Cr+Ni+Cu+Mo
LF02: Nb+V+Ti
LF01: Nb+V

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Test results: C10-C29 Tensile Test acc. EN ISO 6892-1

B07 Heat No.	B06 Plate No	C41 Width	SpThickn mm	C01 loc.	PosTh.	C02 Dir	C11 Reh MPa	C11 Rp0,2 MPa	C12 Rm MPa	L0	C13 E %	C11 Reh/Rm %	C11 Rp0,2/Rm %	Sim.htm	WBH
>=							405	405	505		17.0				
Set values <=									665			90.00	90.00		
882852	186892	Ø	9.98	F	V	T	445	445	535	A5	32.0	83.07	83.09		
	186896	Ø	9.98	F	V	T	447	443	535	A5	30.9	83.47	82.69		
	186898	Ø	9.99	F	V	T	441	438	538	A5	31.2	81.97	81.41		
	186900	Ø	9.98	F	V	T	457	440	533	A5	30.3	85.65	82.52		
	186892	Ø	9.99	F	V	T		436	527	A5	30.0		82.78	001	1
	186896	Ø	9.99	F	V	T	468	443	524	A5	32.3	89.30	84.50	001	1
	186898	Ø	9.98	F	V	T	465	445	527	A5	32.4	88.24	84.44	001	1
	186900	Ø	9.99	F	V	T		437	524	A5	31.6		83.43	001	1
972090	184827	Ø	10.00	F	V	T	456	449	541	A5	29.3	84.28	82.93		
	184828	Ø	10.00	F	V	T	442	440	536	A5	30.8	82.41	82.00		
	186723	Ø	9.98	F	V	T		429	545	A5	27.5		78.81		
	184827	Ø	9.99	F	V	T		432	520	A5	28.5		83.09	001	1
	184828	Ø	9.99	F	V	T		440	529	A5	31.2		83.32	001	1
	186723	Ø	9.96	F	V	T	487	474	563	A5	28.1	86.53	84.17	001	1
972093	181846	Ø	9.95	F	V	T		415	564	A5	32.1		73.58		
	186842	Ø	9.98	F	V	T	456	449	540	A5	32.5	84.45	83.24		
	186843	Ø	9.99	F	V	T	461	452	544	A5	32.6	84.74	83.09		
	186902	Ø	9.98	F	V	T	456	448	532	A5	32.5	85.67	84.18		
	181846	Ø	9.98	F	V	T	460	424	524	A5	32.6	87.79	80.92	001	1
	186842	Ø	9.99	F	V	T	471	440	526	A5	32.4	89.49	83.56	001	1
	186843	Ø	9.98	F	V	T	470	443	532	A5	32.6	88.35	83.27	001	1
	186902	Ø	9.99	F	V	T	463	436	518	A5	32.9	89.37	84.16	001	1
972096	186841	Ø	9.98	F	V	T	459	429	529	A5	30.9	86.77	81.10		
	186906	Ø	9.98	F	V	T	466	436	524	A5	31.2	88.86	83.05		
	186841	Ø	9.98	F	V	T	470	441	525	A5	32.1	89.52	84.00	001	1
	186906	Ø	9.97	F	V	T		439	523	A5	32.7		83.96	001	1

SpThickn: specimen thickness
C01;loc.:
F: Bottom
PosTh.: Pos Thickness
V: ¼

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Test results: C10-C29 Tensile Test acc. EN ISO 6892-1

B07 Heat No.	B06 Plate No	C41 Width mm	SpThickn	C01 loc.	PosTh.	C02 Dir	C11 Reh MPa	C11 Rp0,2 MPa	C12 Rm MPa	L0	C13 E %	C11 Reh/Rm %	C11 Rp0,2/Rm %	Sim.htm	WBH

C02;Dir:
  T: transverse
C12; Rm: Tensile Strength
L0: gauge
  A5: Length = 5.65 * sqr (area) mm
C13;E: elongation
Sim.htm: sim. heat treatment
  001: Sim.htm group #1
WBH: sim. heat treatment

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07	B06	C40	C01			C02	C03	C42	C42	C42	C43		
Heat No. samp.cond.	Plate No	shape	loc.	Pos.	PosTh.	Dir	temp	SV	SV	SV	AV	Sim.htm	WBH
							°C	J	J	J	J		
>=							-40	42	42	42	60		
Set values <=													

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No, samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>=							-40	42	42	42	60		
Set values <=													
882852	186892	CV 10x10	F	O		T	-40	340	328	325	331		
	186896	CV 10x10	F	O		T	-40	345	328	327	333		
	186898	CV 10x10	F	O		T	-40	352	332	322	335		
	186900	CV 10x10	F	O		T	-40	345	348	344	346		
	186892	CV 10x10	F	O		T	-40	307	310	303	307	001	1
	186896	CV 10x10	F	O		T	-40	314	321	315	317	001	1
	186898	CV 10x10	F	O		T	-40	323	311	317	317	001	1
	186900	CV 10x10	F	O		T	-40	334	324	325	328	001	1
	186892	CV 10x10	F	K		T	-40	348	364	385	366		
	186896	CV 10x10	F	K		T	-40	365	356	353	358		
	186898	CV 10x10	F	K		T	-40	352	365	345	354		
	186900	CV 10x10	F	K		T	-40	372	347	354	357		
	186892	CV 10x10	F	K		T	-40	345	329	324	333	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>=							-40	42	42	42	60		
Set values <=													
882852	186896	CV 10x10	F		K	T	-40	344	328	284	319	001	1
	186898	CV 10x10	F		K	T	-40	310	337	320	322	001	1
	186900	CV 10x10	F		K	T	-40	357	349	347	351	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>=							-40	42	42	42	60		
Set values <=													
972090	184827	CV 10x10	F		O	T	-40	321	320	314	318		
	184828	CV 10x10	F		O	T	-40	320	303	303	309		
	186723	CV 10x10	F		O	T	-40	323	327	322	324		
	184827	CV 10x10	F		O	T	-40	332	319	327	326	001	1
	184828	CV 10x10	F		O	T	-40	318	323	321	321	001	1
	186723	CV 10x10	F		O	T	-40	295	263	303	287	001	1
	184827	CV 10x10	F		K	T	-40	340	328	251	306		
	184828	CV 10x10	F		K	T	-40	346	336	317	333		
	186723	CV 10x10	F		K	T	-40	268	289	311	289		
	184827	CV 10x10	F		K	T	-40	321	331	357	336	001	1
	184828	CV 10x10	F		K	T	-40	326	353	89	256	001	1
	186723	CV 10x10	F		K	T	-40	284	266	276	275	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	42	42	42	60		
972093	181846	CV 10x10	F	O		T	-40	319	324	322	322		
	186842	CV 10x10	F	O		T	-40	345	347	334	342		
	186843	CV 10x10	F	O		T	-40	343	339	342	341		
	186902	CV 10x10	F	O		T	-40	349	344	335	342		
	181846	CV 10x10	F	O		T	-40	329	302	323	318	001	1
	186842	CV 10x10	F	O		T	-40	312	310	308	310	001	1
	186843	CV 10x10	F	O		T	-40	305	315	311	310	001	1
	186902	CV 10x10	F	O		T	-40	323	322	318	321	001	1
	181846	CV 10x10	F	K		T	-40	304	366	370	347		
	186842	CV 10x10	F	K		T	-40	362	369	351	361		
	186843	CV 10x10	F	K		T	-40	358	366	356	360		
	186902	CV 10x10	F	K		T	-40	357	366	377	366		
	181846	CV 10x10	F	K		T	-40	359	364	355	359	001	1

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
>= Set values <=							-40	42	42	42	60		
972093	186842	CV 10x10	F	K		T	-40	323	298	331	317	001	1
	186843	CV 10x10	F	K		T	-40	313	304	301	306	001	1
	186902	CV 10x10	F	K		T	-40	361	363	364	362	001	1
972096	186841	CV 10x10	F	O		T	-40	345	333	341	339		
	186906	CV 10x10	F	O		T	-40	338	340	346	341		
	186841	CV 10x10	F	O		T	-40	324	316	313	318	001	1
	186906	CV 10x10	F	O		T	-40	317	321	323	320	001	1
	186841	CV 10x10	F	K		T	-40	337	342	353	344		
	186906	CV 10x10	F	K		T	-40	348	357	334	346		
	186841	CV 10x10	F	K		T	-40	309	332	343	328	001	1
	186906	CV 10x10	F	K		T	-40	347	338	278	321	001	1
>= Set values <=							-40	29	29	29	46		

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No. samp.cond.	B06 Plate No	C40 shape	C01 loc.	Pos.	C02 PosTh.	C03 Dir	C42 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH
	>=						-40	29	29	29	46		
Set values <=													
882852	186892	CV 10x10	F		ZB2	T	-40	320	310	312	314		strain aged 5%, 60 min. at 250°C
	186896	CV 10x10	F		ZB2	T	-40	305	297	314	305		strain aged 5%, 60 min. at 250°C
	186898	CV 10x10	F		ZB2	T	-40	311	303	309	307		strain aged 5%, 60 min. at 250°C
	186900	CV 10x10	F		ZB2	T	-40	305	317	306	309		strain aged 5%, 60 min. at 250°C
972090	184827	CV 10x10	F		ZB2	T	-40	341	317	326	328		strain aged 5%, 60 min. at 250°C
	186723	CV 10x10	F		ZB2	T	-40	259	299	299	286		strain aged 5%, 60 min. at 250°C
972093	181846	CV 10x10	F		ZB2	T	-40	306	302	323	310		strain aged 5%, 60 min. at 250°C
	186842	CV 10x10	F		ZB2	T	-40	316	299	319	311		strain aged 5%, 60 min. at 250°C
	186843	CV 10x10	F		ZB2	T	-40	322	309	315	315		strain aged 5%, 60 min. at 250°C
	186902	CV 10x10	F		ZB2	T	-40	306	302	323	310		strain aged 5%, 60 min. at 250°C
972096	186841	CV 10x10	F		ZB2	T	-40	311	302	314	309		strain aged 5%, 60 min. at 250°C
	186906	CV 10x10	F		ZB2	T	-40	305	310	313	309		strain aged 5%, 60 min. at 250°C

C40;shape:
CV 10x10: Test shape , Dimensions

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07	B06	C40	C01			C02	C03	C42	C42	C42	C43			
Heat No. samp.cond.	Plate No	shape	loc.	Pos.	PosTh.	Dir	temp	SV	SV	SV	AV		Sim.htm	WBH
							°C	J	J	J	J			

C01;loc.:
F: Bottom
Pos.: test specimen position
PosTh.: Pos Thickness
K: ½
O: surface
ZB2: 2mm below surface
C02;Dir:
T: transverse
C42;SV: single value
C43;AV: average value
Sim.htm: sim. heat treatment
001: Sim.htm group #1
WBH: sim. heat treatment
samp.cond.: sample condition

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Test results: C10-C29 through Thickness Test acc. DIN / EN

B07 Heat No.	B06 Plate No	C40 Shape	SpThickn mm	C01 loc.	C02 Dir	C12 Rm MPa	C12 Rm MPa	C12 Rm MPa	Z(SV) %	Z(SV) %	Z(SV) %	Z(AV) %
Set values >=						404	404	404	25	25	25	35
882852	186892	Ø	10.01	F	S	531	531	531	72	78	60	70
	186896	Ø	10.00	F	S	539	530	532	78	78	70	75
	186900	Ø	10.00	F	S	526	521	530	77	79	78	78
972090	184827	Ø	10.03	F	S	528	528	525	60	67	58	62
	186723	Ø	9.96	F	S	539	544	525	73	74	79	75
972093	181846	Ø	10.00	F	S	522	520	520	75	74	77	75
	186842	Ø	10.00	F	S	535	533	536	78	75	72	75
	186902	Ø	10.01	F	S	515	520	517	77	71	74	74
972096	186906	Ø	9.87	F	S	527	525	539	77	79	70	75

SpThickn: specimen thickness
C01;loc.:
F: Bottom
C02;Dir:
S: through thickness direction
C12; Rm: Tensile Strength
Z(SV): reduction of area (single value)
Z(AV): reduction of area (average value)

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Chemical composition (Product analysis) - part 1 of 2

B07 Heat No.	B06 Plate No	C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %
	>=		.150				.015													
Set values	<=	.140	.550	1.650	.020	.0050	.055	.250	.700	.250	.300	.080	.040	.025	.0100	.0005	.0200	.0050	.0300	.0100
882852	186892	.052	.184	1.520	.008	.0010	.028	.181	.520	.123	.067	.004	.029	.012	.0058	.0002	.0020	.0002	.0030	.0020
	186896	.052	.185	1.530	.008	.0009	.030	.179	.520	.122	.071	.004	.029	.012	.0053	.0002	.0020	.0003	.0030	.0020
	186898	.052	.175	1.530	.007	.0009	.029	.180	.521	.123	.071	.003	.030	.012	.0051	.0001	.0020	.0002	.0010	.0010
	186900	.052	.184	1.530	.009	.0010	.029	.178	.520	.122	.072	.004	.030	.012	.0050	.0002	.0020	.0003	.0020	.0020
972090	184827	.054	.178	1.530	.007	.0007	.024	.176	.520	.127	.046	.004	.027	.013	.0056	.0002	.0020	.0002	.0030	.0020
	184828	.054	.176	1.530	.007	.0007	.024	.174	.520	.127	.045	.004	.027	.013	.0059	.0002	.0020	.0002	.0020	.0020
	186723	.055	.179	1.540	.007	.0010	.024	.174	.510	.126	.046	.004	.027	.013	.0061	.0002	.0020	.0002	.0030	.0020
972093	181846	.051	.180	1.520	.007	.0010	.029	.170	.520	.122	.060	.004	.029	.012	.0044	.0002	.0020	.0003	.0020	.0020
	186842	.052	.185	1.510	.007	.0012	.028	.168	.510	.124	.061	.004	.029	.013	.0042	.0002	.0020	.0003	.0020	.0020
	186843	.052	.177	1.500	.008	.0010	.027	.173	.531	.125	.066	.004	.029	.011	.0042	.0002	.0030	.0003	.0030	.0020
	186902	.048	.183	1.500	.007	.0010	.028	.168	.510	.122	.060	.004	.028	.012	.0045	.0002	.0020	.0003	.0020	.0020
972096	186841	.054	.175	1.530	.006	.0007	.024	.170	.527	.117	.055	.003	.027	.013	.0040	.0002	.0020	.0003	.0020	.0030
	186906	.053	.179	1.530	.007	.0010	.027	.174	.520	.121	.050	.004	.027	.013	.0040	.0002	.0020	.0002	.0020	.0020

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Z02
Inspection representative voestalpine Grobblech
Quality Department Heavy Plates
BERGER Alfred

voestalpine
ONE STEP AHEAD.

Chemical composition (Product analysis) - part 2 of 2

B07 Heat No.	B06 Plate No	Pb %	Cae %	Pcm %	LF01 %	LF02 %	LF03 %
Set values >= / <=		.010	.43	.22	.090	.110	.900
882852	186892	.002	.41	.16	.033	.045	.891
	186896	.002	.41	.17	.033	.045	.892
	186898	.002	.41	.16	.033	.045	.895
	186900	.002	.41	.17	.034	.046	.892
972090	184827	.002	.41	.17	.031	.044	.869
	184828	.002	.41	.17	.031	.044	.866
	186723	.002	.41	.17	.031	.044	.856
972093	181846	.002	.40	.16	.033	.045	.872
	186842	.002	.40	.16	.033	.046	.863
	186843	.002	.40	.16	.033	.044	.895
	186902	.002	.39	.16	.032	.044	.860
972096	186841	.002	.41	.17	.030	.043	.869
	186906	.002	.41	.16	.031	.044	.865

C99 - Supplementary information
BI <= 0,01%

C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF03: Cr+Ni+Cu+Mo
LF02: Nb+V+Ti
LF01: Nb+V

Remarks

Simulated heat treatment of test coupons:

Pos 30:
001/1: 1 cycle(s) sim. PWHT: furnace charge temperature at max. 400 °C, heating with max. 55 °C/h up to 580 °C, +20 °C/-20 °C, holding time 240 minutes, cooling with max. 55 °C/h down to 400 °C, final cooling in calm air.

Z03
Stamp of the inspection representative

LR
Lloyd's Register EMEA
Vienna Office
Initials: KH
24 FEB 2017

Z02
Inspection representative voestalpine Grobblech
Quality Department Heavy Plates
BERGER Alfred

voestalpine

voestalpine
ONE STEP AHEAD.

Remarks

We confirm that the above-mentioned delivery corresponds to the order (and standard).

Reduction of area on tensile test specimens in the through-thickness direction in accordance with EN 10164:2004, class Z35.

The signature of the inspection representative from voestalpine Grobblech GmbH is substituted by a electronic Signature, because the certificates of voestalpine Grobblech GmbH are prepared by a suitable data processing system (EN 10204, Pt.5).

voestalpine

Z03
Stamp of the inspection representative

LR
Lloyd's Register EMEA
Vienna Office
Initials: KH
24 FEB 2017

Z02
Inspection representative voestalpine Grobblech
Quality Department Heavy Plates
BERGER Alfred

voestalpine
ONE STEP AHEAD.

ULTRASONIC EXAMINATION

SPECIFICATION
Ultrasonic examination acc. to EN 10160, EN 10160 class S1/Body, Grid 200 mm, EN 10160 class E2/Edge Zone, Edge zone 75 mm

VALID TEST EQUIPMENT
mechanized ultrasonic "In-Line testing system" (Manufacturer: NDT-Systems & Services) and
mechanized ultrasonic "off-line - testing system" (manufacturer: Windhoff Bahn- und Anlagentechnik GmbH) and
MUT (optional): Sonatest D20 no. 90006523 or Sonatest D20 no. 90007346 or Sonatest Masterscan 380 no. 90007347 or Sonatest Masterscan 380 no. 90006522 or Sonatest D50 no. 90010231 or GE - USM 36 no. 90010775

PROBE
(in-line AUT): 3STSE 18.3/8 P5, SEZ5R10RS, SE3 18.3/10 5A, (5MHz)
(off-line AUT): S140 (4MHz) 3T/1R
(MUT): SEB4E (4MHz), SEB4E0° (4MHz), MSEB4E (4MHz), B2SO (2MHz)
watergapcoupling

RESULT
Plate(s) comply with the specification.

INSPECTION OPERATOR
Operators Level 1 or 2: qualified and certified according ÖNORM EN 473 or EN ISO 9712 (since 01.01.2013) respectively according the Written Practice „NDT-WP" (in accordance to Recommended Practice SNT-TC-1A). Operators Level 2 for ASME/ASTM.

INSPECTION SUPERVISOR
Responsible Level 3: Bindreiter Erich

Z03
Stamp of the inspection representative

LR
Lloyd's Register EMEA
Vienna Office
Initials: KH
24 FEB 2017

Z02
Inspection representative voestalpine Grobblech
Quality Department Heavy Plates
BERGER Alfred

voestalpine

voestalpine
ONE STEP AHEAD.

Consumables certificate

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2018-07-27

Numero certificato/Cert no: EC25251151 rev. 0

Nostro ordine/Our order:	2013780	Vostro ordine/Your order:	1718000897
Nostro riferimento/Our ref:	Web user - Movex CMP020 ITB	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB00060	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20180727	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address

ESAB SALDATURA S.P.A. (6155)
STRADA PROVINCIALE 34, N. 7
IT-20010 OSSONA MI
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address

ROSETTI MARINO SPA
.
VIA TRIESTE 230
48100 RAVENNA RA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PNS24006 Quantità/Quantity: 20 CT

PRODOTTO/PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK Tubrod 15.17 1.2mm 16kg
Codice/Item no:	**1517127730**

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.36: E81T1-M21A4-Ni1
EN ISO 17632-A: T 46 3 1Ni P C1 2 H5
EN ISO 17632-A: T 46 4 1Ni P M21 2 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:	M21 (EN ISO 14175)
C	0.05%
Si	0.39%
Mn	1.15%
P	0.01%
S	0.02%
Cr	0.03%
Ni	1.0%
Mo	0.03%
Nb	0.02%
Cu	0.06%
V	0.02%

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:	EN
Altro/Auxiliary:	M21 (EN ISO 14175)
Condizione/Condition:	As welded

TRAZIONE/TENSILE

ReL	Rm	A5
544 MPa	613 MPa	26 %

RESILIENZA/IMPACT

Temp	-40 °C
KV	124 J

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis

Piotr Grela Quality Assurance Manager

Validazione - altro/Validation - Others

Neil Farrow Product Manager

ROSETTI MARINO

PQR 47/18

preliminary WPS

PQR ref.:	TBQ	pWPS (EEMUA 158:2014)	47/18	REV.:	0	Data /date	13/12/2018

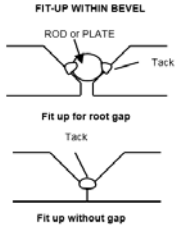
Procedimento di saldatura / Welding process: **136-FCAW** Tipo / Type: **SEMIAUTOMATIC**

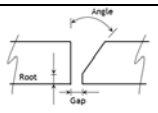
GIUNTO – JOINT

Tipo di giunto / Joint Design: **1/2V** Supporto / Backing: ☐ Si / Yes ☒ No

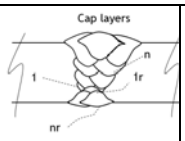
Materiale di supporto (tipo) / Backing material (type). ☐ Metallico / Metal ☐ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:





Angle: 45°
Root: 2 mm
Gap: 3 mm



Note: **1.Surfaces cleaned from moisture, oil, grease, paint before welding (by grinding)/** *Pulire le superfici da liquidi, oli, grasso e vernici con molatura prima di saldare.*
2.Minimum tack weld lengths shall be 4 times the thk or 50 mm, whichever is less/ I tacchetti devono essere lunghi almeno 50 mm o 4 volte lo spessore (il più piccolo dei due);
3.Welding shall not be discontinued before 25% of the weld thickness or 3 passes are completed, whichever gives adequate cross section to prevent craking/ *La saldatura non può essere interrotta prima di aver completato almeno 3 passate o il 25% dello spessore da saldare*
4.Preheat shall be performed by electrical resistance, induction equioment or with gas burners. Cutting torches shall not be permitted. *Il preriscaldo può essere eseguito con resitenze, induzione o torcia. Non può essere utilizzato l'ossitaglio.*

MATERIALE BASE – BASE MATERIAL

Da / from P-N°: **/** Group N° **5** A / to P-N°: **/** Group N° **5**

DA Tipo e grado / From type and grade **S460 G2+M**

A Tipo e grado / To type and grade **S460 G2+M**

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove **13,5 mm**

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove **N.A.**

METALLO D'APPORTO – FILLER METAL

	GS FCAW	
Spec. N° (SFA)	**5.29/5.36**	
AWS N° (CLASS)	**E81T1-1/E81T1-Ni1**	
F-N°	**6**	
A-N°	**1**	
Diametro mat. D'apporto / Size of filler metal	**1,2**	
Gamma spessori / Thick. Range (mm)	**Up to filling**	
Accoppiamento filo-flusso / Electrode-flux (CLASS)	**NA**	
Denom. Comm. Flusso / FLUX trade name	**NA**	
Inserto consumabile / Consumable insert	**NA**	
Altro / other	**OK Tubrod 15.17**	

POSIZIONI – POSITION

giunto / Joint: **Cianfrino / groove** Posizione / position **PC(2G)+PF(3G)** Progressione / weld progression: **Ascendente / UP hill**

PRERISCALDO – PRE-HEAT

Temp.preriscaldo minima / Min. pre-heat temp: **50 °C** Max temp. Di interpass / Max interpass temp.: **250 °C** Mantenimento interpass / Interpass maintenance : **N.A.** Tempo di mantenimento prerisc.: / Maintenance timing: **N.A.**

TRATTAMENTO TERMICO DOPO SALDATURA – POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs): **N.A.** Temperatura di stasi / Holding temperature °C: **N.A.** Tempo di stasi / Holding time (min.): **N.A.** Velocità di raffreddamento: / Cooling rate (°C/Hrs): **N.A.**

GAS DI PROTEZIONE – GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	**Ar+CO2**	**80%+20%**	**16-24 lt/min**
Protezione al seguito / Trailing:	**N.A.**	**N.A.**	**N.A.**
Prot. Al rovescio / Backing:	**N.A.**	**N.A.**	**N.A.**

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current : **DC** Polarità / Polarity **RP**

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: **N.A.**

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: **N.A.**

Velocità alimentazione filo / Electr. Wire feed speed range: **Self regulated**

TECNICA – TECHNIQUE

Passata / Bead: **Tirata/String** Dimensione bocchello gas / Orifice of gas cup size: **1/2"** Pulizia iniziale e fra le passate / Initial and interpass cleaning: **Spazzolatura/Brushing**

Metodo di solcatura a rovescio / Method of back gouging: **Scriccatura + molatura/ Arcair + grinding** Oscillazione / Oscillation: **N.A.** Distanza zona di contatto e pezzo / Contact zone to work distance: **N.A.**

N°Passate / Passes nr.: **Multipla/Multiple** Elettrodo multiplo o singolo / Multiple or single electrodes: **Singolo/Single** Martellatura / Peening: **N.A.**

Altro / Other: **All arc/air gouged surface shall be dressed to bright clean metal by grinding at an additional depth of minimum 2 mm/** *Molare per una profondità minima di 2 mm dopo scriccatura.*

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range		Vel. Avanzamento / Travel speed range (mm/min)		Apporto termico / Heat input (KJ/mm)	
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. Range						
Tack-1	**FCAW**	**E81T1-1/E81T1-Ni1**	**1,2**	**RP**	**175 200**	**26**	**28**	**143**	**151**	**1,45**	**1,88**
2	**FCAW**	**E81T1-1/E81T1-Ni1**	**1,2**	**RP**	**196 245**	**26**	**28**	**175**	**250**	**0,98**	**1,88**
3-n	**FCAW**	**E81T1-1/E81T1-Ni1**	**1,2**	**RP**	**210 264**	**26**	**28**	**193**	**275**	**0,95**	**1,84**
Cap layers	**FCAW**	**E81T1-1/E81T1-Ni1**	**1,2**	**RP**	**205 250**	**26**	**28**	**176**	**310**	**0,83**	**1,91**
Back gouging (minimum back gouging layers shall be 2 /Le passate di ripresa devono essere minimo 2)											
1r	**FCAW**	**E81T1-1/E81T1-Ni1**	**1,2**	**RP**	**185 247**	**26**	**28**	**165**	**236**	**0,98**	**2,01**
2r-3r	**FCAW**	**E81T1-1/E81T1-Ni1**	**1,2**	**RP**	**198 245**	**26**	**28**	**178**	**260**	**0,95**	**1,85**

Preparato da / prepared by:	Client/Third part signature:	Client/Third part signature:
D.Cenacchi	*Premier Oil*	*DNV*

NDE certificate

ROSETTI MARINO	**VERBALE DI CONTROLLO VISIVO/DIMENSIONALE** **visual/dimensional inspection report**	VDR N° 47-18 data: 19-12-2018

progetto project	TOLMOUNT REDEVELOPMENT PROJECT	cliente client	PREMIER OIL
ordine PO	/	commessa job	118A50
disegno dwg	/	ITP N°	AB-TO-ROS-PM-QA-PL-0002 REV.C01
fase step	8.1		

SI CERTIFICA CHE :

gli item di seguito indicati sono stati sottoposti a controllo dimensionale ed accettati in accordo alla procedura / specifica sotto indicata ed ai criteri di accettabilita' in essa definiti.

WE CERTIFY THAT:

items below indicated have undergone a dimensional inspection and have been accepted according to the specific / procedure mentioned hereunder and to acceptance criteria defined in it.

oggetto – item

COUPON	STAMP	POS	THK	LENGHT	WPS	Date of examination
47/18 PC	NC272	PC	13,5mm	600mm	pWPS 47/18	19/12/2018
47/18 PF	NC219	PF	13,5mm	600mm	pWPS 47/18	19/12/2018

RINA Services SpA No. Bo. 0474 Date 20/12/2018
Noted ☐ File
Reviewed ☑ Signature
Witnessed ☑ Tinotti Davide
Approved ☐

note - remarks

Acceptance criteria: EEMUA 158 TABLE 14

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

AB-TO-ROS-PM-QA-PR-0006 Rev.01

Operatore - Operator	Controllo Qualita' - Quality Control	Cliente - Client
CSWIP D.CENACCHI 305250 WI 3.1		

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 19/12/2018	FOGLIO – Sheet 1
RAPPORTO D'ESAME MAGNETOSCOPICO ***MAGNETIC PARTICLE TEST***		MT N° : 06	Ns. Rif./Our Ref. 18307

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	TOULMONT DEVELOPMENT	118A50	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
PremierOil / TOLMOUNT	PQR	/	/	8.1

CODICE / code	PROCEDURA/Procedure	ACCETTABILITA - Acceptance level
UNI EN ISO 23278	AB-TO-ROS-PM-QA-PR-0007_C01	AB-TO-ROS-PM-QA-PR-0007_C01

MATERIALE Material	TEMPERATURA DELLE SUPERFICI Surface temperature	INTENSITA' LUMINOSA / Light intensity	
		LUCE BIANCA	LUCE NERA
S460 G2+M	INTERVALLO 5÷52°C	☑ > 1000 LUX	☐ 1000 µW/cm².

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined
☐ MOLATO – Ground	☐ LAMINATO – Rolled	☐ GREZZO – Forged

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☐ PUNTALI/Prods	☑ GIOGO/Yoke	☐ SOLENOIDE/Solenoid	☐ CONDUTTORE CENTRALE/Central conduttor

TIPO APPARECCHIO/Type of equipment	SILVER YOKE HR230 S.No. 03.230-16	DISTANZA PUNTALI/Pole spacing mm	180mm
TIPO DI CORRENTE/Type current	C.A	INTENSITÀ/Intesity (Amp)	4,5 kg

MEZZO DI ISPEZIONE / Examination medium	☑ UMIDO/Wet	☐ SECCO/Dry

PARTICELLE UTILIZZATE/Particle Type			
POLVERE NERA/Black powder	☑	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	NDT BW2	MARCA TIPO/Mark Type	NDT FW1
LOTTO/BACH	7241s	LOTTO/BACH	
VERNICE DI CONTRASTO/Contrast Paint	☑ NDT WBL5	☐ CGM VECOPLAST	
LOTTO/BACH	U180327s	X	

SALDATURE CONTROLLATE / Welds Verified

THE CONTROL HAS BEEN CARRIED OUT ON 100% OF FOLLOWING WELDS:

ITEM	THICKNESS	STAMP	LENGHT	PROCESS
PQR 47/18 PF	13.5	NC219	600	FCAW
PQR 47/18 PC	13.5	NC272	600	FCAW

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Nico Tomasi II° Livello SNT-TC-1A 9712	ROSETTI MARINO SpA Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 20/12/2018 File Signature Cimatti Dario

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items examine*

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 19-12-2018	FOGLIO – Sheet 1/1
RAPPORTO D'ESAME CON ULTRASUONI ***Ultrasonic examination report***		UT N° : 06	Ns. Rif./Our Ref. 18307

CLIENTE – Client	ORDINE – Order	PROGETTO – Project		COMMESSA – Job
ROSETTI MARINO	/	TULMONT DEVELOPMENT PROJECT		118A50
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
PremierOil / TULMOUNT	PQR	/	/	8.1

CODICE / Code	PROCEDURA / Procedure	ACCETTABILITA' / Acceptance level
UNI EN 17640	AB-TO-ROS-PM-QA-PR-0011_C01	AB-TO-ROS-PM-QA-PR-0011_C01
MATERIALE Material	DIMENSIONI Dimension	SPESSORE NOMINALE / Thk
S460 G2+M	SEE TABLE	SEE TABLE

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO - Brushed	☐ LAVORATO DI MACCHINA - Machined
☐ MOLATO - Ground	☐ LAMINATO - Rolled	☐ GREZZO - Forged

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG 700	No. SERIE Serial Number	1003937

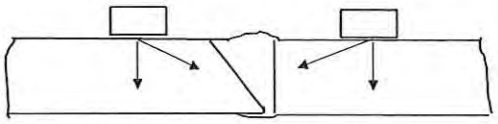
TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	AMPLIFICAZIONE dB value	ONDE Waves
OLYMPUS PF4R	4	10	0	40	L
DOPPLER A2P	2	10x14	45	42	T
DOPPLER A2P	2	10x14	60	44	T
DOPPLER A2P	2	10x14	70	45	T

BLOCCO DI CALIBRAZIONE Calibration block	IIW V1	BLOCCO DI RIFERIMENTO Reference block	QT BLOCK No. 02
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity	DAC ON SDH Ø 3mm

MATERIALE CONTROLLATE / Material Verified

ITEM	THICKNESS	STAMP	LENGHT	PROCESS
PQR 47/18 PF	13.5	NC219	600	FCAW
PQR 47/18 PC	13.5	NC272	600	FCAW

PIANO DI SCANSIONE / Scanning Plan



RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Nico Tomasi II° Livello SNT-TC-1A [illegible] 9712	ROSETTI MARINO SpA Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 20/12/2018 File Signature Cimatti Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items esamine*

ROSETTI MARINO

PQR 47/18

Mechanical test report

Element Materials Technology Milan S.r.l.
Via della Pierina 9/11
26013 Crema (CR)
Italy

P: +39 0373 89721
F: +39 0373 897200
info.milan@element.com
element.com

TEST REPORT

Client
Cod. 1737

ROSETTI MARINO S.P.A
VIA TRIESTE, 230
48122 RAVENNA (RA)
Italia

	Your ref. :	Document :	Ddt n. 1VTS180585	Date:	21/12/2018
	Our ref. :	Report :	RPR1550-1E1R0A18	Date:	16/01/2019
		Job :	ADC1550-1E1R0A18	Date:	27/12/2018

Remarks: PQR 47/18
PLATE DIMENSION : 13.5mm
CLIENT : PREMIER OIL

Project: TOLMOUNT DEVELOPMENT PROJECT

Doc. reference: EEMUA 158 ed.2014

Test standard: UNI EN ISO 17639:2013 - UNI EN ISO 6507-1:2006 - EEMUA 158 ed.2014 - UNI EN ISO 5173:2012 - UNI EN ISO 148-1:2016 - UNI EN ISO 4136:2012 - UNI EN ISO 6892-1:2016

This Report (RPR) contains tests results on the following materials

Ref:	Identification	Material	Dn (mm)	Thk (mm)	Remarks
4980A18	PQR 47/18 PC	EN 10225 S460G2+M			

Report signatories and approval

☐ Third party	☐ Third party	☐ Third party	Client
☐ Witness	☐ Witness	☐ Witness	

Digitally signed by Cantoni Luca
Element Materials Technology Milan S.r.l.

Issue approved

ROSETTI MARINO S.p.A.
Matteo Del Prete
Welding Dept.

RINA Services SpA
No. Bo. 0474
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
Date 16/01/2019
File
Signature
Cimatti Davide

General conditions:
1. The Customer accepts general conditions and prices fixed by the laboratory to perform the tests.
2. Test results will be communicated only by means of test report except for different contractual agreement.
3. Tests sample will be destroyed 30 days after test except for different written Client request.
4. The spare will be destroyed 90 days after date of receipt for different written Client request.
5. The test results described in the following test report are referring only to the sample mentioned in it.
6. The date of material receivement is the same as the date of job opening. The date of testing is the same as the date of test report, except for different info.
7. The laboratory has examined the material sampled an supplied by the Client in compliance with standard request.
8. This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.
9. Unless otherwise agreed, sales terms and conditions (MOD20-1E1R0) will be apply.

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TEST REPORT

Test	Page	Technician
Macrographic examination	Pag. 3	**Cristian Piloni**
Hardness test	Pag. 4	**Cristian Piloni**
Bend test	Pag. 5	**Luigi Vailati**
Charpy impact test	Pag. 6	**Luigi Vailati**
Tensile test	Pag. 7..8	**Luigi Vailati**

ROSETTI MARINO S.p.A.
Matteo Del Prete
Welding Dept.

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No. Bo. 0474
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Cimatti Davide

Technician signatories

Digitally signed by
Cristian Piloni
Element Materials
Technology Milan S.r.l.

Digitally signed by
Luigi Vailati
Element Materials
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TEST REPORT

MACROGRAPHIC EXAMINATION

General info

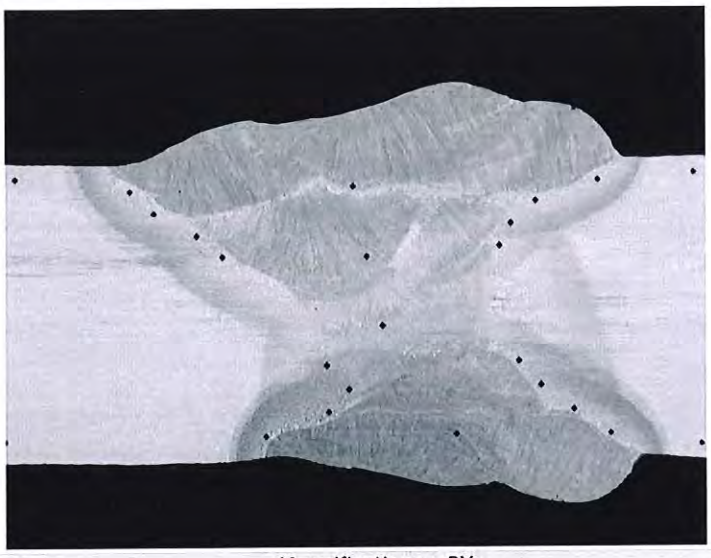
Test start - Test finish	16/01/2019 - 16/01/2019
MIF reference (Lab)	4980A18
Client reference	PQR 47/18 PC
Identification of specimen (Lab)	980 MC 1
Material	EN 10225 S460G2+M
Position	T WM Full thk
Test standard	UNI EN ISO 17639:2013

Equipments

(Inv.N°1961) PHOTOCAMERA

Test properties

Etching: Nital 3%



Magnification: ~3X

Result

Test specimen has been examined at low magnification (25x) with and without etching.
According to UNI EN ISO 5817:2014, level B and C, the results of this exam didn't show the presence of imperfections or defects in weld metal.

ROSETTI MARINO S.p.A.
Matteo Del Prete
Welding Dept.

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TEST REPORT

HARDNESS TEST

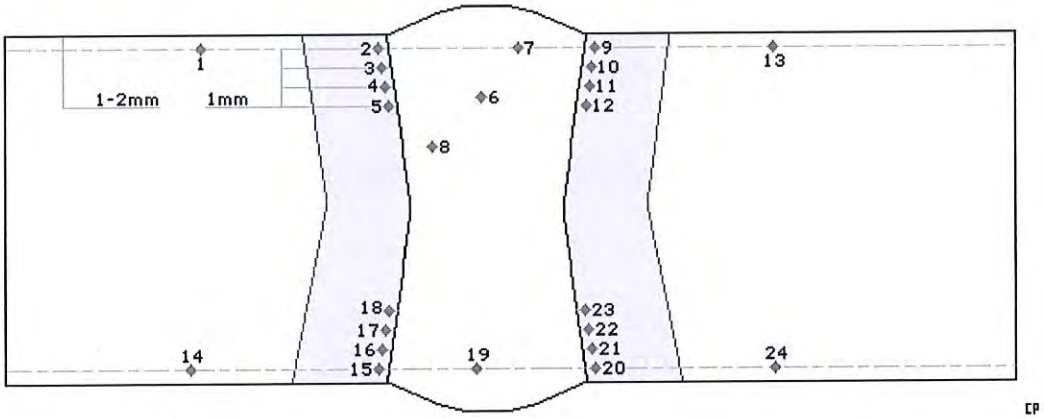
General info

Test start - Test finish	16/01/2019 - 16/01/2019
MIF reference (Lab)	4980A18
Client reference	PQR 47/18 PC
Identification of specimen (Lab)	980 MC 1
Material	EN 10225 S460G2+M
Position	T WM Full thk
Test standard	UNI EN ISO 6507-1:2006 + EEMUA 158 ed.2014

Equipments

(Inv.N°9) HARDNESS TESTING MACHINE

Results



Cap

N°	Value HV10
1	**174.0**
2	**228.0**
3	**204.0**
4	**195.0**
5	**191.0**
6	**219.0**
7	**221.0**
8	**183.0**
9	**224.0**
10	**197.0**
11	**198.0**
12	**179.0**
13	**186.0**

Root

N°	Value HV10
14	**175.0**
15	**240.0**
16	**232.0**
17	**201.0**
18	**180.0**
19	**233.0**
20	**222.0**
21	**216.0**
22	**197.0**
23	**196.0**
24	**179.0**

Min: **174.0** Max: **240.0** **Required:** : ≤325 HV10

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Welding Dept.

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TEST REPORT

BEND TEST

General info

Test start - Test finish	16/01/2019 - 16/01/2019
MIF reference (Lab)	4980A18
Client reference	PQR 47/18 PC
Material	EN 10225 S460G2+M
Test standard	UNI EN ISO 5173:2012 + EEMUA 158 ed.2014

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1123) BEND MACHINE

Test parameters

Jig (mm)	40
Rollers distance (mm)	66
Angle (°)	180
Method	FORMER

Results

Ref.Lab.	T (°C)	Type	Position	Dimensions (mm)	L0 (mm)	Elongation (%)	Results
980 PI 1	20	SBB (Transverse side bend)	T Side Bend	10.01 x 13.13			No defect
980 PI 2	20	SBB (Transverse side bend)	T Side Bend	10.02 x 13.11			No defect
980 PI 3	20	SBB (Transverse side bend)	T Side Bend	10.01 x 13.14			No defect
980 PI 4	20	SBB (Transverse side bend)	T Side Bend	10.02 x 13.16			No defect

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Welding Dept.

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TEST REPORT

CHARPY IMPACT TEST

General info

Test start - Test finish	16/01/2019 - 16/01/2019
MIF reference (Lab)	4980A18
Client reference	PQR 47/18 PC
Material	EN 10225 S460G2+M
Test standard	UNI EN ISO 148-1:2016

Equipments

(Inv.N°814) CHARPY IMPACT 450 - (Inv.N°1102) CALIPER - (Inv.N°1806) CRYOSTAT

Specimen informations

Notch: KV2

Test parameters

Nominal energy of test machine (J): 450

Results

Lab Id.	T (°C)	Position	Dimensions (mm)	A Value (J)	B Value (J)	C Value (J)	Average Value (J)
980 RE 1	-40	T WM 2mm from Cap	10.0 x 10.0	118	82	61	87
980 RE 2	-40	T FL 2mm from Cap	10.0 x 10.0	114	174	71	120
980 RE 3	-40	T FL +2 2mm from Cap	10.0 x 10.0	298	312	125	245
980 RE 4	-40	T FL +5 2mm from Cap	10.0 x 10.0	273	285	241	266

Required

Single value (J)	≥35.0
AVG (J)	≥46.0

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RINA Services SpA
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TEST REPORT

TENSILE TEST

General info

Test start - Test finish	16/01/2019 - 16/01/2019
MIF reference (Lab)	4980A18
Client reference	PQR 47/18 PC
Identification of specimen (Lab)	980 TR 1
Material	EN 10225 S460G2+M
Position	T WM Full thk
Test standard	UNI EN ISO 6892-1:2016

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1153) UNIVERSAL MACHINE QUASAR 600

Specimen informations

Type	Prismatic
Width (mm)	25.00
Thickness (mm)	11.23
Section (mm²)	280.75

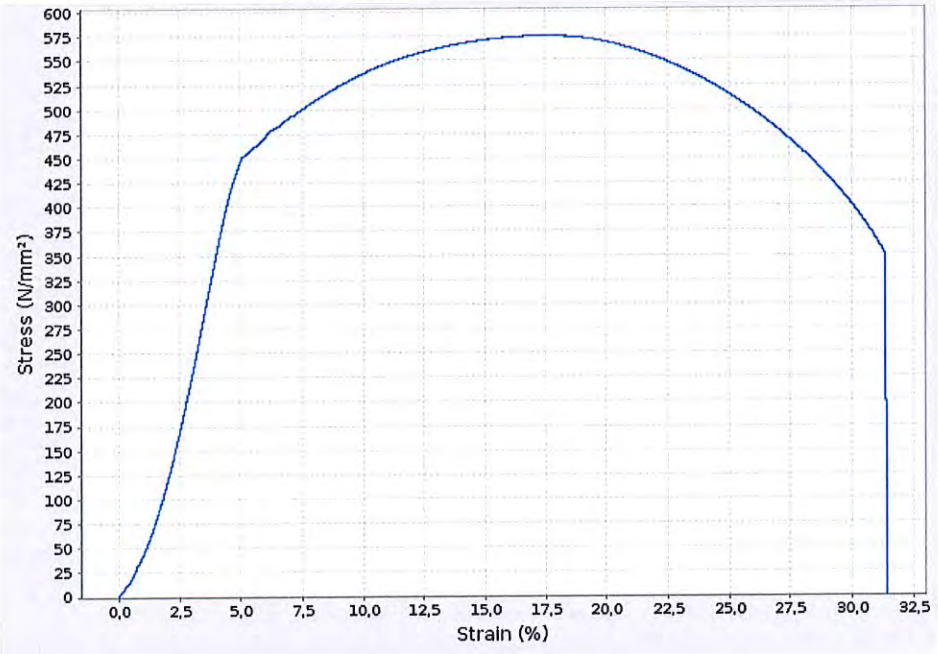
Test parameters

Temperature (°C)	20.0

Results		**Required**
Rp0.2% (N/mm²)	464.0	≥460
Rm (N/mm²)	575.0	≥540

Note

Broken out of weld
Speed of testing during yielding ref. method B PAR.10.3.3.2.1 - after yielding according to PAR.10.3.3.3



ROSETTI MARINO S.p.A.
Matteo Del Prete
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RINA Services SpA No. Bo. 0474	Date 16/01/2019
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TEST REPORT

TENSILE TEST

General info

Test start - Test finish	16/01/2019 - 16/01/2019
MIF reference (Lab)	4980A18
Client reference	PQR 47/18 PC
Identification of specimen (Lab)	980 TR 2
Material	EN 10225 S460G2+M
Position	T WM Full thk
Test standard	UNI EN ISO 4136:2012 + UNI EN ISO 6892-1:2016

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1153) UNIVERSAL MACHINE QUASAR 600

Specimen informations

Type	Prismatic
Width (mm)	25.01
Thickness (mm)	11.20
Section (mm²)	280.11

Test parameters

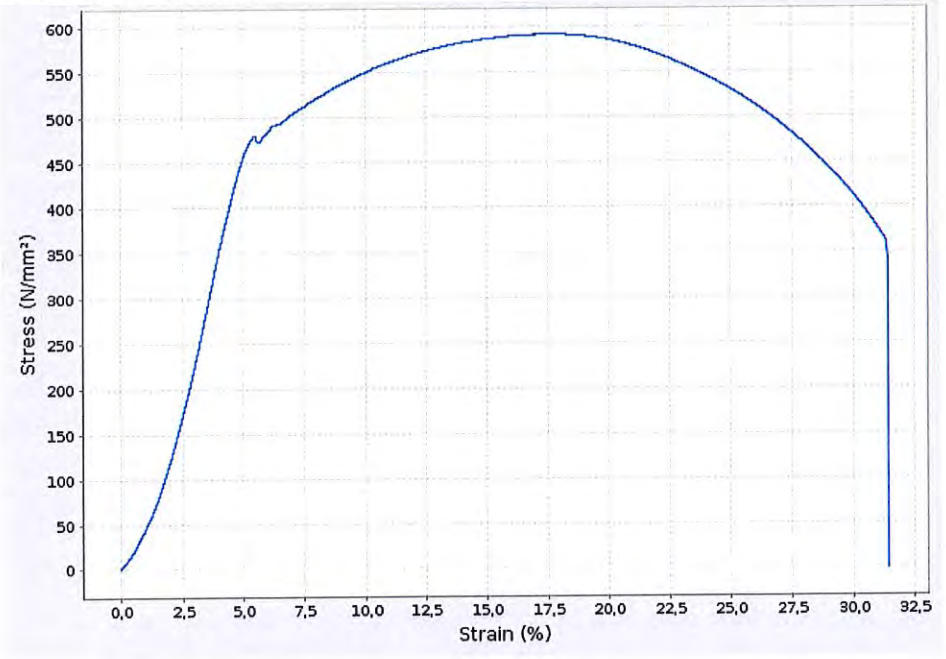
Temperature (°C)	20.0

Results

		Required
Rp0.2% (N/mm²)	464.0	≥460
Rm (N/mm²)	592.0	≥540

Note

Broken out of weld
Speed of testing during yielding ref. method B PAR.10.3.3.2.1 - after yielding according to PAR.10.3.3.3



ROSETTI MARINO S.p.A.
Matteo Del Prete
Welding Dept.

RINA Services SpA No. Bo. 0474	Date 16/01/2019
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TEST REPORT

Client
Cod. 1737

ROSETTI MARINO S.P.A
VIA TRIESTE, 230
48122 RAVENNA (RA)
Italia

Your ref. :	Document :	Ddt n. 1VTS180585	Date:	21/12/2018
Our ref. :	Report :	RPR1550-2E1R0A18	Date:	16/01/2019
	Job :	ADC1550-1E1R0A18	Date:	27/12/2018

Remarks: PQR 47/18
PLATE DIMENSION : 13.5mm
CLIENT : PREMIER OIL

Project: TOLMOUNT DEVELOPMENT PROJECT

Doc. reference: EEMUA 158 ed.2014

Test standard: UNI EN ISO 17639:2013 - UNI EN ISO 6507-1:2006 - EEMUA 158 ed.2014 - UNI EN ISO 5173:2012 - UNI EN ISO 148-1:2016 - UNI EN ISO 4136:2012 - UNI EN ISO 6892-1:2016

This Report (RPR) contains tests results on the following materials

Ref:	Identification	Material	Dn (mm)	Thk (mm)	Remarks
4981A18	PQR 47/18 PF	EN 10225 S460G2+M			

Report signatories and approval

☐ Third party	☐ Third party	☐ Third party	Client
☐ Witness	☐ Witness	☐ Witness	

Digitally signed by Cantoni Luca
Element Materials Technology Milan S.r.l.

Issue approved

ROSETTI MARINO S.p.A
Matteo Del Prete
Welding Dept.

RINA Services SpA No. Bo. 0474	Date 16/01/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimatti Davide
Approved ☐	

General conditions:
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TEST REPORT

Test	Page	Technician
Macrographic examination	Pag. 3	**Cristian Piloni**
Hardness test	Pag. 4	**Cristian Piloni**
Bend test	Pag. 5	**Luigi Vailati**
Charpy impact test	Pag. 6	**Luigi Vailati**
Tensile test	Pag. 7..8	**Luigi Vailati**

ROSETTI MARINO S.r.l.
Matteo Del Prete
Welding Dept.

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Witnessed ☑
Approved ☐
Date 16/01/2019
File
Signature
Cimatti Davide

Technician signatories

Digitally signed by Cristian Piloni
Element Materials Technology Milan S.r.l.

Digitally signed by Luigi Vailati
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TEST REPORT

MACROGRAPHIC EXAMINATION

General info

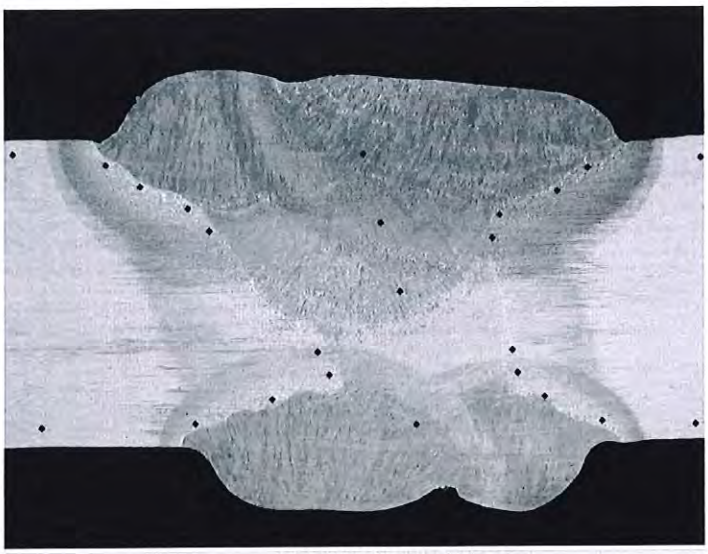
Test start - Test finish	16/01/2019 - 16/01/2019
MIF reference (Lab)	4981A18
Client reference	PQR 47/18 PF
Identification of specimen (Lab)	981 MC 1
Material	EN 10225 S460G2+M
Position	T WM Full thk
Test standard	UNI EN ISO 17639:2013

Equipments

(Inv.N°1961) PHOTOCAMERA

Test properties

Etching: Nital 3%



Magnification: ~3X

Result

Test specimen has been examined at low magnification (25x) with and without etching.
According to UNI EN ISO 5817:2014, level B and C, the results of this exam didn't show the presence of imperfections or defects in weld metal.

ROSETTI MARINO S.p.A.
Matteo Del Prete
Welding Dept.

RINA Services SpA No. Bo. 0474	Date 16/01/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimatti Davide

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TEST REPORT

HARDNESS TEST

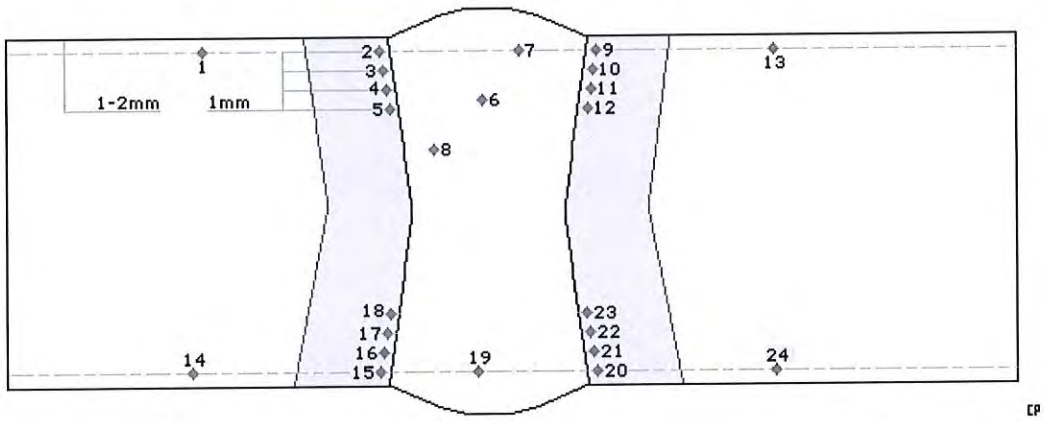
General info

Test start - Test finish	16/01/2019 - 16/01/2019
MIF reference (Lab)	4981A18
Client reference	PQR 47/18 PF
Identification of specimen (Lab)	981 MC 1
Material	EN 10225 S460G2+M
Position	T WM Full thk
Test standard	UNI EN ISO 6507-1:2006 + EEMUA 158 ed.2014

Equipments

(Inv.N°9) HARDNESS TESTING MACHINE

Results



Cap

N°	Value HV10
1	**178.0**
2	**199.0**
3	**203.0**
4	**194.0**
5	**172.0**
6	**188.0**
7	**183.0**
8	**194.0**
9	**182.0**
10	**197.0**
11	**204.0**
12	**184.0**
13	**173.0**

Root

N°	Value HV10
14	**169.0**
15	**196.0**
16	**179.0**
17	**189.0**
18	**172.0**
19	**193.0**
20	**205.0**
21	**196.0**
22	**176.0**
23	**163.0**
24	**169.0**

Min: **163.0** Max: **205.0** **Required:** : ≤325 HV10

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Welding Dept.

RINA Services SpA
No. Bo. 0474
Date 16/01/2019
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TEST REPORT

BEND TEST

General info

Test start - Test finish	16/01/2019 - 16/01/2019
MIF reference (Lab)	4981A18
Client reference	PQR 47/18 PF
Material	EN 10225 S460G2+M
Test standard	UNI EN ISO 5173:2012 + EEMUA 158 ed.2014

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1123) BEND MACHINE

Test parameters

Jig (mm)	40
Rollers distance (mm)	66
Angle (°)	180
Method	FORMER

Results

Ref.Lab.	T (°C)	Type	Position	Dimensions (mm)	L0 (mm)	Elongation (%)	Results
981 PI 1	20	SBB (Transverse side bend)	T Side Bend	10.01 x 13.15			No defect
981 PI 2	20	SBB (Transverse side bend)	T Side Bend	10.02 x 13.17			No defect
981 PI 3	20	SBB (Transverse side bend)	T Side Bend	10.01 x 13.19			No defect
981 PI 4	20	SBB (Transverse side bend)	T Side Bend	10.02 x 13.17			No defect

ROSETTI MARINO S.p.A.
Matteo Del Prete
Welding Dept.

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TEST REPORT

CHARPY IMPACT TEST

General Info

Test start - Test finish	16/01/2019 - 16/01/2019
MIF reference (Lab)	4981A18
Client reference	PQR 47/18 PF
Material	EN 10225 S460G2+M
Test standard	UNI EN ISO 148-1:2016

Equipments

(Inv.N°814) CHARPY IMPACT 450 - (Inv.N°1102) CALIPER - (Inv.N°1806) CRYOSTAT

Specimen informations

Notch: KV2

Test parameters

Nominal energy of test machine (J): 450

Results

Lab Id.	T (°C)	Position	Dimensions (mm)	A Value (J)	B Value (J)	C Value (J)	Average Value (J)
981 RE 1	-40	T WM 2mm from Cap	10.0 x 10.0	128	44	99	90
981 RE 2	-40	T FL 2mm from Cap	10.0 x 10.0	65	85	88	79
981 RE 3	-40	T FL +2 2mm from Cap	10.0 x 10.0	354	279	296	310
981 RE 4	-40	T FL +5 2mm from Cap	10.0 x 10.0	256	274	330	287

Required

Single value (J)	≥35.0
AVG (J)	≥46.0

ROSETTI MARINO S.p.A.
Matteo Del Prete
Welding Dept.

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TEST REPORT

TENSILE TEST

General info

Test start - Test finish	16/01/2019 - 16/01/2019
MIF reference (Lab)	4981A18
Client reference	PQR 47/18 PF
Identification of specimen (Lab)	981 TR 1
Material	EN 10225 S460G2+M
Position	T WM Full thk
Test standard	UNI EN ISO 4136:2012 + UNI EN ISO 6892-1:2016

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1153) UNIVERSAL MACHINE QUASAR 600

Specimen informations

Type	Prismatic
Width (mm)	25.00
Thickness (mm)	11.14
Section (mm²)	278.50

Test parameters

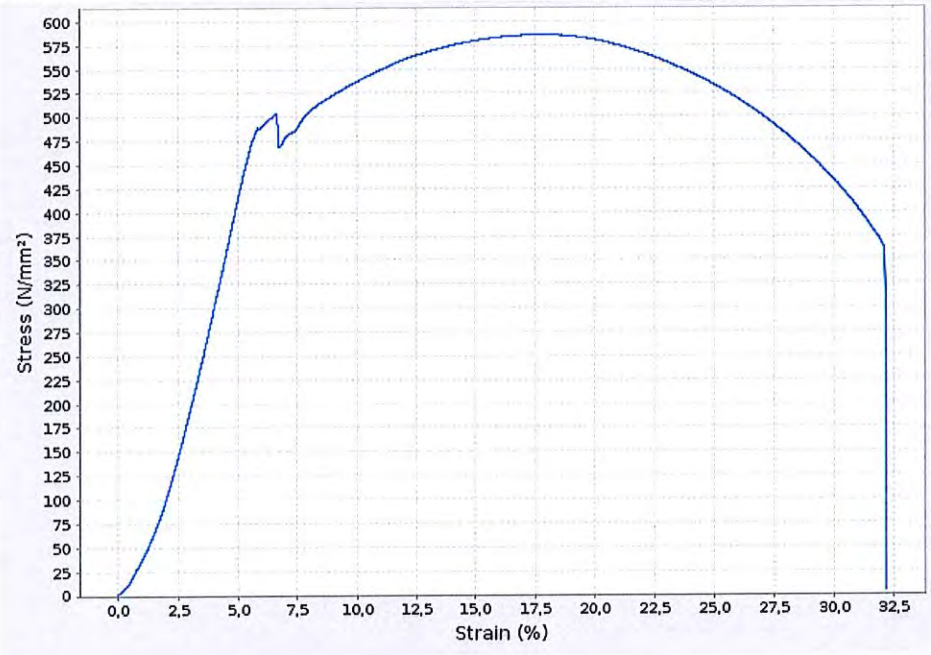
Temperature (°C)	20.0

Results

		Required
Rp0.2% (N/mm²)	488.0	≥460
Rm (N/mm²)	585.0	≥540

Note

Broken out of weld
Speed of testing during yielding ref. method B PAR.10.3.3.2.1 - after yielding according to PAR.10.3.3.3



ROSETTI MARINO S.p.A.
Matteo Del Prete
Welding Dept.

RINA Services SpA No. Bo. 0474	Date 16/01/2019
Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimatti Davide

Element Materials Technology Milan S.r.l.
Via della Pierina 9/11
26013 Crema (CR)
Italy
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TEST REPORT

TENSILE TEST

General info

Test start - Test finish	16/01/2019 - 16/01/2019
MIF reference (Lab)	4981A18
Client reference	PQR 47/18 PF
Identification of specimen (Lab)	981 TR 2
Material	EN 10225 S460G2+M
Position	T WM Full thk
Test standard	UNI EN ISO 4136:2012 + UNI EN ISO 6892-1:2016

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1153) UNIVERSAL MACHINE QUASAR 600

Specimen informations

Type	Prismatic
Width (mm)	25.01
Thickness (mm)	11.21
Section (mm²)	280.36

Test parameters

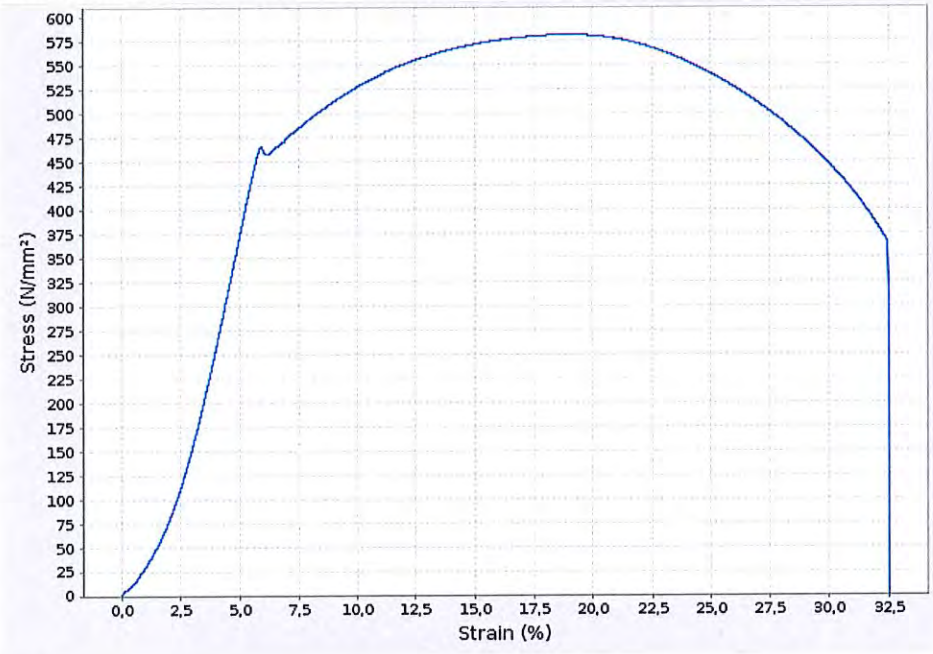
Temperature (°C)	20.0

Results

		Required
Rp0.2% (N/mm²)	464.0	≥460
Rm (N/mm²)	582.0	≥540

Note

Broken out of weld
Speed of testing during yielding ref. method B PAR.10.3.3.2.1 - after yielding according to PAR.10.3.3.3



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ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 49/18	Sheet/Foglio 1/3

Manufacturer's Welding Procedure. Ref. no.	49/18 REV. 0		
Manufacturer	ROSETTI MARINO S.p.A.		
Address	VIA TRIESTE 230 - 48121 RAVENNA		
Code, Testing Standard	PremierOil Spec. AB-TO-WGP-TO-ST-BD-0001 Rev. B02 and AB-TO-WGP-TO-ST-SP-0002 Rev. B01; EEMUA 158:2014 (Third Edition)		
	Location of test specimen according to EEMUA 158:2014 (Third Edition) Section 4.4.4, Fig. 7 to 11 Essential variables according to EEMUA 158:2014, Section 4.5		
Date of welding	Start: January 14th , 2019 Complete: January 15th, 2019		
Examiner of examining body	Rina Services S.p.A.		
RANGE OF QUALIFICATION			
Welding process	111 - SMAW	136 - FCAW	
Type(s)	Manual	Semiautomatic	
Welding Equipment Type	HF inverter type		
Actual parent Material side A	Pipe: EN 10225: S355G15+N (Heat: 81092)		
Actual parent Material side B	Pipe: EN 10225: S355G15+N (Heat: 81092)		
Parent Material grade	Carbon steel with maximum strength of 470 MPa		
Supply condition	Hot rolled and normalized		
Carbon equivalent/Pcm/C	Heat Values: 0,43/0,25/ 0,16		
Groove design/configuration	Half Vee Butt Joint (one side welding), for groove dimension and details see page 4 of 5		
Parent material thickness (mm)	19,05 mm		
Weld metal thickness (mm)	111 - SMAW 5 mm	136 - FCAW 14,05 mm	
Single or Multi-pass	111 - SMAW MULTIPLE	136 - FCAW MULTIPLE	
Outside diameter	/		
Filler material Designation	111 SMAW EN ISO 2560-A: E 50 6 Mn1Ni B 12 H5 (AWS A5.5: E8016-G) 136 FCAW EN ISO 17632-A: T 46 4 1Ni P M 21 2 H5 (AWS 5.36: E81T1-M21A4-Ni1)		
Filler material Maker	111 - Esab Filarc 88S	136 - Esab OK Tubrod 15.17	
Filler material Size	111 - SMAW ∅ 2,5mm ∅ 3,2 mm 136 - FCAW ∅ 1,2 mm		
Shielding gas/Flux	ISO 14175 :2008 M21 (80% Ar + 20% CO_2)		
Shielding gas flow rate	20 l/min.		
Backing gas (purging)	None		

Type of welding current & polarity	DC - RP	Heat input / Apporto termico (kJ/mm) ± 10%		Diameter	2G (PC)	5G (PH)
			Pass	mm		
			Root	∅ 2,5 (5G) ∅ 3,2 (2G)	1,86 to 2,45	1,23 to 1,65
			Hot	∅ 3,2	1,16 to 1,42	1,52 to 2,38
			Filll	∅ 1,2	0,63 to 0,92	1,13 to 1,67
			Cap	∅ 1,2	0,50 to 0,67	0,91 to 1,18

Welding position	All, vertical down progression excluded		
Preheat (°C)	50	Interpass temperature / Temp. di interpass (°C)	250
Post-Weld Heat Treatment and/or ageing	NONE		
Weld bead width	SMAW: Max. 10 mm ∅ 3,2 mm for 2G position; Max. 8mm ∅ 2,5 mm , Max. 10 mm ∅ 3,2 mm for 2G position FCAW: Max. 12 mm for 2G position; Max. 14 mm for 5G position		
Welder's detail	Dragomir Iulian NC258, Pagliai Paolo NC76 (SMAW, 2G Test Coupon) ; Ciocan Vasile NC219 (FCAW, 2G Test Coupon) Dragomir Iulian NC258, Pagliai Paolo NC76 (SMAW & FCAW, 5G Test Coupon)		
Time lapse between root and hot pass	N.A.		
Other information / Altre informazioni	- Preheat performed by propane torch -Accelerate weld cooling not permitted; -Base material origin: Seamless pipe		

Manufacturer's Welding Procedure. Ref. no.	49/18 REV. 0		
Test result (WPQR) N°	49/18	Date/Data	28/01/2019
Manufacturer's WPS No.	pWPS 49/18 REV. 1	Date/Data	14/01/2019

TESTS CARRIED OUT ON SAMPLE 49/18 WELDED IN 2G POSITION (PC)

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 49/18 2G
Penetrant test	N.A.	/
Magnetic particle test	Acceptable	07-18307
Radiographic test	N.A.	/
Ultrasonic test	Acceptable	07-18307

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2] ≥ 355	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 470	A [%]	Z [%]	Fracture Location	Remarks
TRANSVERSE 1	369	/	525	/	/	Base metal	/
TRANSVERSE 2	372	/	531	/	/	Base metal	/

BEND TEST

Type & N.	Bend angle	Remarks	Results
4 Side bend	180°	Former Ø 40 mm	Satisfactory

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] ≥ 27J			Avarage value [J] ≥ 36J	Remarks
10x10x55	Weld metal 2 mm from cap	KV2	-40°C	104	96	132	111	/
10x10x55	FL 2 mm from cap	KV2	-40°C	163	78	83	108	/
10x10x55	FL+2 2 mm from cap	KV2	-40°C	62	50	54	55	/
10x10x55	FL+5 2 mm from cap	KV2	-40°C	123	45	33	67	/
10x10x55	Weld metal 2 mm from root	KV2	-40°C	68	83	83	78	/
10x10x55	FL 2 mm from root	KV2	-40°C	81	57	67	68	/
10x10x55	FL+2 2 mm from root	KV2	-40°C	86	83	66	78	/
10x10x55	FL+5 2 mm from root	KV2	-40°C	253	277	188	239	/

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
2 Macro examination+Hardness test	Satisfactory-See Element Materials Technology Milan Certificate No. RPR51-2E1R0A19
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Element Materials Technology Milan S.r.l. - Crema (CR)
Laboratory report reference N.	Report No. RPR51-2E1R0A19 dated JANUARY 28th 2019
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of PremierOil Spec. AB-TO-WGP-TO-ST-BD-0001 Rev. B02 and AB-TO-WGP-TO-ST-SP-0002 Rev. B01; EEMUA 158:2014 (Third Edition)

Date/Data
28/01/2019
ROSETTI MARINO S.p.A.
Welding Dept.
D. Canacchi
ROSETTI MARINO S.p.A.

Examiner or Examination Body
RINA Services S.p.A.
RINA
F. Lago
RINA Services S.p.A.
Name and signature / Nome e firma

Test result (WPQR) N°	49/18	Date/Data	28/01/2019
Manufacturer's WPS No.	pWPS 49/18 REV. 1	Date/Data	14/01/2019

TESTS CARRIED OUT ON SAMPLE 49/18 WELDED IN 5G POSITION (PH)

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 49/18 5G
Penetrant test	N.A.	/
Magnetic particle test	Acceptable	08-18307
Radiographic test	N.A.	/
Ultrasonic test	Acceptable	08-18307

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2] ≥ 355	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 470	A [%]	Z [%]	Fracture Location	Remarks
TRANSVERSE 1	360	/	505	/	/	Base metal	/
TRANSVERSE 2	363	/	519	/	/	Base metal	/

BEND TEST

Type & N.	Bend angle	Remarks	Results
4 Side bend	180°	Former Ø 40 mm	Satisfactory

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] ≥ 27J			Avarage value [J] ≥ 36J	Remarks
10x10x55	Weld metal 2 mm from cap	KV2	-40°C	84	90	97	90	/
10x10x55	FL 2 mm from cap	KV2	-40°C	67	71	50	63	/
10x10x55	FL+2 2 mm from cap	KV2	-40°C	164	234	148	182	/
10x10x55	FL+5 2 mm from cap	KV2	-40°C	154	184	161	166	/
10x10x55	Weld metal 2 mm from root	KV2	-40°C	88	79	66	78	/
10x10x55	FL 2 mm from root	KV2	-40°C	29	39	61	43	/
10x10x55	FL+2 2 mm from root	KV2	-40°C	175	270	194	213	/
10x10x55	FL+5 2 mm from root	KV2	-40°C	165	163	160	163	/

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
2 Macro examination+Hardness test	Satisfactory-See Element Materials Technology Milan Certificate No. RPR51-1E1R0A19
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Element Materials Technology Milan S.r.l. - Crema (CR)
Laboratory report reference N.	Report No. RPR51-1E1R0A19 dated JANUARY 28th 2019
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of PremierOil Spec. AB-TO-WGP-TO-ST-BD-0001 Rev. B02 and AB-TO-WGP-TO-ST-SP-0002 Rev. B01; EEMUA 158:2014 (Third Edition)

Date/Data
28-01-2019
ROSETTI MARINO S.p.A.

Examiner or Examination Body
RINA Services S.p.A.
Name and signature / Nome e firma

PremierOil ROSETTI MARINO

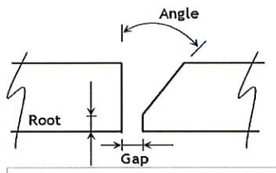
PQR - AS- RUN PARAMETER SHEET

pWPS 49/18			
PQR 49/18			
Coupon Nr. 49/18 PC			
Date:	14/01/2019	Page:	1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: **EEMUA 158 Third Edition (2014) and PremierOil Spec. AB-TO-WGP-TO-ST-BD-0001 Rev. B02 and AB-TO-WGP-TO-ST-SP-0002 Rev. B01**

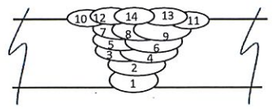
Welder Name(s):	DRAGOMIR IULIAN (SMAW, SIDE 1) ; PAGLIAI PAOLO (SMAW, SIDE 2); CIOCAN VASILE (FCAW)	Welder Id No(s):	NC258 ; NC76 ; NC219		
Welding Process(es):	111-SMAW ; 136-FCAW	Type(s):	MANUAL ; SEMIAUTOMATIC		
Welding Position:	PC (2G)	Progression:	N.A.		
Base Materials:	EN 10225: S355 G15+N	Wall Thickness:	19,05	Diameter:	508 mm (20")
Heat No(s):	81092	Joint Type:	HALF VEE BUTT JOINT; ONE SIDE WELDED		

WELD PREPARATION:



Root: 1-2 mm ; Gap : 3,5-4,5 mm ; Angle : 45°

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	3,2	SBR41145	FILARC 88S
Hot Pass	3,2	SBR41145	FILARC 88S
Filling Runs	1,2	PNS24006	ESAB OK TUBROD 15.17
Cap	1,2	PNS24006	ESAB OK TUBROD 15.17

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar+ 20%CO2
Flow:	20 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/8"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
10 mm (SMAW) ; 12 mm (FCAW)	String		Multiple (each side)	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required		Holding Temperature °c	Holding Time °c	Heating Rate °C	Cooling Rate °C
50°C	PROPANE TORCH	250	CONTACT DIGITAL THERMOMETHER	NA		NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
1 (NC258)	1	SMAW	1	-	E8016-G E50 6 Mn1Ni B12 H5	3,2	DC EP	105	120	112,5	22	24	23,0	-	-	6	2,07	0,80	50	Welding unit: LINCOLN IDEALARC R3R 600-i (SECOM SE00.13) ; GOLD STAR 400 DC (SECOM SE00.11)
2 (NC 76)	1	SMAW	1	-	E8016-G E50 6 Mn1Ni B12 H5	3,2	DC EP	104	118	111,0	22	24	23,0	-	-	6	2,23	0,80	50	Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635
NA (NC258)	2	SMAW	2	-	E8016-G E50 6 Mn1Ni B12 H5	3,2	DC EP	125	133	129,0	22	24	23,0	-	-	11	1,29	0,80	110	Cap passes from nr. 10 to nr. 14 Last weld bead in the center of the weld cap
NA	3	FCAW	3	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	190	210	200,0	26	28	27,0	-	-	37	0,70	0,80	130	
NA	3	FCAW	4		E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	210	230	220,0	26	28	27,0	-	-	37	0,77	0,80	150	
NA	4	FCAW	5		E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	210	230	220,0	26	28	27,0	-	-	37	0,77	0,80	190	
NA	4	FCAW	6		E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	220	240	230,0	27	29	28,0	-	-	37	0,84	0,80	250	
NA	5	FCAW	7		E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	220	240	230,0	27	29	28,0	-	-	37	0,84	0,80	180	
NA	5	FCAW	8		E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	220	240	230,0	27	29	28,0	-	-	37	0,84	0,80	170	
NA	5	FCAW	9		E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	220	240	230,0	27	29	28,0	-	-	37	0,84	0,80	180	
NA	6	FCAW	10		E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	170	190	180,0	25	27	26,0	-	-	37	0,61	0,80	200	
NA	6	FCAW	11		E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	170	190	180,0	25	27	26,0	-	-	40	0,56	0,80	180	
NA	6	FCAW	12		E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	170	190	180,0	25	27	26,0	-	-	41	0,55	0,80	150	
NA	6	FCAW	13		E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	170	190	180,0	25	27	26,0	-	-	37	0,61	0,80	210	
NA	6	FCAW	14		E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	170	190	180,0	25	27	26,0	-	-	38	0,59	0,80	220	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:		SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	RINA Services SpA No. Bo. 0474	Name:
Signature: ROSETTI MARINO SpA Welding Dept. D. Gonacchi	Signature:	Signature:	Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	Signature:
Date:	Date:	Date:	Date 14/01/2019 File Signature Cimino Davide	Date:

PremierOil ROSETTI MARINO

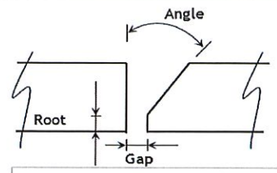
PQR - AS- RUN PARAMETER SHEET

pWPS 49/18	
PQR 49/18	
Coupon Nr. 49/18 PH	
Date: 15/01/2019	Page: 1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: **EEMUA 158 Third Edition (2014) and PremierOil Spec. AB-TO-WGP-TO-ST-BD-0001 Rev. B02 and AB-TO-WGP-TO-ST-SP-0002 Rev. B01**

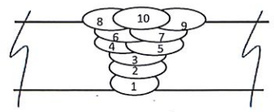
Welder Name(s):	DRAGOMIR IULIAN (SIDE A) ; PAGLIAI PAOLO (SIDE B)	Welder Id No(s):	NC258 ; NC76		
Welding Process(es):	111-SMAW ; 136-FCAW	Type(s):	MANUAL ; SEMIAUTOMATIC		
Welding Position:	PH (5G)	Progression:	Vertical Uphill		
Base Materials:	EN 10225: S355 G15+N	Wall Thickness:	19,05	Diameter:	508 mm (20")
Heat No(s):	81092	Joint Type:	HALF VEE BUTT JOINT; ONE SIDE WELDED		

WELD PREPARATION:



Root: 1-2 mm ; Gap : 2,5-3,5 mm ; Angle : 45°

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	2,5	SBR09225	FILARC 88S
Hot Pass	3,2	SBR41145	FILARC 88S
Filling Runs	1,2	PNS24006	ESAB OK TUBROD 15.17
Cap	1,2	PNS24006	ESAB OK TUBROD 15.17

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar+ 20%CO2
Flow:	20 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/8"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
SMAW: 8 mm (ø2,5 mm), 10 mm (ø3,2 mm) ; 14 mm (FCAW)	String		Multiple (each side)	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required		Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
50°C PROPANE TORCH	250	CONTACT DIGITAL THERMOMETHER	NA		NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
A	1	SMAW	1	-	E8016-G E50 6 Mn1Ni B12 H5	2,5	DC EP	74	82	78,0	21	23	22,0	-	-	5,5	1,50	0,80	50	Welding unit: LINCOLN IDEALARC R3R 600-i (SECOM SE00.13) ; GOLD STAR 400 DC (SECOM SE00.11)
A	2	SMAW	2	-	E8016-G E50 6 Mn1Ni B12 H5	3,2	DC EP	100	115	107,5	22	24	23,0	-	-	6	2,16	0,80	120	Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635
A	3	FCAW	3	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	180	200	190,0	25	27	26,0	-	-	17	1,39	0,80	150	Cap passes from nr. 8 to nr. 10 Last weld bead in the center of the weld cap
A	4	FCAW	4	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	180	200	190,0	25	27	26,0	-	-	18	1,32	0,80	120	
A	4	FCAW	5	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	180	200	190,0	25	27	26,0	-	-	19	1,25	0,80	150	
A	5	FCAW	6	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	190	210	200,0	26	28	27,0	-	-	17	1,52	0,80	200	
A	5	FCAW	7	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	190	210	200,0	26	28	27,0	-	-	18	1,44	0,80	250	
A	6	FCAW	8	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	150	170	160,0	24	26	25,0	-	-	18	1,07	0,80	150	
A	6	FCAW	9	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	150	170	160,0	24	26	25,0	-	-	19	1,01	0,80	200	
A	6	FCAW	10	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	150	170	160,0	24	26	25,0	-	-	18	1,07	0,80	180	
B	1	SMAW	1	-	E8016-G E50 6 Mn1Ni B12 H5	2,5	DC EP	75	81	78,0	21	23	22,0	-	-	6,0	1,37	0,80	50	
B	2	SMAW	2	-	E8016-G E50 6 Mn1Ni B12 H5	3,2	DC EP	102	112	107,0	22	24	23,0	-	-	7	1,69	0,80	120	
B	3	FCAW	3	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	180	200	190,0	25	27	26,0	-	-	16	1,48	0,80	150	
B	4	FCAW	4	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	180	200	190,0	25	27	26,0	-	-	17	1,39	0,80	120	
B	4	FCAW	5		E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	180	200	190,0	25	27	26,0	-	-	17	1,39	0,80	150	
B	5	FCAW	6		E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	190	210	200,0	26	28	27,0	-	-	18	1,44	0,80	200	
B	5	FCAW	7		E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	190	210	200,0	26	28	27,0	-	-	18	1,44	0,80	250	
B	6	FCAW	8		E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	150	170	160,0	24	26	25,0	-	-	18	1,07	0,80	150	
B	6	FCAW	9		E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	150	170	160,0	24	26	25,0	-	-	19	1,01	0,80	200	
B	6	FCAW	10		E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	150	170	160,0	24	26	25,0	-	-	18	1,07	0,80	180	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA Welding Dept. D.Genacchi	Signature:	Signature:	Signature:
Date:	Date:	Date:	Date:

RINA S.p.A. No. Bo. 0474 — Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ — Date 15/01/2019 — File — Signature Cimarti Davide

PQR attachments index:

Base material certificate (Pipe EN 10225: S355 G15+N)

Consumables certificate

preliminary WPS

NDE certificate

Mechanical test report

ROSETTI MARINO

PQR 49/18

Base material certificate
(Pipe EN 10225: S355 G15+N)

Válcovny trub Chomutov, a.s.

Tovární 629, Chomutov 430 01, Czech Republic www.vtchomutov.cz

Inspekční certifikát
Abnahmenprüfzeugnis
Inspection Certificate
Certificat de Reception **EN 10204:2004/3.2**

Atest č. - Attest Nr.
Certificate No - Certificat No : **2884/18**

Objednávka č. - Bestell Nr.
Order No - No de la commande :
3200062501
Code : 1841324
Zakázka č. - Bestell Nr. - Order No - Commande No:
644745

Zákazník - Besteller - Customer - Client:
ArcelorMittal Projects
Europe B.V.
Mannesmannweg 5

4794SL Heijningen
Netherlands

Znak výrobce - Herstellerszeichen
Brand of the manufacture-Marque du fabricant:

Razítko znalce - Stempel des Sachverständigen
Inspector's stamp - Poincon de l'expert **TK7**

PRA 1800584

Ocelové bezešvé trubky - Nahtlose Stahlrohre - Seamless steel tubes - Tubes en aciers sans soudure
inside pickled and outside de-scaled by grinding, lacquered / innen gebeizt und außen entzundert durch Schleifen mit dem Lack geschützt

Úkosy - Beweled ends
beveled for welding 30° (-0/+5°) with flat 1,6 mm with tol. -0/+0,8 mm / bearbeitete Schräge für Schweißnaht 30° (-0/+5°) mit Stirnfläche 1,6 mm, Tol. -/+0,8mm

Technické požadavky - Prüfgrundlagen/Anforderugen - Technical requirements/Demand - Exigences techniques:
Norsok M120, MDS-Y22 rev.5 june2007 API Spec. 5L - 45 ed., july 1, 2013 PSL2 EN 10225:2009 EN 10210-1:2006 EN 10210-2:2006/AC:2007-02 ANSI/NACE MR0175/ISO 15156:ed2015 NACE MR 0103-2015

Materiál - Werkstoff - Material - Matiére:	Dle - Entsprechend - According to - Selon:	Vydání - Ausgabe - Edition - Edition:
X52N	**API 5L**	**2013**
L360N	**API 5L**	**2013**
S355G15 +N	**EN 10225**	**2009**
S355NLH	**EN 10210-1**	**2006**

Stav dodávky - Lieferzustand - State of delivery - Etat de livraison:
Warmgewalzt - hot rolled - normalized 925 +/- 15 °C - cooled in air

Způsob zpracování tavby - Erschmelzungsart - Melting process - Procédé d´élaboration:
Stahlhersteller:Válcovny trub Chomutov, a.s., Workplace-Rokycanská 204, 338 42 Hrádek, Tschechische Republik; Vollständig getötet E+LF/Steelmakers:Válcovny trub Chomutov, a.s., Workplace-Rokycanská 204, 338 42 Hrádek, Czech republic;Fully killed-E+LF

Značení - Kennzeichnung - Marking - Marquage:
Stamping / gepragt : logo VT API 5L EN 10225 EN 10210 X52N/L360N PSL2/S355G15+N/S355NLH 508,0 x 19,05 (heat no./Schmelzennummer) (pipe no./Rohr Nr.) TK7 LLRS Stencilled / gespritzt : logo VT API Spec 5L 0286 API (10-2018) EN 10225 EN 10210 508,0 x 19,05 X52N/L360N PSL2 S355G15+N S355NLH SMLS (heat no./Schmelzennumemr) (pipe no./Rohr Nr.) (length/länge) ... m (weight/gewicht) ... kg 20,5 MPa ARCELOR MITTAL PROJECTS logo CE

Specifikace - Specification:
Pipe no. / Rohr Nr. 14510,14511,14512,14513,14514

Rozsah dodávky - Umfang der Lieferung - Extent of material delivery - Liste descriptive

Kusy Stücke Pieces Piéces	Celková délka Gesamtlänge Total length Longueur totale [m]	Celková hmotnost Gesamtmasse Total mass Masse totale [t]	Rozměry Dimensionen Dimensions Dimensions [mm]	Tavba číslo Schmelze Nr. Heat No. No Coulée	Vodní tlak Druckprobe Hydr. Test Essai hydralique [MPa]	Avízo: Aviso: Advice: Avis:	Datum: Datum: Date: Date:
5	**53,720**	**12,463**	**508,0 x 19,05 8 - 12,6 m**	**81092**	**20.500 10 sec.**		

Lloyd's Register EMEA
Prague Office
Tomas Prouza
Lloyd's Register

Country of melt - Czech republic.
The Manufacturer declares that it is certified by the notified body TÜV NORD reg. No 0045 according to Article 4.3 Annex I of Directive 2014/68/EU and AD-2000 Merkblatt W0 and EN 10210-1:2006 appendix to ZA CPR (EU) No. 305/2011.
Uvedené výrobky jsou ve shodě s předpisy, které jsou specifikovány kupní smlouvou. -Angegebene produkte sind in einklang mit den vorschriften, die im Kaufvertrag spezifiziert werden.We thereby declare that the above mentioned products were manufactured in accordance with specifications and contract requirements. - Des produits indiqués sont dans un accord avec les disposition contrait de vente on spécifie.
Raw material by used for pipe production is without radioactive contamination.

Jana SOCHROVÁ

Válcovny trub Chomutov, a.s.
Tovární 629, 430 01 Chomutov
IČ: 227 74 645

Chomutov J.....30.10.2018.....
Dne - Datum - Date - Date

Příloha-Anlage-Annex-Annexe: 1

Zodpovědná osoba - Der Werkssachverständige - Inspector-le responsable

Válcovny trub Chomutov, a.s.

Tovární 629, Chomutov 430 01, Czech Republic www.vtchomutov.cz

Inspekční certifikát
Abnahmenprüfzeugnis
Inspection Certificate

Certificat de Reception **EN 10204:2004/3.2**

Atest č. - Attest Nr.
Certificate No - Certificat No : **2884/18**

Objednávka č. - Bestell Nr.
Order No - No de la commande :
3200062501
Code : 1841324
Zakázka č. - Bestell Nr. - Order No - Commande No:
644745

Zákazník - Besteller - Customer - Client:
ArcelorMittal Projects
Europe B.V.
Mannesmannweg 5

4794SL Heijningen
Netherlands

Znak výrobce - Herstellerszeichen
Brand of the manufacture-Marque du fabricant:

Razítko znalce - Stempel des Sachverständigen
Inspector's stamp - Poincon de l'expert **TK7**

CE
07
0045 - CPR - 0887

Válcovny trub Chomutov, a.s.
Tovární 629
430 01 Chomutov

S355NLH EN 10210-1:2006

Duté profily tvářené za tepla z konstrukčních ocelí
Warmgefertigtes Hohlprofil für den Stahlbau
Hot-rolled hollow section for steel construction

Prohlášení o vlastnostech (POV)
Leistungserklärung (LE) *008-16*
Declaration of Performance (DOP)

Prohlášení o vlastnostech (POV) je k nalezení zde:	www.steel-holding.cz/cs/produkty/certifikaty/certifikaty.html
Die Leistungserklärung (LE) ist hier zu finden:	www.steel-holding.cz/de/produkte/zertifikate/zertifikate.html
The Declaration of Performence (DoP), see here:	www.steel-holding.cz/en/products/certificates/certificates.html

Doplňující údaje - Zusätzliche - Additional remarks - Autres remarques:
Visual inspection and dimensional check without objection. Closed plastic ends protectors. Visuel-und Masskontrolle ohne Beanstandung mit Kappen verschlossen.

Lloyd's Register EMEA
Prague Office
Tomas Prouza
Lloyd's Register

Country of melt - Czech republic.
The Manufacturer declares that it is certified by the notified body TÜV NORD reg. No 0045 according to Article 4.3 Annex I of Directive 2014/68/EU and AD-2000 Merkblatt W0 and EN 10210-1:2006 appendix to ZA CPR (EU) No. 305/2011.
Uvedené výrobky jsou ve shodě s předpisy, které jsou specifikovány kupní smlouvou. -Angegebene produkte sind in einklang mit den vorschriften, die im Kaufvertrag spezifiziert werden.We thereby declare that the above mentioned products were manufactured in accordance with specifications and contract requirements. - Des produits indiqués sont dans un accord avec les disposition contrait de vente on spécifie.
Raw material by used for pipe production is without radioactive contamination.

Jana SOCHROVÁ

Válcovny trub Chomutov, a.s.
Tovární 629, 430 01 Chomutov
IČ: 227 74 645

Chomutov J. 30.10.2018
Dne - Datum - Date - Date

Příloha-Anlage-Annex-Annexe: 2

Zodpovědná osoba - Der Werkssachverständige - Inspector-le responsable

Válcovny trub Chomutov, a.s.
Tovární 629, Chomutov 430 01, Czech Republic www.vtchomutov.cz

Příloha - Anlage - Annex - Annexe
3

Výsledky zkoušek - Ergebnis der Prüfungen - Test results - Résultats des tests

Atest č. - Attest Nr. - Certificate No - Certificat No : **2884/18** **30.10.2018**

Mechanické zkoušky-Mechanische Prüfungen-Mechanical tests-Tests méchaniques								ASTM A 370			ASTM A 370	
		Rozměry vzorku Probeabmessung Dim. of. Specimen Dim. de l'echantillion		Odběr vzorku Probenentnahme Specimen Prélevement		Mez kluzu Streck/Dehngrenze Yield strength/ Proof stress Limite d'elasticité	Pevnost v tahu Zugfestigkeit Tensile strength Résistence á la traction	Tažnost Bruchdehnung Elongation Allongement	Kontrakce Brucheinschnürung Reduction of area Contraction	Nárazová práce Schlagarbeit Energy of Impact Energie de rupture	Vrub.Houževnatost Kerbschlagzähigkeit Impact strength Résilience
Č. zkoušky Probe Nr. Test No No du test	Číslo tavby Schmelze Nr. Heat No No coulée	Tloušťka Dicke Thickness Epaisseur "	Šíře Breite Largeur "	Směr Richtung Direction Direction	Zkuš. teplota Prüftemperatur Test temperature Temperature du test C°	360-530 Rt 0,5 MPa	470-620 Rm MPa	2" %	Z %	Kv J	J/cm2
14511	**81092**		**Ø1/2**	**L**	**20**	**366**	**529**	**37,00**			
	81092		**10 mm**	**T**	**-50**					**119**	
	81092				**-50**					**116**	
	81092				**-50**					**171**	
	81092				**A**					**135**	
						ReH		**A5**			
14511	**81092**		**Ø10**	**L**	**20**	**381**	**530**	**32,80**			
	81092		**10 mm**	**L**	**-40**					**261**	
	81092				**-40**					**267**	
	81092				**-40**					**251**	
	81092				**A**					**260**	
	81092		**10mm**	**L**	**-50**					**247**	
	81092				**-50**					**250**	
	81092				**-50**					**242**	
	81092				**A**					**246**	
						Rt0,5					
14511	**81092**		**Ø10**	**L**	**20**	**372**	**530**	**32,80**			

L = Podél - Längs - Along - En longueur: T = Příčně = Quer = Transverse = En travers, A = Average

Technologické zkoušky - Technologische Prüfungen - Technological test - Test technologiques:

Hardness test < 22 HRC.UT acc. to ASTM E213 for long.,trans.defects (notch depth 5%), EN ISO 10893-10U2/C; EN ISO 1893-8 U3 satisfied-100% of pipes.Magnetic testing MPI outside and inside-EN ISO 10893-5, MPI ASTM E709 satisfied.

Chemické složení - Chemische Zusammensetzung - Chemical composition - Composition chimique (%)

Tavba číslo Schmelze Nr. Heat No No Coulée	Heat analysis (S) / product analysis (K)																
	C	Mn	Si	P	S	Cr	Ni	Cu	Mo	V	Nb	Ti	Al	N	B	Cev	Co
min.		**0,90**	**0,15**										**0,020**				
max.	**0,16**	**1,40**	**0,45**	**0,025**	**0,007**	**0,30**	**0,30**	**0,35**	**0,08**	**0,10**	**0,050**	**0,020**	**0,060**	**0,014**	**0,0005**	**0,43**	
	Sn 0,0200	**As 0,0200**	**Sb 0,0100**	**Ca 0,0050**	**Pb 0,010**	**Bi 0,010**											
81092S	**0,15**	**1,33**	**0,18**	**0,018**	**0,002**	**0,09**	**0,07**	**0,16**	**0,03**	**0,05**	**0,016**	**0,001**	**0,032**	**0,007**	**0,0002**	**0,42**	
	Sn 0,0110	**Ca 0,0010**															
81092K	**0,16**	**1,33**	**0,19**	**0,018**	**0,001**	**0,10**	**0,06**	**0,15**	**0,04**	**0,05**	**0,016**	**0,001**	**0,030**	**0,007**	**0,0003**	**0,43**	
	Sn 0,0100	**As 0,0090**	**Sb 0,0020**	**Ca 0,0006**	**Pb 0,001**	**Bi 0,003**											
81092K	**0,16**	**1,31**	**0,18**	**0,017**	**0,001**	**0,09**	**0,06**	**0,14**	**0,04**	**0,05**	**0,013**	**0,001**	**0,030**	**0,007**	**0,0003**	**0,43**	
	Sn 0,0100	**As 0,0090**	**Sb 0,0020**	**Ca 0,0006**	**Pb 0,001**	**Bi 0,003**											

Lloyd's Register EMEA
Prague Office
Tomas Prouza
Lloyd's Register

Jana SOCHROVÁ

Chomutov J....30.10.2018.....
Dne - Datum - Date - Date

.....
Zodpovědná osoba - Der Werkssachverständige - Inspector-le responsable

Válcovny trub Chomutov, a.s.
Tovární 629, 430 01 Chomutov
IČ: 227 74 645

ROSETTI MARINO

PQR 49/18

Consumables certificate

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2017-11-30

Numero certificato/Cert no: EC24970318 rev. 0

Nostro ordine/Our order:	1801150	Vostro ordine/Your order:	1717001851-Z1AS
Nostro riferimento/Our ref:	Web user - Movex CMP020 ITB	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB00060	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20171116	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address	Destinatario del certificato/Cert receiver	Indirizzo di spedizione/Delivery address
ESAB SALDATURA SpA . VIA ROSA LUXEMBURG 49 20085 LOCATE DI TRIULZI (MI) 20085 ITALY Italy		ROSETTI MARINO SPA . VIA TRIESTE 230 48100 RAVENNA RA Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: SBR09225 Quantità/Quantity: 136.8 KG

PRODOTTO/PRODUCT

Marchio/Brand:	Filarc
Descrizione/Desc:	FILARC 88S 2.5x350mm 1/4 VP
Codice/Item no:	**77692539K3**

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.5: E8016-G
EN ISO 2560-A: E 50 6 Mn1Ni B 12 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:		
C		0.06%
Si		0.33%
Mn		1.72%
P		0.016%
S		0.007%
Cr		0.03%
Ni		0.90%
Mo	<	0.01%
Nb	<	0.01%
Cu		0.03%
V		0.01%

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:
Altro/Auxiliary:
Condizione/Condition:

TRAZIONE/TENSILE

Rp0.2	Rm	A5
560 MPa	640 MPa	27 %

RESILIENZA/IMPACT

Temp	-40 °C	-60 °C
KV	115 J	100 J

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis		Validazione - altro/Validation - Others	
Ellen Björgan	Quality Manager	J-P Emoult	Product Manager

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2018-01-22 Numero certificato/Cert no: EC25021325 rev. 0

Nostro ordine/Our order:	1849085	Vostro ordine/Your order:	Verb. Sig. Dal Prete
Nostro riferimento/Our ref:	Web user - Movex CMP020 ITB	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB00060	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20180122	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address	Destinatario del certificato/Cert receiver	Indirizzo di spedizione/Delivery address
ESAB SALDATURA S.P.A. (6155) VIA ROSA LUXEMBURG, 49 IT-20085 LOCATE TRIULZI MI Italy		ROSETTI MARINO SPA . VIA TRIESTE 230 48100 RAVENNA RA Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: SBR41145 Quantità/Quantity: 28 CT

PRODOTTO/PRODUCT

Marchio/Brand: Filarc
Descrizione/Desc: FILARC 88S 3.2x350mm 1/2 VP
Codice/Item no: **77693239G3**

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.5: E8016-G
EN ISO 2560-A: E 50 6 Mn1Ni B 12 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:

C		0.05%
Si		0.24%
Mn		1.87%
P		0.018%
S		0.007%
Cr		0.03%
Ni		0.91%
Mo	<	0.01%
Nb	<	0.01%
Cu		0.02%
V		0.01%

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:
Altro/Auxiliary:
Condizione/Condition:

TRAZIONE/TENSILE

Rp0.2	Rm	A5
560 MPa	640 MPa	27 %

RESILIENZA/IMPACT

Temp	-40 °C	-60 °C
KV	115 J	100 J

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
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ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1

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Ellen Björgan Quality Manager J-P Ernoult Product Manager

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2018-07-27

Numero certificato/Cert no: EC25251151 rev. 0

Nostro ordine/Our order:	2013780	Vostro ordine/Your order:	1718000897
Nostro riferimento/Our ref:	Web user - Movex CMP020 ITB	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB00060	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20180727	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address

ESAB SALDATURA S.P.A. (6155)
STRADA PROVINCIALE 34, N. 7
IT-20010 OSSONA MI
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address

ROSETTI MARINO SPA
.
VIA TRIESTE 230
48100 RAVENNA RA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PNS24006 Quantità/Quantity: 20 CT

PRODOTTO/PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK Tubrod 15.17 1.2mm 16kg
Codice/Item no:	**1517127730**

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.36: E81T1-M21A4-Ni1
EN ISO 17632-A: T 46 3 1Ni P C1 2 H5
EN ISO 17632-A: T 46 4 1Ni P M21 2 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:	M21 (EN ISO 14175)
C	0.05%
Si	0.39%
Mn	1.15%
P	0.01%
S	0.02%
Cr	0.03%
Ni	1.0%
Mo	0.03%
Nb	0.02%
Cu	0.06%
V	0.02%

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:	EN
Altro/Auxiliary:	M21 (EN ISO 14175)
Condizione/Condition:	As welded

TRAZIONE/TENSILE

ReL	Rm	A5
544 MPa	613 MPa	26 %

RESILIENZA/IMPACT

Temp	-40 °C
KV	124 J

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis

Piotr Grela Quality Assurance Manager

Validazione - altro/Validation - Others

Neil Farrow Product Manager

ROSETTI MARINO

PQR 49/18

preliminary WPS

PQR ref.:	TBQ	pWPS (EEMUA 158:2014)	49/18	REV.:	1	Data /date	14/01/2019

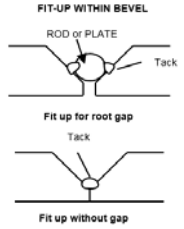
Procedimento di saldatura / Welding process: **111 SMAW+136-FCAW** — Tipo / Type: **MANUAL+SEMIAUTOMATIC**

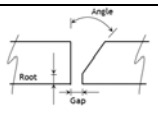
GIUNTO - JOINT

Tipo di giunto / Joint Design: **1/2V** — Supporto / Backing: ☐ Si / Yes ☒ No

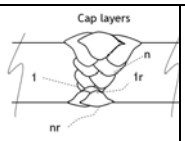
Materiale di supporto (tipo) / Backing material (type): ☐ Metallico / Metal ☐ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:





Angle: 45°
Root: 2 mm
Gap: 3 mm



Note: **1.Surfaces cleaned from moisture, oil, grease, paint before welding (by grinding)/** *Pulire le superfici da liquidi, oli, grasso e vernici con molatura prima di saldare.*
2.Minimum tack weld lengths shall be 4 times the thk or 50 mm, whichever is less/ I tacchetti devono essere lunghi almeno 50 mm o 4 volte lo spessore (il più piccolo dei due);
3.Preheat shall be performed by electrical resistance, induction equioment or with gas burners. Cutting torches shall not be permitted. *Il preriscaldo può essere eseguito con resitenze, induzione o torcia. Non può essere utilizzato l'ossitaglio.*

MATERIALE BASE - BASE MATERIAL

Da / from P-N°: **/** — Group N° **5** — A / to P-N°: **/** — Group N° **5**

DA Tipo e grado / From type and grade: **EN 10225 S355 G15+N**

A Tipo e grado / To type and grade: **EN 10225 S355 G15+N**

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove **19,05 mm**

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove **508 mm**

METALLO D'APPORTO - FILLER METAL

	SMAW	GS FCAW
Spec. N° (SFA)	5.5	5.29/5.36
AWS N° (CLASS)	E8016-G	E81T1-1/E81T1-Ni1
F-N°	4	6
A-N°	10	1
Diametro mat. D'apporto / Size of filler metal	3,2	1,2
Gamma spessori /Thick. Range (mm)	Only root	Up to filling
Accoppiamento filo-flusso / Electrode-flux (CLASS)	NA	NA
Denom. Comm. Flusso / FLUX trade name	NA	NA
Inserto consumabile / Consumable insert	NA	NA
Altro / other	FILARC 88S	OK Tubrod 15.17

POSIZIONI - POSITION

giunto / Joint: **Cianfrino / groove** — Posizione / position **PC(2G)+PF(3G)** — Progressione / weld progression: **Ascendente / UP hill**

PRERISCALDO - PRE-HEAT

Temp.preriscaldo minima / Min. pre-heat temp: **50 °C** — Max temp. Di interpass / Max interpass temp.: **250 °C** — Mantenimento interpass / Interpass maintenance: **N.A.** — Tempo di mantenimento prerisc. / Maintenance timing: **N.A.**

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs): **N.A.** — Temperatura di stasi / Holding temperature °C: **N.A.** — Tempo di stasi / Holding time (min.): **N.A.** — Velocità di raffreddamento / Cooling rate (°C/Hrs): **N.A.**

GAS DI PROTEZIONE - GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar+CO2	80%+20%	16-24 lt/min
Protezione al seguito / Trailing:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current: **DC** — Polarità / Polarity **RP**

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: **N.A.**

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: **N.A.**

Velocità alimentazione filo / Electr. Wire feed speed range: **Self regulated**

TECNICA - TECHNIQUE

Passata / Bead: **Tirata/String** — Dimensione bocchello gas / Orifice of gas cup size: **1/2"** — Pulizia iniziale e fra le passate / Initial and interpass cleaning: **Spazzolatura/Brushing**

Metodo di solcatura a rovescio / Method of back gouging: **N.A.** — Oscillazione / Oscillation: **N.A.** — Distanza zona di contatto e pezzo / Contact zone to work distance: **N.A.**

N°Passate / Passes nr.: **Multipla/Multiple** — Elettrodo multiplo o singolo / Multiple or single electrodes: **Singolo/Single** — Martellatura / Peening: **N.A.**

Altro / Other:

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range		Vel. Avanzamento / Travel speed range (mm/min)		Apporto termico / Heat input (KJ/mm)	
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. Range						
Tack-1	SMAW	E8016-G	3,2	RP	90 104	21	23	57	90	1,01	2,01
2	SMAW	E8016-G	3,2	RP	90 104	21	23	57	90	1,01	2,01
3	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	196 245	26	28	175	250	0,98	1,88
4-n	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	210 264	26	28	193	275	0,95	1,84
Cap layers	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	205 250	26	28	176	310	0,83	1,91

Preparato da / prepared by:	Client/Third part signature:	Client/Third part signature:
D.Cenacchi	*Premier Oil*	*DNV*

NDE certificate

ROSETTI MARINO	**VERBALE DI CONTROLLO VISIVO/DIMENSIONALE** **visual/dimensional inspection report**	VDR N° 49-18 data: 15-01-2019

progetto project	TOLMOUNT REDEVELOPMENT PROJECT	cliente PREMIER OIL client	ordine / PO	commessa 118A50 job

disegno dwg	/	ITP N° AB-TO-ROS-PM-QA-PL-0002 REV.C01	fase 8.1 step

SI CERTIFICA CHE :

gli item di seguito indicati sono stati sottoposti a controllo dimensionale ed accettati in accordo alla procedura / specifica sotto indicata ed ai criteri di accettabilita' in essa definiti.

WE CERTIFY THAT:

items below indicated have undergone a dimensional inspection and have been accepted according to the specific / procedure mentioned hereunder and to acceptance criteria defined in it.

oggetto – item

COUPON	STAMP	POS	THK	LENGHT	WPS	Date of examination
49/18 PC	NC258-NC219	PC	19,05 mm	508 mm	pWPS 49/18	15/01/2019
49/18 PH	NC258-NC76	PH	19,05 mm	508 mm	pWPS 49/18	15/01/2019

RINA Services SpA
No. Bo. 0474
Noted ☐
Reviewed ☑
Witnessed ☐
Approved ☐
Date 15/01/2019
File
Signature
Cimatti Davide

note - remarks

Acceptance criteria: EEMUA 158 TABLE 14

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

AB-TO-ROS-PM-QA-PR-0006 Rev.01

Operatore - Operator	Controllo Qualita' - Quality Control	Cliente - Client
CSWIP D.CENACCHI 305250 WI 3.1		

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 17/01/2019	FOGLIO – Sheet 1
RAPPORTO D'ESAME MAGNETOSCOPICO ***MAGNETIC PARTICLE TEST***		MT N° : 08	Ns. Rif./Our Ref. 18307

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	TOULMONT DEVELOPMENT	118A50	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
PremierOil TOULMOUNT	PQR	/	/	8.1

CODICE / code	PROCEDURA/Procedure	ACCETTABILITA - Acceptance level
UNI EN ISO 23278	AB-TO-ROS-PM-QA-PR-0007_C01	AB-TO-ROS-PM-QA-PR-0007_C01

MATERIALE Material	TEMPERATURA DELLE SUPERFICI Surface temperature	INTENSITA' LUMINOSA / Light intensity	
		LUCE BIANCA	LUCE NERA
S355 G14+N	INTERVALLO 5÷52°C	☑ > 1000 LUX	☐ 1000 µW/cm².

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined
☐ MOLATO – Ground	☐ LAMINATO – Rolled	☐ GREZZO – Forged

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics

☐ PUNTALI/Prods ☑ GIOGO/Yoke ☐ SOLENOIDE/Solenoid ☐ CONDUTTORE CENTRALE/Central conduttor

TIPO APPARECCHIO/Type of equipment	SILVER YOKE HR230 S.No. 03.230-16	DISTANZA PUNTALI/Pole spacing mm	180mm
TIPO DI CORRENTE/Type current	C.A	INTENSITÀ/Intesity (Amp)	4,5 kg

MEZZO DI ISPEZIONE / Examination medium	☑ UMIDO/Wet	☐ SECCO/Dry

PARTICELLE UTILIZZATE/Particle Type

POLVERE NERA/Black powder	☑	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	NDT BW2	MARCA TIPO/Mark Type	NDT FW1
LOTTO/BACH	7241s	LOTTO/BACH	
VERNICE DI CONTRASTO/Contrast Paint	☑ NDT WBL5	☐ CGM VECOPLAST	
LOTTO/BACH	U180327s	X	

SALDATURE CONTROLLATE / Welds Verified

THE CONTROL HAS BEEN CARRIED OUT ON 100% OF FOLLOWING WELDS:

ITEM	THICKNESS	STAMP	Ø	PROCESS
PQR 49/18 PH	~~19,08~~ 19,05	NC258-NC76	508	SMAW+FCAW

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Nico Tomasi II° Livello SNT-TC-1A / ISO 9712	ROSETTI MARINO SpA Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 22/01/2019 File Signature Cimatti Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items esamine*

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 17/01/2019	FOGLIO – Sheet 1/1
RAPPORTO D'ESAME CON ULTRASUONI ***Ultrasonic examination report***		UT N° : 08	Ns. Rif./Our Ref. 18307

CLIENTE – Client	ORDINE – Order	PROGETTO – Project		COMMESSA – Job
ROSETTI MARINO	/	TULMONT DEVELOPMENT PROJECT		118A50
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
PremierOil / TULMOUNT	PQR	/	/	8.1

CODICE / Code	PROCEDURA / Procedure	ACCETTABILITA' / Acceptance level
UNI EN 17640	AB-TO-ROS-PM-QA-PR-0011_C01	AB-TO-ROS-PM-QA-PR-0011_C01
MATERIALE Material	DIMENSIONI Dimension	SPESSORE NOMINALE / Thk
S355 G14+N	SEE TABLE	SEE TABLE

STATO DELLA SUPERFICIE – Surface condition

☑ COME SALDATO As welded	☑ SPAZZOLATO - Brushed	☐ LAVORATO DI MACCHINA - Machined
☐ MOLATO - Ground	☐ LAMINATO - Rolled	☐ GREZZO - Forged

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG 700	No. SERIE Serial Number	1003937

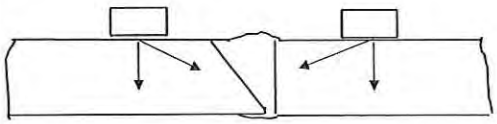
TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	AMPLIFICAZIONE dB value	ONDE Waves
OLYMPUS PF4R	4	10	0	40	L
PF4R	4	8x9	60	51	T
PF4R	4	8x9	70	54	T

BLOCCO DI CALIBRAZIONE Calibration block	IIW V1	BLOCCO DI RIFERIMENTO Reference block	QT BLOCK No. 02
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity	DAC ON SDH Ø 3mm

MATERIALE CONTROLLATE / Material Verified

ITEM	THK	STAMP	Ø	PROCESS
PQR 49/18 PH	19,08 19,05	NC258-NC76	508	SMAW+FCAW

PIANO DI SCANSIONE / Scanning Plan



RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Nico Tomasi II° Livello SNT-TC-1A / ISO 9712	ROSETTI MARINO SpA Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 22/01/2019 File Signature Cimatti Davide

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QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 16/01/2019	FOGLIO – Sheet 1
RAPPORTO D'ESAME MAGNETOSCOPICO ***MAGNETIC PARTICLE TEST***		MT N° : 07	Ns. Rif./Our Ref. 18307

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	TOULMONT DEVELOPMENT	118A50	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
PremierOil / TOULMOUNT	PQR	/	/	8.1

CODICE / code	PROCEDURA/Procedure	ACCETTABILITA - Acceptance level
UNI EN ISO 23278	AB-TO-ROS-PM-QA-PR-0007_C01	AB-TO-ROS-PM-QA-PR-0007_C01

MATERIALE Material	TEMPERATURA DELLE SUPERFICI Surface temperature	INTENSITA' LUMINOSA / Light intensity	
		LUCE BIANCA	LUCE NERA
S355G15 +N	INTERVALLO 5÷52°C	☑ > 1000 LUX	☐ 1000 µW/cm².

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined
☐ MOLATO – Ground	☐ LAMINATO – Rolled	☐ GREZZO – Forged

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☐ PUNTALI/Prods	☑ GIOGO/Yoke	☐ SOLENOIDE/Solenoid	☐ CONDUTTORE CENTRALE/Central conduttor

TIPO APPARECCHIO/Type of equipment	SILVER YOKE HR230 S.No. 03.230-16	DISTANZA PUNTALI/Pole spacing mm	180mm
TIPO DI CORRENTE/Type current	C.A	INTENSITÀ/Intesity (Amp)	4,5 kg

MEZZO DI ISPEZIONE / Examination medium		☑ UMIDO/Wet	☐ SECCO/Dry
PARTICELLE UTILIZZATE/Particle Type			
POLVERE NERA/Black powder	☑	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	NDT BW2	MARCA TIPO/Mark Type	NDT FW1
LOTTO/BACH	7241s	LOTTO/BACH	
VERNICE DI CONTRASTO/Contrast Paint		☑ NDT WBL5	☐ CGM VECOPLAST
LOTTO/BACH		U180327s	X

SALDATURE CONTROLLATE / Welds Verified

THE CONTROL HAS BEEN CARRIED OUT ON 100% OF FOLLOWING WELDS:

ITEM	THICKNESS	STAMP	LENGHT	PROCESS
PQR 49/18 PC	~~19.8~~ 19,05	NC258-NC219	508	SMAW+FCAW

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Andrea Carbone II° Livello SNT - TC - 1A / ISO 9712	ROSETTI MARINO SpA Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 22/01/2019 File Signature Cimatti Davide

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QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 16-01-2019	FOGLIO – Sheet 1/1
RAPPORTO D'ESAME CON ULTRASUONI *Ultrasonic examination report*		UT N° : 07	Ns. Rif./Our Ref. 18307

CLIENTE – Client	ORDINE – Order	PROGETTO – Project		COMMESSA – Job
ROSETTI MARINO	/	TULMONT DEVELOPMENT PROJECT		118A50
CLIENTE FINALE - Customer	**OGGETTO - Object**	**DISEGNO – Drawing**	**P.F.C. – Q.C.P.**	**Fase - Step**
PremierOil / TULMOUNT	PQR	/	/	8.1

CODICE / Code	PROCEDURA / Procedure	ACCETTABILITA' / Acceptance level
UNI EN 17640	AB-TO-ROS-PM-QA-PR-0011_C01	AB-TO-ROS-PM-QA-PR-0011_C01
MATERIALE Material	DIMENSIONI Dimension	SPESSORE NOMINALE / Thk
S355G15 + N	SEE TABLE	SEE TABLE

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO - Brushed	☐ LAVORATO DI MACCHINA - Machined
☐ MOLATO - Ground	☐ LAMINATO - Rolled	☐ GREZZO - Forged

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG 700	No. SERIE Serial Number	1003937

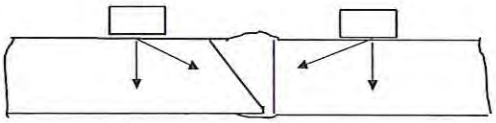
TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	AMPLIFICAZIONE dB value	ONDE Waves
OLYMPUS PF4R	4	10	0	40	L
SIRIO SMA	4	8x9	45	42	T
SIRIO SMA	4	8x9	60	44	T
SIRIO SMA	4	8x9	70	45	T

BLOCCO DI CALIBRAZIONE Calibration block	IIW V1	BLOCCO DI RIFERIMENTO Reference block	QT BLOCK No. 02
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity	DAC ON SDH Ø 3mm

MATERIALE CONTROLLATE / Material Verified

ITEM	THICKNESS	STAMP	LENGHT	PROCESS
PQR 49/18 PC	~~19.8~~ 19,05	NC258-NC219	508	SMAW+FCAW

PIANO DI SCANSIONE / Scanning Plan



RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Andrea Carbone II° Livello SNT - TC - 1A / ISO 9712	ROSETTI MARINO SpA Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Date 22/01/2019 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ File Signature Cimatti Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items esamine*

ROSETTI MARINO

PQR 49/18

Mechanical test report

Element Materials Technology Milan S.r.l.
Via della Pierina 9/11
26013 Crema (CR)
Italy

P: +39 0373 89721
F: +39 0373 897200
info.milan@element.com
element.com

TEST REPORT

Client
Cod. 1737

ROSETTI MARINO S.P.A
VIA TRIESTE, 230
48122 RAVENNA (RA)
Italia

Your ref. :	Document :	Ddt n. Quality test N.000029	Date:	17/01/2019
Our ref. :	Report :	RPR51-1E1R0A19	Date:	28/01/2019
	Job :	ADC51-1E1R0A19	Date:	18/01/2019

Remarks: PQR 49/18
PIPE DIMENSION : 508mm x 19.05mm
CLIENT : PREMIER OIL
TOLMOUNT DEVELOPMENT PROJECT

Project:

Doc. reference: EEMUA 158 ed.2014

Test standard: UNI EN ISO 17639:2013 - UNI EN ISO 6507-1:2006 - EEMUA 158 ed.2014 - UNI EN ISO 5173:2012 - UNI EN ISO 148-1:2016 - UNI EN ISO 4136:2012 - UNI EN ISO 6892-1:2016

This Report (RPR) contains tests results on the following materials

Ref:	Identification	Material	Dn (mm)	Thk (mm)	Remarks
130A19	PQR 49/18 "PH"	EN 10225 S355 G15+N			

Report signatories and approval

☐ Third party	☐ Third party	☐ Third party	Client
☐ Witness	☐ Witness	☐ Witness	

Digitally signed by Cantoni Luca
Element Materials Technology Milan S.r.l.

Issue approved

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA No. Bo. 0474	Date 28/01/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimatti Davide
Approved ☐	

General conditions:
1. The Customer accepts general conditions and prices fixed by the laboratory to perform the tests.
2. Test results will be communicated only by means of test report except for different contractual agreement.
3. Tests sample will be destroyed 30 days after test except for different written Client request.
4. The spare will be destroyed 90 days after date of receipt for different written Client request.
5. The test results described in the following test report are referring only to the sample mentioned in it.
6. The date of material receivement is the same as the date of job opening. The date of testing is the same as the date of test report, except for different info.
7. The laboratory has examined the material sampled an supplied by the Client in compliance with standard request.
8. This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.
9. Unless otherwise agreed, sales terms and conditions (MOD20-1E1R0) will be apply.

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TEST REPORT

Test	Page	Technician
Macrographic examination	Pag. 3..4	**Michele Confalonieri**
Hardness test	Pag. 5..6	**Michele Confalonieri**
Bend test	Pag. 7	**Luigi Vailati**
Charpy impact test	Pag. 8	**Luigi Vailati**
Tensile test	Pag. 9..10	**Luigi Vailati**

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Cimatti Davide

Technician signatories

Digitally signed by
Michele Confalonieri
Element Materials
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Digitally signed by
Luigi Vailati
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TEST REPORT

MACROGRAPHIC EXAMINATION

General Info

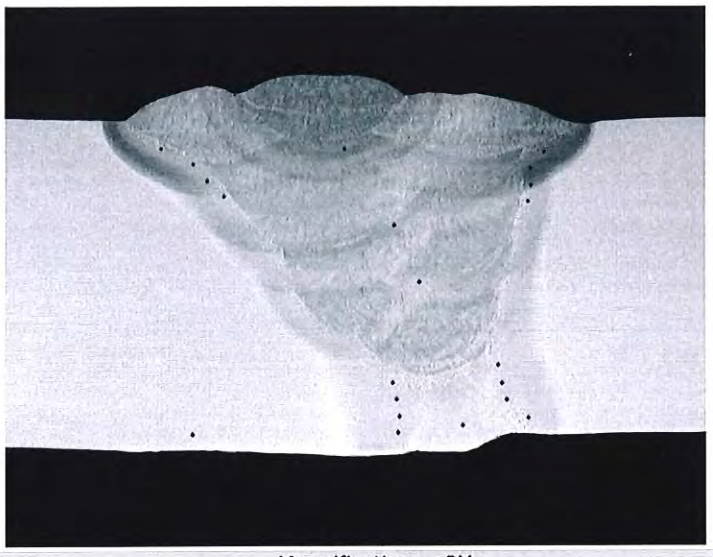
Test start - Test finish	28/01/2019 - 28/01/2019
MIF reference (Lab)	130A19
Client reference	PQR 49/18 "PH"
Identification of specimen (Lab)	130 MC 1
Material	EN 10225 S355 G15+N
Position	T WM Full thk h12
Test standard	UNI EN ISO 17639:2013

Equipments

(Inv.N°1871) PHOTOCAMERA

Test properties

Etching	Nital 3%



Magnification: ~2X

Result

Macrographic examination has been performed at 10x magnification.
The sample has shown full penetration and the absence of crack or lack of fusion.
Test meets the requirements of paragraph 7.5.4 of Eemua 158:2014

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA
No. Bo. 0474
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Witnessed ☑
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Date 28/01/2019
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Signature
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TEST REPORT

MACROGRAPHIC EXAMINATION

General Info

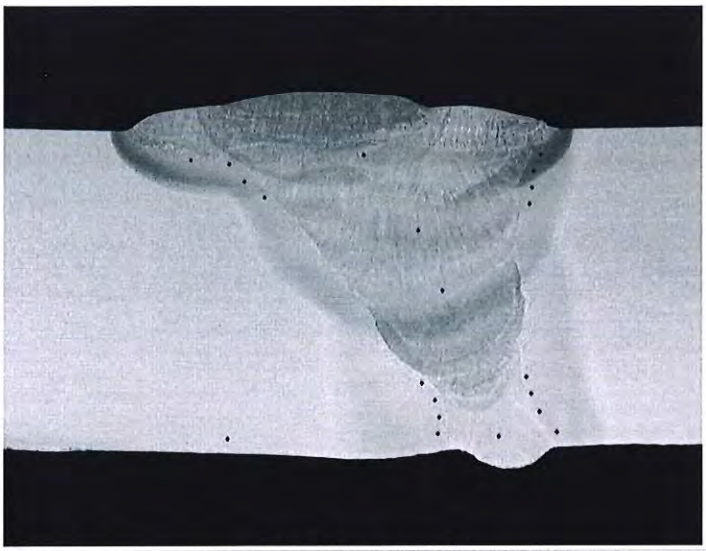
Test start - Test finish	28/01/2019 - 28/01/2019
MIF reference (Lab)	130A19
Client reference	PQR 49/18 "PH"
Identification of specimen (Lab)	130 MC 2
Material	EN 10225 S355 G15+N
Position	T WM Full thk h6
Test standard	UNI EN ISO 17639:2013

Equipments

(Inv.N°1871) PHOTOCAMERA

Test properties

Etching	Nital 3%



Magnification: ~2X

Result

Macrographic examination has been performed at 10x magnification.
The sample has shown full penetration and the absence of crack or lack of fusion.
Test meets the requirements of paragraph 7.5.4 of Eemua 158:2014

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Welding Dept
D.Cenacchi

RINA Services SpA
No. Bo. 0474
Date 28/03/2019
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Reviewed ☐
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Approved ☐
Signature
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TEST REPORT

HARDNESS TEST

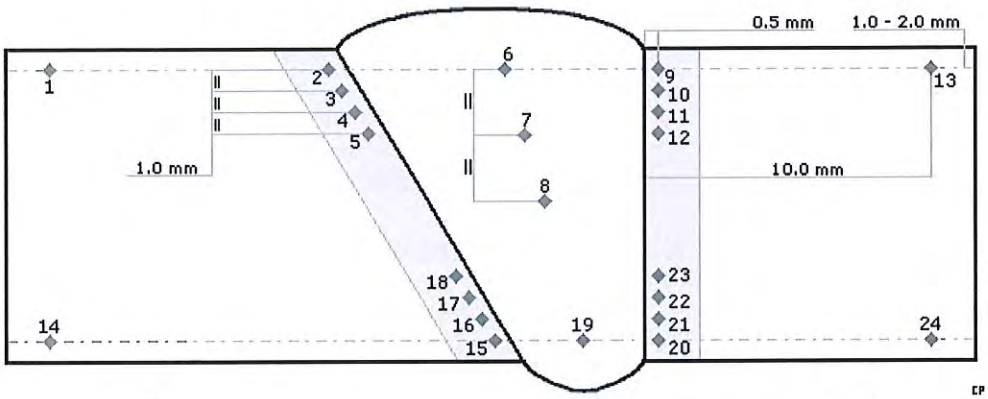
General info

Test start - Test finish	28/01/2019 - 28/01/2019
MIF reference (Lab)	130A19
Client reference	PQR 49/18 "PH"
Identification of specimen (Lab)	130 MC 1
Material	EN 10225 S355 G15+N
Position	T WM Full thk h12
Test standard	UNI EN ISO 6507-1:2006 + EEMUA 158 ed.2014

Equipments

(Inv.N°9) HARDNESS TESTING MACHINE

Results



Cap

N°	Value HV10
1	**166.0**
2	**316.0**
3	**298.0**
4	**242.0**
5	**235.0**
6	**240.0**
7	**211.0**
8	**202.0**
9	**314.0**
10	**248.0**
11	**227.0**
12	**239.0**
13	**169.0**

Root

N°	Value HV10
14	**176.0**
15	**194.0**
16	**199.0**
17	**212.0**
18	**211.0**
19	**188.0**
20	**228.0**
21	**193.0**
22	**197.0**
23	**204.0**
24	**166.0**

Min: **166.0** Max: **316.0** **Required:** : ≤325 HV10

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D. Cenacchi

RINA Services SpA No. Bo. 0474	Date 28/01/2019
Noted ☐	File
Reviewed ☐	Signature
Witnessed ☑	Cimatti Davide
Approved ☐	

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TEST REPORT

HARDNESS TEST

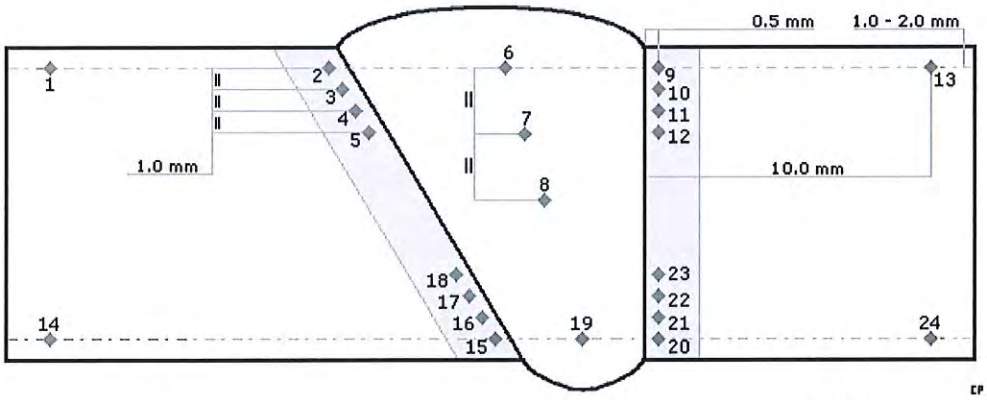
General info

Test start - Test finish	28/01/2019 - 28/01/2019
MIF reference (Lab)	130A19
Client reference	PQR 49/18 "PH"
Identification of specimen (Lab)	130 MC 2
Material	EN 10225 S355 G15+N
Position	T WM Full thk h6
Test standard	UNI EN ISO 6507-1:2006 + EEMUA 158 ed.2014

Equipments

(Inv.N°9) HARDNESS TESTING MACHINE

Results



Cap

N°	Value HV10
1	**164.0**
2	**295.0**
3	**270.0**
4	**230.0**
5	**236.0**
6	**207.0**
7	**218.0**
8	**204.0**
9	**313.0**
10	**248.0**
11	**218.0**
12	**217.0**
13	**173.0**

Root

N°	Value HV10
14	**168.0**
15	**199.0**
16	**202.0**
17	**203.0**
18	**210.0**
19	**183.0**
20	**191.0**
21	**180.0**
22	**184.0**
23	**201.0**
24	**165.0**

Min: **164.0** Max: **313.0** **Required:** : ≤325 HV10

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Welding Dept.
D. Cenacchi

RINA Services SpA
No. Bo. 0474
Date 28/01/2019
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TEST REPORT

BEND TEST

General info

Test start - Test finish	28/01/2019 - 28/01/2019
MIF reference (Lab)	130A19
Client reference	PQR 49/18 "PH"
Material	EN 10225 S355 G15+N
Test standard	UNI EN ISO 5173:2012 + EEMUA 158 ed.2014

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1123) BEND MACHINE

Test parameters

Jig (mm)	40
Rollers distance (mm)	66
Angle (°)	180
Method	FORMER

Results

Ref.Lab.	T (°C)	Type	Position	Dimensions (mm)	L0 (mm)	Elongation (%)	Results
130 PI 1	20	SBB (Transverse side bend)	T Side Bend h2	10.01 x 19.01			No defect
130 PI 2	20	SBB (Transverse side bend)	T Side Bend h2	10.02 x 19.02			No defect
130 PI 3	20	SBB (Transverse side bend)	T Side Bend h4	10.01 x 19.03			No defect
130 PI 4	20	SBB (Transverse side bend)	T Side Bend h4	10.02 x 19.02			No defect

ROSE RINA MARINO SpA Welding Dept. D. Ceracchi

RINA Services SpA No. Bo. 0474 Date 29/05/2019
Noted ☐ File
Reviewed ☐ Signature
Witnessed ☑ Cimatti Davide
Approved ☐

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TEST REPORT

CHARPY IMPACT TEST

General Info

Test start - Test finish	28/01/2019 - 28/01/2019
MIF reference (Lab)	130A19
Client reference	PQR 49/18 "PH"
Material	EN 10225 S355 G15+N
Test standard	UNI EN ISO 148-1:2016

Equipments

(Inv.N°814) CHARPY IMPACT 450 - (Inv.N°1102) CALIPER - (Inv.N°1806) CRYOSTAT

Specimen informations

Notch: KV2

Test parameters

Nominal energy of test machine (J): 450

Results

Lab Id.	T (°C)	Position	Dimensions (mm)	A Value (J)	B Value (J)	C Value (J)	Average Value (J)
130 RE 1	-40	T WM 2mm from Cap h3	10.0 x 10.0	84	90	97	90
130 RE 2	-40	T FL 2mm from Cap h3	10.0 x 10.0	67	71	50	63
130 RE 3	-40	T FL +2 2mm from Cap h3	10.0 x 10.0	164	234	148	182
130 RE 4	-40	T FL +5 2mm from Cap h3	10.0 x 10.0	154	184	161	166
130 RE 5	-40	T WM Root h3	10.0 x 10.0	88	79	66	78
130 RE 6	-40	T FL Root h3	10.0 x 10.0	29	39	61	43
130 RE 7	-40	T FL +2 Root h3	10.0 x 10.0	175	270	194	213
130 RE 8	-40	T FL +5 Root h3	10.0 x 10.0	165	163	160	163

Required

Single value (J)	≥27.0
AVG (J)	≥36.0

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA
No. Bo. 0474
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Date 28/01/2019
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TEST REPORT

TENSILE TEST

General Info

Test start - Test finish	28/01/2019 - 28/01/2019
MIF reference (Lab)	130A19
Client reference	PQR 49/18 "PH"
Identification of specimen (Lab)	130 TR 1
Material	EN 10225 S355 G15+N
Position	T WM Full thk h2
Test standard	UNI EN ISO 4136:2012 + UNI EN ISO 6892-1:2016

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1153) UNIVERSAL MACHINE QUASAR 600 - (Inv.N°1379) EXTENSOMETER

Specimen informations

Type	Prismatic
Width (mm)	25.01
Thickness (mm)	18.66
Section (mm²)	466.69

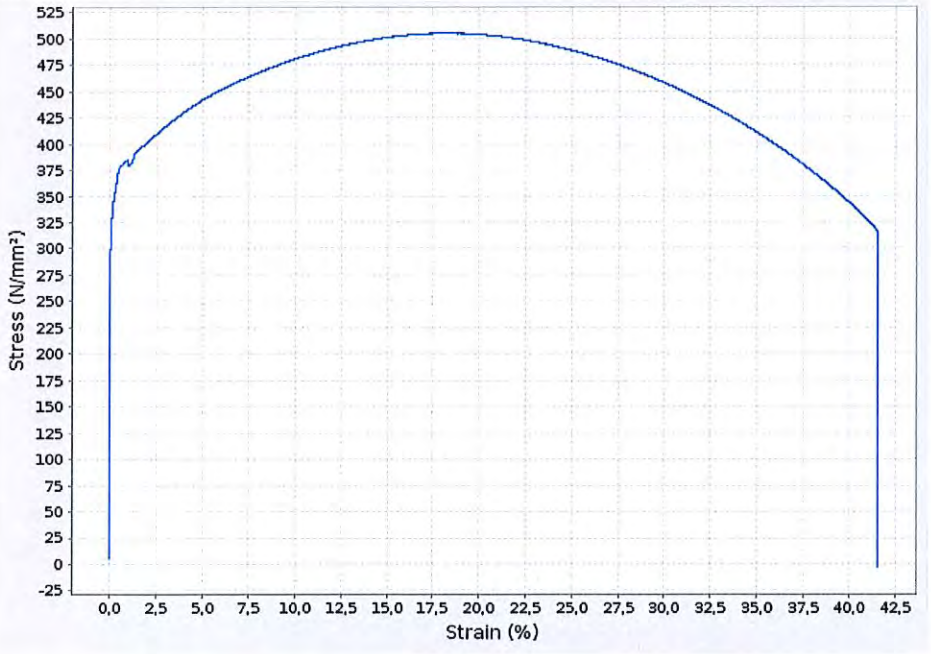
Test parameters

Temperature (°C)	20.0

Results		**Required**
Rp0.2% (N/mm²)	360.0	≥355
Rm (N/mm²)	505.0	≥470

Note

Broken out of weld
Speed of testing during yielding ref. method B PAR.10.3.3.2.1 - after yielding according to PAR.10.3.3.3



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Welding Dept.
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RINA Services SpA
No. Bo. 0474
Date 28/01/2019
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TEST REPORT

TENSILE TEST

General info

Test start - Test finish	28/01/2019 - 28/01/2019
MIF reference (Lab)	130A19
Client reference	PQR 49/18 "PH"
Identification of specimen (Lab)	130 TR 3
Material	EN 10225 S355 G15+N
Position	T WM Full thk h4
Test standard	UNI EN ISO 4136:2012 + UNI EN ISO 6892-1:2016

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1153) UNIVERSAL MACHINE QUASAR 600 - (Inv.N°1379) EXTENSOMETER

Specimen informations

Type	Prismatic
Width (mm)	25.01
Thickness (mm)	18.94
Section (mm²)	473.69

Test parameters

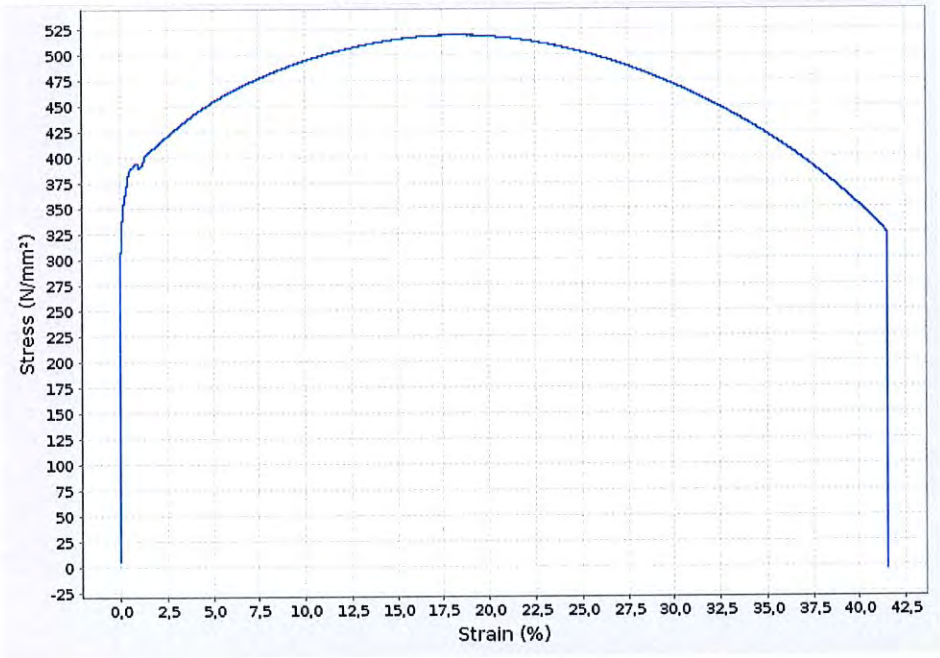
Temperature (°C)	20.0

Results

		Required
Rp0.2% (N/mm²)	363.0	≥355
Rm (N/mm²)	519.0	≥470

Note

Broken out of weld
Speed of testing during yielding ref. method B PAR.10.3.3.2.1 - after yielding according to PAR.10.3.3.3



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TEST REPORT

Client
Cod. 1737

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48122 RAVENNA (RA)
Italia

Your ref. :	Document :	Ddt n. Quality test N.000029	Date:	17/01/2019
Our ref. :	Report :		Date:	28/01/2019
	Job :	RPR51-2E1R0A19	Date:	18/01/2019
		ADC51-1E1R0A19		

Remarks: PQR 49/18
PIPE DIMENSION : 508mm x 19.05mm
CLIENT : PREMIER OIL
TOLMOUNT DEVELOPMENT PROJECT

Project: TOULMONT

Doc. reference: EEMUA 158 ed.2014

Test standard: UNI EN ISO 17639:2013 - UNI EN ISO 6507-1:2006 - EEMUA 158 ed.2014 - UNI EN ISO 5173:2012 - UNI EN ISO 148-1:2016 - UNI EN ISO 4136:2012 - UNI EN ISO 6892-1:2016

This Report (RPR) contains tests results on the following materials

Ref:	Identification	Material	Dn (mm)	Thk (mm)	Remarks
131A19	PQR 49/18 "PC"	EN 10225 S355 G15+N			

Report signatories and approval

☐ Third party	☐ Third party	☐ Third party	Client
☐ Witness	☐ Witness	☐ Witness	

Digitally signed by Cantoni Luca
Element Materials Technology Milan S.r.l.

Issue approved

ROSETTI MARINO S.P.A. Welding Dept. D. Cenacchi

RINA Services SpA No. Bo. 0474	Date 28/01/2019
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TEST REPORT

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File
Signature
Cimatti Davide

Technician signatories

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Michele Confalonieri
Element Materials
Technology Milan S.r.l.

Digitally signed by
Luigi Vailati
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TEST REPORT

MACROGRAPHIC EXAMINATION

General info

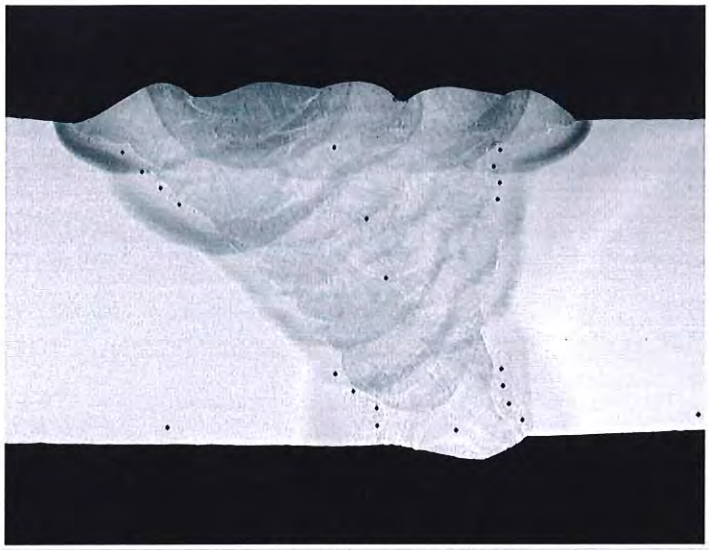
Test start - Test finish	28/01/2019 - 28/01/2019
MIF reference (Lab)	131A19
Client reference	PQR 49/18 "PC"
Identification of specimen (Lab)	131 MC 1
Material	EN 10225 S355 G15+N
Position	T WM Full thk h12
Test standard	UNI EN ISO 17639:2013

Equipments

(Inv.N°1871) PHOTOCAMERA

Test properties

Etching	Nital 3%



Magnification: ~2X

Result

Macrographic examination has been performed at 10x magnification.
The sample has shown full penetration and the absence of crack or lack of fusion.
Test meets the requirements of paragraph 7.5.4 of Eemua 158:2014

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA
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TEST REPORT

MACROGRAPHIC EXAMINATION

General info

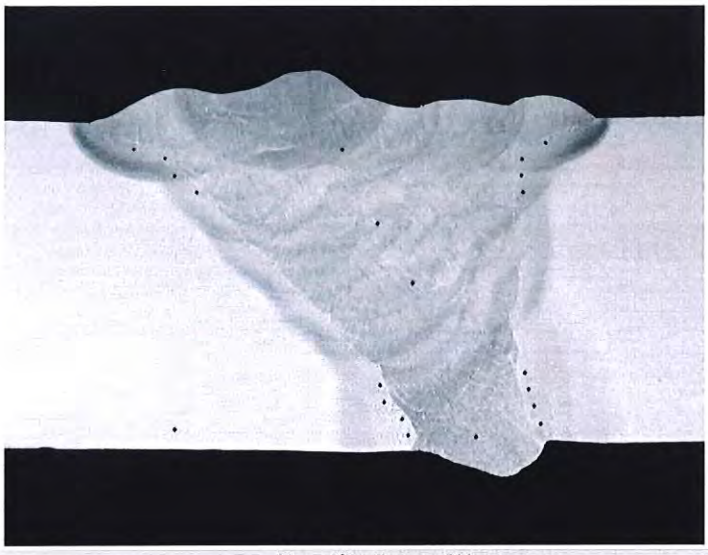
Test start - Test finish	28/01/2019 - 28/01/2019
MIF reference (Lab)	131A19
Client reference	PQR 49/18 "PC"
Identification of specimen (Lab)	131 MC 2
Material	EN 10225 S355 G15+N
Position	T WM Full thk h6
Test standard	UNI EN ISO 17639:2013

Equipments

(Inv.N°1871) PHOTOCAMERA

Test properties

Etching	Nital 3%



Magnification: ~2X

Result

Macrographic examination has been performed at 10x magnification.
The sample has shown full penetration and the absence of crack or lack of fusion.
Test meets the requirements of paragraph 7.5.4 of Eemua 158:2014

ROSETTI MARINO S.p.A.
Welding Dept.
D.Ceriaceni

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Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cimatti Davide

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TEST REPORT

HARDNESS TEST

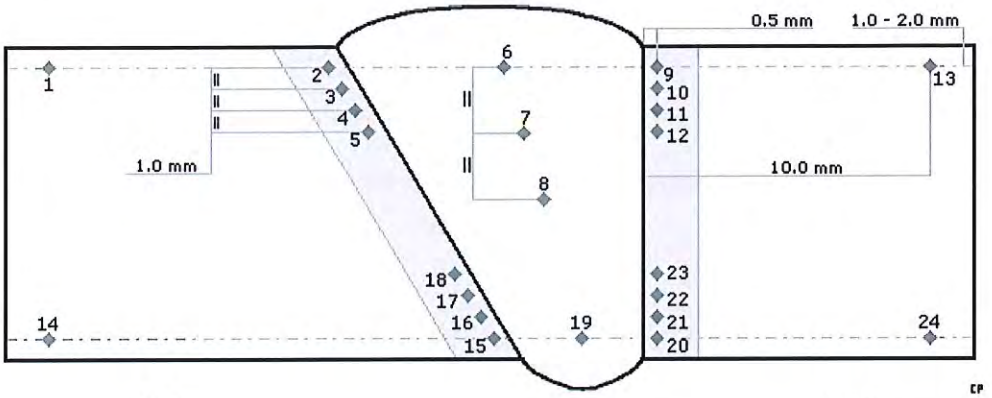
General info

Test start - Test finish	28/01/2019 - 28/01/2019
MIF reference (Lab)	131A19
Client reference	PQR 49/18 "PC"
Identification of specimen (Lab)	131 MC 1
Material	EN 10225 S355 G15+N
Position	T WM Full thk h12
Test standard	UNI EN ISO 6507-1:2006 + EEMUA 158 ed.2014

Equipments

(Inv.N°9) HARDNESS TESTING MACHINE

Results



Cap

N°	Value HV10
1	**165.0**
2	**320.0**
3	**261.0**
4	**257.0**
5	**268.0**
6	**230.0**
7	**233.0**
8	**228.0**
9	**286.0**
10	**235.0**
11	**239.0**
12	**226.0**
13	**164.0**

Root

N°	Value HV10
14	**166.0**
15	**232.0**
16	**235.0**
17	**240.0**
18	**214.0**
19	**203.0**
20	**211.0**
21	**211.0**
22	**195.0**
23	**208.0**
24	**151.0**

Min: **151.0** Max: **320.0** **Required:** : ≤325 HV10

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

RINA Services SpA
No. Bo. 0474
Date 28/01/2019
File
Noted ☐
Reviewed ☐
Witnessed ☑
Approved ☐
Signature
Cimatti Davide

Element Materials Technology Milan S.r.l.
Via della Pierina 9/11
26013 Crema (CR)
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TEST REPORT

HARDNESS TEST

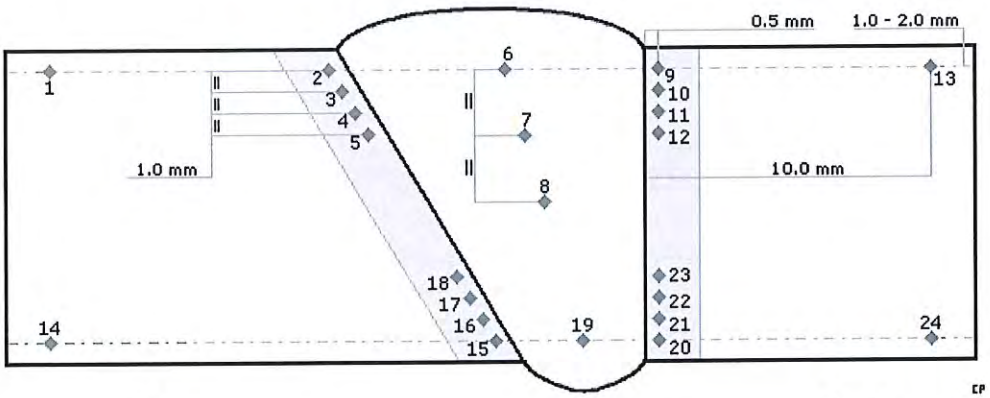
General info

Test start - Test finish	28/01/2019 - 28/01/2019
MIF reference (Lab)	131A19
Client reference	PQR 49/18 "PC"
Identification of specimen (Lab)	131 MC 2
Material	EN 10225 S355 G15+N
Position	T WM Full thk h6
Test standard	UNI EN ISO 6507-1:2006 + EEMUA 158 ed.2014

Equipments

(Inv.N°9) HARDNESS TESTING MACHINE

Results



Cap

N°	Value HV10
1	**158.0**
2	**317.0**
3	**304.0**
4	**246.0**
5	**250.0**
6	**237.0**
7	**214.0**
8	**200.0**
9	**317.0**
10	**277.0**
11	**233.0**
12	**220.0**
13	**164.0**

Root

N°	Value HV10
14	**163.0**
15	**227.0**
16	**230.0**
17	**216.0**
18	**224.0**
19	**211.0**
20	**188.0**
21	**201.0**
22	**204.0**
23	**194.0**
24	**152.0**

Min: **152.0** Max: **317.0** **Required:** : ≤325 HV10

ROSETTI MARINO SpA
Welding Dept.
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TEST REPORT

BEND TEST

General Info

Test start - Test finish	28/01/2019 - 28/01/2019
MIF reference (Lab)	131A19
Client reference	PQR 49/18 "PC"
Material	EN 10225 S355 G15+N
Test standard	UNI EN ISO 5173:2012 + EEMUA 158 ed.2014

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1123) BEND MACHINE

Test parameters

Jig (mm)	40
Rollers distance (mm)	66
Angle (°)	180
Method	FORMER

Results

Ref.Lab.	T (°C)	Type	Position	Dimensions (mm)	L0 (mm)	Elongation (%)	Results
131 PI 1	20	SBB (Transverse side bend)	T Side Bend	10.01 x 19.56			No defect
131 PI 2	20	SBB (Transverse side bend)	T Side Bend	10.01 x 19.51			No defect
131 PI 3	20	SBB (Transverse side bend)	T Side Bend	10.02 x 19.53			No defect
131 PI 4	20	SBB (Transverse side bend)	T Side Bend	10.02 x 19.55			No defect

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Welding Dept.
D. Genacchi

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TEST REPORT

CHARPY IMPACT TEST

General info

Test start - Test finish	28/01/2019 - 28/01/2019
MIF reference (Lab)	131A19
Client reference	PQR 49/18 "PC"
Material	EN 10225 S355 G15+N
Test standard	UNI EN ISO 148-1:2016

Equipments

(Inv.N°814) CHARPY IMPACT 450 - (Inv.N°1102) CALIPER - (Inv.N°1806) CRYOSTAT

Specimen informations

Notch	KV2

Test parameters

Nominal energy of test machine (J)	450

Results

Lab Id.	T (°C)	Position	Dimensions (mm)	A Value (J)	B Value (J)	C Value (J)	Average Value (J)
131 RE 1	-40	T WM 2mm from Cap h3	10.0 x 10.0	104	96	132	111
131 RE 2	-40	T FL 2mm from Cap h3	10.0 x 10.0	163	78	83	108
131 RE 3	-40	T FL +2 2mm from Cap h3	10.0 x 10.0	62	50	54	55
131 RE 4	-40	T FL +5 2mm from Cap h3	10.0 x 10.0	123	45	33	67
131 RE 5	-40	T WM Root h3	10.0 x 10.0	68	83	83	78
131 RE 6	-40	T FL Root h3	10.0 x 10.0	81	57	67	68
131 RE 7	-40	T FL +2 Root h3	10.0 x 10.0	86	83	66	78
131 RE 8	-40	T FL +5 Root h3	10.0 x 10.0	253	277	188	239

Required

Single value (J)	≥27.0
AVG (J)	≥36.0

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TEST REPORT

TENSILE TEST

General info

Test start - Test finish	28/01/2019 - 28/01/2019
MIF reference (Lab)	131A19
Client reference	PQR 49/18 "PC"
Identification of specimen (Lab)	131 TR 1
Material	EN 10225 S355 G15+N
Position	T WM Full thk
Test standard	UNI EN ISO 4136:2012 + UNI EN ISO 6892-1:2016

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1153) UNIVERSAL MACHINE QUASAR 600 - (Inv.N°1379) EXTENSOMETER

Specimen informations

Type	Prismatic
Width (mm)	25.01
Thickness (mm)	19.01
Section (mm²)	475.44

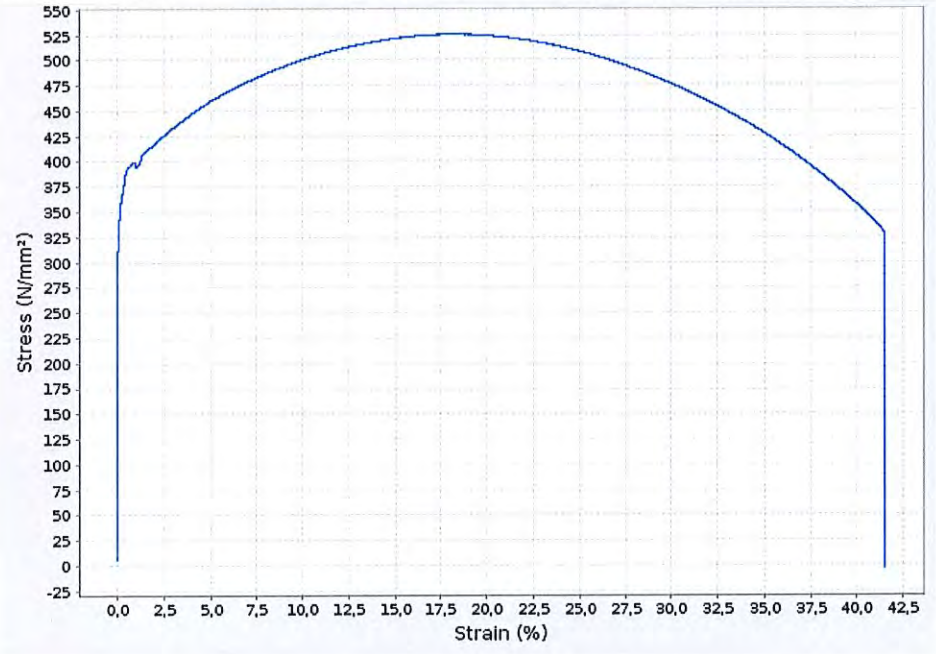
Test parameters

Temperature (°C)	20.0

Results		**Required**
Rp0.2% (N/mm²)	369.0	≥355
Rm (N/mm²)	525.0	≥470

Note

Broken out of weld
Speed of testing during yielding ref. method B PAR.10.3.3.2.1 - after yielding according to PAR.10.3.3.3



ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

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TEST REPORT

TENSILE TEST

General info

Test start - Test finish	28/01/2019 - 28/01/2019
MIF reference (Lab)	131A19
Client reference	PQR 49/18 "PC"
Identification of specimen (Lab)	131 TR 2
Material	EN 10225 S355 G15+N
Position	T WM Full thk
Test standard	UNI EN ISO 4136:2012 + UNI EN ISO 6892-1:2016

Equipments

(Inv.N°1102) CALIPER - (Inv.N°1153) UNIVERSAL MACHINE QUASAR 600 - (Inv.N°1379) EXTENSOMETER

Specimen informations

Type	Prismatic
Width (mm)	25.01
Thickness (mm)	18.93
Section (mm²)	473.44

Test parameters

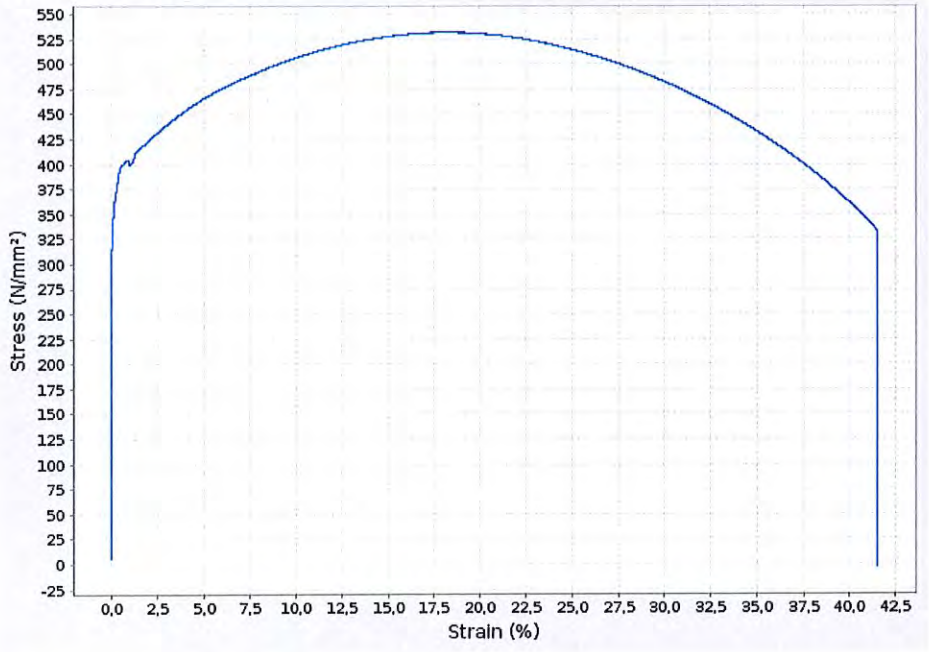
Temperature (°C)	20.0

Results

		Required
Rp0.2% (N/mm²)	372.0	≥355
Rm (N/mm²)	531.0	≥470

Note

Broken out of weld
Speed of testing during yielding ref. method B PAR.10.3.3.2.1 - after yielding according to PAR.10.3.3.3



ROSETTI MARINO SpA
Welding Dept
D. Cenacchi

RINA Services SpA
No. Bo. 0474
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Witnessed ☑
Approved ☐
Signature
Cimatti Davide

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 27/19	Sheet/Foglio 1/3

Manufacturer's Welding Procedure. Ref. no.	27/19 REV. 0		
Manufacturer	ROSETTI MARINO S.p.A.		
Address	VIA TRIESTE 230 - 48121 RAVENNA		
Code, Testing Standard	MAERSK OIL Specification MOG-FP-MET-STD-0012 Rev. 5.0; EN ISO 15614-1:2017 Lev. 2, AWS D1.1:2017		
	Location of test specimen according to EN ISO 15614-1:2017 Section 7.2, Fig. 5 Essential variables according to EN ISO 15614-1:2017, Chapter 8 and MAERSK OIL Specification MOG-FP-MET-STD-0012 Rev. 5.0 par. 6.4		
Date of welding	Start: July 04th , 2019 Complete: July 04th , 2019		
Examiner of examining body	Rina Services S.p.A.		
RANGE OF QUALIFICATION			
Welding process	136 - FCAW		
Type(s)	Semiautomatic		
Welding Equipment Type	HF inverter type		
Actual parent Material side A	Plate: EN 10225: S460G2+M Z35 EN ISO 15608 Gr. 2.1 (Heat: 904426 Plate: 390143-1)		
Actual parent Material side B	Plate: EN 10225: S460G2+M Z35 EN ISO 15608 Gr. 2.1 (Heat: 904426 Plate: 390143-1)		
Parent Material grade	Carbon steel with maximum strength of 540 MPa		
Supply condition	Thermomechanical rolled and accelerated cooled		
Carbon equivalent/Pcm/C	Max:0,38/0,16 (Heat Values: 0,36/0,14/ C for information only: 0,030)		
Groove design/configuration	Half Vee Butt Joint with ceramic backing, both sides with back gouging. For groove dimension and details see page 4 of 5		
Parent material thickness (mm)	5,9 mm (Machined from 20 mm)		
Weld metal thickness (mm)	136 - FCAW 5,9 mm		
Single or Multi-pass	136 - FCAW MULTIPLE		
Outside diameter	≥150 mm (PA, PC, PF rotated position) ; ≥500 mm (all other qualified positions)		
Filler material Designation	**136 FCAW** EN ISO 17632-A: T 46 4 1Ni P M 21 2 H5 (AWS 5.36: E81T1-M21A4-Ni1)		
Filler material Maker	136 - Esab ESAB OK TUBROD 15.17		
Filler material Size	136 - FCAW ∅ 1,2 mm		
Shielding gas/Flux	ISO 14175 :2008 M21 (80% Ar + 20% CO_2)		
Shielding gas flow rate	20 l/min.		
Backing gas (purging)	None		

Type of welding current & polarity	DC - RP	Heat input / Apporto termico (kJ/mm) ± 25%

	Diameter	2G	3G
Pass	Mm		
Root	∅ 1,2	0,74 to 1,24	1,37 to 2,29
Fill/Cap	∅ 1,2	0,38 to 0,64	0,55 to 0,91
Reverse pass	∅ 1,2	0,37 to 0,61	0,63 to 1,05
Note: Heat Input for Fill/Cap passes has been calculated on mean values			

Welding position	All, vertical down progression excluded		
Preheat (°C)	20	Interpass temperature / Temp. di interpass (°C)	250
Post-Weld Heat Treatment and/or ageing	NONE		
Weld bead width	12 mm for 2G position , 15 mm for 3G position		
Welder's detail	Lanzoni Angelo AX112 (2G & 3G Test Coupon)		
Time lapse between root and hot pass	N.A.		
Other information / Altre informazioni	- Preheat performed by propane torch -Accelerate weld cooling not permitted; -Base material origin: plate		

Manufacturer's Welding Procedure. Ref. no.	27/19 REV. 0		
Test result (WPQR) N°	27/19	Date/Data	15/07/2019
Manufacturer's WPS No.	pWPS 27/19 REV. 0	Date/Data	03/07/2019

TESTS CARRIED OUT ON SAMPLE 27/19 WELDED IN 2G POSITION (PC)

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 27/19
Penetrant test	N.A.	/
Magnetic particle test	Acceptable	19-18205
Radiographic test	Acceptable	04-18205
Ultrasonic test	Acceptable	18-18205

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2]	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 540	A [%]	Z [%]	Fracture Location	Remarks
258/19 A TWT	511		569			Ductile out of weld	/
258/19 B TWT	558		564			Ductile out of weld	/

BEND TEST

Type & N.	Bend angle	Former	Results
2 Face Bend	180°	20 mm	Satisfactory
2 Root Bend	180°	20 mm	Satisfactory

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] 9			Avarage value [J] 13	Remarks
2,5x10x55	258/19 VWT 0/1 (Weld)	KV2	-59,5	22	19	24	22	(Sample 2.5x10)
2,5x10x55	258/19 VHT 0/1 (FL)	KV2	-59,5	29	25	28	27	(Sample 2.5x10)
2,5x10x55	258/19 VHT 1/1 (FL+1)	KV2	-59,5	35	39	39	38	(Sample 2.5x10)
2,5x10x55	258/19 VWT 2/1 (FL+2)	KV2	-59,5	39	38	39	39	(Sample 2.5x10)
2,5x10x55	258/19 VWT 5/1 (FL+5)	KV2	-59,5	38	37	37	37	(Sample 2.5x10)

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
3 Macro examination+ 1 Hardness test	Satisfactory-See Inspecta Certificate No. 0206-00210-19
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Inspecta S.r.l. - Ravenna
Laboratory report reference N.	Report No. 0206-00210-19 dated JULY 15th 2019
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of MOG-FP-MET-STD-0012 Rev. 5.0 Specification; EN ISO 15614-1:2017 Lev. 2

Date/Data	Examiner or Examination Body
15-07-2019	RINA Services S.p.A.
ROSETTI MARINO S.p.A.	Name and signature / Nome e firma

Manufacturer's Welding Procedure. Ref. no.	27/19 REV. 0		
Test result (WPQR) N°	27/19	Date/Data	15/07/2019
Manufacturer's WPS No.	pWPS 27/19 REV. 0	Date/Data	03/07/2019

TESTS CARRIED OUT ON SAMPLE 27/19 WELDED IN 3G POSITION (PF)

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 27/19
Penetrant test	N.A.	/
Magnetic particle test	Acceptable	19-18205
Radiographic test	Acceptable	04-18205
Ultrasonic test	Acceptable	18-18205

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2]	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] ≥ 540	A [%]	Z [%]	Fracture Location	Remarks
259/19 A TWT	526		539			Ductile out of weld	/
259/19 B TWT	522		536			Ductile out of weld	/

BEND TEST

Type & N.	Bend angle	Former	Results
2 Face Bend	180°	20 mm	Satisfactory
2 Root Bend	180°	20 mm	Satisfactory

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] 9			Avarage value [J] 13	Remarks
2,5x10x55	259/19 VWT 0/1 (Weld)	KV2	-59,5	26	25	22	24	(Sample 2.5x10)
2,5x10x55	259/19 VHT 0/1 (FL)	KV2	-59,5	27	25	28	27	(Sample 2.5x10)
2,5x10x55	259/19 VHT 1/1 (FL+1)	KV2	-59,5	37	39	39	38	(Sample 2.5x10)
2,5x10x55	259/19 VWT 2/1 (FL+2)	KV2	-59,5	39	37	39	38	(Sample 2.5x10)
2,5x10x55	259/19 VWT 5/1 (FL+5)	KV2	-59,5	36	36	36	36	(Sample 2.5x10)

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
3 Macro examination+ 1 Hardness test	Satisfactory-See Inspecta Certificate No. 0207-00210-19
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Inspecta S.r.l. - Ravenna
Laboratory report reference N.	Report No. 0207-00210-19 dated JULY 15th 2019
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of MOG-FP-MET-STD-0012 Rev. 5.0 Specification; EN ISO 15614-1:2017 Lev. 2

Date/Data	Examiner or Examination Body
15-07-2019	RINA Services S.p.A.
ROSETTI MARINO S.p.A. Matteo Del Prete Welding Dept.	RINA F. Lago RINA Services S.p.A.
ROSETTI MARINO S.p.A.	Name and signature / Nome e firma

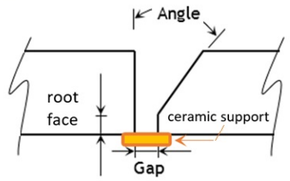
PQR - AS- RUN PARAMETER SHEET

pWPS 27/19			
PQR 27/19			
Coupon Nr. 27/19 PC			
Date:	04/07/2019	Page:	1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: **EN 15614-1 Ed.2017 Lev. 2 +MOTS 12 Rev. 5.0**

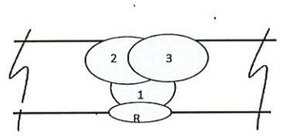
Welder Name(s):	LANZONI ANGELO	Welder Id No(s):	AX 112		
Welding Process(es):	136-FCAW	Type(s):	SEMIAUTOMATIC		
Welding Position:	2G	Progression:	N.A.		
Base Materials:	EN 10225: S460 G2+M Z35	Wall Thickness:	5,9 mm (*)	Diameter:	/
Heat No(s):	904426 plate: 390143-1	Joint Type:	1/2V BUTT JOINT WITH CERAMIC BACKING; BOTH SIDES WELDING WITH BACK GOUGING		

WELD PREPARATION:



Root gap: 3-4 mm ; angle: 45° ; Root face : 0 mm; Ceramic backing

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNS24006	OK TUBROD 15.17
Fill/Cap	1,2	PNS24006	OK TUBROD 15.17
Rev. Pass	1,2	PNS24006	OK TUBROD 15.17

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar+ 20%CO2
Flow:	20 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/8"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
12 mm	String		Multiple	Single

Preheat °C :	Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required		Holding Temperature °c	Holding Time °c	Heating Rate °C	Cooling Rate °C
20°C	PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER	NA		NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
NA	1	136 FCAW	1	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	145	155	150,0	21	23	22,0	-	-	16	0,99	0,80	20	Welding unit: AXO 508
NA	2	136 FCAW	2	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	155	165	160,0	22	24	23,0	-	-	36	0,49	0,80	150	Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635
NA	3	136 FCAW	3	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	155	165	160,0	23	25	24,0	-	-	35	0,53	0,80	250	Cap passes from 2nd to 3rd
																				Heat input mean value for fill/cap: 0,51
NA	R	136 FCAW	R	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	155	165	160,0	23	25	24,0	-	-	38	0,49	0,80	120	Heat input mean value for R pass: 0,49
																				(*) machined from wall thickness 20 mm

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO S.p.A. Matteo del Prete Welding Dept.	Signature:	Signature: RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 04/07/2019 File Signature Cimarti Davide	Signature:
Date:	Date:		Date:

PQR - AS- RUN PARAMETER SHEET

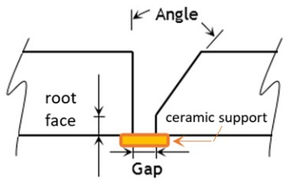
pWPS 27/19	
PQR 27/19	
Coupon Nr. 27/19 PF	
Date: 04/07/2019	Page: 1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: **EN 15614-1 Ed.2017 Lev. 2 +MOTS 12 Rev. 5.0**

Welder Name(s):	LANZONI ANGELO	Welder Id No(s):	AX 112
Welding Process(es):	136-FCAW	Type(s):	SEMIAUTOMATIC
Welding Position:	3G	Progression:	VERTICAL UPHILL
Base Materials:	EN 10225: S460 G2+M Z35	Wall Thickness:	5,9 mm (*)
Heat No(s):	904426 plate: 390143-1	Joint Type:	1/2V BUTT JOINT WITH CERAMIC BACKING; BOTH SIDES WELDING WITH BACK GOUGING

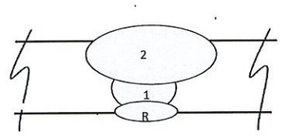
Diameter: /

WELD PREPARATION:



Root gap: 3-4 mm ; angle: 45° ; Root face : 0 mm; Ceramic backing

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNS24006	OK TUBROD 15.17
Fill/Cap	1,2	PNS24006	OK TUBROD 15.17
Rev. Pass	1,2	PNS24006	OK TUBROD 15.17

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar+ 20%CO2
Flow:	20 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/8"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:		No of Passes:	Multiple or Single Electrodes:
15 mm	String and weave		Multiple	Single

Preheat °C :	Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required		Holding Temperature °c	Holding Time °c	Heating Rate °C	Cooling Rate °C
20°C	PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER	NA		NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
NA	1	136 FCAW	1	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	126	134	130,0	21	23	22,0	-	-	7,5	1,83	0,80	20	Welding unit: AXO 508
NA	2	136 FCAW	2	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	155	163	159,0	22	24	23,0	-	-	24	0,73	0,80	250	Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635
																				Cap passes from 2nd to 3rd
																				Heat input mean value for fill/cap: 0,73
NA	R	136 FCAW	R	-	E81T1-M21A4-Ni1 T 46 4 1Ni P M 21 2 H5	1,2	DCEP	155	163	159,0	22	24	23,0	-	-	21	0,84	0,80	120	Heat input mean value for R pass: 0,84
																				(*) machined from wall thickness 20 mm

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO S.p.A. Matteo Del Freo Welding Dept.	Signature:	Signature:	Signature:
Date:	Date:	Date: 04/07/2019	Date:

RINA Services S.p.A. No. Bo. 0474 — Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ — File — Signature Cimatti Davide

PQR attachments index:

Base material certificate (Plate EN 10225: S460G2+M Z35)

Consumables certificate

preliminary WPS

NDE certificate

Mechanical test report

ROSETTI MARINO

PQR 27/19

Base material certificate
(Plate EN 10225: S460 G2+M Z35)

ROSETTI MARINO

MATERIAL CERTIFICATES BOOK

Supplier	Purchase Order nr.	Job	Barcode
VOESTALPINE GROBBLECH GMBH & CO.	1718001190	118A50C	Q011801282

ROSETTI MARINO

ROSETTI MARINO

Conforme alla spec **P.O.**

According to the spc.----------

TMUGF Firma — Data

MTSMD Signature — Date

P. Ancarani — 21.01.2019

PAOLO ANCARANI

[X] REVIEW

[ ] WITNESS

CUSTOMER

Certificate Number: **VNA 1800119 / 4**
Page: 1 of 1

Inspection Certificate

Project: ----------
Client: **voestalpine Grobblech GmbH**
voestalpine-Straße 3, 4020 Linz, Austria

Office: **Vienna**

Clients Order Number: **8500923**

Date: **03-12-2018**

Order Status: **incomplete**

Inspection Dates
First: **14-11-2018**

final: **22-11-2018**

This certificate is issued to voestalpine Grobblech GmbH, Linz/Austria, to certify that the undersigned Surveyor attended their works Linz for the purpose of testing and inspecting the undernoted material with satisfactory results as stated below.

Purchaser: **Rosetti Marino Spa**
Via Trieste 230
I-48122 RAVENNA

Order No.: **1718001190 118A50C**

Description:

6 piece(s) of steel plate(s) **50650 kg** , as per attached inspection Certificate no.: **A0362490**

Specification

S460G2+M Z35 EN 10225 : 2009

Heat treatment/Delivery Condition: thermomechanical rolled + accelerated cooled

Scope of inspection:

witness mechanical testing: yes ☑
review manufacturer's declared analysis: yes ☑
witness / verify ultrasonic examination: yes ☑ n/a ☐
witness / verify microstructure examination: yes ☐ n/a ☑
witness /verify corrosion testing: yes ☐ n/a ☑
random visual and dimensional control and check of hard stamping: yes ☑

Identification:

Makers Brand voestalpine
Material Quality
Heat No.
Plate No.
Brand of LR

Lloyd's Register EMEA
Vienna Office
Lloyd's Register

03 DEC 2018

Helmut Berger
Surveyor to Lloyd's Register EMEA

a member of the Lloyd's Register group.

K. EDER

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Form 1123 (2017.07)

voestalpine Grobblech GmbH

A02
Inspection certificate
EN 10204 - 3.2

VNA1800119-4

Z02 Date 03-12-2018

voestalpine-Straße 3
4020 Linz, Austria
www.voestalpine.com/grobblech

A03 Document number	A0362490	A08 Order-No.:	8500923	A07 OrderDat.	03-10-2018

4F

A06 Customer	Rosetti Marino Spa Via Trieste 230 I-48122 RAVENNA	B01 Product	Plate		
		B02 Material	S460G2+M Z35	B03 Standard	EN 10225 : 2009
A07 OrderNo.	1718001190 118A50C	Supplementary requirements	Z35 - EN 10164		
A06 Consignee	Rosetti Marino Spa Via Trieste 230 I-48122 RAVENNA	B04 Delivery condition	thermomechanical rolled + accelerated cooled		

A10 - Supplementary information
TOLMOUNT

B03 - Supplementary requirements
MATERIAL IS FINE GRAINED, VACUUM DEGASSED AND FULLY KILLED, PRODUCED BY BOF // MATERIAL IS PRE-QUALIFIED AS PER EN10225 OPTION 18, ANNEX E // FINAL ROLLING DIRECTION IS PERPENDICULAR TO DIE STAMPING // MATERIAL IS ACCORDING TO AB-TO-ROS-TE-ST-SP-0006 REV. A01 AND AB-TO-PMO-TE-MT-SP-0001 REV. B01 // MATERIAL IS ACCORDING TO EN10225 OPTIONS 2,6,9,10, 12,13, 15,16 AND 18 - > 40MM // MATERIAL IS ACCORDING TO EN10225 OPTIONS 2,6,9,12,13, 15,16 AND 18 - > 14,99 UP TO AND INCL. 40MM

D01 - Visual Examination and dimensional checking: satisfactory. The results of tests performed are in compliance with the requirements.

Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Date of Tests	reference no.
710462	392542/1	40	40,00	2050,0	12000	1		7.711	75991	22-11-2018	1PLATCS40030
710462	392542/2	40	40,00	2050,0	12000	1		7.715	75991	22-11-2018	1PLATCS40030
814391	388681/1	20	50,00	3000,0	12000	1		14.231	75849	19-11-2018	1PLATCS50031
814391	388700/1	60	35,00	2500,0	12000	1		8.310	76026	14-11-2018	1PLATCS35029
903569	389765/1	130	40,00	2900,0	9600	1		8.757	75893	17-11-2018	1PLATCS40030
904426	390143/1	90	20,00	2500,0	10000	1		3.926	75994	21-11-2018	1PLATCS20029
		Sum				6		50.650			

B14 - Supplementary information
Dimensional tolerances acc. EN 10029/10

A04
Symbol of the manufacturer's work

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Quality Department Heavy Plates
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Flatness acc. EN 10029/10 class N
EN10163-2: Class A3 - Repair-welding not permitted.
Thicknesstolerance acc. EN 10029/10 tab. 1 class A

Chemical composition (Heat analysis) - part 1 of 2

B07 Heat No.	C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %	Pb %	Cae %	Pcm %
>=		.150				.015																
Set values <=	.140	.550	1.650	.020	.0050	.055	.250	.700	.250	.300	.080	.040	.025	.0100	.0005	.0200	.0050	.0300	.0100	.010	.43	.22
710462	.061	.387	1.560	.006	.0009	.036	.190	.270	.008	.157	.004	.027	.013	.0043	.0002	.0040	.0017	.0020	.0020	.002	.39	.18
814391	.061	.396	1.540	.008	.0010	.036	.186	.280	.030	.164	.004	.026	.012	.0048	.0002	.0050	.0020	.0030	.0030	.002	.39	.18
903569	.057	.366	1.530	.007	.0009	.037	.181	.270	.012	.158	.004	.028	.013	.0049	.0002	.0020	.0023	.0030	.0020	.002	.38	.17
904426	.030	.319	1.610	.007	.0008	.037	.175	.170	.026	.162	.003	.036	.010	.0042	.0002	.0030	.0021	.0020	.0020	.002	.36	.14

Chemical composition (Heat analysis) - part 2 of 2

B07 Heat No.	LF01 %	LF02 %	LF03 %
>=			
Set values <=	.090	.110	.900
710462	.031	.044	.625
814391	.030	.042	.660
903569	.032	.045	.621
904426	.039	.049	.533

C99 - Supplementary information
BI <= 0,01%
C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF03: Cr+Ni+Cu+Mo
LF02: Nb+V+Ti
LF01: Nb+V

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Test results: C10-C29 Tensile Test acc. EN ISO 6892-1

B07 Heat No.	B06 Plate No	C41 Width	SpThickn mm	C01 loc.	PosTh.	C02 Dir	C11 Reh MPa	C11 Rp0,2 MPa	C12 Rm MPa	L0	C13 E %	C11 Reh/Rm %	C11 Rp0,2/Rm %	Sim.htm	WBH
Set values >=							415	415	515		17.0				
Set values <=									675			90.00	90.00		
814391	388681	Ø	9.96	F	V	T		497	646	A5	24.4		76.94		
	388681	Ø	9.98	F	V	L		471	625	A5	25.7		75.44		
	388681	Ø	9.99	F	V	T	531	529	616	A5	24.8	86.25	85.88	001	1
	388681	Ø	9.99	F	V	L		521	609	A5	27.4		85.60	001	1
Set values >=							420	420	520		17.0				
Set values <=									680			90.00	90.00		
710462	392542	Ø	10.00	F	V	L		468	623	A5	27.7		75.16		
	392542	30,0	39.71	F	O	T		493	644	A5	22.0		76.50		
814391	388700	Ø	9.98	F	V	L		469	639	A5	27.5		73.44		
	388700	30,0	35.23	F	O	T		518	678	A5	19.8		76.49		
903569	389765	Ø	9.99	F	V	L		469	612	A5	26.9		76.60		
	389765	30,0	39.83	F	O	T		499	638	A5	20.6		78.16		
Set values >=							440	440	530		17.0				
Set values <=									690			90.00	90.00		
904426	390143	Ø	9.98	F	V	L		501	575	A5	27.9		87.13		
	390144	30,0	19.71	F	O	T		547	618	A5	23.1		88.48		

SpThickn: specimen thickness
C01;loc.:
F: Bottom
PosTh.: Pos Thickness
O: surface
V: ¼
C02;Dir:
L: longitudinal
T: transverse
C12; Rm: Tensile Strength
L0: gauge
A5: Length = 5.65 * sqr (area) mm
C13;E: elongation
Sim.htm: sim. heat treatment

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Test results: C10-C29 Tensile Test acc. EN ISO 6892-1

B07 Heat No.	B06 Plate No	C41 Width mm	SpThickn	C01 loc.	PosTh.	C02 Dir	C11 Reh MPa	C11 Rp0,2 MPa	C12 Rm MPa	L0	C13 E %	C11 Reh/Rm %	C11 Rp0,2/Rm %	Sim.htm	WBH
001: Sim.htm group #1															
WBH: sim. heat treatment															

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No.	B06 Plate No	C40 shape	C01 loc.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH	samp.cond.
>= Set values <=						-40	42	42	42	60			
710462	392542	CV 10x10	F	O	T	-40	354	338	356	349			
814391	388681	CV 10x10	F	O	T	-40	308	337	298	314			
	388700	CV 10x10	F	O	T	-40	234	285	332	284			
	388681	CV 10x10	F	O	T	-40	230	247	252	243	001	1	
	388681	CV 10x10	F	K	T	-40	290	345	318	318			
	388681	CV 10x10	F	K	T	-40	232	149	247	209	001	1	
903569	389765	CV 10x10	F	O	T	-40	332	297	310	313			
904426	389715	CV 10x10	F	O	T	-40	355	351	358	355			
>= Set values <=						-40	29	29	29	46			
710462	392542	CV 10x10	F	ZB2	T	-40	240	34	228	167			strain aged 5%, 60 min. at 250°C
814391	388681	CV 10x10	F	ZB2	T	-40	119	171	268	186			strain aged 5%, 60 min. at 250°C
	388700	CV 10x10	F	ZB2	T	-40	266	254	260	260			strain aged 5%, 60 min. at 250°C

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Test results: C40-C49 Impact Test acc. EN ISO 148-1

B07 Heat No.	B06 Plate No	C40 shape	C01 loc.	PosTh.	C02 Dir	C03 temp °C	C42 SV J	C42 SV J	C42 SV J	C43 AV J	Sim.htm	WBH	samp.cond.
	>=					-40	29	29	29	46			
Set values <=													
903569	389765	CV 10x10	F	ZB2	T	-40	33	272	264	190		strain aged 5%, 60 min. at 250°C	
904426	389715	CV 10x10	F	ZB2	T	-40	308	308	321	312		strain aged 5%, 60 min. at 250°C	

C40;shape:
CV 10x10: Test shape , Dimensions
C01;loc.:
F: Bottom
PosTh.: Pos Thickness
K: ½
O: surface
ZB2: 2mm below surface
C02;Dir:
T: transverse
C42;SV: single value
C43;AV: average value
Sim.htm: sim. heat treatment
001: Sim.htm group #1
WBH: sim. heat treatment
samp.cond.: sample condition

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Test results: C10-C29 through Thickness Test acc. DIN / EN

B07 Heat No.	B06 Plate No	C40 Shape	SpThickn mm	C01 loc.	C02 Dir	C12 Rm MPa	C12 Rm MPa	C12 Rm MPa	Z(SV) %	Z(SV) %	Z(SV) %	Z(AV) %
>=						412	412	412	25	25	25	35
Set values <=												
814391	388681	Ø	10.02	F	S	615	616	616	78	77	78	78
>=						416	416	416	25	25	25	35
Set values <=												
710462	392542	Ø	9.99	F	S	619	617	617	76	76	70	74
814391	388700	Ø	9.96	F	S	642	645	645	77	74	75	76
903569	389869	Ø	10.01	F	S	634	635	635	74	73	76	74
>=						424	424	424	25	25	25	35
Set values <=												
904426	389715	Ø	6.05	F	S	600	599	596	78	80	78	79

SpThickn: specimen thickness
C01;loc.:
F: Bottom
C02;Dir:
S: through thickness direction
C12; Rm: Tensile Strength
Z(SV): reduction of area (single value)
Z(AV): reduction of area (average value)

Chemical composition (Product analysis) - part 1 of 2

B07 Heat No.	B06 Plate No	C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %
>=			.150				.015													
Set values <=		.140	.550	1.650	.020	.0050	.055	.250	.700	.250	.300	.080	.040	.025	.0100	.0005	.0200	.0050	.0300	.0100
710462	392542	.052	.390	1.540	.007	.0009	.038	.188	.270	.015	.158	.004	.027	.013	.0036	.0002	.0020	.0015	.0030	.0020
814391	388700	.063	.387	1.540	.007	.0008	.034	.172	.280	.027	.165	.003	.026	.012	.0049	.0002	.0020	.0021	.0020	.0020
903569	389765	.059	.362	1.530	.007	.0009	.036	.179	.270	.012	.158	.004	.027	.013	.0043	.0002	.0020	.0019	.0020	.0020
904426	390148	.028	.329	1.610	.008	.0010	.040	.182	.180	.027	.161	.003	.036	.011	.0049	.0002	.0020	.0018	.0030	.0020

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Chemical composition (Product analysis) - part 2 of 2

B07 Heat No.	B06 Plate No	Pb %	Cae %	Pcm %	LF01 %	LF02 %	LF03 %
Set values >=		.010	.43	.22	.090	.110	.900
710462	392542	.002	.38	.17	.031	.044	.631
814391	388700	.002	.39	.18	.029	.041	.644
903569	389765	.002	.38	.17	.031	.044	.619
904426	390148	.002	.36	.14	.039	.050	.550

C99 - Supplementary information
BI <= 0,01%
C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF03: Cr+Ni+Cu+Mo
LF02: Nb+V+Ti
LF01: Nb+V

Remarks

Simulated heat treatment of test coupons:

Pos 20:
001/1: 1 cycle(s) sim. PWHT: furnace charge temperature at max. 400 °C, heating with max. 55 °C/h up to 580 °C, +20 °C/-20 °C, holding time 240 minutes, cooling with max. 55 °C/h down to 400 °C, final cooling in calm air.

We confirm that the above-mentioned delivery corresponds to the order (and standard).

C70 - Method of steelmaking: Basic oxygen furnace (BOF) steelmaking, continuous casting, steel is fully killed, vacuum degassed and melted by fine grain practice, austenitic grain size 5 or finer.

Reduction of area on tensile test specimens in the through-thickness direction in accordance with EN 10164:2004, class Z35.

The signature of the inspection representative from voestalpine Grobblech GmbH is substituted by a electronic Signature, because the certificates of voestalpine Grobblech GmbH are prepared by a suitable data processing system (EN 10204, Pt.5).

Z03 Stamp of the inspection representative

LR

Z02 Inspection representative voestalpine Grobblech
Quality Department Heavy Plates
BERGER Alfred

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D02-D50 - ULTRASONIC EXAMINATION PLATE(S)

SPECIFICATION

Item 20
Ultrasonic test acc. EN 10160, EN 10160 class S1/Body, Grid 200 mm, EN 10160 class E2/Edge Zone, Edge zone longitudinal 75 mm, Edge zone transverse 75 mm; satisfactory
Item 40, 60, 90, 130
Ultrasonic test acc. EN 10160, EN 10160 class S1/Body, Grid 200 mm, EN 10160 class E2/Edge Zone, Edge zone longitudinal 50 mm, Edge zone transverse 50 mm; satisfactory

VALID TEST EQUIPMENT
mechanized ultrasonic "In-Line testing system" (Manufacturer: NDT-Systems & Services) and
mechanized ultrasonic "off-line - testing system" (manufacturer: Windhoff Bahn- und Anlagentechnik GmbH) and
MUT (optional): Sonatest D20 no. 90006523 or Sonatest D20 no. 90007346 or Sonatest Masterscan 380 no. 90007347 or Sonatest Masterscan 380 no. 90006522 or Sonatest D50 no. 90010231 or GE - USM 36 no. 90010775

PROBE
(in-line AUT): 3STSE 18.3/8 P5, SEZ5R10RS, SE3 18.3/10 5A, (5MHz)
(off-line AUT): S140 (4MHz) 3T/1R
(MUT): SEB4E (4MHz), SEB4E0° (4MHz), MSEB4E (4MHz), B2SO (2MHz)
watergapcoupling

SURFACE CONDITION
Scaled surface - cleaned surface and free of loose scale.

RESULT
Plate(s) comply with the specification.

INSPECTION OPERATOR
Operators Level 1 or 2: qualified and certified according EN ISO 9712 (since 01.01.2013) respectively according the Written Practice „NDT-WP" (in accordance to Recommended Practice SNT-TC-1A). Operators Level 2 for ASME/ASTM.

INSPECTION SUPERVISOR
Responsible Level 3: Bindreiter Erich

Z03
Stamp of the inspection representative

LR

Z02
Inspection representative voestalpine Grobblech
Quality Department Heavy Plates
BERGER Alfred

voestalpine

voestalpine

Certificate Number: **VNA 1800119 / 7**
Page: 1 of 1

Inspection Certificate

Project: ----------
Client: **voestalpine Grobblech GmbH**
voestalpine-Straße 3, 4020 Linz, Austria

Office: **Vienna**

Clients Order Number: **8500923**

Date: **07-12-2018**

Order Status: **incomplete**

Inspection Dates
First: **11-11-2018**

final: **11-11-2018**

This certificate is issued to voestalpine Grobblech GmbH, Linz/Austria, to certify that the undersigned Surveyor attended their works Linz for the purpose of testing and inspecting the undernoted material with satisfactory results as stated below.

Purchaser: **Rosetti Marino Spa**
Via Trieste 230
I-48122 RAVENNA

Order No.: **1718001190 118A50C**

Description:

1 piece(s) of steel plate(s) **9964 kg** , as per attached inspection Certificate no.: **A0362537**

Specification

S355G10+M Z35 EN 10225 : 2009

Heat treatment/Delivery Condition: thermomechanical rolled + accelerated cooled

Scope of inspection:

witness mechanical testing: yes ☑
review manufacturer's declared analysis: yes ☑
witness / verify ultrasonic examination: yes ☑ n/a ☐
witness / verify microstructure examination: yes ☐ n/a ☒
witness /verify corrosion testing: yes ☐ n/a ☒
random visual and dimensional control and check of hard stamping: yes ☑

Identification:

Makers Brand voestalpine
Material Quality
Heat No.
Plate No.
Brand of LR

Lloyd's Register EMEA
Vienna Office
Lloyd's Register
07 DEC 2018

Helmut Berger
Surveyor to Lloyd's Register EMEA

a member of the Lloyd's Register group.

K. EDER

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Form 1123 (2017.07)

voestalpine Grobblech GmbH

A02
Inspection certificate

EN 10204 - 3.2

VNA1800119-7

Z02 Date 07-12-2018

voestalpine-Straße 3
4020 Linz, Austria
www.voestalpine.com/grobblech

A03 Document number	A0362537	A08 Order-No.:	8500923	A07 OrderDat.	03-10-2018	Date of dispatch	03-12-2018 4F

A06 Customer
Rosetti Marino Spa
Via Trieste 230
I-48122 RAVENNA

A07 OrderNo.
1718001190 118A50C

A06 Consignee
Rosetti Marino Spa
Via Trieste 230
I-48122 RAVENNA

B01 Product: Plate

B02 Material: S355G10+M Z35

B03 Standard: EN 10225 : 2009

B04 Delivery condition: thermomechanical rolled + accelerated cooled

A10 - Supplementary information
TOLMOUNT

B03 - Supplementary requirements
MATERIAL IS FINE GRAINED, VACUUM DEGASSED AND FULLY KILLED, PRODUCED BY BOF // MATERIAL IS PRE-QUALIFIED AS PER EN10225 OPTION 18, ANNEX E // FINAL ROLLING DIRECTION IS PERPENDICULAR TO DIE STAMPING // MATERIAL IS ACCORDING TO AB-TO-ROS-TE-ST-SP-0006 REV. A01 AND AB-TO-PMO-TE-MT-SP-0001 REV. B01 // MATERIAL IS ACCORDING TO EN10225 OPTIONS 2, 6, 9, 12, 13, 15, 16 AND 18

D01 - Visual Examination and dimensional checking: satisfactory. The results of tests performed are in compliance with the requirements.

Detail of supply

B07 Heat No.	B06 Plate No	Item	Dimensions B09 Thickness mm	B10 Width mm	B11 Length mm	B08 Piece	ind. Weight kg	total Weight kg	A09 Disp-No 130 42	Date of Tests	reference no.
814696	386477/1	70	35,00	3000,0	12000	1		9.964	76073	11-11-2018	1PLATCS35035
		Sum				1		9.964			

B14 - Supplementary information
Dimensional tolerances acc. EN 10029/10
Flatness acc. EN 10029/10 class N
EN10163-2: Class A3 - Repair-welding not permitted.
Thicknesstolerance acc. EN 10029/10 tab. 1 class A

A04 Symbol of the manufacturer's work

voestalpine

Z03 Stamp of the inspection representative

LR

07 DEC 2018

Lloyd's Register EMEA
Vienna Office
Initials: KE
Lloyd's Register

Z02 Inspection representative voestalpine Grobblech
LINTNER Norbert

voestalpine
ONE STEP AHEAD.

Chemical composition (Heat analysis) - part 1 of 2

B07 Heat No.	C %	Si %	Mn %	P %	S %	Al %	Cr %	Ni %	Mo %	Cu %	V %	Nb %	Ti %	N %	B %	Sn %	Ca %	As %	Sb %	Pb %	Cae %	Pcm %
>=		.150				.015																
Set values <=	.120	.550	1.650	.015	.0050	.055	.200	.700	.080	.300	.060	.030	.025	.0100	.0005	.0200	.0050	.0300	.0100	.010	.41	.21
814696	.032	.327	1.370	.006	.0007	.038	.122	.057	.007	.012	.003	.027	.014	.0039	.0002	.0030	.0003	.0020	.0020	.002	.29	.12

Chemical composition (Heat analysis) - part 2 of 2

B07 Heat No.	LF01 %	LF02 %
>=		
Set values <=	.060	.080
814696	.030	.044

C99 - Supplementary information
BI <= 0,01%
C99 - Supplementary information
Cae: C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15
Pcm: C+((Mn+Cu+Cr)/20)+(Si/30)+(Ni/60)+(Mo/15)+(V/10)+(B*5)
LF02: Nb+V+Ti
LF01: Nb+V

Z03 Stamp of the inspection representative

LR 07 DEC 2018

Lloyd's Register EMEA
Vienna Office
Initials: KE

Z02 Inspection representative voestalpine
Grobbleoh
LINTNER Norbert

voestalpine

voestalpine
ONE STEP AHEAD.

Consumables certificate

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2018-07-27

Numero certificato/Cert no: EC25251151 rev. 0

Nostro ordine/Our order:	2013780	Vostro ordine/Your order:	1718000897
Nostro riferimento/Our ref:	Web user - Movex CMP020 ITB	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB00060	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20180727	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address

ESAB SALDATURA S.P.A. (6155)
STRADA PROVINCIALE 34, N. 7
IT-20010 OSSONA MI
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address

ROSETTI MARINO SPA
.
VIA TRIESTE 230
48100 RAVENNA RA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PNS24006 Quantità/Quantity: 20 CT

PRODOTTO/PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK Tubrod 15.17 1.2mm 16kg
Codice/Item no:	**1517127730**

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.36: E81T1-M21A4-Ni1
EN ISO 17632-A: T 46 3 1Ni P C1 2 H5
EN ISO 17632-A: T 46 4 1Ni P M21 2 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:	M21 (EN ISO 14175)
C	0.05%
Si	0.39%
Mn	1.15%
P	0.01%
S	0.02%
Cr	0.03%
Ni	1.0%
Mo	0.03%
Nb	0.02%
Cu	0.06%
V	0.02%

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:	EN
Altro/Auxiliary:	M21 (EN ISO 14175)
Condizione/Condition:	As welded

TRAZIONE/TENSILE

ReL	Rm	A5
544 MPa	613 MPa	26 %

RESILIENZA/IMPACT

Temp	-40 °C
KV	124 J

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis

Piotr Grela Quality Assurance Manager

Validazione - altro/Validation - Others

Neil Farrow Product Manager

ROSETTI MARINO

PQR 27/19

preliminary WPS

pWPS 27/19

PQR ref.:	27/19 TBQ	pWPS (ISO 15614-1+ MOTS-12 Rev 5.0+AWS D1.1)	27/19	REV.:	0	Data /date	03/07/2019

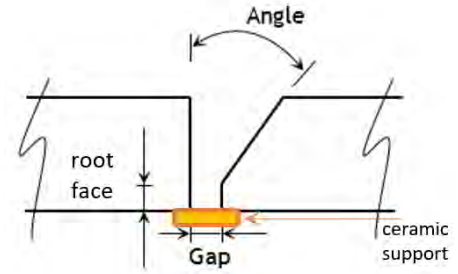
Procedimento di saldatura / Welding process: **136-FCAW** — Tipo / Type: **SEMIAUTOMATIC**

GIUNTO - JOINT

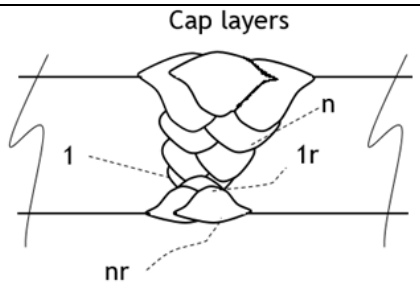
Tipo di giunto / Joint Design: **½ V** — Supporto / Backing: ☒ Si / Yes ☐ No

Materiale di supporto (tipo) / Backing material (type): ☐ Metallico / Metal ☒ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:



Angle: 40°-50°
Root face: 0-2 mm
Gap: 2-6 mm



Note: 1.Surfaces cleaned from moisture, oil, grease, paint before welding (by grinding)/ *Pulire le superfici da liquidi, oli, grasso e vernici con molatura prima di saldare.*
2.Preheat shall be performed by electrical resistance, induction equipment or with gas burners. Cutting torches shall not be permitted. *Il preriscaldo può essere eseguito con resitenze, induzione o torcia. Non può essere utilizzato l'ossitaglio.*

MATERIALE BASE - BASE MATERIAL

Da / from P-N°: **/** — Group N° **S4 - 15608:2.1** — A / to P-N°: **/** — Group N° **S4 - 15608:2.1**

Type and Grade: **EN 10225: S460 G2+M Z35**

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove **5.9 mm (machined from 20mm)**

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove **N.A.**

METALLO D'APPORTO - FILLER METAL

	GS FCAW	
Spec. N° (SFA)	5.36	
AWS N° (CLASS)	E81T12-1/E81T12-M21-Ni1-H4	
F-N°	6	
A-N°	1	
Diametro mat. D'apporto / Size of filler metal	1,2	
Gamma spessori /Thick. Range (mm)	Up to filling	
Accoppiamento filo-flusso / Electrode-flux (CLASS)	NA	
Denom. Comm. Flusso / FLUX trade name	NA	
Inserto consumabile / Consumable insert	NA	
Altro / other	OK Tubrod 15.17	

POSIZIONI - POSITION

giunto / Joint: **Cianfrino / groove** — Posizione / position **2G+3G / PC+PF** — Progressione / weld progression: **Ascendente / UP hill**

PRERISCALDO - PRE-HEAT

Temp.preriscaldo minima / Min. pre-heat temp: **20°C** — Max temp. Di interpass / Max interpass temp.: **250 °C** — Mantenimento interpass / Interpass maintenance: **N.A.** — Tempo di mantenimento prerisc.: / Maintenance timing: **N.A.**

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs): **N.A.** — Temperatura di stasi / Holding temperature °C: **N.A.** — Tempo di stasi / Holding time (min.): **N.A.** — Velocità di raffreddamento: / Cooling rate (°C/Hrs): **N.A.**

GAS DI PROTEZIONE - GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar+CO2	80%+20%	14-22 lt/min
Protezione al seguito / Trailing:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current: **DC-CV** — Polarità / Polarity **RP**

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: **N.A.**

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: **Spray arc**

Velocità alimentazione filo / Electr. Wire feed speed range: **Self regulated**

TECNICA - TECHNIQUE

Passata / Bead: **Tirata/String - max 16mm** — Dimensione bocchello gas / Orifice of gas cup size: **1/2"** — Pulizia iniziale e fra le passate / Initial and interpass cleaning: **Spazzolatura e Molatura/Brushing Grinding**

Metodo di solcatura a rovescio / Method of back gouging: **Molatura/Grinding** — Oscillazione / Oscillation: **N.A.** — Distanza zona di contatto e pezzo / Contact zone to work distance: **N.A.**

N°Passate / Passes nr.: **Multipla/Multiple** — Elettrodo multiplo o singolo / Multiple or single electrodes: **Singolo/Single** — Martellatura / Peening: **N.A.**

Altro / Other: **K factor= 0,8**

N° Passate / Weld layers nr.		Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current			Voltaggio / Volt range		Vel. Avanzamento / Travel speed range (mm/min)		Apporto termico / Heat input (KJ/mm)	
			Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. Range							
3G-PF	ROOT	GS FCAW	E81T1-1/E81T1-Ni1	1,2	RP	160	190	18	22	100	140	1.0	2.0
3G-PF	HOT	GS FCAW	E81T1-1/E81T1-Ni1	1,2	RP	180	220	23	26	140	180	1.1	1.9
3G-PF	Fill/Cap layer	GS FCAW	E81T1-1/E81T1-Ni1	1,2	RP	190	230	24	26	150	190	1.1	1.9
2G-PC	ROOT	GS FCAW	E81T1-1/E81T1-Ni1	1,2	RP	180	220	23	26	180	220	0.9	1.5
2G-PC	HOT	GS FCAW	E81T1-1/E81T1-Ni1	1,2	RP	200	250	26	28	260	300	0.8	1.3
2G-PC	Fill/Cap layer	GS FCAW	E81T1-1/E81T1-Ni1	1,2	RP	210	260	26	28	320	360	0.7	1.1

Back gouging shall be performed with fill/cap parameters

Prepared by:

NDE certificate

ROSETTI MARINO	VERBALE DI CONTROLLO VISIVO/DIMENSIONALE visual/dimensional inspection report	VDR N° 27-19 data: 04-07-2019

progetto project	TYRA REDEVELOPMENT PROJECT	cliente TOTAL client	ordine / PO	commessa 118A10 job
disegno dwg	/	ITP N°	fase / step	

SI CERTIFICA CHE :

gli item di seguito indicati sono stati sottoposti a controllo dimensionale ed accettati in accordo alla procedura / specifica sotto indicata ed ai criteri di accettabilita' in essa definiti.

WE CERTIFY THAT:

items below indicated have undergone a dimensional inspection and have been accepted according to the specific / procedure mentioned hereunder and to acceptance criteria defined in it.

oggetto – item

COUPON	STAMP	POS	THK	LENGHT	WPS	Date of examination
27/19 2G	AX112	2G	5.9 mm	600mm	pWPS 27/19	04/07/2019
27/19 3G	AX112	3G	5.9 mm	600mm	pWPS 27/19	04/07/2019

RINA Services SpA No. Bo. 0474	Date 04/07/2019
Noted ☐ Reviewed ☑ Witnessed ☑ Approved ☐	File Signature Cimatti Davide

note - remarks

Acceptance criteria: EN-ISO 5817-2014 LEV. B & AWS D1.1:2017

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

UNI EN ISO 17637 REV. 2017

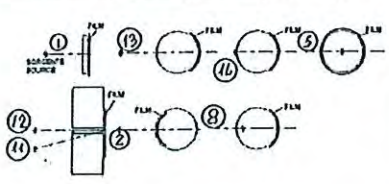
Operatore - Operator	Controllo Qualita' - Quality Control	Cliente - Client
CSWIP A.KHALIFA 69505 WI 3.1 04/07/19		

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	Date 05-07-2019	Sheet 1
RADIOGRAPHIC TEST		RT N° : 04	Our Ref. 18205

Client	Order	Project	Job	
ROSETTI MARINO	/	TYRA FUTURE	118A10	
Customer	Object	Dwg	Q.C.P.	Step
MAERSK OIL	/	/	/	/

Sketch	Weld	Diameter	Thickness	Welder	Position	Defect	Judgemen
PQR 27/19 2G	/	L=600mm	5,9mm	AX112	0-1 1-2	/	A
PQR 27/19 3G	/	L=600mm	5,9mm	AX112	0-1 1-2	/	A

Defect	
Longitudinal crack	101
Crater crack	104
Porosity	2011
Clustered	2013
Linear porosity	2014
Wormholes	2016
Crater pipe	2024
Slag inclusion	301
Tungsten inclusion	3041
Copper inclusion	3042
Lack of fusion	401
Lack of penetration	402
Undercut	501
Excess metal	502
Excess penetration	504
misaligment	507
Root concavity	515
Shrincage groove	5013
Spatten	602
Film defect	DF
Judgement	
Acceptable	A
Repair	NR
Repeat film	NX
Confirm the defect	RX

Norma /Normative	EN ISO 17636-1 B-class				Accettabilità / acceptance level	EN ISO 5817 B			EN ISO 10675-1 level 1			
Procedura / procedure					RT DK-TEHY-MET-PRO-000-10002_1_IFC_2018-06-14							
Tipo macchina RX / Type machine RX					Gilardoni MHF 300 matricola 044757002							
Schermi / Shields	Pb 0,10/Pb 0,10				Densità / Density range				> 2,3	Film type	KODAK C4	
Source	☑ RX	☐ Ir 192	☐ Se 75	Rx Tecnique	1 ☑ 11 ☐	13 ☐ 12 ☐	14 ☐ 2 ☐	5 ☐ 8 ☐	I.Q.I type	☐ ☑	ASTM EN	
Energy	Ci /	kV 150	mA 2						I.Q.I Position	☐ ☑	Film side Source side	
Focal spot		3	Mm						Esposition	☑ ☐	Single film Double film	
Exposure time		Min 1	Sec						Film processing	☐ ☑	Manual Automatic	
Crossed thickness 5,9 mm		SFD Source film distan 700 mm		(d)Film object distance 5,9 mm					f-min mm 150	Visible Wire n° 16	Films n° 4	

Level II° Technician	Quality Control	Company Repr.	Inspection Agency
Ing. Roberto Zauli 3° Livello SNT-TC-1A/ISO 9712	ROSETTI MARINO S.p.A. Matteo Del Prete Welding Dept.		RINA Services S.p.A. No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 05/07/2019 File Signature Cimatti Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items examine*

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 05/07/2019	FOGLIO – Sheet 1
RAPPORTO D'ESAME CON ULTRASUONI ***Ultrasonic examination report***		UT N° : 18	Ns. Rif./Our Ref. 18205

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	TYRA FUTURE	118A10	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
MAERSK OIL	PQR	/	-	-

CODICE / Code	PROCEDURA / Procedure	ACCETTABILITA' / Acceptance level			
/	DK-TEHY-MET-PRO-000-10004	Quality Level ISO 5817	☑ B	☐ C	☐ D
		Acceptance level ISO 11666	☑ 2	☐ 3	☐ 3b

MATERIALE Material	DIMENSIONI Dimension	SPESSORE NOMINALE / Thk
S460G2+MZ35	L=600 mm	Butt weld 1/2V 5,9 mm

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO - Brushed	☐ LAVORATO DI MACCHINA - Machined
☐ MOLATO - Ground	☐ LAMINATO - Rolled	☐ GREZZO - Forged

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG 600	No. SERIE Serial Number	II03483

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	ONDE Waves
PANAMETRICS	PF4MR	4	10	0°	LONG.
CASONI	MMS	5	5x5	70°	SHEAR

BLOCCO DI CALIBRAZIONE Calibration block	IIW V2	BLOCCO DI RIFERIMENTO Reference block	QT-REF-BLOCK 5
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity	DAC ON SDH 3 mm

SALDATURE CONTROLLATE / Welds Verified	PIANO DI SCANSIONE / Scanning plan
PQR 27/19 2G PQR 27/19 5G	The Scanning plan used is in accordance with the requirements of IDL-QCI-UT-0215

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Stefano Zauli 3° Livello SNT - TC - IA / ISO 9712	ROSETTI MARINO S.p.A. Matteo Dell'Erete Welding Dept.		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 05/07/2019 File Signature Cimatti Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items esamine*

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 05/07/2019	FOGLIO – Sheet 1
RAPPORTO D'ESAME MAGNETOSCOPICO ***MAGNETIC PARTICLE TEST***		MT N° : 19	Ns. Rif./Our Ref. 18205

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	TYRA FUTURE	118A10	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
MAERSK OIL	PQR	/	/	/

CODICE / code	PROCEDURA/Procedure	ACCETTABILITA - Acceptance level	
/	DK-TEHY-MET-PRO-000-10006	Quality Level ISO 5817 ☑ B ☐ C ☐ D Acceptance level ISO 23278 ☑ 2x ☐ 2x ☐ 3x	
MATERIALE Material	TEMPERATURA DELLE SUPERFICI Surface temperature	INTENSITA' LUMINOSA / Light intensity LUCE BIANCA	LUCE NERA
S460G2+M Z35	RANGE 5÷52°C	☑ > 500 LUX	☐ 500 µW/cm².

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined
☐ MOLATO – Ground	☐ LAMINATO – Rolled	☐ GREZZO – Forged

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☐ PUNTALI/Prods	☑ GIOGO/Yoke	☐ SOLENOIDE/Solenoid	☐ CONDUTTORE CENTRALE/Central conduttor

TIPO APPARECCHIO/Type of equipment	SILVER YOKE/S.No.03 230-16	DISTANZA PUNTALI/Pole spacing mm	180mm
TIPO DI CORRENTE/Type current	C.A	INTENSITÀ/Intesity (Amp)	4,5 kg

MEZZO DI ISPEZIONE / Examination medium		☑ UMIDO/Wet	☐ ASCIUTTO/Dry
PARTICELLE UTILIZZATE/Particle Type			
POLVERE NERA/Black powder	☑	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	NDT BW2	MARCA TIPO/Mark Type	NDT FW1
LOTTO / Batck No.	7242s	LOTTO / Batck No.	
VERNICE DI CONTRASTO/Contrast Paint		☑ NDT WBL5	☐ CGM VECOPLAST
LOTTO / Batck No.		U171011c	

SALDATURE CONTROLLATE / Welds Verified

ITEM	STAMP	Ø	THK	PROCESS
PQR 27/19 2G	AX112	L=600	5,9	FCAW
PQR 27/19 3G	AX112	L=600	5,9	FCAW

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐	
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Stefano Zauli 3° Livello SNT - TC - 1A / ISO 9712	ROSETTI MARINO S.p.A. Matteo Del Prete Welding Dept.		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 05/07/2019 File Signature Cimatti Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items esamine*

ROSETTI MARINO

PQR 27/19

Mechanical test report

INSPECTA S.R.L.	**TEST REPORT** ***RAPPORTO DI PROVA*** **N° 0207-00210-19** **Rev.00** **Data: 15/07/2019**	ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO **LAB N°1607 L**

Object: *Oggetto:*	**MECHANICAL TEST ON PQR 27/19 PF**			Pag. 1 di 9
Specimen: *Saggio:* **259/19**	**Base Material:** *Materiale Base:*	**Plate THK. 5,90 mm**	**EN 10225; S460 G2+M**	
	# Informazione fornita dal cliente/ Information provided by the customer			
Customer: ROSETTI MARINO S.p.A. *Committente:* **Address: Via Trieste, 230 - 48122 Ravenna (RA)** *Indirizzo:*		**Witnessed by:** *Presenziato da:*	**RINA SERVICES** **ROSETTI MARINO S.p.A.**	
Final customer:. *Cliente finale:*	//			
Reference Yours bill of landing: *Vs. DDT di consegn*	**n°** // *n°*	**Date:** *Data:* //	**MD52** *MD 52* **085/19**	**Date:** *Data:* **15/07/2019**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **15/07/2019**	**End of activities:** *Fine prove:*		**Date:** *Data:* **15/07/2019**

PROVE RICHIESTE

☒ **TENSILE TEST/***Trazione*	☒ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*
☒ **BEND TEST/***Piega*	☒ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☒ Face/Root */Dritto/Rovescio* ☐ Side/ *Laterale*
☒ **IMPACT TEST/***Resilienza*	☒ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*
☒ **MACROEXAMINATION TEST /** *Macrografia*		
☒ **HARDNESS TEST/** *Durezza*	☐ HV 5	☒ HV 10
☐ **FRACTURE TEST/** *Frattura*	☐ Plate on Plate/ *Piastra su Piastra*	☐ Pipe on Plate/*Tubo su Piastra*
☐ **CHEMICAL ANALYSIS/***Analisi Chimica*		
☐ **MICROEXAMINATION TEST /** *Micrografia*		
☐ **OTHER (Specify)/***Altro/(Specificare)*		

Allegati /Attachments: NONE

NOTE/ Remarks: **REFERENCE CODE FROM CUSTOMER REQUEST: MOTS 12 Rev. 5 + UNI EN ISO 15614-1:17**

Informazioni aggiuntive fornite dal cliente:
Additional information provided by the customer

*** Dove indicato la prova si intende non accreditata da ACCREDIA**

Laboratory Responsible *Responsabile Laboratorio* *Sig. Davide Ciregia*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
INSPECTA Via Ravegnana, 379/a 47121 Forlì (FC) P.IVA 03944480403 15-07-19	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date File Signature 15/7/19

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova. Il committente si impegna a riprodurre integralmente il rapporto di prova. Vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I risultati di prova si riferiscono al campione così come ricevuto,essendo il campionamento eseguito dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%.The results in this test report refers only to the specimen that has been tested.The customer undertakes to print out /reproduce the test report. Any partial reproduction is prohibited.Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory.The test results refer to the sample as received, since the sampling is performed by the customer..Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku = 2 equivalent to a level of confidence of 95 % .

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

Date of Testing:15/07/2019
Data esecuzione prova:

Serial N. VAUP 01

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-18*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *Procedura interna :* ***PP08 rev.05***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
259/19 A TWT	5,20x25,01	130,05	24,0°C	//	//	/	526	/	70'079	539	/	//	//	FOW



Remarks */ Note:*

Legend / *Legenda*

TT = Transverse Tension*/Trazione.trasversale;*
TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;*
FOW = Failure Out of Weld*/Rottura fuori dalla saldatura*
FIW = Failure in Weld*/Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Sig.Matteo Galdieri - INSPECTA Srl - 15/07/19 Laboratory Technician	Sig. Davide Cirelli INSPECTA Srl Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403 15-07-19	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services SpA No Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ Date _____ File _____ Signature 15/7/19 Cimatti Davide

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

Date of Testing:15/07/2019
Data esecuzione prova:

Serial N. VAUP 01

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-18*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *Procedura interna :* ***PP08 rev.05***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
259/19 B TWT	**5,39x25,00**	**134,74**	**24,0°C**	//	//	/	**522**	/	**72'217**	**536**	/	//	//	**FOW**



Remarks */ Note:*

Legend / *Legenda*

TT = Transverse Tension*/Trazione.trasversale;*
TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;*
FOW = Failure Out of Weld*/Rottura fuori dalla saldatura*
FIW = Failure in Weld*/Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio* Sig.Matteo Galdieri	**Laboratory Responsible** *Responsabile Laboratorio* Sig.Davide Crega	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - 15/07/19 Laboratory Technician	INSPECTA srl Via Ravegnana, 379/a 47121 Forlì (FC) P IVA 03944480403 15-07-19	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date _____ File _____ Signature 15/7/19 Cimatti Davide

BEND TEST
Prova di piega

Date of Testing:15/07/2019
Data esecuzione prova:

☒ *UNI EN ISO 5173: 2012* | ☐ *ASME IX QW-160: 2017* | ☐ _____

Serial N. VAUP / 01

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *Procedura interna* **:*PP11 rev.03***

Specimen id. *Identificazione provino*		Dimension *Dimensioni (mm)*	Test Temp. *Temp.test °C*	Bend Angle *Angolo di piega*	Ø Former *Ø Mandrino (mm)*	Distance between rollers *Distanza appoggi (mm)*	Remarks *Note*
259/19 TFB	A	5,90X24,00	24,0°C	180°	20	34	No open discontinuities have been found in weld metal and heat affected zone
259/19 TFBB	B	5,90X24,00	24,0°C	180°	20	34	No open discontinuities have been found in weld metal and heat affected zone
259/19 TRB	C	5,90X24,00	24,0°C	180°	20	34	No open discontinuities have been found in weld metal and heat affected zone
259/19 TRB	D	5,90X24,00	24,0°C	180°	20	34	No open discontinuities have been found in weld metal and heat affected zone

Remarks *Note:*

Legend *Legenda*

SBB. = Transverse Side Bend/*Piega Trasversale laterale*
TRB. = Transverse Root Bend/*Piega Trasversale al rovescio*
TFB. = Transverse Face Bend/*Piega Trasversale al dritto*
LRB = Longitudinal Root Bend */ Piega Longitudinale al rovescio*
LFB. = Longitudinal Face Bend */ Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Sig.Matteo Galdieri - INSPECTA srl - 15/07/19 Laboratory Technician	Sig.Nicola Ciriello INSPECTA srl 15.07.19 Via Ravegnana, 379/a 47121 Forlì (FC) P IVA 03944480403	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services SpA No. Bp. 0474 Noted ☐ Reviewed ☑ Witnessed ☒ Approved ☐ Date _____ File _____ Signature 15/7/19 Ciriatti Davide

IMPACT TEST
Prova di resilienza

Date of Testing:*15/07/2019*
Data esecuzione prova:

☐ *UNI EN ISO 148-1: 2016* ☒ *UNI EN ISO 9016: 2012* ☐ *ASTM E23: 18* ☐ *ASME IX QW-170: 2017* ☐ *ASTM A923-14 Method B*

Serial N. VAUP / 02

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *Procedura interna* **:*PP09 rev.05***

Specimen id. *Identificazione provino*	**Direction** *Direzione*	**Dimension** *Dimensioni (mm)*	**Test Temp.** *Temp .test*	**Notch Type** *Intaglio*	**Knife / coltello**	**Requirement / Requisiti**											**Remarks** *Note*
						Energy absorbed/ / Energia assorbita				**U**	**Lateral Expansion** *Espansione laterale (mm)*			**Shear Area** *Area fragile %*			
						Individual *Individuale Joule*			**Average** *Media Joule*								
						1	2	3			1	2	3	1	2	3	
259/19 VWT 0/1	**T**	**2.5x10x55**	**-59,5°C**	**V**	**2**	**26**	**25**	**22**	**24**	/	//	//	//	/	/	/	//
259/19 VHT 0/1	**T**	**2.5x10x55**	**-59,5°C**	**V**	**2**	**27**	**25**	**28**	**27**	/	//	//	//	/	/	/	//
259/19 VHT 1/1	**T**	**2.5x10x55**	**-59,5°C**	**V**	**2**	**37**	**39**	**39**	**38**	/	//	//	//	/	/	/	//
259/19 VHT 2/1	**T**	**2.5x10x55**	**-59,5°C**	**V**	**2**	**39**	**37**	**39**	**38**	/	//	//	//	/	/	/	//
259/19 VHT 5/1	**T**	**2.5x10x55**	**-59,5°C**	**V**	**2**	**36**	**36**	**36**	**36**	/	//	//	//	/	/	/	//

Remarks *Note:*	//
Legend *Legenda*	**L= Longitudinal / Longitudinale** **T= Trasversal / Trasversale** **VWT 0/2 = Impact Test on Weld Metal/** *Resilienza trasversale in saldatura* **VHT 0/2 = Impact Test on Fusion Line /** *Resilienza Trasversale in linea di fusione* **VHT 1/2 = Impact Test at 1mm from Fusion Line /** *Resilienza trasversale a 1 mm dalla linea di fusione* **VHT 2/2 = Impact Test at 2 mm from Fusion Line /** *Resilienza trasversale a 2 mm dalla linea di fusione* **VHT 5/2 = Impact Test at 5 mm from Fusion Line /** *Resilienza trasversale a 5 mm dalla linea di fusione* **WM = Impact Test on Weld Metal/** *Resilienza trasversale in saldatura* **HAZ = Impact Test on Heat Affected Zone /** *Resilienza Trasversale in zona termicamente alterata* **BM = Impact Test on Base Metal /** *Resilienza Trasversale in materiale base* **FL = Fusion Line/** *Linea di fusione* **FL+1 = Fusion Line + 1mm/** *Linea di fusione+1mm* **FL+2 = Fusion Line + 2mm/** *Linea di fusione+2mm* **FL +5= Fusion Line + 5mm/** *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig Matteo Galdieri - INSPECTA srl - 15/07/19 *Laboratory Technician*	*Sig. Davide Ciregia* INSPECTA srl 15-07-19 Via Ravegnana, 379/a 47121 Forlì (FC) P IVA 03944480403	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date File Signature Curatti Davide

VICKERS HARDNESS TEST METHOD

Prova di durezza Vickers

Date of Testing:15/07/2019
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* ☒ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

Serial N. 43030614C

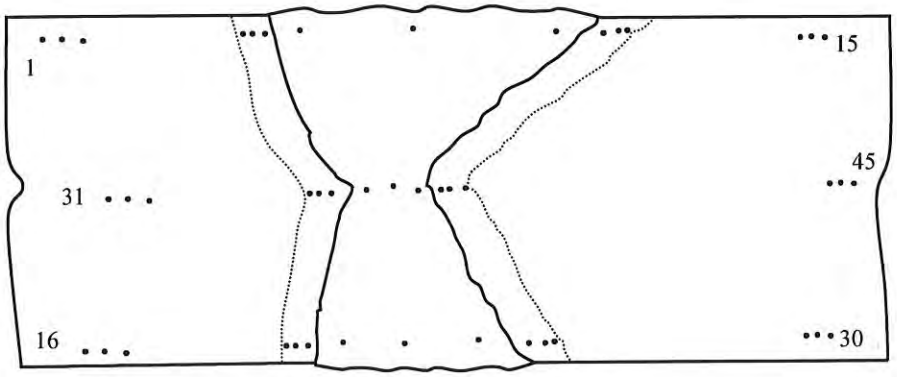
*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *Procedura interna*	PP10 rev.03	Sample Identification *Identificazione provino*	259/19 A	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	24,0°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: **Base Material Side B:**

BM	HAZ	WM	HAZ	BM
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
31 - 32 - 33	34 - 35 - 36	37 - 38 - 39	40 - 41 - 42	43 - 44 - 45
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**196-194-191**	//	16 – 17 - 18	**200-203-195**	//	31 – 32 - 33	**198-201-200**	//
4 - 5 - 6	**187-193-205**	//	19 - 20 - 21	**195-192-196**	//	34 - 35 - 36	**206-210-215**	//
7 – 8 - 9	**227-226-229**	//	22 – 23 - 24	**205-207-210**	//	37 – 38 - 39	**212-204-213**	//
10 - 11 - 12	**205-197-191**	//	25 - 26 - 27	**202-195-194**	//	40 - 41 - 42	**215-213-220**	//
13 – 14 - 15	**204-200-195**	//	28 – 29 - 30	**195-200-205**	//	43 – 44 - 45	**205-200-200**	//

Remarks/ *Note:* //

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Sig.Matteo Galdieri - INSPECTA srl - 15/07/19 Laboratory Technician	Sig. Davide Ciregia INSPECTA 15-07-19 Via Ravegnana, 379/a 47121 Forlì (FC) P IVA 03944480403	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services S.p.A. No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date _____ File _____ Signature Cimatti Davide 15/7/19

MACRO EXAMINATION TEST
Prova Macrografica

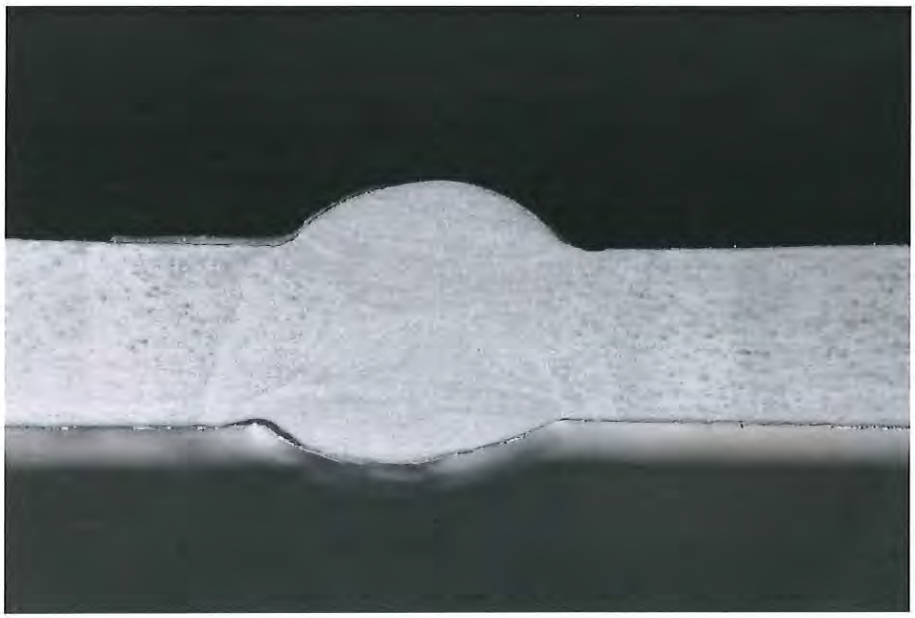
Date of Testing: *15/07/2019*
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *PP12 rev.01* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,0°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**259/19 A**	**Magnification:** *Ingrandimento:*	**Photo at 4.1X** **Examination at 10X**
Designation: *Designazione:*	**ISO 17639-A-E-1.3-1.3/1.3/1.3-Nital**		



Remarks / *Note:*	**THE MACRO SHOW COMPLETE FUSION, FREEDOM FROM CRACKS AND NO LINEAR INDICATION**

Laboratory Technician *Tecnico di Laboratorio* *Sig: Matteo Galdieri*	**Laboratory Responsible** *Responsabile Laboratorio* *Sig. Davide Ciregia*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore di parte*
- INSPECTA srl - 15/07/19 Laboratory Technician	INSPECTA 15-07-19 Via Ravegnana, 379/a 47121 Forlì (FC) P IVA 03944480403	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services S.p.A. No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☐ Approved ☐ File _____ Signature Ciriaty Davide 15/7/19

MACRO EXAMINATION TEST
Prova Macrografica

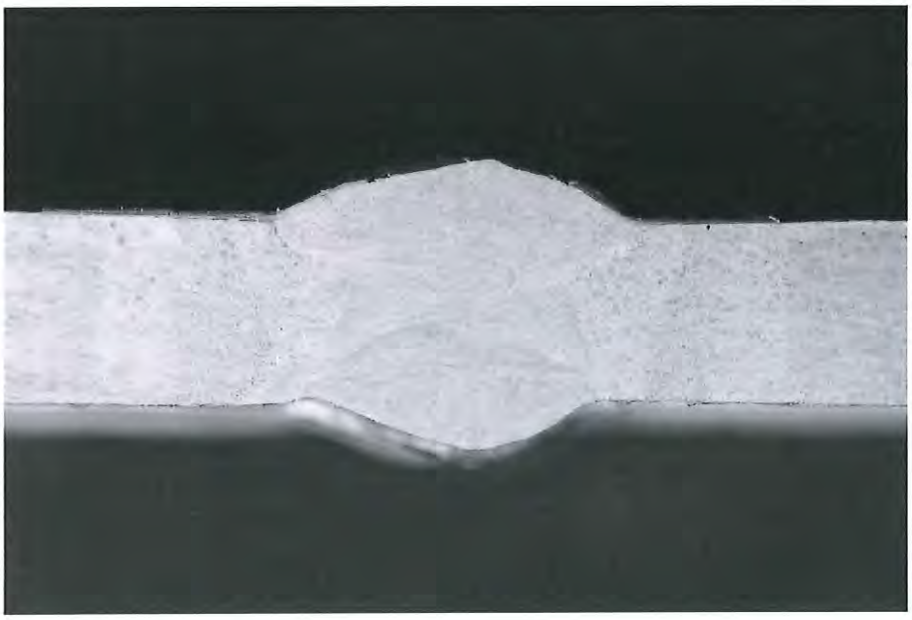
Date of Testing: *15/07/2019*
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *PP12 rev.01* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,0°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**259/19 B**	**Magnification:** *Ingrandimento:*	**Photo at 4.2X** **Examination at 10X**
Designation: *Designazione:*	**ISO 17639-A-E-1.3-1.3/1.3/1.3-Nital**		



Remarks / *Note:* **THE MACRO SHOW COMPLETE FUSION, FREEDOM FROM CRACKS AND NO LINEAR INDICATION**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third Part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Sig: Matteo Galdieri	*Sig. Davide Ciregia*		
- INSPECTA srl -	INSPECTA srl Via Ravegnana, 379/a 47121 Forlì (FC) P IVA 03944480403	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services SpA No. Bo. 0371
Laboratory Technician	15-07-19		Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐
15/07/19			Date 15/7/19 File _____ Signature Cimatti Davide

MACRO EXAMINATION TEST
Prova Macrografica

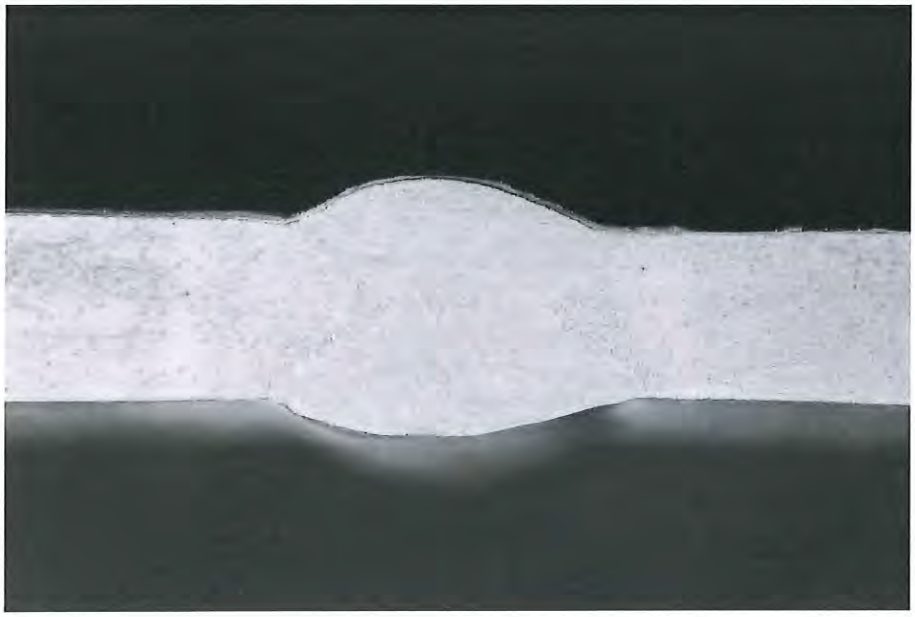
Date of Testing: *15/07/2019*
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *PP12 rev.01* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,0°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**259/19 C**	**Magnification:** *Ingrandimento:*	**Photo at 4.2X** **Examination at 10X**
Designation: *Designazione:*	**ISO 17639-A-E-1.3-1.3/1.3/1.3-Nital**		



Remarks / *Note:* **THE MACRO SHOW COMPLETE FUSION, FREEDOM FROM CRACKS AND NO LINEAR INDICATION**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Sig: Matteo Galdieri	*Sig. Davide Ciregia*		RINA Services S.p.A. No. Bo. 0474
- INSPECTA srl -	INSPECTA S.r.l. Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403 15-07-19	ROSETTI MARINO SpA A. Khalifa Welding Dept.	Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ File _____ Signature
15/07/19			Date 15/7/19
Laboratory Technician			Cimatti Davide

INSPECTA S.R.L.	**TEST REPORT** ***RAPPORTO DI PROVA*** **N° 0206-00210-19** **Rev.00** **Data: 24/06/2019**	ilac-MRA ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO **LAB N°1607 L**

Object: *Oggetto:*	**MECHANICAL TEST ON PQR 27/19 PC**			Pag. 1 di 9
Specimen: *Saggio:* **258/19**	**#Base Material:** *Materiale Base:*	**Plate THK. 5,90 mm**	**EN 10225; S460 G2+M**	
	# Informazione fornita dal cliente/ Information provided by the customer			
Customer: ROSETTI MARINO S.p.A. *Committente:* **Address: Via Trieste, 230 - 48122 Ravenna (RA)** *Indirizzo:*		**Witnessed by:** *Presenziato da:*	**RINA SERVICES** **ROSETTI MARINO S.p.A.**	
Final customer:. *Cliente finale:*	//			
Reference Yours bill of landing: *Vs. DDT di consegn*	**n°** // *n°*	**Date:** *Data:* //	**MD52** **085/19** *MD 52*	**Date:** *Data:* **15/07/2019**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **15/07/2019**	**End of activities:** *Fine prove:*		**Date:** *Data:* **15/07/2019**

PROVE RICHIESTE

☒ **TENSILE TEST**/*Trazione*	☒ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*
☒ **BEND TEST**/*Piega*	☒ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☒ Face/Root */Dritto/Rovescio* ☐ Side/ *Laterale*
☒ **IMPACT TEST**/*Resilienza*	☒ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*
☒ **MACROEXAMINATION TEST /** *Macrografia*		
☒ **HARDNESS TEST**/ *Durezza*	☐ HV 5	☒ HV 10
☐ **FRACTURE TEST**/ *Frattura*	☐ Plate on Plate/ *Piastra su Piastra*	☐ Pipe on Plate/*Tubo su Piastra*
☐ **CHEMICAL ANALYSIS**/*Analisi Chimica*		
☐ **MICROEXAMINATION TEST /** *Micrografia*		
☐ **OTHER (Specify)**/*Altro/(Specificare)*		

Allegati /Attachments: NONE

NOTE/ Remarks: **REFERENCE CODE FROM CUSTOMER REQUEST: MOTS 12 Rev. 5 + UNI EN ISO 15614-1:17**

Informazioni aggiuntive fornite dal cliente:
Additional information provided by the customer

*** Dove indicato la prova si intende non accreditata da ACCREDIA**

Laboratory Responsible *Responsabile Laboratorio* *Sig. Davide Ciregia*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
INSPECTA srl Via Ravegnana, 379/a 15-07-19	ROSETTI MARINO SpA Khalifa Welding Dept.	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date File Signature 15/7/19 Cimatti Davide

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I risultati di prova si riferiscono al campione così come ricevuto,essendo il campionamento eseguito dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%.The results in this test report refers only to the specimen that has been tested.The customer undertakes to print out /reproduce the test report. Any partial reproduction is prohibited.Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory.The test results refer to the sample as received, since the sampling is performed by the customer..Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku = 2 equivalent to a level of confidence of 95 % .

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

Date of Testing:15/07/2019
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-18*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *Procedura interna :* ***PP08 rev.05***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
258/19 A TWT	**5,54x24,99**	**138,44**	**24,0°C**	//	//	/	**511**	/	**78'822**	**569**	/	//	//	**FOW**



Remarks */ Note:*

Legend / *Legenda*

TT = Transverse Tension*/Trazione.trasversale;*
TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;*
FOW = Failure Out of Weld*/Rottura fuori dalla saldatura*
FIW = Failure in Weld*/Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio* *Sig.Matteo Galdieri*	**Laboratory Responsible** *Responsabile Laboratorio* *Sig.Davide Cingolani*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - 15/07/19 Laboratory Technician	INSPECTA srl 15-07-19 Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403	ROSETTI MARINO SpA A. Khelifa Welding Dept.	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☐ Approved ☐ Date ____ File ____ Signature 15/7/19 Cingolani Davide

TRANSVERSE TENSILE TEST AT ROOM TEMPERATURE

Prova di trazione trasversale a temperatura ambiente

Date of Testing:15/07/2019
Data esecuzione prova:

☒ *UNI EN ISO 4136: 2012* ☐ *UNI EN ISO 6892-1: 2016 metod B* ☐ *ASTM A370-18*
☐ *ASME IX QW–150:2017* ☐ *ASTM E8 / E8M 16a* ☐ _____

Serial N. VAUP 01

* Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA

Internal procedure *Procedura interna :* ***PP08 rev.05***

Specimen id. *Identificazione provino*	Dimension *Dimensioni (mm)*	Section *Sezione (mm2)*	Test Temp. *Temp. test*	Feh N	Reh Mpa	U	Rp 0,2% Mpa	U	Fm N	Rm Mpa	U	Elong. *Allung.* A (%)	Red. of area *Strizione* Z (%)	Failure location *Posizione frattura*
Value Required *Valori Richiesti* ☐ Standards ☐ Client Spec.														
258/19 B TWT	5,46x24,99	136,45	24,0°C	//	//	/	558	/	76'982	564	/	//	//	FOW



Remarks */ Note:*

Legend / *Legenda*

TT = Transverse Tension*/Trazione.trasversale;* **FOW = Failure Out of Weld***/Rottura fuori dalla saldatura*

TWT = Transverse Weld Tension*/Trazione.trasversale saldatura;* **FIW = Failure in Weld***/Rottura in saldatura*

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible Responsabile Laboratorio	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Sig.Matteo Galdieri	*Sig. Davide Ciregia*		RINA Services SpA No. Bo. 0474 Date
- INSPECTA srl - 15/07/19 Laboratory Technician	INSPECTA srl Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403 15-07-19	ROSETTI MARINO SpA A. Khalifa Welding Dept.	Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature 15/7/19 Ciregia Davide

BEND TEST
Prova di piega

Date of Testing:15/07/2019
Data esecuzione prova:

☒ *UNI EN ISO 5173: 2012* | ☐ *ASME IX QW-160: 2017* | ☐ _____

Serial N. VAUP / 01

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *Procedura interna* **: *PP11 rev.03***

Specimen id. *Identificazione provino*		**Dimension** *Dimensioni (mm)*	**Test Temp.** *Temp.test °C*	**Bend Angle** *Angolo di piega*	**Ø Former** *Ø Mandrino (mm)*	**Distance between rollers** *Distanza appoggi (mm)*	**Remarks** *Note*
258/19 TFB	A	5,90X24,00	24,0°C	180°	20	34	No open discontinuities have been found in weld metal and heat affected zone
258/19 TFBB	B	5,90X24,00	24,0°C	180°	20	34	No open discontinuities have been found in weld metal and heat affected zone
258/19 TRB	C	5,90X24,00	24,0°C	180°	20	34	No open discontinuities have been found in weld metal and heat affected zone
258/19 TRB	D	5,90X24,00	24,0°C	180°	20	34	No open discontinuities have been found in weld metal and heat affected zone

Remarks *Note:*

Legend *Legenda*

SBB. = Transverse Side Bend/*Piega Trasversale laterale*
TRB. = Transverse Root Bend/*Piega Trasversale al rovescio*
TFB. = Transverse Face Bend/*Piega Trasversale al dritto*
LRB = Longitudinal Root Bend */ Piega Longitudinale al rovescio*
LFB. = Longitudinal Face Bend */ Piega Longitudinale al dritto*

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** Responsabile Laboratorio	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig.Matteo Galdieri	*Sig. Davide Ciregia*		
- INSPECTA srl - 15/07/19 Laboratory Technician	INSPECTA S.r.l. Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403 15-07-19	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services SpA No. Bo. 0474 Date ____ File ____ Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ Signature Ciregia Davide 15/7/19

IMPACT TEST
Prova di resilienza

Date of Testing: *15/07/2019*
Data esecuzione prova:

☐ *UNI EN ISO 148-1: 2016* ☒ *UNI EN ISO 9016: 2012* ☐ *ASTM E23: 18* ☐ *ASME IX QW-170: 2017* ☐ *ASTM A923-14 Method B*

Serial N. VAUP / 02

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *Procedura interna* **:*PP09 rev.05***

Specimen id. *Identificazione provino*	Direction *Direzione*	Dimension *Dimensioni (mm)*	Test Temp. *Temp .test*	Notch Type *Intaglio*	Knife / *coltello*	Requirement / Requisiti: Energy absorbed/ / Energia assorbita – Individual *Individuale Joule* 1	2	3	Average *Media Joule*	U	Lateral Expansion *Espansione laterale (mm)* 1	2	3	Shear Area *Area fragile %* 1	2	3	Remarks *Note*
258/19 VWT 0/1	T	2.5x10x55	-59,5°C	V	2	22	19	24	22	/	//	//	//	/	/	/	//
258/19 VHT 0/1	T	2.5x10x55	-59,5°C	V	2	29	25	28	27	/	//	//	//	/	/	/	//
258/19 VHT 1/1	T	2.5x10x55	-59,5°C	V	2	35	39	39	38	/	//	//	//	/	/	/	//
258/19 VHT 2/1	T	2.5x10x55	-59,5°C	V	2	39	38	39	39	/	//	//	//	/	/	/	//
258/19 VHT 5/1	T	2.5x10x55	-59,5°C	V	2	38	37	37	37	/	//	//	//	/	/	/	//

Remarks *Note:* //

Legend *Legenda*

L= Longitudinal / Longitudinale
T= Trasversal / Trasversale
VWT 0/2 = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
VHT 0/2 = Impact Test on Fusion Line */ Resilienza Trasversale in linea di fusione*
VHT 1/2 = Impact Test at 1mm from Fusion Line */ Resilienza trasversale a 1 mm dalla linea di fusione*
VHT 2/2 = Impact Test at 2 mm from Fusion Line */ Resilienza trasversale a 2 mm dalla linea di fusione*
VHT 5/2 = Impact Test at 5 mm from Fusion Line */ Resilienza trasversale a 5 mm dalla linea di fusione*
WM = Impact Test on Weld Metal/ *Resilienza trasversale in saldatura*
HAZ = Impact Test on Heat Affected Zone */ Resilienza Trasversale in zona termicamente alterata*
BM = Impact Test on Base Metal */ Resilienza Trasversale in materiale base*

FL = Fusion Line/ *Linea di fusione*
FL+1 = Fusion Line + 1mm/ *Linea di fusione+1mm*
FL+2 = Fusion Line + 2mm/ *Linea di fusione+2mm*
FL +5= Fusion Line + 5mm/ *Linea di fusione +5mm*

NB) I valori al di sopra di 360 Joule sono superiori all'80% del fondo scala della macchina.
Values above 360 Joule are exceding 80% of the machine capacity

Laboratory Technician
Tecnico di Laboratorio
Sig Matteo Galdieri
- INSPECTA srl -
15/07/19
Laboratory Technician

Laboratory Responsible
Responsabile Laboratorio
Sig. Davide Ciregia
INSPECTA srl
15-07-19
Via Ravegnana, 379/a
47121 Forlì (FC)
P IVA 03944480403

Customer Inspector
Ispettore del cliente
ROSETTI MARINO SpA
A. Khalifa
Welding Dept.

Third part Inspector
Ispettore Terza parte
RINA Services SpA
No. Bo. 0474
Noted ☐
Reviewed ☐
Witnessed ☒
Approved ☐
Date
File
Signature
15/7/19
Ciregia Davide

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing:15/07/2019
Data esecuzione prova:

☐ *UNI EN ISO 6507-1: 2018* ☒ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

Serial N. 43030614C

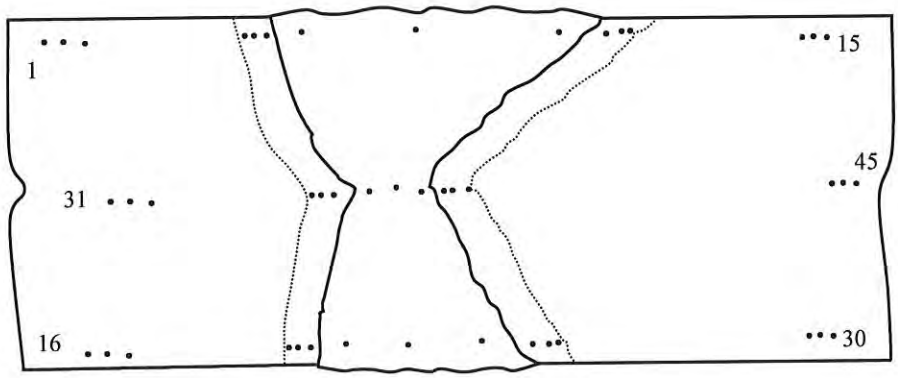
* Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA

Internal procedure *Procedura interna*	PP10 rev.03	Sample Identification *Identificazione provino*	258/19 A	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	24,0°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: **Base Material Side B:**

BM	HAZ	WM	HAZ	BM
1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
31 - 32 - 33	34 - 35 - 36	37 - 38 - 39	40 - 41 - 42	43 - 44 - 45
16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**200-199-207**	//	16 – 17 - 18	**209-209-208**	//	31 – 32 - 33	**207-207-204**	//
4 - 5 - 6	**193-198-209**	//	19 - 20 - 21	**197-196-203**	//	34 - 35 - 36	**201-198-200**	//
7 – 8 - 9	**240-215-245**	//	22 – 23 - 24	**234-231-238**	//	37 – 38 - 39	**249-243-250**	//
10 - 11 - 12	**207-200-190**	//	25 - 26 - 27	**201-196-190**	//	40 - 41 - 42	**203-190-191**	//
13 – 14 - 15	**201-203-200**	//	28 – 29 - 30	**194-194-198**	//	43 – 44 - 45	**193-199-202**	//

Remarks/ *Note:* //

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Sig.Matteo Galdieri	*Sig. Davide Cregia*	ROSETTI MARINO SpA A.Khalifa Welding Dept.	RINA Services SpA No. Bo. 0474
- INSPECTA srl - 15/07/19 Laboratory Technician	INSPECTA srl Via Ravegnana, 379/a 47121 Forlì (FC) P. IVA 03944480403 13-07-19		Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date _____ File _____ Signature 15/7/19 Sinceri Davide

MACRO EXAMINATION TEST
Prova Macrografica

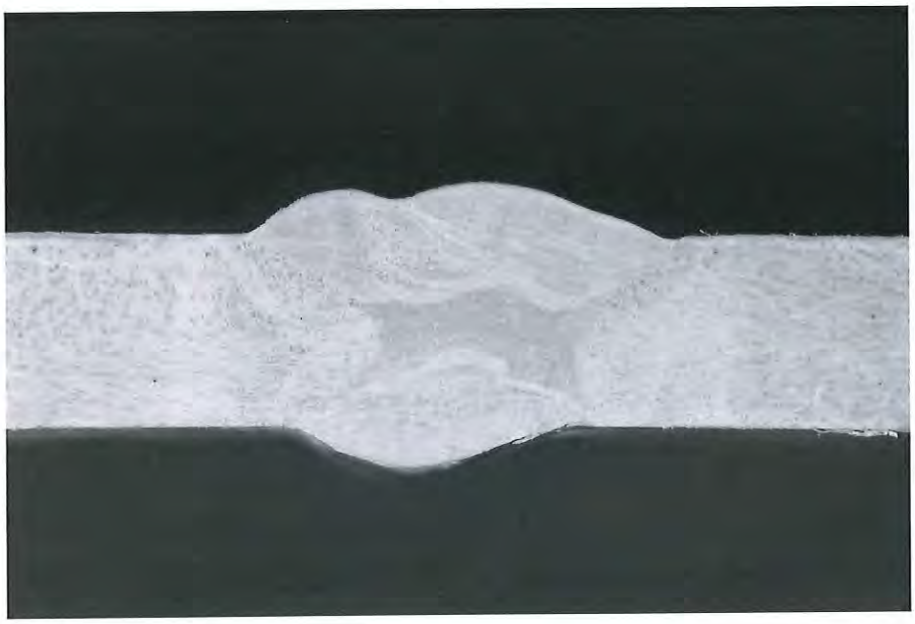
Date of Testing: *15/07/2019*
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *PP12 rev.01* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,0°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**258/19 A**	**Magnification:** *Ingrandimento:*	**Photo at 4.2X** **Examination at 10X**
Designation: *Designazione:*	**ISO 17639-A-E-1.3-1.3/1.3/1.3-Nital**		



Remarks / *Note:* **THE MACRO SHOW COMPLETE FUSION, FREEDOM FROM CRACKS AND NO LINEAR INDICATION**

Laboratory Technician *Tecnico di Laboratorio* *Sig: Matteo Galdieri*	Laboratory Responsible Responsabile Laboratorio *Sig. Davide Ciregia*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
- INSPECTA srl - 15/07/19 Laboratory Technician	INSPECTA srl Via Ravegnana, 379/a 47121 Forlì (FC) P IVA 03944480403 15-07-19	ROSETTI MARINO SpA A.Khalifa Welding Dept.	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date File Signature 15/7/19 Cimatti Davide

MACRO EXAMINATION TEST
Prova Macrografica

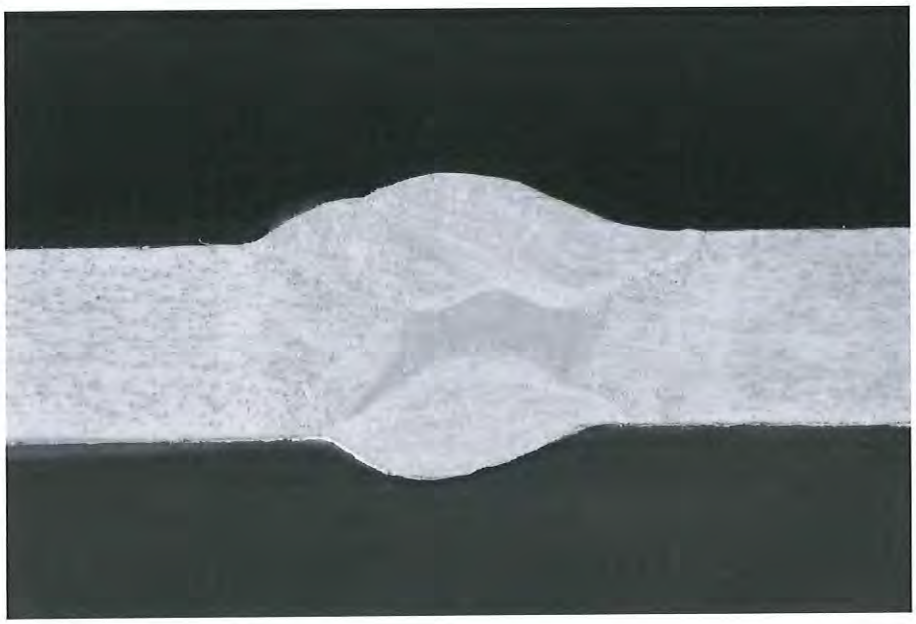
Date of Testing: *15/07/2019*
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *PP12 rev.01* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,0°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**258/19 B**	**Magnification:** *Ingrandimento:*	**Photo at 4.4X** **Examination at 10X**
Designation: *Designazione:*	**ISO 17639-A-E-1.3-1.3/1.3/1.3-Nital**		



Remarks / *Note:* **THE MACRO SHOW COMPLETE FUSION, FREEDOM FROM CRACKS AND NO LINEAR INDICATION**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	Responsabile Laboratorio	*Ispettore del cliente*	*Ispettore Terza parte*
Sig: Matteo Galdieri	*Sig. Davide Ciregia*		RINA Services SpA No. Bo. 0474
- INSPECTA srl -	INSPECTA srl Via Ravegnana, 379/a 47121 Forlì (FC) P IVA 03944480403	ROSETTI MARINO SpA A. Khalifa Welding Dept.	Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐
Laboratory Technician	15-07-19		Date _____ File _____ Signature
15/07/19			15/7/19 Ciregia Davide

MACRO EXAMINATION TEST
Prova Macrografica

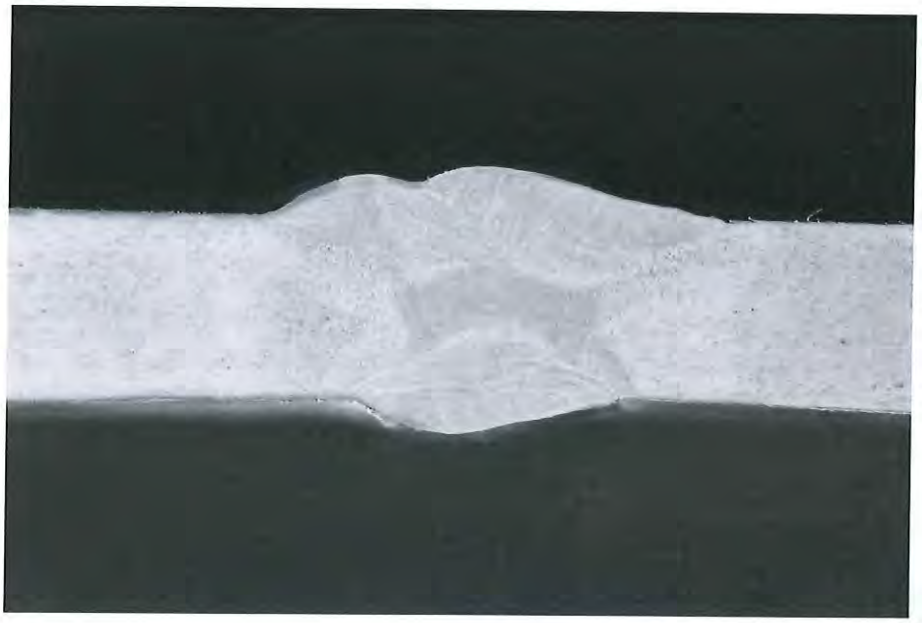
Date of Testing: *15/07/2019*
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

*** Dove indicato la prova si intende non accreditata da ACCREDIA / Where indicated the test is to be considered not accredited by ACCREDIA**

Internal procedure *PP12 rev.01* *Procedura internal*		**Test temperatura** *Temperature Test*	**24,0°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**258/19 C**	**Magnification:** *Ingrandimento:*	**Photo at 4.2X** **Examination at 10X**
Designation: *Designazione:*	**ISO 17639-A-E-1.3-1.3/1.3/1.3-Nital**		



Remarks / *Note:*	**THE MACRO SHOW COMPLETE FUSION, FREEDOM FROM CRACKS AND NO LINEAR INDICATION**

Laboratory Technician *Tecnico di Laboratorio* *Sig: Matteo Galdieri*	**Laboratory Responsible** Responsabile Laboratorio *Sig. Davide Cinggia*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - Laboratory Technician 15/07/19	INSPECTA srl Via Ravegnana, 379/a 47121 Forlì (FC) P IVA 03944480403 15-07-19	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date _____ File _____ Signature 15/7/19 Cinggia Davide

ROSETTI MARINO	Welding Procedure Qualification Record (PQR) Verbale di Qualifica di Procedura di Saldatura	No. 21/22	Sheet/Foglio 1/2

Manufacturer's Welding Procedure. Ref. no.	21/22 REV. 0					
Manufacturer	ROSETTI MARINO S.p.A.					
Address	VIA TRIESTE 230 - 48121 RAVENNA					
Code, Testing Standard	Project Spec. SD-NOC-STR-301 Rev.03					
Date of welding	February 07th , 2022					
Examiner of examining body	Bureau Veritas S.p.A.					
RANGE OF QUALIFICATION						
Welding process	GS FCAW	//	//			
Type(s)	Semiautomatic	//	//			
Welding Equipment Type	HF inverter type					
Actual parent Material side A	Pipe: API 5L X52+N PSL1 (Heat: H1192466)					
Actual parent Material side B	Plate: EN 10225: S355G10+M (Heat: 705587)					
Parent Material grade	AWS D1.1 - II / ISO 15608 1.2					
Supply condition	A) Normalized (+N) to B) Thermomechanically Rolled (+TM)					
Carbon equivalent/Pcm/C	Heat Values: A) 0,40/0,253/0,15 to B) 0,35/0,163/0,06					
Groove design/configuration	Half Vee T-Joint (one side welding without backing), For groove dimension and details see Welding Table 21/22					
Parent material thickness (mm)	A)8,00 mm (obtained from parent material of 12,70 mm thk.) to B)30,00 mm					
Weld metal thickness (mm)	8,00 mm	//	//			
Single or Multi-pass	Multiple	//	//			
Outside diameter	219,10 mm (8")					
Filler material Designation	AWS 5.29 E81T1-Ni1MJ	//	//			
Filler material Maker	OK Tubrod 15.17 - ESAB	//	//			
Filler material Size	Ø 1,2 mm	//	//			
Shielding gas/Flux	80% Ar + 20% CO2	//	//			
Shielding gas flow rate	16 l/min.	//	//			
Backing gas (purging)	None					
Type of welding current & polarity	GS FCAW: DC/RP	Heat input / Apporto termico (kJ/mm) - 25%	Pass	Diameter (mm)	6G	//
			Root	Ø 1,2	2,12 to 2,82	//
			Hot-Fill	Ø 1,2	1,14 to 1,52	//
			Cap	Ø 1,2	1,05 to 1,41	//
Welding position	6G - Uphill progression					
Preheat (°C)	25	Interpass temperature / Temp. di interpass (°C)	240			
Post-Weld Heat Treatment and/or ageing	None					
Weld bead width	Max. 14 mm					
Welder's detail	Giulianini Dario (GX12)					
Time lapse between root and hot pass	N.A.					
Other information / Altre informazioni	- Preheat performed by propane torch					

BUREAU VERITAS ITALY
WITNESSED
SURVEYOR G. TESEI
DATE 04/03/2022

ROSETTI MARINO	Welding Procedure Qualification Record (PQR) Verbale di Qualifica di Procedura di Saldatura	No. 21/22	Sheet/Foglio 2/2

Manufacturer's Welding Procedure. Ref. no.	21/22 REV. 0		
Test result (WPQR) N°	21/22	Date/Data	04/03/2022
Manufacturer's WPS No.	pWPS 21/22 REV. 1	Date/Data	07/02/2022

TESTS CARRIED OUT ON SAMPLE 1/1 WELDED IN 6G POSITION

NON DESTRUCTIVE EXAMINATIONS		
	Judgement	Report No.
Visual examinations	Acceptable	VDR 06/2022 dated 10/02/2022
Penetrant test	N.A.	N.A.
Magnetic particle test	Acceptable	22049 MT 06 SZ Rev.01 dated 10/02/2022
Radiographic test	N.A.	N.A.
Ultrasonic test	Acceptable	22049 UT 01 SZ Rev.01 dated 10/02/2022

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2] //	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] //	A [%]	Z [%]	Fracture Location	Remarks
//	//	//	//	//	//	//	//
//	//	//	//	//	//	//	//

BEND TEST

Type & N.	Bend angle	Remarks	Results
//	//	//	//

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] //			Avarage value [J] //	Remarks
//	//	//	//	//	//	//	//	//
//	//	//	//	//	//	//	//	//
//	//	//	//	//	//	//	//	//
//	//	//	//	//	//	//	//	//

OTHER TESTS	
Type of test / Tipo di prova	Results / Risultati
2 Macro examination and Hardness test	Satisfactory: See INSPECTA S.R.L. Test Report No. 040-00330-22 dated 04/03/2022
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	INSPECTA S.r.l. - Ravenna (RA)
Laboratory report reference N.	Report No. 040-00330-22 dated 04/03/2022
Test carried out in the presence of:	BUREAU VERITAS Italy

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Project Spec. SD-NOC-STR-301 Rev.03

Date/Data
04-03-2022

ROSETTI MARINO S.p.A.

ROSETTI MARINO SpA
A. Khalifa

Examiner or Examination Body
BUREAU VERITAS Italy
Giancarlo Tesei

Name and signature / Nome e firma

BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 04/03/2022

ROSETTI MARINO	PROJECT	Al-Shaheen Field, Gallaf Batch-3 Project - F-DBN EPCIC8 SOW	CLIENT	NOC QATAR
	DOC	pWPS Preliminary Welding Procedure Specification	JOB #:	121A20

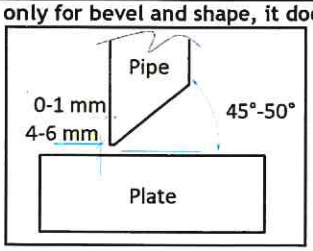
PQR ref.: 21/22	code Project Spec. SD-NOC-STR-301	WPS 21/22	REV.: 1	Data /date 07/02/22

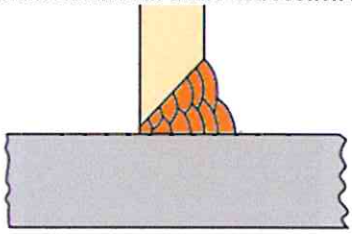
Procedimento di saldatura / Welding process: GS FCAW — Tipo / Type: SEMIAUTOMATIC — scopo / scope: CJP, T-joint

GIUNTO - JOINT

Tipo di giunto / Joint Design: ½ V — ☐ DOUBLE SIDED WELD — ☒ SINGLE SIDED WELD (no backing on root)

Dettagli / Details: sketch is only for bevel and shape, it does not indicate the welding position that is detailed in dedicated section below





MATERIALE BASE - BASE MATERIAL

API 5L X52+N PSL1 to EN 10225: S355G10+M — Material grade: +N to +TM — Max Cev 0.40 to 0.35

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove 8,00 mm obtained from 12,70 mm to 30,00 mm

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove 219,10 mm (8") to Plate

METALLO D'APPORTO - FILLER METAL

	GS FCAW		
Spec. N° (SFA)	5.29		
AWS N° (CLASS)	E81T1-Ni1M		
F-N°	6		
A-N°	10		
Diametro mat. d'apporto / Size of filler metal	1,2		
Metallo depositato / Deposit weld metal	8,00		
Gamma spessori /Thick. range	Up to completion		
Accoppiamento filo-flusso / Electrode-flux (CLASS)	N.A.		
Denom. Comm. flusso / FLUX trade name	N.A.		
Inserto consumabile / Consumable insert	N.A.		
Altro / other	OK Tubrod 15.17 - ESAB		

giunto / Joint: Cianfrino / groove — Posizione / position: 6G — Progressione / weld progression: Uphill

PRERISCALDO - PRE-HEAT (QW406)

Temp.preriscaldo minima / Min. pre-heat temp: 25°C — Max temp. Di interpass / Max interpass temp.: 240°C — Preheat Method / Metodo preriscaldo: Propane Torch

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs): N.A. — Temperatura di stasi / Holding temperature °C: N.A. — Tempo di stasi / Holding time (min.): N.A. — Velocità di raffreddamento / Cooling rate (°C/Hrs): N.A.

GAS DI PROTEZIONE - GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar+CO2	80-20	16-18 lt/min
Protezione / Shielding:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current: DC - CV	Polarità / Polarity: RP
Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type:	N.A.
Metodo di trasferimento per GMAW / GMAW metal tranfer mode:	Spray arc
Velocità alimentazione filo / Electr. Wire feed speed range:	Self regulated

TECNICA - TECHNIQUE

Passata / Bead: Tirata-Larga/String-Wave — Dimensione bocchello gas / Orifice of gas cup size: 3/4" — Pulizia iniziale e fra le passate / Initial and interpass cleaning: Spazzolatura e Molatura/Brushing Grinding

Metodo di solcatura a rovescio / Method of back gouging: N.A. — Oscillazione / Oscillation: N.A. — Distanza tra zona di contatto e pezzo / Contact tube to work distance: 13 - 18 mm

N°Passate / Passes nr.: Multipla/Multiple — Elettrodo multiplo o singolo / Multiple or single electrodes: Singolo/Single — Martellatura / Peening: N.A.

Altro / Other: Max. width of weld bead 14 mm

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range	Vel. avanzamento / Travel speed range (mm/min)	Apporto termico / Heat input (KJ/mm)
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. range			
Root	GS FCAW	E81T1-Ni1M	1,2	DC/RP	155 to 165	24 to 24,5	81 to 85	2,63 to 2,99
Hot - Fill	GS FCAW	E81T1-Ni1M	1,2	DC/RP	205 to 215	24 to 25	195 to 215	1,37 to 1,65
Cap	GS FCAW	E81T1-Ni1M	1,2	DC/RP	230 to 260	24 to 25	230 to 280	1,18 to 1,70

Preparato da / prepared by: *D.Cenacchi*

Approvato da / approved by: *A. Khalifa*

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.37563/h.1/8
DATE: 07/02/2022
WITNESSED ☐ REVIEW ☑

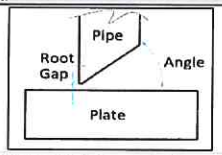
PQR - AS- RUN PARAMETER SHEET

pWPS 21/22	
PQR 21/22	
Coupon Nr. 1/1	
Date: 07/02/22	Page: 1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: **Project Spec. SD-NOC-STR-301 Rev.03**

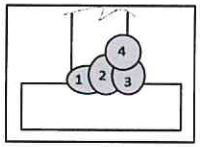
Welder Name(s):	GIULIANINI DARIO	Welder Id No(s):	GX12		
Welding Process(es):	GS FCAW	Type(s):	SEMIAUTOMATIC		
Welding Position:	6G	Progression:	Uphill		
Base Materials:	a) API 5L X52+N PSL1 to b) EN 10225: S355G10+M	Wall Thickness:	a) 8,00 mm (*) to b) 30,00 mm	Diameter:	219,10 mm
Heat No(s):	a) H1192466 to) 705587	Joint Type:	HALF VEE T - JOINT; ONE SIDE WELDING WITHOUT BACKING		

WELD PREPARATION:



Root: 0,50 mm ; Gap : 5,00 mm ; Angle: 45°

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Hot-Fill	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Cap	1,2	PNV4610432	OK Tubrod 15.17 - ESAB

GAS:

Shielding Gas:	Ar + CO2
Composition:	80% CO2 + 20% Ar
Flow:	16 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/4"
Tungsten Type:	N.A.
O2 Content of Back Purge:	N.A.

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
Max. width of weld bead 14 mm	String and weave	Multiple	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
25°C	Propane Torch	240 °C	Contact Digital Thermometer	N.A.	N.A.	N.A.	N.A.

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
N.A.	1	GS FCAW	1	-	5.29 E81T1-Ni1MJ	1,2	DC EP	148	168	158,0	23,4	25,4	24,4	-	-	8,2	2,82	-	79	Welding unit: INE KMP 5000 - TY4
N.A.	2	GS FCAW	2	-	5.29 E81T1-Ni1MJ	1,2	DC EP	202	222	212,0	23,4	25,4	24,4	-	-	20,4	1,52	-	240	Digital thermometer: HT Mod. A103 - Probe: TK100. Matr. 181103331 - 19/2353
N.A.	3	GS FCAW	3	-	5.29 E81T1-Ni1MJ	1,2	DC EP	225	245	235,0	23,4	25,4	24,4	-	-	24,4	1,41	-	148	Ampherometer Clamp: HT Mod. 9020 Matr. 16121407
N.A.	3	GS FCAW	4	-	5.29 E81T1-Ni1MJ	1,2	DC EP	242	262	252,0	23,4	25,4	24,4	-	-	26,4	1,40	-	155	(*) Machined from Base Metal Thickness: 12,70 mm
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
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BUREAU VERITAS ITALIA WELDING 48
TT FILE: 22SFB75630L-138
DATE: 07/02/2022
WITNESSED ☑ REVIEW ☐

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name: SETTI MARINO SpA A. Khalifa Welding Dept.	Name:	Name:	Name:
Signature:	Signature:	Signature:	Signature:
Date:	Date:	Date:	Date:

ROSETTI MARINO	VERBALE DI CONTROLLO VISIVO/DIMENSIONALE visual/dimensional inspection report	VDR N° 06/2022 data: 10/02/2022
progetto project: F Location Debottlenecking (F-DBN)	cliente client: NORTH OIL COMPANY	commessa job: 121A20

oggetto – item

Procedure Qualification Record (PQR) 21/2022

Certificato di Qualifica di Procedimento di Saldatura (PQR) 21/2022

WE CERTIFY THAT:

ITEMS INDICATED ABOVE HAVE UNDERGONE A VISUAL INSPECTION AND HAVE BEEN ACCEPTED ACCORDING TO THE SPECIFICATION / PROCEDURE MENTIONED AND TO ACCEPTANCE CRITERIA DEFINED IN IT

SI CERTIFICA CHE LE SALDATURE DEI SAGGI SOPRA CITATI SONO STATI SOTTOPOSTI AD ESAME VISIVO AL 100% ALLO STATO COME SALDATO IN ACCORDO ALLE SPECIFICHE E STANDARD CITATI.

note – remarks

Inspection on welds 8"x 8 mm WT in as welded condition.

1 Samples in 6G

No visible defects have been detected.

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

SOR-FY-19.257-ROMA-ASFYY-00-300025-0001

Operatore – Operator	Controllo Qualita' - Quality Control	Cliente - Client
Stefano Zauli 3° Livello SNT-TC - 1A / ISO 9712	ROSETTI MARINO SpA A. Khalifa Welding Dept.	BUREAU VERITAS ITALY REVIEWED SURVEYOR G. TESEI DATE 04/03/2022

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n° 22049 MT 06 SZ Rev. 01

RAPPORTO D'ESAME MAGNETOSCOPICO Magnetic Particle Test Report			DATA / Date 10/02/2022	FOGLIO / Sheet 1
CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	F Location Debottlenecking (F-DBN)	121A20	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	FASE Step
NORTH OIL COMPANY	PQR	/	/	/

ESECUZIONE / Execution		ACCETTABILITA' / Acceptance	
SOR-FY-19.257-ROMA-ASFYY-00-300026-0001		SOR-FY-19.257-ROMA-ASFYY-00-300026-0001	
MATERIALE/Material	TEMP. SUPERFICI Surface temperature	INTENSITA' LUMINOSA/ Light intensity	
C.S.	10°	☑ LUCE BIANCA >1076 Lux ☐ LUCE BIANCA >500 Lux	☐ LUCE NERA 1000 µW/cm²

STATO DELLA SUPERFICIE – Surface condition			
☑ COME SALDATO As welded	☐ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined	
☐ GREZZO – Forged	☐ LAMINATO – Rolled	☐ MOLATO – Ground	☐ SABBIATO – Blasted

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☑ GIOGO/Yoke	☐ PUNTALI/Prods	☐ BOBINA/Coil	☐ CONDUTTORE CENTRALE/Central conduttor

METODO / Method		SMAGNETIZZAZIONE/Demagnetization	
☑ CONTINUO/Continuous	☐ RESIDUO /Residual	☐ RICHIESTA/Required	☑ NON RICHIESTA/Not Required
TIPO DI MAGNETIZZAZIONE/magnetization type		DIREZIONE CAMPO MAGNETICO/magnetic field direction	
☑ MAGNETICO/magnetic	☐ ELETTRICO/electric	☐ CIRCOLARE/Circular	☑ LONGITUDINALE/longitudinal
TIPO APPARECCHIO/Type of equipment	MAGNETICONTROL	DISTANZA PUNTALI/Pole spacing	180 mm
NUMERO DI SERIE/Serial number	04.230-15		
TIPO DI CORRENTE/Current Type		POTERE DI SOLLEVAMENTO GIOGO / Lifting power	
☑ A.C.	☐ D.C.	☑ 4,5 kg	☐ 18 kg
MEZZO DI ISPEZIONE / Examination medium		INTENSITÀ DI CORRENTE / Intesity	
☑ UMIDO/Wet	☐ SECCO/Dry	☐ A/ mm	☐ / spira

PARTICELLE UTILIZZATE/Particle Type			
CONTRASTO DI COLOR/Color contrast	☑	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	☑ NDT BW2 ☐ NDT DRY	MARCA TIPO/Mark Type	NDT FW1
LOTTO/BACH	7755s	LOTTO/BACH	/
VERNICE DI CONTRASTO / Contrast Paint		☐ NDT WBL5	LOTTO/BACH U210325s

SALDATURE CONTROLLATE / Welds Verified

THE CONTROL HAS BEEN CARRIED OUT ON 100% OF THE WELD:

- PQR 21/2022 - 8"x 8 mm WT – 6G – WS GX12

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITÀ Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zauli 3° Livello SNT-TC-1A / ISO 9712	ROSETTI MARINO S.p.A. A. Khalifa Welding Dept.	BUREAU VERITAS ITALY REVIEWED SURVEYOR G. TESEI DATE 04/03/2022

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta.
I risultati delle prove si riferiscono unicamente ai particolari esaminati.
Partial reproduction of this certificate must be written authorized.
Test results relate only to examined items.

Z:\Qualita\5 modulistica\01 moduli cnd\validi\01 moduli 2020\convenzionali superficiali

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n° 22049 UT 01 SZ Rev. 01

RAPPORTO D'ESAME CON ULTRASUONI Ultrasonic Examination report			DATA / Date 10/02/2022	FOGLIO / Sheet 1
CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	F Location Debottlenecking (F-DBN)	121A20	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
NORTH OIL COMPANY	PQR	/	/	/

ESECUZIONE / Execution	ACCETTABILITA' / Acceptance level
SOR-FY-19.257-ROMA-ASFYY-00-300028-0001_revA	SOR-FY-19.257-ROMA-ASFYY-00-300028-0001_revA

MATERIALE Material	DIMENSIONI Dimension	SPESSORE NOMINALE / Thk
SD-NOC-STR-201-S355KL40	PIPE 8 INCH	WT PIPE 8 mm

STATO DELLA SUPERFICIE – Surface condition

☑ COME SALDATO As welded	☐ SPAZZOLATO - Brushed	☐ LAVORATO DI MACCHINA - Machined
☐ MOLATO - Ground	☐ LAMINATO - Rolled	☐ GREZZO - Forged

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG 700	No. SERIE Serial Number	I003937

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	AMPLIFICAZIONE dB value	ONDE Waves
KRAUTKRAMER	KNF	4	10	0°	36	Long.
DOPPLER	AT	4	8X9	70°	40	Shear
DOPPLER	AT	4	8X9	60°	40	Shear

BLOCCO DI CALIBRAZIONE Calibration block	IIW V2	BLOCCO DI RIFERIMENTO Reference block	BLOCCO QT 04
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity 3 mm	DAC SU FORI Ø 3 mm

SALDATURE CONTROLLATE / Welds Verified

Stamp	Procedure Qualification	WPS	Joit Type	Position	Bevel	Thk mm	Scan plan
GX12	21/2022	21/2022	T-Joint	6G	1\2V	8	IDL-QCI-UT-222

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Not According to specification ☐

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zauli 3° Livello SNT - TC - 1A / ISO 9712	ROSETTI MARINO SpA S. Khalifa Welding Dept.	BUREAU VERITAS ITALY CHECKED REVIEWED SURVEYOR G. TESEI DATE 04/03/2022

E' vietata la riproduzione parziale del certificato senza l'autorizzazione scritta.
I risultati delle prove si riferiscono unicamente ai particolari esaminati.
Partial reproduction of this certificate must be written authorized.
Test results relate only to examined items.

Z:\Qualita\5 modulistica\Validi\01 moduli cnd\validi\01 2020 rev.0\convenzionali volumetrici

Object: *Oggetto:*	**MECHANICAL TEST ON PQR 21-2022**		Pag. 1 di 5
Specimen: *Saggio:* **076/22**	**#Base Material:** *Materiale Base:*	**API 5L X52 + N PSL1 WITH EN 10225 S355 G10+M**	**PIPE Ø 8'' THK. 8,00 mm OBTAINED FROM THK. 12,70 mm WITH PLATE THK. 30,00 mm**
	# Informazione fornita dal cliente/ Information provided by the customer		
Customer: *Committente:*	**ROSETTI MARINO S.p.a.**		
Address: *Indirizzo:*	**Via Trieste, 230 - 48122 Ravenna (RA)**		
Final customer:. *Cliente finale:*	//		
Your delivery note n°: *Vs. DDT di consegna*	**n°** *n°* //	**Date:** *Data:* //	**MD52** *MD 52* **011/2022** — **Date:** *Data:* **07/02/2022**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **28/02/2022**	**End of activities:** *Fine prove:*	**Date:** *Data:* **28/02/2022**

PROVE RICHIESTE

☐ **TENSILE TEST**/*Trazione*	☐ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*
☐ **BEND TEST**/*Piega*	☐ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root /*Dritto/Rovescio* ☐ Side/ *Laterale*
☐ **IMPACT TEST**/*Resilienza*	☐ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*
☒ **MACROEXAMINATION TEST** / *Macrografia*		
☒ **HARDNESS TEST**/ *Durezza*	☐ HV 5	☒ HV 10
☐ **FRACTURE TEST**/ *Frattura*	☐ Plate with/on Plate/ *Piastra con/su Piastra* ☐ Pipe with/on Pipe/*Tubo con/ su Tubo*	☐ Pipe on Plate/*Tubo su Piastra*
☐ **CHEMICAL ANALYSIS**/*Analisi Chimica*		
☐ **MICROEXAMINATION TEST** / *Micrografia*		
☐ **OTHER (Specify)**/*Altro/(Specificare)*		

Allegati /Attachments: *NONE*

NOTE/ Remarks: **REFERENCE CODE FROM CUSTOMER REQUEST: AWS D1.1: 2020 + SD-NOC-STR-301 Rev.03**
TEST WITNESSED BY ENG. GIANLUCA BRIGHI AND DARIO NAEIMI (DNV) AND ABDUL KARIM KHALIFA (ROSETTI)
Informazioni aggiuntive fornite dal cliente:
Additional information provided by the customer

Laboratory Responsible *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig. Giulio Bagnara - INSPECTA SRL - 04/03/2022 Service Responsible	ROSETTI MARINO SpA A. Khalifa Welding Dept.	ITALY WITNESSED SURVEYOR G. TESEI DATE 04/03/2022

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I risultati di prova si riferiscono al campione così come ricevuto, essendo il campionamento eseguito dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%. Quando emesso il Report in revisione, l'oggetto revisionato è identificabile mediante barra verticale posta sul lato sinistro e dal testo in formato corsivo sottolineato.
The results in this test report refers only to the specimen that has been tested. The customer undertakes to print out/reproduce the test report. Any partial reproduction is prohibited. Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory. The test results refer to the sample as received, since the sampling is performed by the customer. Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku=2 equivalent to a level of confidence of 95 %. When the Report under review is issued, the revised object can be identified by the vertical bar on the left side and by the text in italics underlined.

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::28/02/2022
Data esecuzione prova:

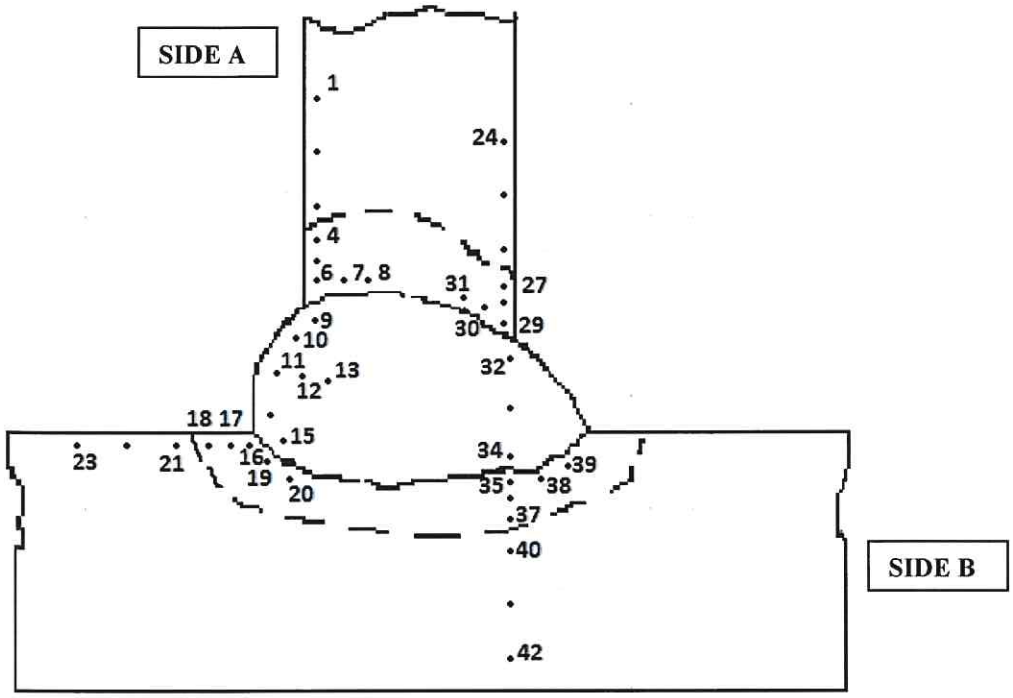
performed in accordance with the standard *eseguita in conformità alla norma* *SD-NOC-STR-301 Rev:03*

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	**Sample Identification** *Identificazione provino*	076/22 A	**Hardness test type** *Tipo di durezza*	HV10	**Test Temp.** *Temp.test*	19,7°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13 – 14 – 15	16 – 17 – 18 – 19 – 20	21 – 22 – 23
24 – 25 – 26	27 – 28 – 29 – 30 – 31	32 – 33 – 34	35 – 36 – 37 – 38 – 39	40 – 41 – 42



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**164-162-163**	/	24 – 25 – 26	**159-163-179**	/
4 – 5 – 6 – 7 – 8	**180-194-248-239-232**	/	27 – 28 – 29 – 30 – 31	**193-214-221-216-207**	/
9 – 10 – 11 – 12 – 13 – 14 – 15	**247-239-234-227-222-227-235**	/	32 – 33 – 34	**212-216-212**	/
16 – 17 – 18 – 19 – 20	**181-182-176-181-174**	/	35 – 36 – 37 – 38 – 39	**179-156-146-174-176**	/
21 – 22 – 23	**163-137-135**	/	40 – 41 – 42	**139-133-135**	/
Remarks/ *Note:*	**TAKEN AT H.6**				

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara		
- INSPECTA - Laboratory Technician 04/03/2022	- INSPECTA srl - 04/03/2022 Service Responsible	OSTELMARINO SpA K. Khalifa Welding Dept.	WITNESSED SURVEYOR G. TESEI DATE 04/03/2022

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::28/02/2022
Data esecuzione prova:

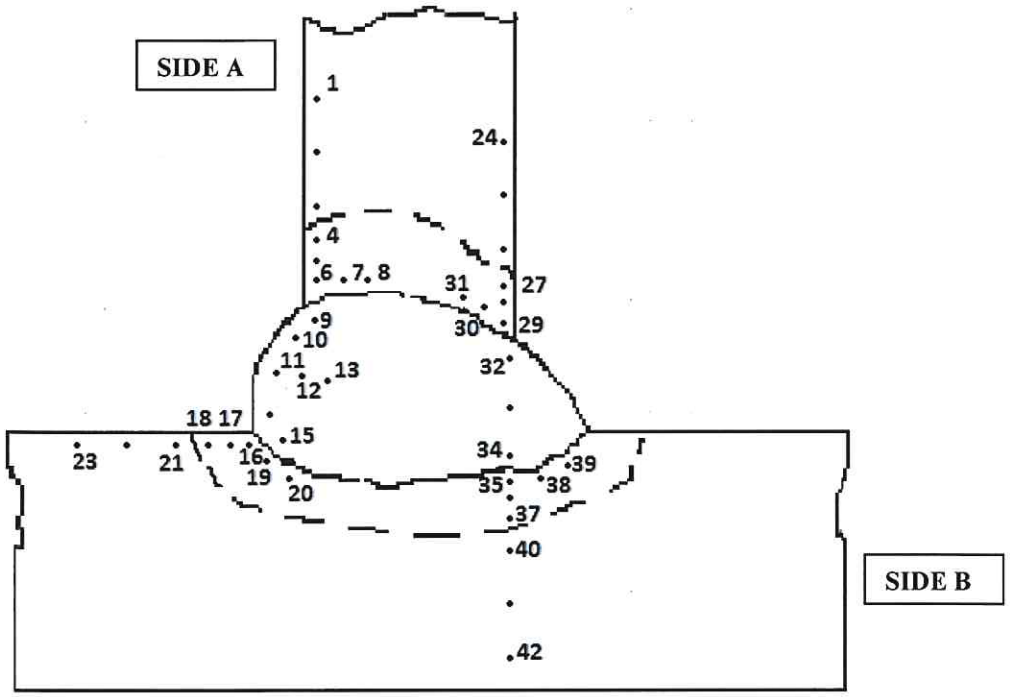
performed in accordance with the standard *eseguita in conformità alla norma* *SD-NOC-STR-301 Rev:03*

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	076/22 B	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	19,7°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13 – 14 – 15	16 – 17 – 18 – 19 – 20	21 – 22 – 23
24 – 25 – 26	27 – 28 – 29 – 30 – 31	32 – 33 – 34	35 – 36 – 37 – 38 – 39	40 – 41 – 42



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**163-156-163**	/	24 – 25 – 26	**160-170-207**	/
4 – 5 – 6 – 7 – 8	**189-231-266-263-240**	/	27 – 28 – 29 – 30 – 31	**214-231-225-229-206**	/
9 – 10 – 11 – 12 – 13 – 14 – 15	**235-250-237-228-238-232-232**	/	32 – 33 – 34	**208-215-244**	/
16 – 17 – 18 – 19 – 20	**186-183-178-184-178**	/	35 – 36 – 37 – 38 – 39	**178-159-145-175-172**	/
21 – 22 – 23	**165-140-134**	/	40 – 41 – 42	**135-137-135**	/

Remarks/ *Note:* **TAKEN AT H.12**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara	ROSETTI MARINO SpA A. Khalifa Welding Dept	WITNESSED SURVEYOR G. TESEI DATE 04/03/2022
Laboratory Technician 04/03/2022	Service Responsible 04/03/2022		

MACRO EXAMINATION TEST
Prova Macrografica

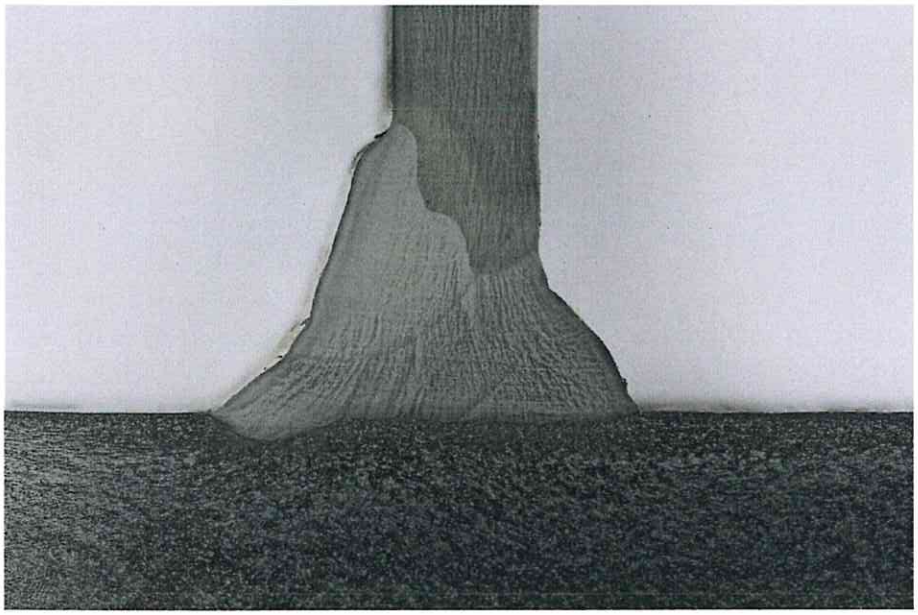
Date of Testing::28/02/2022
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**19,7°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**076/22 A**	**Magnification:** *Ingrandimento:*	**Photo at: 2.30x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.6** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Bucheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA S.p.A. ITALY WITNESSED SURVEYOR G. TESEI DATE 04/03/2022
INSPECTA srl Laboratory Technician 04/03/2022	- INSPECTA srl - Service Responsible 04/03/2022		

MACRO EXAMINATION TEST
Prova Macrografica

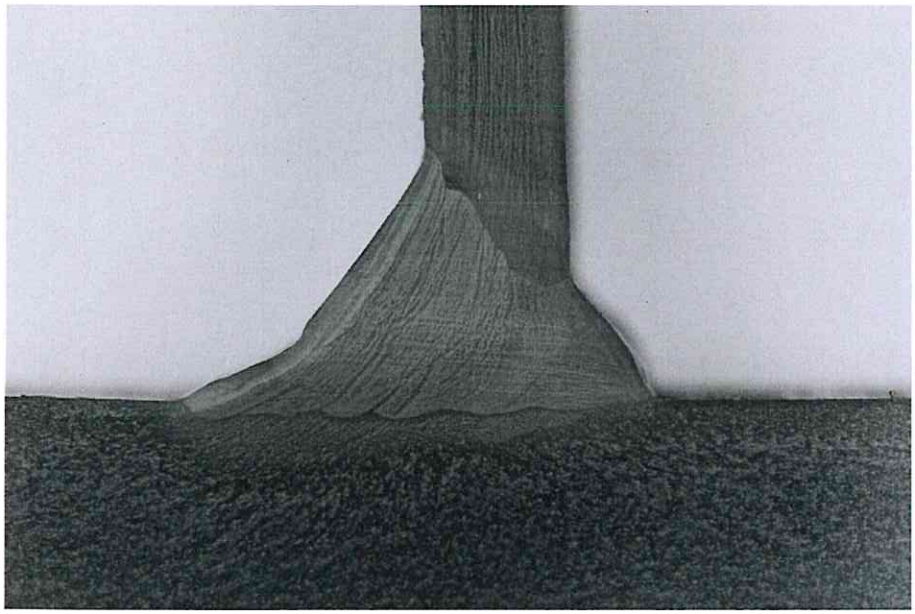
Date of Testing::28/02/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
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Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**19,7°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**076/22 B**	**Magnification:** *Ingrandimento:*	**Photo at: 2.30x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.12** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Bacheschi	Sig. Giulio Bagnara	ROSETTI MARINO SpA A. Khalifa Welding Dept.	BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 04/03/2022
- INSPECTA srl -	- INSPECTA srl -		
Laboratory Technician 04/03/2022	Service Responsible 04/03/2022		

END OF TEST REPORT
FINE DEL RAPPORTO DI PROVA

Manufacturer:
ArcelorMittal Tubular Products Roman S.A.
STEFAN CEL MARE STR, BL 15, SC. A, PARTER I
ROMAN, NEAMT ROMANIA

MILL TEST CERTIFICATE
according to EN 10204/3.1/2004
-

Page 1/3
B 17914/1
04.09.2019

ArcelorMittal

Buyer: T.A.L. S.P.A.con socio unico
VIA G. DI VITTORIO, 6, ZONA IND., 29017
FIORENZUOLA D'ARDA (PIACENZA)
ITALY

SEAMLESS STEEL LINE PIPES

Total weight:	Total Length:	Pieces	Bundles
21.593 tons - lbs	334.04 meters - feets	30	10

Standard: API 5L ed.46-2018-PSL 1; ISO 3183-2012/Amd.1:2017; ASTM A 333/A 333M-2018; ASME SA 333/SA 333M-2017; TS 02 REV.05/24.01.2012 with deviation as per our. TO No.4/2.10.2013; ASME B16.25-2017; ANSI/NACE MR 0103/ISO 17945-2015; NACE MR 0175/ISO 15156-1&2-2015

Buyer's reference: PO NO. : OF190514

Contract 50004296

Item	Item Client
32	-

Dimensions: 219.10 x 12.70 mm
-

Schedule: XS/80

Length: 10.00 - 11.80 m
-

-
-

Hydro Test:	Bar	PSI	MPa	Time(sec)
	205	-	20.5	5

Steel Grade: X52/6/L360
-

Chemical Analysis(%)

Heat	Bulletin No.	Product Req.		C	Mn	Si	S	P	Cr	Ni	Cu	Al	Mo	V	Nb	Ti	B
			Max	0.20	1.30	0.35	0.010	0.020	0.20	0.40	0.30	0.060	0.12	0.080	0.020	0.040	0.0010
			Min	-	-	0.15	-	-	-	-	-	0.015	-	0.060	-	-	-
1192466		Heat analysis		0.14	1.25	0.20	0.003	0.009	0.07	0.08	0.14	0.027	0.01	0.070	0.002	0.002	0.0004
1192466	19-1051	Product analysis		0.15	1.24	0.21	0.003	0.009	0.06	0.08	0.14	0.028	0.01	0.069	0.002	0.001	0.0003
1192466	19-1051	Product analysis		0.15	1.23	0.21	0.003	0.009	0.06	0.08	0.14	0.028	0.01	0.068	0.002	0.001	0.0003

Chemical Analysis(%)

Heat	Bulletin No.	Product Req.		Nb + V	Nb + Ti + V	Cr + Mo + Cu + Nb + V + Ti	CE_IIW
			Max	0.100	0.150	0.600	0.42
			Min	-	-	-	-
1192466		Heat analysis		0.072	0.074	0.295	0.39
1192466	19-1051	Product analysis		0.071	0.072	0.282	0.40
1192466	19-1051	Product analysis		0.070	0.071	0.281	0.40

$CEpcm = C+Si/30+Mn/20+Cu/20+Ni/60+Cr/20+Mo/15+V/10+5B$ $CE_S = C+Mn/6$ $CE_{IIW} = C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15$

Tensile Test

Heat	Orientation	Length		Width/Diameter		Thickness		Section		Mechanical test Bulletin No.	YS MPa	YS (PSI:1000)	UTS MPa	UTS (PSI:1000)	E %	YS/UTS max: -
		mm	inch	mm	inch	mm	inch	mm²	inch²							
1192466	Longitudinal Flat	50.8	-	40.00	-	12.80	-	512.0	-	19-3483	404.00	-	538.00	-	41.20	0.75
1192466	Longitudinal Flat	50.8	-	40.00	-	12.80	-	512.0	-	19-3483	410.00	-	536.00	-	39.90	0.76

BUREAU VERITAS ITALIA WELDING
FILE: 22.56
DATE: 07/04/2022
WITNESSED ☐
REVIEWED
48
375630-4-138

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative

TAL SPA - THIS DOCUMENT IS REPRODUCED BY A COMPUTERIZED SYSTEM AND IS CONFORM TO THE ORIGINAL

Approved by QUALITY1 on 11/09/19

Manufacturer:
ArcelorMittal Tubular Products Roman S.A.
STEFAN CEL MARE STR, BL 15, SC. A, PARTER I
ROMAN, NEAMT ROMANIA

MILL TEST CERTIFICATE
according to EN 10204/3.1/2004
-

B 17914/1
04.09.2019

ArcelorMittal

Buyer: T.A.L. S.P.A.con socio unico
VIA G. DI VITTORIO, 6, ZONA IND., 29017
FIORENZUOLA D'ARDA (PIACENZA)
ITALY

SEAMLESS STEEL LINE PIPES

Total weight:	Total Length:	Pieces	Bundles
21.593 tons - lbs	334.04 meters - feets	30	10

Standard: API 5L ed.46-2018-PSL 1; ISO 3183-2012/Amd.1:2017; ASTM A 333/A 333M-2018; ASME SA 333/SA 333M-2017; TS 02 REV.05/24.01.2012 with deviation as per our. TO No.4/2.10.2013; ASME B16.25-2017; ANSI/NACE MR 0103/ISO 17945-2015; NACE MR 0175/ISO 15156-1&2-2015

Buyer's reference: PO NO. : OF190514
Contract 50004296

Dimensions: 219.10 x 12.70 mm
-

Schedule: XS/80

Length: 10.00 - 11.80 m
-

-
-

Item	Item Client
32	-

Hydro Test:	Bar	PSI	MPa	Time(sec)
	205	-	20.5	5

Steel Grade: X52/6/L360
-

Impact Test

Heat	Impact Test Bulletin No.	Orientation	Size (mm)	Temp. (°C)	Req.KV (min. J)	KV values (J)			Req.Avr. (min. J)	Avr. fracture energy (J)	KCU min:-J/cm² T:°C			Shear Area min. %			Lateral Expansion min. mm		
1192466	19-4147	Longitudinal	10x10x55	-50	27.0	203	282	294	40.0	260	-	-	-	100	100	100	1.80	2.08	2.13

Hardness Test

Heat	Hardness Test Bulletin No.	HB max.-	HV 10 max.-	HV 10 max.-					HRC max.22
				OD	Midwall	ID	End A	End B	
1192466	19-2381	-	-	-	-	-	-	-	<22
1192466	19-2381	-	-	-	-	-	-	-	<22

Technological/Microstructure Test

Heat	Flattening Test Bulletin No.	Flattening Test
1192466	19-3193	OK
1192466	19-3193	OK

BUREAU VERITAS ITALIA WELDING
IT FILE: 22.5F.375304.138
DATE: 07/02/2022
WITNESSED ☐ REVIEW ☑
48

Heat

Heat	Pieces	Length (m)	Weight (kg)
1192466	30	334.04	21593

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative

TAL SPA - THIS DOCUMENT IS REPRODUCED BY A COMPUTERIZED SYSTEM AND IS CONFORM TO THE ORIGINAL

Approved by QUALITY1 on 11/09/19

Manufacturer:
ArcelorMittal Tubular Products Roman S.A.
STEFAN CEL MARE STR, BL 15, SC. A, PARTER I
ROMAN, NEAMT ROMANIA

MILL TEST CERTIFICATE
according to EN 10204/3.1/2004
-

B 17914/1
04.09.2019

ArcelorMittal

Buyer: T.A.L. S.P.A.con socio unico
VIA G. DI VITTORIO, 6, ZONA IND., 29017
FIORENZUOLA D'ARDA (PIACENZA)
ITALY

SEAMLESS STEEL LINE PIPES

Total weight:	Total Length:	Pieces	Bundles
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Standard: API 5L ed.46-2018-PSL 1; ISO 3183-2012/Amd.1:2017; ASTM A 333/A 333M-2018; ASME SA 333/SA 333M-2017; TS 02 REV.05/24.01.2012 with deviation as per our. TO No.4/2.10.2013; ASME B16.25-2017; ANSI/NACE MR 0103/ISO 17945-2015; NACE MR 0175/ISO 15156-1&2-2015

Buyer's reference	PO NO. : OF190514
Contract	**50004296**

Dimensions: 219.10 x 12.70 mm
-
Schedule: XS/80
Length: 10.00 - 11.80 m
-
-
-

Item	Item Client
32	-

Hydro Test:	Bar	PSI	MPa	Time(sec)
	205	-	20.5	5

Steel Grade: X52/6/L360
-

Remarks PIPES IN COMPLIANCE WITH PED: 2014-68-EU/15.05.2014, ANNEX 1, SECTION 4.3.
Manufacturing process – hot rolling.
Hot finished, steel is fully killed and produced by electric furnace, source G300706
Steel is fully killed with a fine grain practice , size min.7.
Visual inspection and dimensional check without objection.
Heat treatment: normalizing at temperature: 890-920°C, time soaking 9 min.
Magnetism residual max.30 Gauss.
Hydrostatic test hold for 5 sec. no leakage noticed.
The products was manufactured, sampled, tested, marked and inspected in accordance with the Standards, the supplementary requirements, and any other requirements designated in the purchase order, and has been found to meet such requirements.

BUREAU VERITAS ITALIA WELDING 48
"IT FILE: 22.5F.3756304.138
DATE: 07/02/2022
WITNESSED ☐ REVIEW ☑

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative

TAL SPA - THIS DOCUMENT IS REPRODUCED BY A COMPUTERIZED SYSTEM AND IS CONFORM TO THE ORIGINAL

Approved by QUALITY1 on 11/09/19

Certificado Nº (Certificate No.) S/ According to EN 10204-3.2 Página (Page) Fecha (Date)	275047-D1-20180404 Pag 1 / 4 04/04/2018

AENOR ER Empresa Registrada UNE-EN ISO 9001 ER-0030/1992

ArcelorMittal España, S.A.
Residencia de la Granda
33418 - Gozón
Asturias - España

CERTIFICADO DE INSPECCIÓN
INSPECTION CERTIFICATE

ArcelorMittal

O. Suministro (Works Order No)	Cliente (Customer)	Destino (Destination)	Producto (Product)	Especificación (Specification)	Pedido cliente/Customer order:
BC8219	ARCELOR PROJECTS INT. BV	MANNESMANNWEG. 5 4794SL - HEIJNINGEN-HOLANDA	Chapa Gruesa / Heavy Plate	S355G10+M S355ML EN 10225 EN 10025-4 MOD NORSOK	FB74AMP01W 3200055705

Descripción del producto / Description of the product

ITEM 10

Colada (Heat No)	Chapa (Plate No)	Dimensiones, mm (Size, mm)	Peso, t (Weight)
705587	42843891	30 x 3050 x 12000	8,619

Colada (Heat No)	Chapa (Plate No)	Dimensiones, mm (Size, mm)	Peso, t (Weight)
705587	42843901	30 x 3050 x 12000	8,619

Colada (Heat No)	Chapa (Plate No)	Dimensiones, mm (Size, mm)	Peso, t (Weight)
705587	42844171	30 x 3050 x 12000	8,619

Colada (Heat No)	Chapa (Plate No)	Dimensiones, mm (Size, mm)	Peso, t (Weight)

Total chapas (plates)	3	Total peso (Weight)	25,86

Análisis de colada y producto / Heat and product analysis

SU02: Nb+V SU03: Nb+V+Ti PCM: C+Si/30+(Mn+Cu+Cr)/20+Ni/60+Mo/15+V/10+5B CEV: C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15

Nº Colada (Heat No)	Nº muestra (Sample No)	Composición química (Chemical analysis)% *(H=Colada / Heat P=Producto / Product)																										
		*H/P	C	Mn	Si	S	P	Al	N	Cu	Ni	Cr	Mo	Nb	V	Ti	B	As	Sn	Sb	Pb	Ca	Bi	Pcm	Cev	SU03	SU02
705587		H	0,06	1,52	0,274	0,002	0,013	0,024	0,0044	0,212	0,301	0,032	0,003	0,028	0,003	0,012	0,0001	0,002	0,0030	0,000	<0,001	0,0001	<0,002	0,16	0,35	0,04	0,03
	20171023081	P	0,06	1,53	0,273	0,003	0,012	0,022	0,0047	0,217	0,301	0,029	0,001	0,025	0,005	0,012	0,0001							0,17	0,36	0,04	0,03

(1) L=longitudinal T= Transversal Z= Through thickness D= Diagonal
(2) C=Cabeza (top) P=Pie (bottom) S= Superficie (surface) 4=1/4 esp. (1/4 thickness) 3=1/3 esp. (1/3 thickness) E=Esp. Completo (full thick.) N=Nucleo (midthickness)
(3) " " =BrutoLaminación (as rolled) - A= N +R - L=Conformado de Normalización (normalizing rolling) - T=Tratamiento Termomec.(termomec. rolling) - N=Normalizado(normalized) - R=Revenido(tempering)
Type of test: A: Ultrasonic test approved; Z35: Through thickness test; HV: Vickers hardness test;(HT)*: Postwelding heat treatment of test coupons: 580 +/- 20ºC Soaking time: 4h.
ISO-V: Toughness; ISO-V(S): Toughness after stretching 5%; ISO-V(S+A): Toughness after stretching 5% + 250ºC, 1 hour

Ensayos mecánicos / Mechanical test

BUREAU VERITAS ITALIA WELDING
IT FILE: 20 [illegible] 6306 138
DATE: 07/0[illegible]029
WITNESSED ☐ REVIEWED

Nº Chapa (Plate No.)	Nº Muestra (Sample No)	Esp. Thickness	Est.Sum (Delivered condition) (3)	UST (Ust test)	Tipo ensayo (Type of test)		Orient. (Orientation) (1)	Local. (Location) (2)	Temp. (Temp) ºC	Ensayo de tracción (Tensile test) Reh Y.P. Mpa	Rm T.S. Mpa	Reh / Rm	%A Elong. (1) 5,65√So (2) 8 Inch	Ensayo Resiliencia (Charpy-V Impact test) Energia (Energy), j Individuales (Inviduals) 1	2	3	Media (Av.)	Otros ensayos (other test) Individuales (Inviduals) 1	2	3	Media (Av)	Doblado (Bend test) Mandril (Mandrel)	Angulo (Angle)	Result. (Result)
42843891	20171023065	30	T	A	ISO-V 10 (HT)	(j)	T	C S	-40					210	238	231	226							
	20171023065	30	T	A	ISO-V 10 (HT)	(j)	L	C S	-50					300	293	282	292							
	20171023065	30	T	A	ISO-V 10	(j)	T	C S	-40					257	300	270	276							
	20171023065	30	T	A	ISO-V 10	(j)	L	C S	-50					300	300	283	294							

B.O.S. Continuously cast slab.
Visual and dimensional inspection of plates: satisfactory
Surface quality according/ EN 10163 Class B Subclass 3+ ISO 8501 Class B
Dimensional tolerances according to EN 10029; thickness tolerances according to EN 10029 class C
Flatness: EN 10029 (2010) Class N
EN 10025: Options 2 and 4; EN 10225: Options 10, 12, 13 and 18
Ultrasonic inspection EN 10160 S2 E3

CE
0099
ArcelorMittal España,S.A.
Residencia la Granda
33418 Gozón (Asturias - España)
07
QP00033_CPR2013-07-01_FC_V006
EN 10025-4:2004
S355ML

Uso previsto: estructuras soldadas, atornilladas o remachadas. (Intented to be used in welded, bolted and riveted structures)
Límite elástico (Yield strength)*
Resistencia a tracción (Tensile strength)*
Alargamiento (Elongation)*
Resis. flexión choque (Impact strength)*
Soldabilidad (Weldability)*
Durabilidad (Durability)*
* Expresado como se indica en el DdP (Expressed as indicated in the DoP)

Por / By Classification society

Javier Sánchez
Gijon Office
Lloyd's Register España SA

Por / By ArcelorMittal España

Juan Manual Vigil Fernández
Jefe Calidad Chapa Gruesa Heavy
Plate Quality Manager
Flat Carbon Europe

ArcelorMittal España,S.A - Registro Mercantil de Asturias,Tomo 2279, Folio 115, Hoja AS- 17946-N.I.F.A81046856 - Oficina de certificados:certificados.gijon@arcelormittal.com-Tlf+ 34985187776

Certificado Nº (Certificate No.) S/ According to EN 10204-3.2 Página (Page) Fecha (Date)	275047-D1-20180404 Pag 2 / 4 04/04/2018

AENOR Empresa Registrada UNE-EN ISO 9001 ER-0030/1992

ArcelorMittal España, S.A.
Residencia de la Granda
33418 - Gozón
Asturias - España

CERTIFICADO DE INSPECCIÓN
INSPECTION CERTIFICATE

ArcelorMittal

O. Suministro (Works Order No)	Cliente (Customer)	Destino (Destination)	Producto (Product)	Especificación (Specification)	Pedido cliente/Customer order:
BC8219	ARCELOR PROJECTS INT. BV	MANNESMANNWEG. 5 4794SL - HEIJNINGEN-HOLANDA	Chapa Gruesa / Heavy Plate	S355G10+M S355ML EN 10225 EN 10025-4 MOD NORSOK	FB74AMP01W 3200055705

(1) L=longitudinal T= Transversal Z= Through thickness D= Diagonal
(2) C=Cabeza (top) P=Pie (bottom) S= Superficie (surface) 4=1/4 esp. (1/4 thickness) 3=1/3 esp. (1/3 thickness) E=Esp. Completo (full thick.) N=Nucleo (midthickness)
(3) " " =BrutoLaminación (as rolled) - A= N +R - L=Conformado de Normalización (normalizing rolling) - T=Tratamiento Termomec.(termomec. rolling) - N=Normalizado(normalized) - R=Revenido(tempering)
Type of test: A: Ultrasonic test approved; Z35: Through thickness test; HV: Vickers hardness test;(HT)*: Postwelding heat treatment of test coupons: 580 +/- 20ºC Soaking time: 4h.
ISO-V: Toughness; ISO-V(S): Toughness after stretching 5%; ISO-V(S+A): Toughness after stretching 5% + 250ºC, 1 hour

Ensayos mecánicos / Mechanical test

Nº Chapa (Plate No.)	Nº Muestra (Sample No)	Esp. Thickness	Est.Sum (Delivered condition) (3)	UST (Us test)	Tipo ensayo (Type of test)	Orient. (Orientation) (1)	Local. (Location) (2)	Temp. (Temp) ºC	Ensayo de tracción (Tensile test) Reh Y.P. Mpa	Rm T.S. Mpa	Reh / Rm	%A Elong. (1) 5,65√So (2) 8 Inch	Ensayo Resiliencia (Charpy-V Impact test) Energia (Energy), j Individuales (Inviduals) 1	2	3	Media (Av.)	Otros ensayos (other test) Individuales (Inviduals) 1	2	3	Media (Av)	Doblado (Bend test) Mandril (Mandrel)	Angulo (Angle)	Result. (Result)
	20171023065	30	T	A	Tensile (HT)* (Mpa)	T	C E		440	509	0,86	31,9											
	20171023065	30	T	A	Tensile Z (Mpa)	Z	C E			587													
	20171023065	30	T	A	Tensile (Mpa)	T	C E		430	511	0,84	28,4											
	20171023065	30	T	A	Z35 (%)	Z	C E										75	44	65	61			
	20171023078	30	T	A	ISO-V(S+A) 10 (j)	T	C S	-40					174	42	182	133							
	20171023078	30	T	A	ISO-V(S) 10 (j)	T	C S	-40					248	207	221	225							
	20171023078	30	T	A	HV 10	T	C S	20									155	149	150	151			
	20171023081	30	T	A	HV 10	T	P S	20									149	151	150	150			
42843901	20171023072	30	T	A	ISO-V 10 (HT) (j)	T	C S	-40					193	233	281	236							
	20171023072	30	T	A	ISO-V 10 (HT) (j)	L	C S	-50					300	300	300	300							
	20171023072	30	T	A	ISO-V 10 (j)	T	C S	-40					300	300	300	300							
	20171023072	30	T	A	ISO-V 10 (j)	L	C S	-50					261	240	253	251							
	20171023072	30	T	A	Tensile (HT)* (Mpa)	T	C E		432	504	0,86	33,0											
	20171023072	30	T	A	Tensile Z (Mpa)	Z	C E			591													
	20171023072	30	T	A	Tensile (Mpa)	T	C E		453	514	0,88	31,9											

BUREAU VERITAS FOR PLATE WELDING
IT FILE: 22.FF.375306.138
DATE: 07/02/2022
WITNESSED ☐ REVIEW ☐
48

B.O.S. Continuously cast slab.
Visual and dimensional inspection of plates: satisfactory
Surface quality according/ EN 10163 Class B Subclass 3+ ISO 8501 Class B
Dimensional tolerances according to EN 10029; thickness tolerances according to EN 10029 class C
Flatness: EN 10029 (2010) Class N
EN 10025: Options 2 and 4; EN 10225: Options 10, 12, 13 and 18
Ultrasonic inspection EN 10160 S2 E3

Por / By Classification society

Javier Sanchez
Gijon Office
Lloyd's Register España SA

Por / By ArcelorMittal España
Juan Manual Vigil Fernández
Jefe Calidad Chapa Gruesa Heavy Plate Quality Manager
Flat Carbon Europe

Certificado Nº (Certificate No.) S/ According to EN 10204-3.2 Página (Page) Fecha (Date)	275047-D1-20180404 Pag 3 / 4 04/04/2018

AENOR ER Empresa Registrada UNE-EN ISO 9001 ER-0030/1992

ArcelorMittal España, S.A.
Residencia de la Granda
33418 - Gozón
Asturias - España

CERTIFICADO DE INSPECCIÓN
INSPECTION CERTIFICATE

ArcelorMittal

O. Suministro (Works Order No)	Cliente (Customer)	Destino (Destination)	Producto (Product)	Especificación (Specification)	Pedido cliente/Customer order:
BC8219	ARCELOR PROJECTS INT. BV	MANNESMANNWEG. 5 4794SL - HEIJNINGEN-HOLANDA	Chapa Gruesa / Heavy Plate	S355G10+M S355ML EN 10225 EN 10025-4 MOD NORSOK	FB74AMP01W 3200055705

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Type of test: A: Ultrasonic test approved; Z35: Through thickness test; HV: Vickers hardness test;(HT)*: Postwelding heat treatment of test coupons: 580 +/- 20ºC Soaking time: 4h.
ISO-V: Toughness; ISO-V(S): Toughness after stretching 5%; ISO-V(S+A): Toughness after stretching 5% + 250ºC, 1 hour

Ensayos mecánicos / Mechanical test

Nº Chapa (Plate No.)	Nº Muestra (Sample No)	Esp. Thickness	Est.Sum (Delivered condition) (3)	UST (Us test)	Tipo ensayo (Type of test)		Orient. (Orientation) (1)	Local. (Location) (2)	Temp. (Temp) ºC	Ensayo de tracción (Tensile test) Reh Y.P. Mpa	Rm T.S. Mpa	Reh / Rm	%A Elong. (1) 5,65√So (2) 8 Inch	Ensayo Resiliencia (Charpy-V Impact test) Energia (Energy), j Individuales (Inviduals) 1	2	3	Media (Av.)	Otros ensayos (other test) Individuales (Inviduals) 1	2	3	Media (Av)	Doblado (Bend test) Mandril (Mandrel)	Angulo (Angle)	Result. (Result)
	20171023072	30	T	A	Z35	(%)	Z	C E										75	72	72	73			
	20171023078	30	T	A	ISO-V(S+A) 10	(j)	T	C S	-40					174	42	182	133							
	20171023078	30	T	A	ISO-V(S) 10	(j)	T	C S	-40					248	207	221	225							
	20171023078	30	T	A	HV 10		T	C S	20									155	149	150	151			
	20171023081	30	T	A	HV 10		T	P S	20									149	151	150	150			
42844171	20171023078	30	T	A	ISO-V(S+A) 10	(j)	T	C S	-40					174	42	182	133							
	20171023078	30	T	A	ISO-V(S) 10	(j)	T	C S	-40					248	207	221	225							
	20171023078	30	T	A	HV 10		T	C S	20									155	149	150	151			
	20171023078	30	T	A	ISO-V 10 (HT)	(j)	T	C S	-40					300	273	251	275							
	20171023078	30	T	A	ISO-V 10 (HT)	(j)	L	C S	-50					213	228	226	222							
	20171023078	30	T	A	ISO-V 10	(j)	T	C S	-40					209	156	169	178							
	20171023078	30	T	A	ISO-V 10	(j)	L	C S	-50					280	300	287	289							
	20171023078	30	T	A	Tensile (HT)*	(Mpa)	T	C E		401	501	0,80	31,9											
	20171023078	30	T	A	Tensile Z	(Mpa)	Z	C E			582													
	20171023078	30	T	A	Tensile	(Mpa)	T	C E		408	507	0,80	31,3											

BUREAU VERITAS ITALIA WELDING
IT FILE: 22.51: 3756306.138
DATE: 07/02/2022
WITNESSED ☐
REVIEW ☐
48

B.O.S. Continuously cast slab.
Visual and dimensional inspection of plates: satisfactory
Surface quality according/ EN 10163 Class B Subclass 3+ ISO 8501 Class B
Dimensional tolerances according to EN 10029; thickness tolerances according to EN 10029 class C
Flatness: EN 10029 (2010) Class N
EN 10025: Options 2 and 4; EN 10225: Options 10, 12, 13 and 18
Ultrasonic inspection EN 10160 S2 E3

Por / By Classification society

Javier Sánchez
Gijon Office
Lloyd's Register España SA

Por / By ArcelorMittal España
Juan Manual Vigil Fernández
Jefe Calidad Chapa Gruesa Heavy
Plate Quality Manager
Flat Carbon Europe

Certificado Nº (Certificate No.) S/ According to EN 10204-3.2 Página (Page) Fecha (Date)	275047-D1-20180404 Pag 4 / 4 04/04/2018

AENOR ER Empresa Registrada UNE-EN ISO 9001 ER-0030/1992

ArcelorMittal España, S.A.
Residencia de la Granda
33418 - Gozón
Asturias - España

CERTIFICADO DE INSPECCIÓN
INSPECTION CERTIFICATE

ArcelorMittal

O. Suministro (Works Order No)	Cliente (Customer)	Destino (Destination)	Producto (Product)	Especificación (Specification)	Pedido cliente/Customer order:
BC8219	ARCELOR PROJECTS INT. BV	MANNESMANNWEG. 5 4794SL - HEIJNINGEN-HOLANDA	Chapa Gruesa / Heavy Plate	S355G10+M S355ML EN 10225 EN 10025-4 MOD NORSOK	FB74AMP01W 3200055705

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(3) " " =BrutoLaminación (as rolled) - A= N +R - L=Conformado de Normalización (normalizing rolling) - T=Tratamiento Termomec.(termomec. rolling) - N=Normalizado(normalized) - R=Revenido(tempering)
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Ensayos mecánicos / Mechanical test

Nº Chapa (Plate No.)	Nº Muestra (Sample No)	Esp. Thickness	Est.Sum (Delivered condition) (3)	UST (Us test)	Tipo ensayo (Type of test)	Orient. (Orientation) (1)	Local. (Location) (2)	Temp. (Temp) °C	Ensayo de tracción (Tensile test) Reh Y.P. Mpa	Rm T.S. Mpa	Reh / Rm	%A Elong. (1) 5,65√So (2) 8 Inch	Ensayo Resiliencia (Charpy-V Impact test) Energia (Energy), j Individuales (Inviduals) 1	2	3	Media (Av.)	Otros ensayos (other test) Individuales (Inviduals) 1	2	3	Media (Av)	Doblado (Bend test) Mandril (Mandrel)	Angulo (Angle)	Result. (Result)
	20171023078	30	T	A	Z35 (%)	Z	C E										73	71	68	71			
	20171023081	30	T	A	HV 10	T	P S	20									149	151	150	150			

BUREAU VERITAS ITALIA WELDING 48
"IT FILE: 22.SF.375630 4.138
DATE: 07/02/2022
WITNESSED ☐ REVIEW ☑

B.O.S. Continuously cast slab.
Visual and dimensional inspection of plates: satisfactory
Surface quality according/ EN 10163 Class B Subclass 3+ ISO 8501 Class B
Dimensional tolerances according to EN 10029; thickness tolerances according to EN 10029 class C
Flatness: EN 10029 (2010) Class N
EN 10025: Options 2 and 4; EN 10225: Options 10, 12, 13 and 18
Ultrasonic inspection EN 10160 S2 E3

Por / By Classification society

Javier Sanchez
Gijon Office
Lloyd's Register España SA

Por / By ArcelorMittal España

Juan Manual Vigil Fernández
Jefe Calidad Chapa Gruesa Heavy
Plate Quality Manager
Flat Carbon Europe

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2021-12-22

Numero certificato/Cert no: EC26661767 rev. 0

Nostro ordine/Our order:	0100420342	Vostro ordine/Your order:	437/21
Nostro riferimento/Our ref:	HYBRIS PRD account	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB01056	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20211221	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address
TECHNO SERVICE S.R.L.
VIA DELLA MERENDA32 FOR.ZARATTINI
48124 RAVENNA
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
TECHNO SERVICE S.R.L.
VIA DELLA MERENDA,32 FOR.ZARATTINI
48124 RAVENNA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PNV4610432 Quantità/Quantity: 896 KGM

PRODOTTO/PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK Tubrod 15.17 1.2mm 16kg
Codice/Item no:	**1517127730**

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.29: E81T1-Ni1CJ H4
SFA/AWS A5.29: E81T1-Ni1MJ
EN ISO 17632-A: T 46 3 1Ni P C1 2 H5
EN ISO 17632-A: T 46 4 1Ni P M21 2 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:	M21 (EN ISO 14175)
C	0.07%
Si	0.37%
Mn	1.15%
P	0.01%
S	0.02%
Cr	0.03%
Ni	1.1%
Mo	0.02%
Nb	0.02%
Cu	0.01%
V	0.02%

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:	EN
Altro/Auxiliary:	M21 (EN ISO 14175)
Condizione/Condition:	As welded

TRAZIONE/TENSILE

ReL	Rm	A5
544 MPa	613 MPa	26 %

RESILIENZA/IMPACT

Temp	-40 °C
KV	124 J

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.375 6304-138
DATE: 07/02/2022
WITNESSED ☐ REVIEW ☑

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura S.p.A. | Str. Provinciale 34, n.37 - 20010 Ossona MI, Italy

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis		Validazione - altro/Validation - Others	
Piotr Grela	Quality Assurance Manager	Neil Farrow	Product Manager

ROSETTI MARINO	Welding Procedure Qualification Record (PQR) Verbale di Qualifica di Procedura di Saldatura	No. 22/22	Sheet/Foglio 1/2

Manufacturer's Welding Procedure. Ref. no.	22/22 REV. 0		
Manufacturer	ROSETTI MARINO S.p.A.		
Address	VIA TRIESTE 230 - 48121 RAVENNA		
Code, Testing Standard	Project Spec. SD-NOC-STR-301 Rev.03		
Date of welding	February 07th , 2022		
Examiner of examining body	Bureau Veritas S.p.A.		
RANGE OF QUALIFICATION			
Welding process	GS FCAW	//	//
Type(s)	Semiautomatic	//	//
Welding Equipment Type	HF inverter type		
Actual parent Material side A	Pipe: API 5L X52+N PSL1 (Heat: H1192466)		
Actual parent Material side B	Plate: EN 10225: S355G10+M (Heat: 705587)		
Parent Material grade	AWS D1.1 - II / ISO 15608 1.2		
Supply condition	A) Normalized (+N) to B) Thermomechanically Rolled (+TM)		
Carbon equivalent/Pcm/C	Heat Values: A) 0,40/0,253/0,15 to B) 0,35/0,163/0,06		
Groove design/configuration	Half Vee T-Joint (one side welding without backing), For groove dimension and details see Welding Table 22/22		
Parent material thickness (mm)	A)12,00 mm (obtained from parent material of 12,70 mm thk.) to B)30,00 mm		
Weld metal thickness (mm)	12,00 mm	//	//
Single or Multi-pass	Multiple	//	//
Outside diameter	219,10 mm (8")		
Filler material Designation	AWS 5.29 E81T1-Ni1MJ	//	//
Filler material Maker	OK Tubrod 15.17 - ESAB	//	//
Filler material Size	Ø 1,2 mm	//	//
Shielding gas/Flux	80% Ar + 20% CO2	//	//
Shielding gas flow rate	16 l/min.	//	//
Backing gas (purging)	None		

Type of welding current & polarity	GS FCAW: DC/RP	Heat input / Apporto termico (kJ/mm) - 25%	Pass	Diameter (mm)	6G	//
			Root	Ø 1,2	2,24 to 2,98	//
			Hot	Ø 1,2	1,52 to 2,03	//
			Fill	Ø 1,2	1,33 to 1,90	//
			Cap	Ø 1,2	0,89 to 1,24	//

Welding position	6G - Uphill progression		
Preheat (°C)	25	Interpass temperature / Temp. di interpass (°C)	208
Post-Weld Heat Treatment and/or ageing	None		
Weld bead width	Max. 11 mm		
Welder's detail	Giulianini Dario (GX12)		
Time lapse between root and hot pass	N.A.		
Other information / Altre informazioni	- Preheat performed by propane torch		

BUREAU VERITAS ITALY
WITNESSED
SURVEYOR G. TESEI
DATE 04/03/2022

ROSETTI MARINO	Welding Procedure Qualification Record (PQR) Verbale di Qualifica di Procedura di Saldatura	No. 22/22	Sheet/Foglio 2/2

Manufacturer's Welding Procedure. Ref. no.	22/22 REV. 0		
Test result (WPQR) N°	22/22	Date/Data	04/03/2022
Manufacturer's WPS No.	pWPS 22/22 REV. 1	Date/Data	07/02/2022

TESTS CARRIED OUT ON SAMPLE 1/1 WELDED IN 6G POSITION

NON DESTRUCTIVE EXAMINATIONS		
	Judgement	Report No.
Visual examinations	Acceptable	VDR 07/2022 dated 10/02/2022
Penetrant test	N.A.	N.A.
Magnetic particle test	Acceptable	22049 MT 07 SZ Rev.01 dated 10/02/2022
Radiographic test	N.A.	N.A.
Ultrasonic test	Acceptable	22049 UT 02 SZ Rev.01 dated 10/02/2022

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2] //	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] //	A [%]	Z [%]	Fracture Location	Remarks
//	//	//	//	//	//	//	//
//	//	//	//	//	//	//	//

BEND TEST

Type & N.	Bend angle	Remarks	Results
//	//	//	//

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] //			Avarage value [J] //	Remarks
//	//	//	//	//	//	//	//	//
//	//	//	//	//	//	//	//	//
//	//	//	//	//	//	//	//	//
//	//	//	//	//	//	//	//	//

OTHER TESTS	
Type of test / Tipo di prova	Results / Risultati
2 Macro examination and Hardness test	Satisfactory: See INSPECTA S.R.L. Test Report No. 041-00330-22 dated 04/03/2022
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	INSPECTA S.r.l. - Ravenna (RA)
Laboratory report reference N.	Report No. 041-00330-22 dated 04/03/2022
Test carried out in the presence of:	BUREAU VERITAS Italy

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Project Spec. SD-NOC-STR-301 Rev.03

Date/Data
04-03-2022

ROSETTI MARINO S.p.A.

ROSETTI MARINO SpA
A. Khalifa
Welding Dept.

Examiner or Examination Body
BUREAU VERITAS Italy
Giancarlo Tesei

Name and signature / Nome e firma

BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 04/03/2022

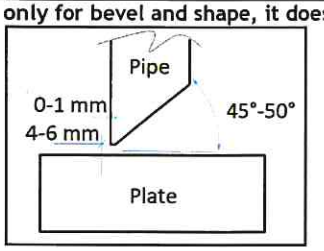
PQR ref.: 22/22	code Project Spec. SD-NOC-STR-301	WPS 22/22	REV.: 1	Data /date 07/02/22

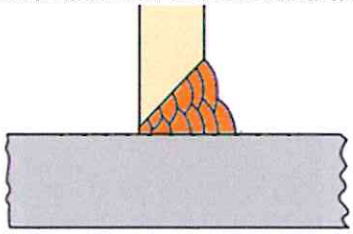
Procedimento di saldatura / Welding process: GS FCAW — Tipo / Type: SEMIAUTOMATIC — scopo / scope: CJP, T-joint

GIUNTO - JOINT

Tipo di giunto / Joint Design: ½ V — ☐ DOUBLE SIDED WELD — ☒ SINGLE SIDED WELD (no backing on root)

Dettagli / Details: sketch is only for bevel and shape, it does not indicate the welding position that is detailed in dedicated section below





MATERIALE BASE - BASE MATERIAL

API 5L X52+N PSL1 to EN 10225: S355G10+M — Material grade: +N to +TM — Max Cev 0.40 to 0.35

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove 12,00 mm obtained from 12,70 mm to 30,00 mm

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove 219,10 mm (8") to Plate

METALLO D'APPORTO - FILLER METAL

	GS FCAW		
Spec. N° (SFA)	5.29		
AWS N° (CLASS)	E81T1-Ni1M		
F-N°	6		
A-N°	10		
Diametro mat. d'apporto / Size of filler metal	1,2		
Metallo depositato / Deposit weld metal	12,00		
Gamma spessori /Thick. range	Up to completion		
Accoppiamento filo-flusso / Electrode-flux (CLASS)	N.A.		
Denom. Comm. flusso / FLUX trade name	N.A.		
Inserto consumabile / Consumable insert	N.A.		
Altro / other	OK Tubrod 15.17 - ESAB		

giunto / Joint: Cianfrino / groove — Posizione / position: 6G — Progressione / weld progression: Uphill

PRERISCALDO - PRE-HEAT (QW406)

Temp.preriscaldo minima / Min. pre-heat temp: 25°C — Max temp. Di interpass / Max interpass temp.: 208°C — Preheat Method / Metodo preriscaldo: Propane Torch

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs): N.A. — Temperatura di stasi / Holding temperature °C: N.A. — Tempo di stasi / Holding time (min.): N.A. — Velocità di raffreddamento / Cooling rate (°C/Hrs): N.A.

GAS DI PROTEZIONE - GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar+CO2	80-20	16-18 lt/min
Protezione / Shielding:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current: DC - CV — Polarità / Polarity: RP

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: N.A.

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: Spray arc

Velocità alimentazione filo / Electr. Wire feed speed range: Self regulated

TECNICA - TECHNIQUE

Passata / Bead: Tirata-Larga/String-Wave — Dimensione bocchello gas / Orifice of gas cup size: 3/4" — Pulizia iniziale e fra le passate / Initial and interpass cleaning: Spazzolatura e Molatura/Brushing Grinding

Metodo di solcatura a rovescio / Method of back gouging: N.A. — Oscillazione / Oscillation: N.A. — Distanza tra zona di contatto e pezzo / Contact tube to work distance: 13 - 18 mm

N°Passate / Passes nr.: Multipla/Multiple — Elettrodo multiplo o singolo / Multiple or single electrodes: Singolo/Single — Martellatura / Peening: N.A.

Altro / Other: Max. width of weld bead 11 mm

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range	Vel. avanzamento / Travel speed range (mm/min)	Apporto termico / Heat input (KJ/mm)
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. range			
Root	GS FCAW	E81T1-Ni1M	1,2	DC/RP	220 to 230	23 to 24	111 to 120	2,53 to 2,98
Hot	GS FCAW	E81T1-Ni1M	1,2	DC/RP	230 to 240	24 to 25	165 to 185	1,79 to 2,18
Fill	GS FCAW	E81T1-Ni1M	1,2	DC/RP	230 to 240	24 to 25	180 to 200	1,66 to 2,00
Cap	GS FCAW	E81T1-Ni1M	1,2	DC/RP	230 to 240	24 to 25	270 to 310	1,07 to 1,33

Preparato da / prepared by: *D.Cenacchi*

Approvato da / approved by: *A. Khalifa*

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.3756304 138
DATE: 07/02/2022
WITNESSED ☐ REVIEW ☑

ROSETTI MARINO

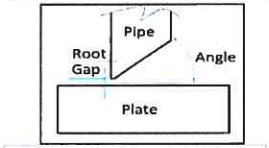
PQR - AS- RUN PARAMETER SHEET

pWPS 22/22	
PQR 22/22	
Coupon Nr. 1/1	
Date: 07/02/22	Page: 1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: **Project Spec. SD-NOC-STR-301 Rev.03**

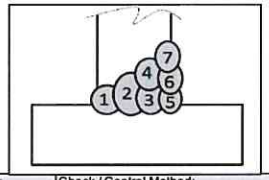
Welder Name(s):	GIULIANINI DARIO	Welder Id No(s):	GX12		
Welding Process(es):	GS FCAW	Type(s):	SEMIAUTOMATIC		
Welding Position:	6G	Progression:	Uphill		
Base Materials:	a) API 5L X52+N PSL1 to b) EN 10225: S355G10+M	Wall Thickness:	a) 12,00 mm (*) to b) 30,00 mm	Diameter:	219,10 mm
Heat No(s):	a) H1192466 to) 705587	Joint Type:	HALF VEE T - JOINT; ONE SIDE WELDING WITHOUT BACKING		

WELD PREPARATION:



Root: 0,50 mm ; Gap : 5,00 mm ; Angle: 45°

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Hot Pass	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Filling Runs	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Cap	1,2	PNV4610432	OK Tubrod 15.17 - ESAB

GAS:

Shielding Gas:	Ar + CO2
Composition:	80% CO2 + 20% Ar
Flow:	16 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/4"
Tungsten Type:	N.A.
O2 Content of Back Purge:	N.A.

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
Max. width of weld bead 11 mm	String and weave	Multiple	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
25°C	Propane Torch	208 °C	Contact Digital Thermometer	N.A.	N.A.	N.A.	N.A.

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
N.A.	1	GS FCAW	1	-	5.29 E81T1-Ni1MJ	1,2	DC EP	220	240	230,0	23	25	24,0	-	-	11,1	2,98	-	68	Welding unit: INE KMP 5000 - TY4
N.A.	2	GS FCAW	2	-	5.29 E81T1-Ni1MJ	1,2	DC EP	226	246	236,0	23,8	25,8	24,8	-	-	17,3	2,03	-	93	Digital thermometer: HT Mod. A103 - Probe: TK100. Matr. 181103331 - 19/2353
N.A.	3	GS FCAW	3	-	5.29 E81T1-Ni1MJ	1,2	DC EP	222	242	232,0	23,9	25,9	24,9	-	-	19,6	1,77	-	106	Amphorometer Clamp: HT Mod. 9020 Matr. 16121407
N.A.	3	GS FCAW	4	-	5.29 E81T1-Ni1MJ	1,2	DC EP	228	248	238,0	23,9	25,9	24,9	-	-	18,7	1,90	-	140	(*) Machined from Base Metal Thickness: 12,70 mm
N.A.	4	GS FCAW	5	-	5.29 E81T1-Ni1MJ	1,2	DC EP	220	240	230,0	23,9	25,9	24,9	-	-	27,8	1,24	-	208	
N.A.	4	GS FCAW	6	-	5.29 E81T1-Ni1MJ	1,2	DC EP	226	246	236,0	23,9	25,9	24,9	-	-	29,6	1,19	-	115	
N.A.	4	GS FCAW	7	-	5.29 E81T1-Ni1MJ	1,2	DC EP	230	250	240,0	23,9	25,9	24,9	-	-	30,0	1,20	-	113	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA A. Khalifa Welding Dept.	Signature:	Signature:	Signature:
Date:	Date:	Date:	Date:

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.3756304.138
DATE: 07/02/2022
WITNESSED ☑ REVIEW ☐

ROSETTI MARINO	VERBALE DI CONTROLLO VISIVO/DIMENSIONALE visual/dimensional inspection report	VDR N° 07/2022 data: 10/02/2022
progetto project: F Location Debottlenecking (F-DBN)	cliente client: NORTH OIL COMPANY	commessa job: 121A20

oggetto – item

Procedure Qualification Record (PQR) 22/2022

Certificato di Qualifica di Procedimento di Saldatura (PQR) 22/2022

WE CERTIFY THAT:

ITEMS INDICATED ABOVE HAVE UNDERGONE A VISUAL INSPECTION AND HAVE BEEN ACCEPTED ACCORDING TO THE SPECIFICATION / PROCEDURE MENTIONED AND TO ACCEPTANCE CRITERIA DEFINED IN IT

SI CERTIFICA CHE LE SALDATURE DEI SAGGI SOPRA CITATI SONO STATI SOTTOPOSTI AD ESAME VISIVO AL 100% ALLO STATO COME SALDATO IN ACCORDO ALLE SPECIFICHE E STANDARD CITATI.

note – remarks

Inspection on welds 8"x 12 mm WT in as welded condition.

1 Samples in 6G

No visible defects have been detected.

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

SOR-FY-19.257-ROMA-ASFYY-00-300025-0001

Operatore – Operator	Controllo Qualita' - Quality Control	Cliente - Client
Stefano Zauli 3° Livello SNT - TC - 1A / ISO 9712	ROSETTI MARINO S.p.A. A. Khalifa Welding Dept.	BUREAU VERITAS ITALY REVIEWED SURVEYOR G. TESEI DATE 04/03/2022

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n° 22049 MT 07 SZ Rev. 01

RAPPORTO D'ESAME MAGNETOSCOPICO Magnetic Particle Test Report			DATA / Date 10/02/2022	FOGLIO / Sheet 1
CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	F Location Debottlenecking (F-DBN)	121A20	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	FASE Step
NORTH OIL COMPANY	PQR	/	/	/

ESECUZIONE / Execution		ACCETTABILITA' / Acceptance	
SOR-FY-19.257-ROMA-ASFYY-00-300026-0001		SOR-FY-19.257-ROMA-ASFYY-00-300026-0001	
MATERIALE/Material	TEMP. SUPERFICI Surface temperature	INTENSITA' LUMINOSA/ Light intensity	
C.S.	10°	☑ LUCE BIANCA >1076 Lux ☐ LUCE BIANCA >500 Lux	☐ LUCE NERA 1000 µW/cm²

STATO DELLA SUPERFICIE – Surface condition			
☑ COME SALDATO As welded	☐ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined	
☐ GREZZO – Forged	☐ LAMINATO – Rolled	☐ MOLATO – Ground	☐ SABBIATO – Blasted

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☑ GIOGO/Yoke	☐ PUNTALI/Prods	☐ BOBINA/Coil	☐ CONDUTTORE CENTRALE/Central conduttor

METODO / Method		SMAGNETIZZAZIONE/Demagnetization	
☑ CONTINUO/Continuous	☐ RESIDUO /Residual	☐ RICHIESTA/Required	☑ NON RICHIESTA/Not Required
TIPO DI MAGNETIZZAZIONE/magnetization type		DIREZIONE CAMPO MAGNETICO/magnetic field direction	
☑ MAGNETICO/magnetic	☐ ELETTRICO/electric	☐ CIRCOLARE/Circular	☑ LONGITUDINALE/longitudinal
TIPO APPARECCHIO/Type of equipment	MAGNETICONTROL	DISTANZA PUNTALI/Pole spacing	180 mm
NUMERO DI SERIE/Serial number	04.230-15		
TIPO DI CORRENTE/Current Type		POTERE DI SOLLEVAMENTO GIOGO / Lifting power	
☑ A.C.	☐ D.C.	☑ 4,5 kg	☐ 18 kg
MEZZO DI ISPEZIONE / Examination medium		INTENSITÀ DI CORRENTE / Intesity	
☑ UMIDO/Wet	☐ SECCO/Dry	☐ A/ mm	☐ / spira

PARTICELLE UTILIZZATE/Particle Type					
CONTRASTO DI COLOR/Color contrast	☑			FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	☑ NDT BW2	☐ NDT DRY		MARCA TIPO/Mark Type	NDT FW1
LOTTO/BACH	7755s			LOTTO/BACH	/
VERNICE DI CONTRASTO / Contrast Paint			☐	NDT WBL5	LOTTO/BACH U210325s

SALDATURE CONTROLLATE / Welds Verified

THE CONTROL HAS BEEN CARRIED OUT ON 100% OF THE WELD:

- PQR 22/2022 - 8"x 12 mm WT – 6G – WS GX12

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITÀ Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zauli 3° Livello SNT-TC-1A / ISO 9712	ROSETTI MARINO SpA A. Khalifa Welding Dept.	BUREAU VERITAS ITALY WITNESSED REVIEWED SURVEYOR G. TESEI DATE 04/03/2022

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta.
I risultati delle prove si riferiscono unicamente ai particolari esaminati.
Partial reproduction of this certificate must be written authorized.
Test results relate only to examined items.

Z:\Qualita\5 modulistica\01 moduli cnd\validi\01 moduli 2020\convenzionali superficiali

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n° 22049 UT 02 SZ Rev. 01

RAPPORTO D'ESAME CON ULTRASUONI Ultrasonic Examination report	DATA / Date 10/02/2022	FOGLIO / Sheet 1

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	F Location Debottlenecking (F-DBN)	121A20	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
NORTH OIL COMPANY	PQR	/	/	/

ESECUZIONE / Execution	ACCETTABILITA' / Acceptance level
SOR-FY-19.257-ROMA-ASFYY-00-300028-0001_revA	SOR-FY-19.257-ROMA-ASFYY-00-300028-0001_revA

MATERIALE Material	DIMENSIONI Dimension	SPESSORE NOMINALE / Thk
SD-NOC-STR-201-S355KL40	PIPE 8 INCH	WT PIPE 12 mm

STATO DELLA SUPERFICIE – Surface condition

☑ COME SALDATO As welded	☐ SPAZZOLATO - Brushed	☐ LAVORATO DI MACCHINA - Machined
☐ MOLATO - Ground	☐ LAMINATO - Rolled	☐ GREZZO - Forged

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG 700	No. SERIE Serial Number	I003937

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	AMPLIFICAZIONE dB value	ONDE Waves
KRAUTKRAMER	KNF	4	10	0°	36	Long.
DOPPLER	AT	4	8X9	70°	40	Shear
DOPPLER	AT	4	8X9	60°	40	Shear

BLOCCO DI CALIBRAZIONE Calibration block	IIW V2	BLOCCO DI RIFERIMENTO Reference block	BLOCCO QT 04
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity 3 mm	DAC SU FORI Ø 3 mm

SALDATURE CONTROLLATE / Welds Verified

Stamp	Procedure Qualification	WPS	Joit Type	Position	Bevel	Thk mm	Scan plan
GX12	22/2022	22/2022	T-Joint	6G	1\2V	12	IDL-QCI-UT-222

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Not According to specification ☐

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zauli 2° Livello SNT-TC - 1A / ISO 9712	ROSETTI MARINO SpA A. Khalifa Welding Dept.	BUREAU VERITAS ITALY REVIEWED SURVEYOR G. TESEI DATE 04/03/2022

E' vietata la riproduzione parziale del certificato senza l'autorizzazione scritta. Partial reproduction of this certificate must be written authorized.
I risultati delle prove si riferiscono unicamente ai particolari esaminati. Test results relate only to examined items.
Z:\Qualita\5 modulistica\Validi\01 moduli cnd\validi\01 2020 rev 0\convenzionali volumetrici

Object: *Oggetto:*	**MECHANICAL TEST ON PQR 22-2022**	Pag. 1 di 5
Specimen: *Saggio:* **077/22**	**#Base Material:** *Materiale Base:* **API 5L X52 + N PSL1 WITH EN 10225 S355 G10+M**	**PIPE Ø 8'' THK. 12,00 mm OBTAINED FROM THK. 12,70 mm WITH PLATE THK. 30,00 mm**
	# Informazione fornita dal cliente/ Information provided by the customer	
Customer: *Committente:*	**ROSETTI MARINO S.p.a.**	
Address: *Indirizzo:*	**Via Trieste, 230 - 48122 Ravenna (RA)**	
Final customer:. *Cliente finale:*	//	

Your delivery note n°: *Vs. DDT di consegna*	**n°** // *n°*	**Date:** *Data:* //	**MD52** *MD 52*	**011/2022**	**Date:** *Data:* **07/02/2022**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **28/02/2022**	**End of activities:** *Fine prove:*			**Date:** *Data:* **28/02/2022**

PROVE RICHIESTE

☐ **TENSILE TEST**/*Trazione*	☐ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*
☐ **BEND TEST**/*Piega*	☐ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root /*Dritto/Rovescio* ☐ Side/ *Laterale*
☐ **IMPACT TEST**/*Resilienza*	☐ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*
☒ **MACROEXAMINATION TEST** / *Macrografia*		
☒ **HARDNESS TEST**/ *Durezza*	☐ HV 5	☒ HV 10
☐ **FRACTURE TEST**/ *Frattura*	☐ Plate with/on Plate/ *Piastra con/su Piastra* ☐ Pipe with/on Pipe/*Tubo con/ su Tubo*	☐ Pipe on Plate/*Tubo su Piastra*
☐ **CHEMICAL ANALYSIS**/*Analisi Chimica*		
☐ **MICROEXAMINATION TEST** / *Micrografia*		
☐ **OTHER (Specify)**/*Altro/(Specificare)*		

Allegati /Attachments: *NONE*

NOTE/ Remarks: **REFERENCE CODE FROM CUSTOMER REQUEST: AWS D1.1: 2020 + SD-NOC-STR-301 Rev.03**
TEST WITNESSED BY ENG. GIANLUCA BRIGHI AND DARIO NAEIMI (DNV) AND ABDUL KARIM KHALIFA (ROSETTI)
Informazioni aggiuntive fornite dal cliente:
Additional information provided by the customer

Laboratory Responsible	**Customer Inspector**	**Third part Inspector**
Responsabile Laboratorio	*Ispettore del cliente*	*Ispettore Terza parte*
Sig. Giulio Bagnara	ROSETTI MARINO SPA A. Khalifa Welding Dept.	DET NORSKE VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 04/03/2022
- INSPECTA srl - 04/03/2022 Servizio Responsabile		

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I risultati di prova si riferiscono al campione così come ricevuto, essendo il campionamento eseguito dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%. Quando emesso il Report in revisione, l'oggetto revisionato è identificabile mediante barra verticale posta sul lato sinistro e dal testo in formato corsivo sottolineato.
The results in this test report refers only to the specimen that has been tested. The customer undertakes to print out/reproduce the test report. Any partial reproduction is prohibited. Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory. The test results refer to the sample as received, since the sampling is performed by the customer. Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku=2 equivalent to a level of confidence of 95 %. When the Report under review is issued, the revised object can be identified by the vertical bar on the left side and by the text in italics underlined.

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::28/02/2022
Data esecuzione prova:

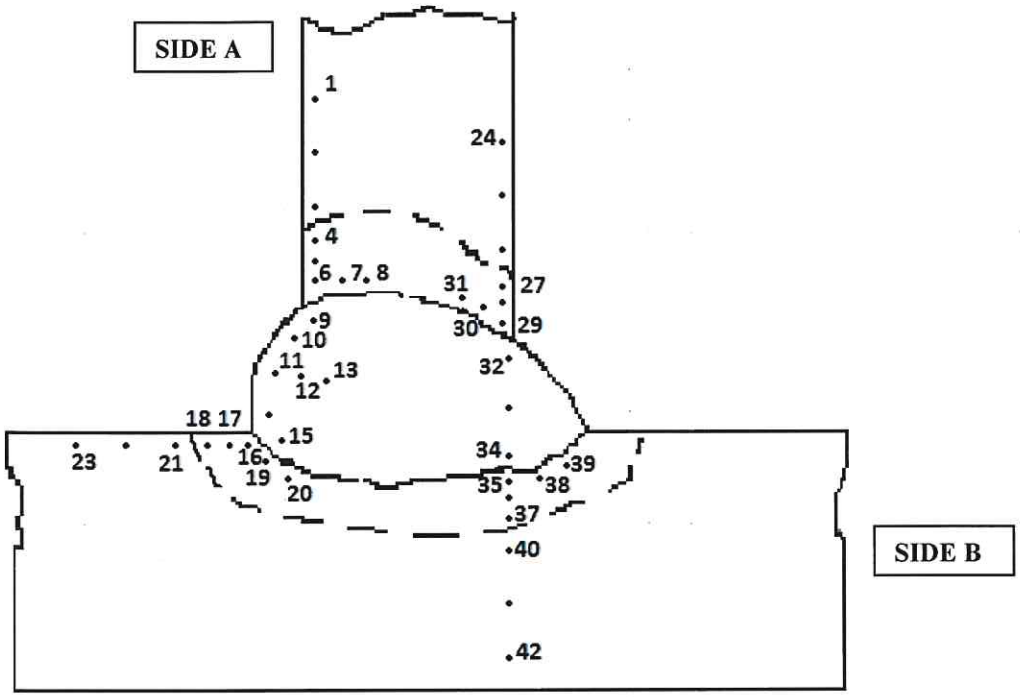
performed in accordance with the standard *eseguita in conformità alla norma* *SD-NOC-STR-301 Rev:03*

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	077/22 A	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	19,7°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13 – 14 – 15	16 – 17 – 18 – 19 – 20	21 – 22 – 23
24 – 25 – 26	27 – 28 – 29 – 30 – 31	32 – 33 – 34	35 – 36 – 37 – 38 – 39	40 – 41 – 42



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**153-159-169**	/	24 – 25 – 26	**175-173-207**	/
4 – 5 – 6 – 7 – 8	**172-191-247-238-229**	/	27 – 28 – 29 – 30 – 31	**217-229-234-240-224**	/
9 – 10 – 11 – 12 – 13 – 14 – 15	**210-232-230-238-236-229**	/	32 – 33 – 34	**211-220-216**	/
16 – 17 – 18 – 19 – 20	**241-225-177-153-170-176**	/	35 – 36 – 37 – 38 – 39	**177-143-138-178-180**	/
21 – 22 – 23	**144-130-135**	/	40 – 41 – 42	**137-135-134**	/

Remarks/ *Note:* **TAKEN AT H.6**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Bacheschi	Sig. Giulio Bolnara	ROSETTI MARINO S.p.A. Khalifa Welding Dept	RINA SERVICES S.p.A. ITALY WITNESSED SURVEYOR G. TESEI
04/03/2022	04/03/2022		04/03/2022

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::28/02/2022
Data esecuzione prova:

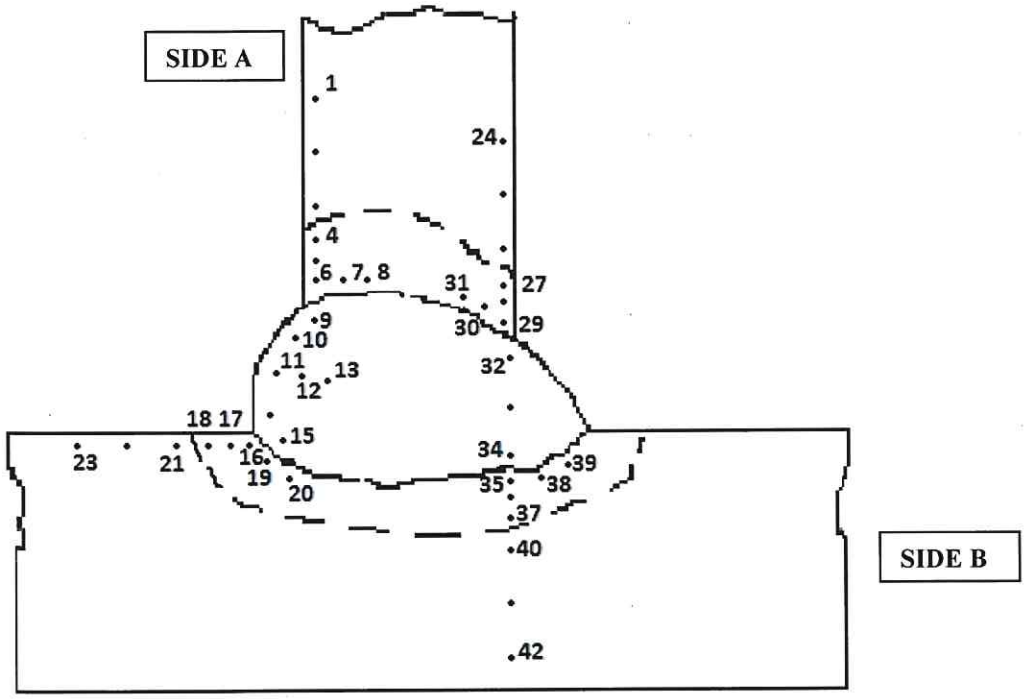
performed in accordance with the standard *eseguita in conformità alla norma* *SD-NOC-STR-301 Rev:03*

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	**Sample Identification** *Identificazione provino*	077/22 B	**Hardness test type** *Tipo di durezza*	HV10	**Test Temp.** *Temp.test*	19,7°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13 – 14 – 15	16 – 17 – 18 – 19 – 20	21 – 22 – 23
24 – 25 – 26	27 – 28 – 29 – 30 – 31	32 – 33 – 34	35 – 36 – 37 – 38 – 39	40 – 41 – 42



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	152-157-171	/	24 – 25 – 26	175-178-214	/
4 – 5 – 6 – 7 – 8	166-195-260-245-207	/	27 – 28 – 29 – 30 – 31	222-234-225-247-199	/
9 – 10 – 11 – 12 – 13 – 14 – 15	236-239-244-242-233-241-239	/	32 – 33 – 34	201-228-219	/
16 – 17 – 18 – 19 – 20	168-160-149-176-172	/	35 – 36 – 37 – 38 – 39	161-143-136-166-166	/
21 – 22 – 23	130-125-130	/	40 – 41 – 42	141-127-132	/

Remarks/ *Note:* TAKEN AT H.12

Laboratory Technician *Tecnico di Laboratorio* *Dott. Ing. Mauro Baccheschi*	**Laboratory Responsible** *Responsabile Laboratorio* *Sig. Giulio Bagnara*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
INSPECTA srl Laboratory Technician 04/03/2022	- INSPECTA srl - 04/03/2022 Service Responsible	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA SERVICES S.p.A. ITALY WITNESSED SURVEYOR G. TESEI DATE 04/03/2022

MACRO EXAMINATION TEST
Prova Macrografica

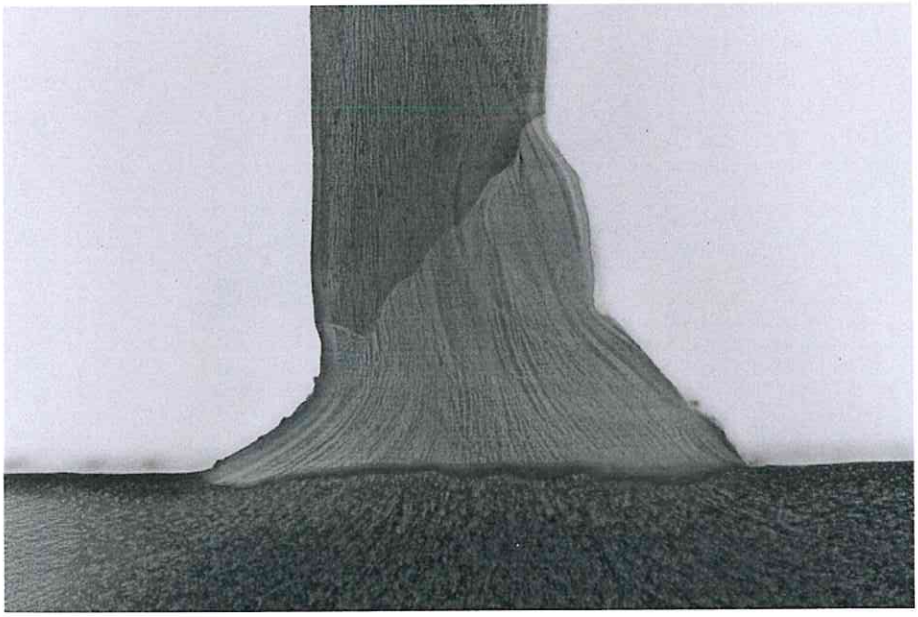
Date of Testing::28/02/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**19,7°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**077/22 A**	**Magnification:** *Ingrandimento:*	**Photo at: 2.50x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.6** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SpA A.Khalifa Welding Dept	RINA SERVICES S.p.A. ITALY WITNESSED SURVEYOR G. TESEI DATE 04/03/2022
- INSPECTA srl - 04/03/2022	- INSPECTA srl - 04/03/2022 Service Responsible		

MACRO EXAMINATION TEST
Prova Macrografica

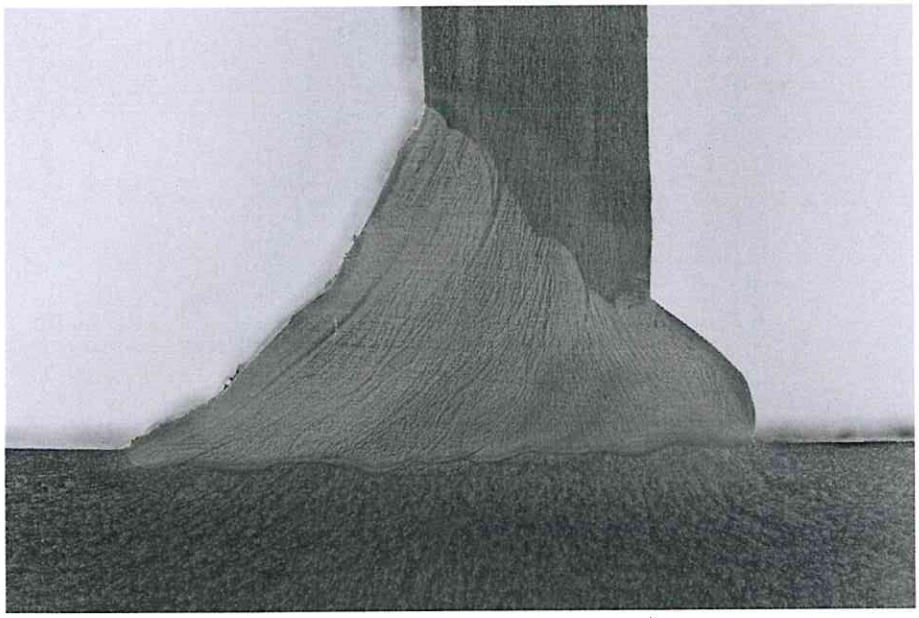
Date of Testing::28/02/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *Procedura internal*	*PP12 rev.04*	**Test temperatura** *Temperature Test*	**19,7°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**077/22 B**	**Magnification:** *Ingrandimento:*	**Photo at: 2.50x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.12** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Bacchetti	*Sig. Giulio Bagnara*	ROSETTI MARINO A. Khalifa Welding Dept	BUREAU VERITAS ITALY WITNESSED REVIEWED SURVEYOR G. TESEI DATE 04/03/2022
04/03/2022	- INSPECTA srl - Service Responsible 04/03/2022		

END OF TEST REPORT
FINE DEL RAPPORTO DI PROVA

Manufacturer:
ArcelorMittal Tubular Products Roman S.A.
STEFAN CEL MARE STR, BL 15, SC. A, PARTER I
ROMAN, NEAMT ROMANIA

MILL TEST CERTIFICATE

according to EN 10204/3.1/2004

-

Page 1/3
B 17914/1
04.09.2019

ArcelorMittal

Buyer: T.A.L. S.P.A.con socio unico
VIA G. DI VITTORIO, 6, ZONA IND., 29017
FIORENZUOLA D'ARDA (PIACENZA)
ITALY

SEAMLESS STEEL LINE PIPES

Total weight:	Total Length:	Pieces	Bundles
21.593 tons - lbs	334.04 meters - feets	30	10

Standard: API 5L ed.46-2018-PSL 1; ISO 3183-2012/Amd.1:2017; ASTM A 333/A 333M-2018; ASME SA 333/SA 333M-2017; TS 02 REV.05/24.01.2012 with deviation as per our. TO No.4/2.10.2013; ASME B16.25-2017; ANSI/NACE MR 0103/ISO 17945-2015; NACE MR 0175/ISO 15156-1&2-2015

Buyer's reference	PO NO. : OF190514
Contract	**50004296**

Dimensions: 219.10 x 12.70 mm
-

Schedule: XS/80

Length: 10.00 - 11.80 m
-

-
-

Item	Item Client
32	-

Hydro Test:

Bar	PSI	MPa	Time(sec)
205	-	20.5	5

Steel Grade: X52/6/L360
-

Chemical Analysis(%)

Heat	Bulletin No.	Product Req.		C	Mn	Si	S	P	Cr	Ni	Cu	Al	Mo	V	Nb	Ti	B
			Max	0.20	1.30	0.35	0.010	0.020	0.20	0.40	0.30	0.060	0.12	0.080	0.020	0.040	0.0010
			Min	-	-	0.15	-	-	-	-	-	0.015	-	0.060	-	-	-
1192466		Heat analysis		0.14	1.25	0.20	0.003	0.009	0.07	0.08	0.14	0.027	0.01	0.070	0.002	0.002	0.0004
1192466	19-1051	Product analysis		0.15	1.24	0.21	0.003	0.009	0.06	0.08	0.14	0.028	0.01	0.069	0.002	0.001	0.0003
1192466	19-1051	Product analysis		0.15	1.23	0.21	0.003	0.009	0.06	0.08	0.14	0.028	0.01	0.068	0.002	0.001	0.0003

Chemical Analysis(%)

Heat	Bulletin No.	Product Req.		Nb + V	Nb + Ti + V	Cr + Mo + Cu + Nb + V + Ti	CE_IIW
			Max	0.100	0.150	0.600	0.42
			Min	-	-	-	-
1192466		Heat analysis		0.072	0.074	0.295	0.39
1192466	19-1051	Product analysis		0.071	0.072	0.282	0.40
1192466	19-1051	Product analysis		0.070	0.071	0.281	0.40

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.3956304-138
DATE: 07/02/2020
WITNESSED ☐ REVIEW ☑

CEpcm = C+Si/30+Mn/20+Cu/20+Ni/60+Cr/20+Mo/15+V/10+5B CE_S = C+Mn/6 CE_{IIW} = C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15

Tensile Test

Heat	Orientation	Length		Width/Diameter		Thickness		Section		Mechanical test Bulletin No.	YS MPa	YS (PSI:1000)	UTS MPa	UTS (PSI:1000)	E %	YS/UTS max: -
		mm	inch	mm	inch	mm	inch	mm²	inch²							
1192466	Longitudinal Flat	50.8	-	40.00	-	12.80	-	512.0	-	19-3483	404.00	-	538.00	-	41.20	0.75
1192466	Longitudinal Flat	50.8	-	40.00	-	12.80	-	512.0	-	19-3483	410.00	-	536.00	-	39.90	0.76

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative

Formular 12A rev 9

TAL SPA - THIS DOCUMENT IS REPRODUCED BY A COMPUTERIZED SYSTEM AND IS CONFORM TO THE ORIGINAL

Approved by QUALITY1 on 11/09/19

Manufacturer:
ArcelorMittal Tubular Products Roman S.A.
STEFAN CEL MARE STR, BL 15, SC. A, PARTER I
ROMAN, NEAMT ROMANIA

MILL TEST CERTIFICATE
according to EN 10204/3.1/2004
-

B 17914/1
04.09.2019

ArcelorMittal

Buyer: T.A.L. S.P.A.con socio unico
VIA G. DI VITTORIO, 6, ZONA IND., 29017
FIORENZUOLA D'ARDA (PIACENZA)
ITALY

SEAMLESS STEEL LINE PIPES

Total weight:	Total Length:	Pieces	Bundles
21.593 tons - lbs	334.04 meters - feets	30	10

Standard: API 5L ed.46-2018-PSL 1; ISO 3183-2012/Amd.1:2017; ASTM A 333/A 333M-2018; ASME SA 333/SA 333M-2017; TS 02 REV.05/24.01.2012 with deviation as per our. TO No.4/2.10.2013; ASME B16.25-2017; ANSI/NACE MR 0103/ISO 17945-2015; NACE MR 0175/ISO 15156-1&2-2015

Buyer's reference: PO NO. : OF190514
Contract 50004296

Dimensions: 219.10 x 12.70 mm
-

Schedule: XS/80

Length: 10.00 - 11.80 m
-

-
-

Item	Item Client
32	-

Hydro Test:

Bar	PSI	MPa	Time(sec)
205	-	20.5	5

Steel Grade: X52/6/L360
-

Impact Test

Heat	Impact Test Bulletin No.	Orientation	Size (mm)	Temp. (°C)	Req.KV (min. J)	KV values (J)			Req.Avr. (min. J)	Avr. fracture energy (J)	KCU min:-J/cm² T:°C			Shear Area min. %			Lateral Expansion min. mm		
1192466	19-4147	Longitudinal	10x10x55	-50	27.0	203	282	294	40.0	260	-	-	-	100	100	100	1.80	2.08	2.13

Hardness Test

Heat	Hardness Test Bulletin No.	HB max.-	HV 10 max.-	HV 10 max.-					HRC max.22
				OD	Midwall	ID	End A	End B	
1192466	19-2381	-	-	-	-	-	-	-	<22
1192466	19-2381	-	-	-	-	-	-	-	<22

Technological/Microstructure Test

Heat	Flattening Test Bulletin No.	Flattening Test
1192466	19-3193	OK
1192466	19-3193	OK

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.3756304.138
DATE: 07/02/2022
WITNESSED ☐ REVIEW ☑

Heat

Heat	Pieces	Length (m)	Weight (kg)
1192466	30	334.04	21593

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative

TAL SPA - THIS DOCUMENT IS REPRODUCED BY A COMPUTERIZED SYSTEM AND IS CONFORM TO THE ORIGINAL

Approved by QUALITY1 on 11/09/19

Manufacturer: ArcelorMittal Tubular Products Roman S.A. STEFAN CEL MARE STR, BL 15, SC. A, PARTER I ROMAN, NEAMT ROMANIA	**MILL TEST CERTIFICATE** according to EN 10204/3.1/2004 -						Page 3/3 B 17914/1 04.09.2019	ArcelorMittal	
Buyer: T.A.L. S.P.A.con socio unico VIA G. DI VITTORIO, 6, ZONA IND., 29017 FIORENZUOLA D'ARDA (PIACENZA) ITALY	SEAMLESS STEEL LINE PIPES						Total weight: 21.593 tons - lbs	Total Length: 334.04 meters - feets	Pieces 30 / Bundles 10
	Standard: API 5L ed.46-2018-PSL 1; ISO 3183-2012/Amd.1:2017; ASTM A 333/A 333M-2018; ASME SA 333/SA 333M-2017; TS 02 REV.05/24.01.2012 with deviation as per our. TO No.4/2.10.2013; ASME B16.25-2017; ANSI/NACE MR 0103/ISO 17945-2015; NACE MR 0175/ISO 15156-1&2-2015								
Buyer's reference PO NO. : OF190514	Dimensions: 219.10 x 12.70 mm -		Schedule: XS/80				Length: 10.00 - 11.80 m -	- -	
Contract 50004296									

Item	Item Client	Hydro Test:	Bar	PSI	MPa	Time(sec)	Steel Grade: X52/6/L360 -
32	-		205	-	20.5	5	

Remarks PIPES IN COMPLIANCE WITH PED: 2014-68-EU/15.05.2014, ANNEX 1, SECTION 4.3.
Manufacturing process – hot rolling.
Hot finished, steel is fully killed and produced by electric furnace, source G300706
Steel is fully killed with a fine grain practice , size min.7.
Visual inspection and dimensional check without objection.
Heat treatment: normalizing at temperature: 890-920°C, time soaking 9 min.
Magnetism residual max.30 Gauss.
Hydrostatic test hold for 5 sec. no leakage noticed.
The products was manufactured, sampled, tested, marked and inspected in accordance with the Standards, the supplementary requirements, and any other requirements designated in the purchase order, and has been found to meet such requirements.

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.3756304.138
DATE: 07/02/2022
WITNESSED ☐ REVIEW ☑

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative

TAL SPA - THIS DOCUMENT IS REPRODUCED BY A COMPUTERIZED SYSTEM AND IS CONFORM TO THE ORIGINAL

Approved by QUALITY1 on 11/09/19

Certificado Nº (Certificate No.) S/ According to EN 10204-3.2 Página (Page) Fecha (Date)	275047-D1-20180404 Pag 1 / 4 04/04/2018

AENOR ER Empresa Registrada UNE-EN ISO 9001 ER-0030/1992

ArcelorMittal España, S.A.
Residencia de la Granda
33418 - Gozón
Asturias - España

CERTIFICADO DE INSPECCIÓN
INSPECTION CERTIFICATE

ArcelorMittal

O. Suministro (Works Order No)	Cliente (Customer)	Destino (Destination)	Producto (Product)	Especificación (Specification)	Pedido cliente/Customer order:
BC8219	ARCELOR PROJECTS INT. BV	MANNESMANNWEG. 5 4794SL - HEIJNINGEN-HOLANDA	Chapa Gruesa / Heavy Plate	S355G10+M S355ML EN 10225 EN 10025-4 MOD NORSOK	FB74AMP01W 3200055705

Descripción del producto / Description of the product

ITEM 10

Colada (Heat No)	Chapa (Plate No)	Dimensiones, mm (Size, mm)	Peso, t (Weight)
705587	42843891	30 x 3050 x 12000	8,619

Colada (Heat No)	Chapa (Plate No)	Dimensiones, mm (Size, mm)	Peso, t (Weight)
705587	42843901	30 x 3050 x 12000	8,619

Colada (Heat No)	Chapa (Plate No)	Dimensiones, mm (Size, mm)	Peso, t (Weight)
705587	42844171	30 x 3050 x 12000	8,619

Colada (Heat No)	Chapa (Plate No)	Dimensiones, mm (Size, mm)	Peso, t (Weight)

Total chapas (plates)	3	Total peso (Weight)	25,86

Análisis de colada y producto / Heat and product analysis

SU02: Nb+V SU03: Nb+V+Ti PCM: C+Si/30+(Mn+Cu+Cr)/20+Ni/60+Mo/15+V/10+5B CEV: C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15

Nº Colada (Heat No)	Nº muestra (Sample No)	Composición química (Chemical analysis)% *(H=Colada / Heat P=Producto / Product)																										
		*H/P	C	Mn	Si	S	P	Al	N	Cu	Ni	Cr	Mo	Nb	V	Ti	B	As	Sn	Sb	Pb	Ca	Bi	Pcm	Cev	SU03	SU02
705587		H	0,06	1,52	0,274	0,002	0,013	0,024	0,0044	0,212	0,301	0,032	0,003	0,028	0,003	0,012	0,0001	0,002	0,0030	0,000	<0,001	0,0001	<0,002	0,16	0,35	0,04	0,03
	20171023081	P	0,06	1,53	0,273	0,003	0,012	0,022	0,0047	0,217	0,301	0,029	0,001	0,025	0,005	0,012	0,0001							0,17	0,36	0,04	0,03

(1) L=longitudinal T= Transversal Z= Through thickness D= Diagonal
(2) C=Cabeza (top) P=Pie (bottom) S= Superficie (surface) 4=1/4 esp. (1/4 thickness) 3=1/3 esp. (1/3 thickness) E=Esp. Completo (full thick.) N=Nucleo (midthickness)
(3) " " =BrutoLaminación (as rolled) - A= N +R - L=Conformado de Normalización (normalizing rolling) - T=Tratamiento Termomec.(termomec. rolling) - N=Normalizado(normalized) - R=Revenido(tempering)
Type of test: A: Ultrasonic test approved; Z35: Through thickness test; HV: Vickers hardness test;(HT)*: Postwelding heat treatment of test coupons: 580 +/- 20ºC Soaking time: 4h.
ISO-V: Toughness; ISO-V(S): Toughness after stretching 5%; ISO-V(S+A): Toughness after stretching 5% + 250ºC, 1 hour

Ensayos mecánicos / Mechanical test

Nº Chapa (Plate No.)	Nº Muestra (Sample No)	Esp. Thickness	Est.Sum (Delivered condition) (3)	UST (Us test)	Tipo ensayo (Type of test)		Ensayo de tracción (Tensile test)						Ensayo Resiliencia (Charpy-V Impact test)						Otros ensayos (other test)				Doblado (Bend test)		
							Orient. (Orientation) (1)	Local. (Location) (2)	Temp. (Temp) ºC	Reh Y.P. Mpa	Rm T.S. Mpa	Reh / Rm	%A Elong. (1) 5,65√So (2) 8 Inch	Energia (Energy) Individuales (Inviduals) 1	2	3	Media (Av.)	Individuales (Inviduals) 1	2	3	Media (Av.)	Mandril (Mandrel)	Angulo (Angle)	Result. (Result)
42843891	20171023065	30	T	A	ISO-V 10 (HT)	(j)	T	C S	-40					210	238	231	226							
	20171023065	30	T	A	ISO-V 10 (HT)	(j)	L	C S	-50					300	293	282	292							
	20171023065	30	T	A	ISO-V 10	(j)	T	C S	-40					257	300	270	276							
	20171023065	30	T	A	ISO-V 10	(j)	L	C S	-50					300	300	283	294							

BUREAU VERITAS ITALIA WELDING
IT FILE: 22 SF 30 48
WITNESSED 1 2 3
REVIEWED 308 138

B.O.S. Continuously cast slab.
Visual and dimensional inspection of plates: satisfactory
Surface quality according/ EN 10163 Class B Subclass 3+ ISO 8501 Class B
Dimensional tolerances according to EN 10029; thickness tolerances according to EN 10029 class C
Flatness: EN 10029 (2010) Class N
EN 10025: Options 2 and 4; EN 10225: Options 10, 12, 13 and 18
Ultrasonic inspection EN 10160 S2 E3

CE 0099 ArcelorMittal España,S.A. Residencia la Granda 33418 Gozón (Asturias - España) 07 QP00033_CPR2013-07-01_FC_V006 EN 10025-4:2004 S355ML

Uso previsto: estructuras soldadas, atornilladas o remachadas. (intented to be used in welded, bolted and riveted structures)
Límite elástico (Yield strength)*
Resistencia a tracción (Tensile strength)*
Alargamiento (Elongation)*
Resis. flexión choque (Impact strength)*
Soldabilidad (Weldability)*
Durabilidad (Durability)*
* Expresado como se indica en el DdP (Expressed as indicated in the DoP)

Por / By Classification society
Lloyd's Register
Javier Sánchez
Gijon Office
Lloyd's Register España SA

Por / By ArcelorMittal España
Juan Manuel Vigil Fernández
Jefe Calidad Chapa Gruesa Heavy Plate Quality Manager
Flat Carbon Europe

ArcelorMittal España,S.A - Registro Mercantil de Asturias,Tomo 2279, Folio 115, Hoja AS- 17946-N.I.F.A81046856 - Oficina de certificados:certificados.gijon@arcelormittal.com-Tlf+ 34985187776

Certificado Nº (Certificate No.) S/ According to EN 10204-3.2 Página (Page) Fecha (Date)	275047-D1-20180404 Pag 2 / 4 04/04/2018

AENOR ER Empresa Registrada UNE-EN ISO 9001 ER-0030/1992

ArcelorMittal España, S.A.
Residencia de la Granda
33418 - Gozón
Asturias - España

CERTIFICADO DE INSPECCIÓN
INSPECTION CERTIFICATE

ArcelorMittal

O. Suministro (Works Order No)	Cliente (Customer)	Destino (Destination)	Producto (Product)	Especificación (Specification)	Pedido cliente/Customer order:
BC8219	ARCELOR PROJECTS INT. BV	MANNESMANNWEG. 5 4794SL - HEIJNINGEN-HOLANDA	Chapa Gruesa / Heavy Plate	S355G10+M S355ML EN 10225 EN 10025-4 MOD NORSOK	FB74AMP01W 3200055705

Ensayos mecánicos / Mechanical test

(1) L=longitudinal T= Transversal Z= Through thickness D= Diagonal
(2) C=Cabeza (top) P=Pie (bottom) S= Superficie (surface) 4=1/4 esp. (1/4 thickness) 3=1/3 esp. (1/3 thickness) E=Esp. Completo (full thick.) N=Nucleo (midthickness)
(3) " " =BrutoLaminación (as rolled) - A= N +R - L=Conformado de Normalización (normalizing rolling) - T=Tratamiento Termomec.(termomec. rolling) - N=Normalizado(normalized) - R=Revenido(tempering)
Type of test: A: Ultrasonic test approved; Z35: Through thickness test; HV: Vickers hardness test;(HT)*: Postwelding heat treatment of test coupons: 580 +/- 20ºC Soaking time: 4h.
ISO-V: Toughness; ISO-V(S): Toughness after stretching 5%; ISO-V(S+A): Toughness after stretching 5% + 250ºC, 1 hour

Nº Chapa (Plate No.)	Nº Muestra (Sample No)	Esp. Thickness	Est.Sum (Delivered condition) (3)	UST (Us test)	Tipo ensayo (Type of test)	Orient. (Orientation) (1)	Local. (Location) (2)	Temp. (Temp) °C	Ensayo de tracción (Tensile test) Reh Y.P. Mpa	Rm T.S. Mpa	Reh / Rm	%A Elong. (1) 5,65√So (2) 8 Inch	Ensayo Resiliencia (Charpy-V Impact test) Energia (Energy), j Individuales (Inviduals) 1	2	3	Media (Av.)	Otros ensayos (other test) Individuales (Inviduals) 1	2	3	Media (Av)	Doblado (Bend test) Mandril (Mandrel)	Angulo (Angle)	Result. (Result)
	20171023065	30	T	A	Tensile (HT)* (Mpa)	T	C E		440	509	0,86	31,9											
	20171023065	30	T	A	Tensile Z (Mpa)	Z	C E			587													
	20171023065	30	T	A	Tensile (Mpa)	T	C E		430	511	0,84	28,4											
	20171023065	30	T	A	Z35 (%)	Z	C E										75	44	65	61			
	20171023078	30	T	A	ISO-V(S+A) 10 (j)	T	C S	-40					174	42	182	133							
	20171023078	30	T	A	ISO-V(S) 10 (j)	T	C S	-40					248	207	221	225							
	20171023078	30	T	A	HV 10	T	C S	20									155	149	150	151			
	20171023081	30	T	A	HV 10	T	P S	20									149	151	150	150			
42843901	20171023072	30	T	A	ISO-V 10 (HT) (j)	T	C S	-40					193	233	281	236							
	20171023072	30	T	A	ISO-V 10 (HT) (j)	L	C S	-50					300	300	300	300							
	20171023072	30	T	A	ISO-V 10 (j)	T	C S	-40					300	300	300	300							
	20171023072	30	T	A	ISO-V 10 (j)	L	C S	-50					261	240	253	251							
	20171023072	30	T	A	Tensile (HT)* (Mpa)	T	C E		432	504	0,86	33,0											
	20171023072	30	T	A	Tensile Z (Mpa)	Z	C E			591													
	20171023072	30	T	A	Tensile (Mpa)	T	C E		453	514	0,88	31,9											

BUREAU VERITAS ITALIA WELDING
IT FILE: 22 EF. 375G30 48
DATE: 07/02/2022
WITNESSED ☐ REVIEW ☑

B.O.S. Continuously cast slab.
Visual and dimensional inspection of plates: satisfactory
Surface quality according/ EN 10163 Class B Subclass 3+ ISO 8501 Class B
Dimensional tolerances according to EN 10029; thickness tolerances according to EN 10029 class C
Flatness: EN 10029 (2010) Class N
EN 10025: Options 2 and 4; EN 10225: Options 10, 12, 13 and 18
Ultrasonic inspection EN 10160 S2 E3

Por / By Classification society

Javier Sánchez
Gijon Office
Lloyd's Register España SA

Por / By ArcelorMittal España

Juan Manual Vigil Fernández
Jefe Calidad Chapa Gruesa Heavy Plate Quality Manager
Flat Carbon Europe

Certificado Nº (Certificate No.) S/ According to EN 10204-3.2 Página (Page) Fecha (Date)	275047-D1-20180404 Pag 3 / 4 04/04/2018

AENOR ER Empresa Registrada UNE-EN ISO 9001 ER-0030/1992

ArcelorMittal España, S.A.
Residencia de la Granda
33418 - Gozón
Asturias - España

CERTIFICADO DE INSPECCIÓN
INSPECTION CERTIFICATE

ArcelorMittal

O. Suministro (Works Order No)	Cliente (Customer)	Destino (Destination)	Producto (Product)	Especificación (Specification)	Pedido cliente/Customer order:
BC8219	ARCELOR PROJECTS INT. BV	MANNESMANNWEG. 5 4794SL - HEIJNINGEN-HOLANDA	Chapa Gruesa / Heavy Plate	S355G10+M S355ML EN 10225 EN 10025-4 MOD NORSOK	FB74AMP01W 3200055705

(1) L=longitudinal T= Transversal Z= Through thickness D= Diagonal
(2) C=Cabeza (top) P=Pie (bottom) S= Superficie (surface) 4=1/4 esp. (1/4 thickness) 3=1/3 esp. (1/3 thickness) E=Esp. Completo (full thick.) N=Nucleo (midthickness)
(3) " " =BrutoLaminación (as rolled) - A= N +R - L=Conformado de Normalización (normalizing rolling) - T=Tratamiento Termomec.(termomec. rolling) - N=Normalizado(normalized) - R=Revenido(tempering)
Type of test: A: Ultrasonic test approved; Z35: Through thickness test; HV: Vickers hardness test;(HT)*: Postwelding heat treatment of test coupons: 580 +/- 20ºC Soaking time: 4h.
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Ensayos mecánicos / Mechanical test

Nº Chapa (Plate No.)	Nº Muestra (Sample No)	Esp. Thickness	Est.Sum (Delivered condition) (3)	UST (Us test)	Tipo ensayo (Type of test)	Orient. (Orientation) (1)	Local. (Location) (2)	Temp. (Temp) ºC	Ensayo de tracción (Tensile test) Reh Y.P. Mpa	Rm T.S. Mpa	Reh / Rm	%A Elong. (1) 5,65√So (2) 8 Inch	Ensayo Resiliencia (Charpy-V Impact test) Energía (Energy), j Individuales (Inviduals) 1	2	3	Media (Av.)	Otros ensayos (other test) Individuales (Inviduals) 1	2	3	Media (Av)	Doblado (Bend test) Mandril (Mandrel)	Angulo (Angle)	Result. (Result)
	20171023072	30	T	A	Z35 (%)	Z	C E										75	72	72	73			
	20171023078	30	T	A	ISO-V(S+A) 10 (j)	T	C S	-40					174	42	182	133							
	20171023078	30	T	A	ISO-V(S) 10 (j)	T	C S	-40					248	207	221	225							
	20171023078	30	T	A	HV 10	T	C S	20									155	149	150	151			
	20171023081	30	T	A	HV 10	T	P S	20									149	151	150	150			
42844171	20171023078	30	T	A	ISO-V(S+A) 10 (j)	T	C S	-40					174	42	182	133							
	20171023078	30	T	A	ISO-V(S) 10 (j)	T	C S	-40					248	207	221	225							
	20171023078	30	T	A	HV 10	T	C S	20									155	149	150	151			
	20171023078	30	T	A	ISO-V 10 (HT) (j)	T	C S	-40					300	273	251	275							
	20171023078	30	T	A	ISO-V 10 (HT) (j)	L	C S	-50					213	228	226	222							
	20171023078	30	T	A	ISO-V 10 (j)	T	C S	-40					209	156	169	178							
	20171023078	30	T	A	ISO-V 10 (j)	L	C S	-50					280	300	287	289							
	20171023078	30	T	A	Tensile (HT)* (Mpa)	T	C E		401	501	0,80	31,9											
	20171023078	30	T	A	Tensile Z (Mpa)	Z	C E			582													
	20171023078	30	T	A	Tensile (Mpa)	T	C E		408	507	0,80	31,3											

BUREAU VERITAS ITALIA WELDING
IT FILE: 22.SF.325304
DATE: 07/04/2020
WITNESSED ☐
REVIEW ☑
138

B.O.S. Continuously cast slab.
Visual and dimensional inspection of plates: satisfactory
Surface quality according/ EN 10163 Class B Subclass 3+ ISO 8501 Class B
Dimensional tolerances according to EN 10029; thickness tolerances according to EN 10029 class C
Flatness: EN 10029 (2010) Class N
EN 10025: Options 2 and 4; EN 10225: Options 10, 12, 13 and 18
Ultrasonic inspection EN 10160 S2 E3

Por / By Classification society

Javier Sánchez
Gijon Office
Lloyd's Register España SA

Por / By ArcelorMittal España

Juan Manual Vigil Fernández
Jefe Calidad Chapa Gruesa Heavy Plate Quality Manager
Flat Carbon Europe

Certificado Nº (Certificate No.) S/ According to EN 10204-3.2 Página (Page) Fecha (Date)	275047-D1-20180404 Pag 4 / 4 04/04/2018

AENOR ER Empresa Registrada UNE-EN ISO 9001 ER-0030/1992

ArcelorMittal España, S.A.
Residencia de la Granda
33418 - Gozón
Asturias - España

CERTIFICADO DE INSPECCIÓN
INSPECTION CERTIFICATE

ArcelorMittal

O. Suministro (Works Order No)	Cliente (Customer)	Destino (Destination)	Producto (Product)	Especificación (Specification)	Pedido cliente/Customer order:
BC8219	ARCELOR PROJECTS INT. BV	MANNESMANNWEG. 5 4794SL - HEIJNINGEN-HOLANDA	Chapa Gruesa / Heavy Plate	S355G10+M S355ML EN 10225 EN 10025-4 MOD NORSOK	FB74AMP01W 3200055705

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(3) " " =BrutoLaminación (as rolled) - A= N +R - L=Conformado de Normalización (normalizing rolling) - T=Tratamiento Termomec.(termomec. rolling) - N=Normalizado(normalized) - R=Revenido(tempering)
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ISO-V: Toughness; ISO-V(S): Toughness after stretching 5%; ISO-V(S+A): Toughness after stretching 5% + 250°C, 1 hour

Ensayos mecánicos / Mechanical test

Nº Chapa (Plate No.)	Nº Muestra (Sample No)	Esp. Thickness	Est.Sum (Delivered condition) (3)	UST (Us test)	Tipo ensayo (Type of test)	Orient. (Orientation) (1)	Local. (Location) (2)	Temp. (Temp) °C	Ensayo de tracción (Tensile test) Reh Y.P. Mpa	Rm T.S. Mpa	Reh / Rm	%A Elong. (1) 5,65√So (2) 8 Inch	Ensayo Resiliencia (Charpy-V Impact test) Energia (Energy), j Individuales (Inviduals) 1	2	3	Media (Av.)	Otros ensayos (other test) Individuales (Inviduals) 1	2	3	Media (Av)	Doblado (Bend test) Mandril (Mandrel)	Angulo (Angle)	Result. (Result)
	20171023078	30	T	A	Z35 (%)	Z	C E										73	71	68	71			
	20171023081	30	T	A	HV 10	T	P S	20									149	151	150	150			

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.375 6304.138
DATE: 07/02/2022
WITNESSED ☐ REVIEW ☑

B.O.S. Continuously cast slab.
Visual and dimensional inspection of plates: satisfactory
Surface quality according/ EN 10163 Class B Subclass 3+ ISO 8501 Class B
Dimensional tolerances according to EN 10029; thickness tolerances according to EN 10029 class C
Flatness: EN 10029 (2010) Class N
EN 10025: Options 2 and 4; EN 10225: Options 10, 12, 13 and 18
Ultrasonic inspection EN 10160 S2 E3

Por / By Classification society

Javier Sanchez
Gijon Office
Lloyd's Register España SA

Por / By ArcelorMittal España

Juan Manual Vigil Fernández
Jefe Calidad Chapa Gruesa Heavy
Plate Quality Manager
Flat Carbon Europe

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2021-12-22

Numero certificato/Cert no: EC26661767 rev. 0

Nostro ordine/Our order:	0100420342	Vostro ordine/Your order:	437/21
Nostro riferimento/Our ref:	HYBRIS PRD account	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB01056	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20211221	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address

TECHNO SERVICE S.R.L.
VIA DELLA MERENDA32 FOR.ZARATTINI
48124 RAVENNA
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address

TECHNO SERVICE S.R.L.
VIA DELLA MERENDA,32 FOR.ZARATTINI
48124 RAVENNA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PNV4610432 Quantità/Quantity: 896 KGM

PRODOTTO/PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK Tubrod 15.17 1.2mm 16kg
Codice/Item no:	**1517127730**

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.29: E81T1-Ni1CJ H4
SFA/AWS A5.29: E81T1-Ni1MJ
EN ISO 17632-A: T 46 3 1Ni P C1 2 H5
EN ISO 17632-A: T 46 4 1Ni P M21 2 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:	M21 (EN ISO 14175)
C	0.07%
Si	0.37%
Mn	1.15%
P	0.01%
S	0.02%
Cr	0.03%
Ni	1.1%
Mo	0.02%
Nb	0.02%
Cu	0.01%
V	0.02%

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:	EN
Altro/Auxiliary:	M21 (EN ISO 14175)
Condizione/Condition:	As welded

TRAZIONE/TENSILE

ReL	Rm	A5
544 MPa	613 MPa	26 %

RESILIENZA/IMPACT

Temp	-40 °C
KV	124 J

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.3756304.138
DATE: 07/02/2022
WITNESSED ☐ REVIEWED ☑

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura S.p.A. | Str. Provinciale 34, n.37 - 20010 Ossona MI, Italy

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis		Validazione - altro/Validation - Others	
Piotr Grela	Quality Assurance Manager	Neil Farrow	Product Manager

ROSETTI MARINO	Welding Procedure Qualification Record (PQR) Verbale di Qualifica di Procedura di Saldatura	No. 23/22	Sheet/Foglio 1/2

Manufacturer's Welding Procedure. Ref. no.	23/22 REV. 0		
Manufacturer	ROSETTI MARINO S.p.A.		
Address	VIA TRIESTE 230 - 48121 RAVENNA		
Code, Testing Standard	Project Spec. SD-NOC-STR-301 Rev.03		
Date of welding	February 11st , 2022		
Examiner of examining body	Bureau Veritas S.p.A.		
RANGE OF QUALIFICATION			
Welding process	GS FCAW	//	//
Type(s)	Semiautomatic	//	//
Welding Equipment Type	HF inverter type		
Actual parent Material side A	Pipe: EN 10225-3:2019: S355NLHHO (Heat: 808993)		
Actual parent Material side B	Plate: EN 10225: S355G10+M (Heat: 705587)		
Parent Material grade	AWS D1.1 - II / ISO 15608 1.2		
Supply condition	A) Normalized (+N) to B) Thermomechanically Rolled (+TM)		
Carbon equivalent/Pcm/C	Heat Values: A) 0,39/0,228/0,14 to B) 0,35/0,163/0,06		
Groove design/configuration	Half Vee T-Joint (one side welding without backing), For groove dimension and details see Welding Table 23/22		
Parent material thickness (mm)	A)25,40 mm to B)30,00 mm		
Weld metal thickness (mm)	25,40 mm	//	//
Single or Multi-pass	Multiple	//	//
Outside diameter	406,40 (16")		
Filler material Designation	AWS 5.29 E81T1-Ni1MJ	//	//
Filler material Maker	OK Tubrod 15.17 - ESAB	//	//
Filler material Size	Ø 1,2 mm	//	//
Shielding gas/Flux	80% Ar + 20% CO2	//	//
Shielding gas flow rate	16 l/min.	//	//
Backing gas (purging)	None		

Type of welding current & polarity	SMAW: DC/RP	Heat input / Apporto termico (kJ/mm) - 25%	Pass	Diameter (mm)	6G	//
			Root	Ø 1,2	2,15 to 2,87	//
			Hot	Ø 1,2	1,29 to 1,73	//
			Fill	Ø 1,2	0,97 to 1,83	
			Cap	Ø 1,2	0,91 to 1,30	//

Welding position	6G - Uphill progression		
Preheat (°C)	50	Interpass temperature / Temp. di interpass (°C)	200
Post-Weld Heat Treatment and/or ageing	None		
Weld bead width	Max 13 mm		
Welder's detail	Giulianini Dario (GX12)		
Time lapse between root and hot pass	N.A.		
Other information / Altre informazioni	- Preheat performed by propane torch		

BUREAU VERITAS ITALY
WITNESSED RECEIVED
SURVEYOR G. TESEI
DATE 04/03/2022

ROSETTI MARINO	Welding Procedure Qualification Record (PQR) Verbale di Qualifica di Procedura di Saldatura	No. 23/22	Sheet/Foglio 2/2

Manufacturer's Welding Procedure. Ref. no.	23/22 REV. 0		
Test result (WPQR) N°	23/22	Date/Data	04/03/2022
Manufacturer's WPS No.	pWPS 23/22 REV. 1	Date/Data	11/02/2022

TESTS CARRIED OUT ON SAMPLE 1/1 WELDED IN 5F POSITION

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 11/2022 dated 14/02/2022
Penetrant test	N.A.	N.A.
Magnetic particle test	Acceptable	22049 MT 11 RN Rev.01 dated 14/02/2022
Radiographic test	N.A.	N.A.
Ultrasonic test	Acceptable	22049 UT 05 SZ Rev.01 dated 14/02/2022

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2] //	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] //	A [%]	Z [%]	Fracture Location	Remarks
//	//	//	//	//	//	//	//
//	//	//	//	//	//	//	//

BEND TEST

Type & N.	Bend angle	Remarks	Results
//	//	//	//

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] //			Avarage value [J] //	Remarks
//	//	//	//	//	//	//	//	//
//	//	//	//	//	//	//	//	//
//	//	//	//	//	//	//	//	//
//	//	//	//	//	//	//	//	//

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
2 Macro examination and Hardness test	Satisfactory: See INSPECTA S.R.L. Test Report No. 042-00330-22 dated 04/03/2022
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	INSPECTA S.r.l. - Ravenna (RA)
Laboratory report reference N.	Report No. 042-00330-22 dated 04/03/2022
Test carried out in the presence of:	BUREAU VERITAS Italy

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Project Spec. SD-NOC-STR-301 Rev.03

Date/Data
04-03-2022
ROSETTI MARINO SpA
A. Khalifa
ROSETTI MARINO S.p.A.

Examiner or Examination Body
BUREAU VERITAS Italy
Giancarlo Tesei

BUREAU VERITAS ITALY
WITNESSED
SURVEYOR G. TESEI
DATE 04/03/2022

Name and signature / Nome e firma

ROSETTI MARINO	PROJECT	Al-Shaheen Field, Gallaf Batch-3 Project - F-DBN EPCIC8 SOW	CLIENT	NOC QATAR
	DOC	pWPS Preliminary Welding Procedure Specification	JOB #:	121A20

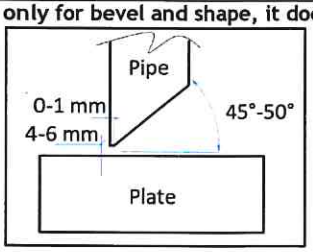
PQR ref.: 23/22	code	Project Spec. SD-NOC-STR-301	WPS 23/22	REV.: 1	Data /date 11/02/22

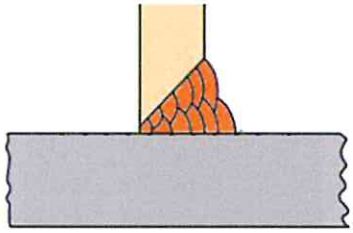
Procedimento di saldatura / Welding process: **GS FCAW** — Tipo / Type: **SEMIAUTOMATIC** — scopo / scope: **CJP, T-joint**

GIUNTO - JOINT

Tipo di giunto / Joint Design: **½ V** — ☐ DOUBLE SIDED WELD — ☒ SINGLE SIDED WELD (no backing on root)

Dettagli / Details: **sketch is only for bevel and shape, it does not indicate the welding position that is detailed in dedicated section below**





MATERIALE BASE - BASE MATERIAL

EN 10225-3:2019 : S355NLHHO to EN 10225: S355G10+M — **Material grade: +N to +TM** — **Max Cev 0.39 to 0.35**

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove **25,40 mm to 30,00 mm**

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove **406,40 mm (16") to Plate**

METALLO D'APPORTO - FILLER METAL

	GS FCAW		
Spec. N° (SFA)	5.29		
AWS N° (CLASS)	E81T1-Ni1M		
F-N°	6		
A-N°	10		
Diametro mat. d'apporto / Size of filler metal	1,2		
Metallo depositato / Deposit weld metal	25,40		
Gamma spessori /Thick. range	Up to completion		
Accoppiamento filo-flusso / Electrode-flux (CLASS)	N.A.		
Denom. Comm. flusso / FLUX trade name	N.A.		
Inserto consumabile / Consumable insert	N.A.		
Altro / other	OK Tubrod 15.17 - ESAB		

giunto / Joint: **Cianfrino / groove** — Posizione / position: **6G** — Progressione / weld progression: **Uphill**

PRERISCALDO - PRE-HEAT (QW406)

Temp.preriscaldo minima / Min. pre-heat temp: **50 °C** — Max temp. Di interpass / Max interpass temp.: **200 °C** — Preheat Method / Metodo preriscaldo: **Propane Torch**

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs): **N.A.** — Temperatura di stasi / Holding temperature °C: **N.A.** — Tempo di stasi / Holding time (min.): **N.A.** — Velocità di raffreddamento / Cooling rate (°C/Hrs): **N.A.**

GAS DI PROTEZIONE - GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar+CO2	80-20	16-18 lt/min
Protezione / Shielding:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current:	DC - CV	Polarità / Polarity	RP
Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type:	N.A.		
Metodo di trasferimento per GMAW / GMAW metal tranfer mode:	Spray arc		
Velocità alimentazione filo / Electr. Wire feed speed range:	Self regulated		

TECNICA - TECHNIQUE

Passata / Bead: **Tirata-Larga/String-Wave** — Dimensione bocchello gas / Orifice of gas cup size: **3/4"** — Pulizia iniziale e fra le passate / Initial and interpass cleaning: **Spazzolatura e Molatura/Brushing Grinding**

Metodo di solcatura a rovescio / Method of back gouging: **N.A.** — Oscillazione / Oscillation: **N.A.** — Distanza tra zona di contatto e pezzo / Contact tube to work distance: **13 - 18 mm**

N°Passate / Passes nr.: **Multipla/Multiple** — Elettrodo multiplo o singolo / Multiple or single electrodes: **Singolo/Single** — Martellatura / Peening: **N.A.**

Altro / Other: **Max. width of weld bead 13 mm**

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range	Vel. avanzamento / Travel speed range (mm/min)	Apporto termico / Heat input (KJ/mm)
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. range			
Root	GS FCAW	E81T1-Ni1M	1,2	DC/RP	230 to 234	24 to 24,5	115 to 125	2,65 to 2,99
Hot	GS FCAW	E81T1-Ni1M	1,2	DC/RP	230 to 240	24 to 25	205 to 225	1,47 to 1,76
Fill	GS FCAW	E81T1-Ni1M	1,2	DC/RP	240 to 250	24 to 26	190 to 290	1,19 to 2,05
Cap	GS FCAW	E81T1-Ni1M	1,2	DC/RP	235 to 245	24 to 25	250 to 300	1,13 to 1,47

Preparato da / prepared by: *D.Cenacchi*

Approvato da / approved by: *A. Khalifa*

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.3756304.138
DATE: 11/02/2022
WITNESSED ☐ REVIEW ☑

ROSETTI MARINO

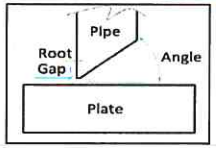
PQR - AS- RUN PARAMETER SHEET

pWPS 23/22	
PQR 23/22	
Coupon Nr. 1/1	
Date: 11/02/22	Page: 1_ of _1

REFERENCE CODE AND PROJECT SPECIFICATIONS: **Project Spec. SD-NOC-STR-301 Rev.03**

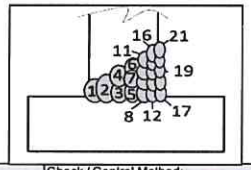
Welder Name(s):	GIULIANINI DARIO	Welder Id No(s):	GX12		
Welding Process(es):	GS FCAW	Type(s):	SEMIAUTOMATIC		
Welding Position:	6G	Progression:	Uphill		
Base Materials:	a) EN 10225-3:2019 : S355NLHHO to b) EN 10225: S355G10+M	Wall Thickness:	a) 25,40 mm to b) 30,00 mm	Diameter:	406,40 mm
Heat No(s):	a) 808993 to) 705587	Joint Type:	HALF VEE T - JOINT; ONE SIDE WELDING WITHOUT BACKING		

WELD PREPARATION:



Root: 0,50 mm ; Gap : 5,00 mm ; Angle: 45°

WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Hot Pass	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Filling Runs	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Cap	1,2	PNV4610432	OK Tubrod 15.17 - ESAB

GAS:

Shielding Gas:	Ar + CO2
Composition:	80% CO2 + 20% Ar
Flow:	16 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/4"
Tungsten Type:	N.A.
O2 Content of Back Purge:	N.A.

Max Weld Bead Width:	String or Weave:	No of Passes:	Mulliple or Single Electrodes:
Max. width of weld bead 13 mm	String and weave	Multiple	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature °C	Holding Time °C	Heating Rate °C	Cooling Rate °C
50°C	Propane Torch	200 °C	Contact Digital Thermometer	N.A.	N.A.	N.A.	N.A.

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
N.A.	1	GS FCAW	1	-	5.29 E81T1-Ni1MJ	1,2	DC EP	223	243	233,0	23,2	25,2	24,2	-	-	11,8	2,87	-	70	Welding unit: INE KMP 5000 - TY4
N.A.	2	GS FCAW	2	-	5.29 E81T1-Ni1MJ	1,2	DC EP	226	246	236,0	23,5	25,5	24,5	-	-	20,1	1,73	-	105	Digital thermometer: HT Mod. A103 - Probe: TK100. Matr. 181103331 - 19/2353
N.A.	3	GS FCAW	3	-	5.29 E81T1-Ni1MJ	1,2	DC EP	232	252	242,0	24,9	26,9	25,9	-	-	20,5	1,83	-	100	Ampherometer Clamp: HT Mod. 9020 Matr. 16121407
N.A.	3	GS FCAW	4	-	5.29 E81T1-Ni1MJ	1,2	DC EP	236	256	246,0	24,5	26,5	25,5	-	-	20,7	1,82	-	115	
N.A.	4	GS FCAW	5	-	5.29 E81T1-Ni1MJ	1,2	DC EP	239	259	249,0	23,7	25,7	24,7	-	-	20,2	1,83	-	120	
N.A.	4	GS FCAW	6	-	5.29 E81T1-Ni1MJ	1,2	DC EP	238	258	248,0	23,7	25,7	24,7	-	-	22,0	1,67	-	205	
N.A.	4	GS FCAW	7	-	5.29 E81T1-Ni1MJ	1,2	DC EP	237	257	247,0	23,8	25,8	24,8	-	-	21,0	1,75	-	95	
N.A.	5	GS FCAW	8	-	5.29 E81T1-Ni1MJ	1,2	DC EP	236	256	246,0	23,8	25,8	24,8	-	-	23,5	1,56	-	105	
N.A.	5	GS FCAW	9	-	5.29 E81T1-Ni1MJ	1,2	DC EP	236	256	246,0	23,7	25,7	24,7	-	-	24,7	1,48	-	110	
N.A.	5	GS FCAW	10	-	5.29 E81T1-Ni1MJ	1,2	DC EP	234	254	244,0	23,8	25,8	24,8	-	-	27,3	1,33	-	115	
N.A.	5	GS FCAW	11	-	5.29 E81T1-Ni1MJ	1,2	DC EP	236	256	246,0	23,8	25,8	24,8	-	-	25,4	1,44	-	120	
N.A.	6	GS FCAW	12	-	5.29 E81T1-Ni1MJ	1,2	DC EP	234	254	244,0	23,7	25,7	24,7	-	-	28,1	1,29	-	120	
N.A.	6	GS FCAW	13	-	5.29 E81T1-Ni1MJ	1,2	DC EP	236	256	246,0	23,7	25,7	24,7	-	-	27,9	1,31	-	200	
N.A.	6	GS FCAW	14	-	5.29 E81T1-Ni1MJ	1,2	DC EP	235	255	245,0	23,8	25,8	24,8	-	-	26,9	1,36	-	115	
N.A.	6	GS FCAW	15	-	5.29 E81T1-Ni1MJ	1,2	DC EP	236	256	246,0	23,8	25,8	24,8	-	-	27,4	1,34	-	125	
N.A.	6	GS FCAW	16	-	5.29 E81T1-Ni1MJ	1,2	DC EP	238	258	248,0	23,9	25,9	24,9	-	-	27,3	1,36	-	110	
N.A.	7	GS FCAW	17	-	5.29 E81T1-Ni1MJ	1,2	DC EP	228	248	238,0	23,2	25,2	24,2	-	-	28,2	1,23	-	105	
N.A.	7	GS FCAW	18	-	5.29 E81T1-Ni1MJ	1,2	DC EP	231	251	241,0	23,1	25,1	24,1	-	-	28,4	1,23	-	115	
N.A.	7	GS FCAW	19	-	5.29 E81T1-Ni1MJ	1,2	DC EP	229	249	239,0	23,1	25,1	24,1	-	-	28,5	1,21	-	125	
N.A.	7	GS FCAW	20	-	5.29 E81T1-Ni1MJ	1,2	DC EP	233	253	243,0	23,3	25,3	24,3	-	-	27,3	1,30	-	130	
N.A.	7	GS FCAW	21	-	5.29 E81T1-Ni1MJ	1,2	DC EP	231	251	241,0	23,2	25,2	24,2	-	-	27,2	1,29	-	135	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA A. Khalifa Welding Dept.	Signature:	Signature:	Signature:
Date:	Date:	Date:	Date:

DVS REPRESENTATIVE: ITALIA WELDING 48
IT FILE: 22.SF.3756304.138
DATE: 11/02/2022
WITNESSED ☑ REVIEW ☐

ROSETTI MARINO	VERBALE DI CONTROLLO VISIVO/DIMENSIONALE visual/dimensional inspection report	VDR N° 11/2022 data: 14/02/2022
progetto project: F Location Debottlenecking (F-DBN)	cliente client: NORTH OIL COMPANY	commessa job: 121A20

oggetto – item

Procedure Qualification Record (PQR) 23/2022

Certificato di Qualifica di Procedimento di Saldatura (PQR) 23/2022

WE CERTIFY THAT:

ITEMS INDICATED ABOVE HAVE UNDERGONE A VISUAL INSPECTION AND HAVE BEEN ACCEPTED ACCORDING TO THE SPECIFICATION / PROCEDURE MENTIONED AND TO ACCEPTANCE CRITERIA DEFINED IN IT

SI CERTIFICA CHE LE SALDATURE DEI SAGGI SOPRA CITATI SONO STATI SOTTOPOSTI AD ESAME VISIVO AL 100% ALLO STATO COME SALDATO IN ACCORDO ALLE SPECIFICHE E STANDARD CITATI.

note – remarks

Inspection on welds 16"x 25,4 mm WT in as welded condition.

1 Samples in 6G

No visible defects have been detected.

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

SOR-FY-19.257-ROMA-ASFYY-00-300025-0001

Operatore – Operator	Controllo Qualita' - Quality Control	Cliente - Client
Stefano Zauli 3° Livello SNT-TC - 1A / ISO 9712	ROSETTI MARINO SpA A. Khalifa Welding Dept.	BUREAU VERITAS ITALY REVIEWED SURVEYOR G. TESEI DATE 04/03/2022

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n° 22049 MT 11 RN Rev. 01

RAPPORTO D'ESAME MAGNETOSCOPICO Magnetic Particle Test Report			DATA / Date 14/02/2022	FOGLIO / Sheet 1
CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	F Location Debottlenecking (F-DBN)	121A20	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	FASE Step
NORTH OIL COMPANY	PQR	/	/	/

ESECUZIONE / Execution		ACCETTABILITA' / Acceptance	
SOR-FY-19.257-ROMA-ASFYY-00-300026-0001		SOR-FY-19.257-ROMA-ASFYY-00-300026-0001	
MATERIALE/Material	TEMP. SUPERFICI Surface temperature	INTENSITA' LUMINOSA/ Light intensity	
C.S.	10°	☑ LUCE BIANCA >1076 Lux ☐ LUCE BIANCA >500 Lux	☐ LUCE NERA 1000 µW/cm²

STATO DELLA SUPERFICIE – Surface condition			
☑ COME SALDATO As welded	☐ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined	
☐ GREZZO – Forged	☐ LAMINATO – Rolled	☐ MOLATO – Ground	☐ SABBIATO – Blasted

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☑ GIOGO/Yoke	☐ PUNTALI/Prods	☐ BOBINA/Coil	☐ CONDUTTORE CENTRALE/Central conduttor

METODO / Method		SMAGNETIZZAZIONE/Demagnetization	
☑ CONTINUO/Continuous	☐ RESIDUO /Residual	☐ RICHIESTA/Required	☑ NON RICHIESTA/Not Required
TIPO DI MAGNETIZZAZIONE/magnetization type		DIREZIONE CAMPO MAGNETICO/magnetic field direction	
☑ MAGNETICO/magnetic	☐ ELETTRICO/electric	☐ CIRCOLARE/Circular	☑ LONGITUDINALE/longitudinal
TIPO APPARECCHIO/Type of equipment	MAGNETICONTROL	DISTANZA PUNTALI/Pole spacing	180 mm
NUMERO DI SERIE/Serial number	04.230-15		
TIPO DI CORRENTE/Current Type		POTERE DI SOLLEVAMENTO GIOGO / Lifting power	
☑ A.C.	☐ D.C.	☑ 4,5 kg	☐ 18 kg
MEZZO DI ISPEZIONE / Examination medium		INTENSITÀ DI CORRENTE / Intesity	
☑ UMIDO/Wet	☐ SECCO/Dry	☐ A/ mm	☐ / spira

PARTICELLE UTILIZZATE/Particle Type			
CONTRASTO DI COLOR/Color contrast	☑	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	☑ NDT BW2 ☐ NDT DRY	MARCA TIPO/Mark Type	NDT FW1
LOTTO/BACH	7755s	LOTTO/BACH	/
VERNICE DI CONTRASTO / Contrast Paint		☑ NDT WBL5	LOTTO/BACH U210325s

SALDATURE CONTROLLATE / Welds Verified

THE CONTROL HAS BEEN CARRIED OUT ON 100% OF THE WELD:

- PQR 23/2022 - 16"x 25,4 mm WT – 6G – WS GX12

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITÀ Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zauli 3° Livello SNT-TC-1A / ISO 9712	ROSETTI MARINO SpA A. Khalifa Welding Dept.	BUREAU VERITAS ITALY REVIEWED SURVEYOR G. TESEI DATE 04/03/2022

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta.
I risultati delle prove si riferiscono unicamente ai particolari esaminati.
Partial reproduction of this certificate must be written authorized.
Test results relate only to examined items.

Z:\Qualita\5 modulistica\01 moduli cnd\validi\01 moduli 2020\convenzionali superficiali

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n° 22049 UT 05 SZ Rev. 01

RAPPORTO D'ESAME CON ULTRASUONI Ultrasonic Examination report			DATA / Date 14/02/2022	FOGLIO / Sheet 1
CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	F Location Debottlenecking (F-DBN)	121A20	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
NORTH OIL COMPANY	PQR	/	/	/

ESECUZIONE / Execution	ACCETTABILITA' / Acceptance level
SOR-FY-19.257-ROMA-ASFYY-00-300028-0001_revA	SOR-FY-19.257-ROMA-ASFYY-00-300028-0001_revA

MATERIALE Material	DIMENSIONI Dimension	SPESSORE NOMINALE / Thk
SD-NOC-STR-201-S355KL40	PIPE 16 INCH	WT PIPE 25,4 mm

STATO DELLA SUPERFICIE – Surface condition

☑ COME SALDATO As welded	☐ SPAZZOLATO - Brushed	☐ LAVORATO DI MACCHINA - Machined
☐ MOLATO - Ground	☐ LAMINATO - Rolled	☐ GREZZO - Forged

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG 700	No. SERIE Serial Number	I003937

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	AMPLIFICAZIONE dB value	ONDE Waves
KRAUTKRAMER	KNF	4	10	0°	36	Long.
DOPPLER	AT	4	8X9	70°	40	Shear
DOPPLER	AT	4	8X9	60°	40	Shear

BLOCCO DI CALIBRAZIONE Calibration block	IIW V2	BLOCCO DI RIFERIMENTO Reference block	BLOCCO QT 04
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity 3 mm	DAC SU FORI Ø 3 mm

SALDATURE CONTROLLATE / Welds Verified

Stamp	Procedure Qualification	WPS	Joit Type	Position	Bevel	Thk mm	Scan plan
GX12	23/2022	23/2022	T-Joint	6G	1\2V	25,4	IDL-QCI-UT-223

FOUND DEFECT IN MIDLE THICKNESS ON THE 30 mm SHEET FBH 2÷5 mm

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Not According to specification ☐

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zauli 3° Livello SNT - TC - 1A / ISO 9712	OSETTI MARINO SpA A. Khalifa Welding Dept.	BUREAU VERITAS ITALY REVIEWED SURVEYOR G. TESEI DATE 04/03/2022

E' vietata la riproduzione parziale del certificato senza l'autorizzazione scritta.
I risultati delle prove si riferiscono unicamente ai particolari esaminati.
Partial reproduction of this certificate must be written authorized.
Test results relate only to examined items.

Z:\Qualita\5 modulistica\Validi\01 moduli cnd\validi\01 2020 rev.0\convenzionali volumetrici

Object: *Oggetto:*	**MECHANICAL TEST ON PQR 23-2022**		Pag. 1 di 5
Specimen: *Saggio:* **078/22**	**#Base Material:** *Materiale Base:*	**EN 10225-3 S355 NLHHO WITH EN 10225 S355 G10+M**	**PIPE Ø 16'' THK. 25,40 mm WITH PLATE THK. 30,00 mm**
	# Informazione fornita dal cliente/ Information provided by the customer		
Customer: *Committente:*	**ROSETTI MARINO S.p.a.**		
Address: *Indirizzo:*	**Via Trieste, 230 - 48122 Ravenna (RA)**		
Final customer:. *Cliente finale:*	//		
Your delivery note n°: *Vs. DDT di consegna*	**n°** // *n°*	**Date:** // *Data:*	**MD52** **012/2022** *MD 52* — **Date:** **10/02/2022** *Data:*
Start of activities:: *Inizio prove :*	**Date:** **28/02/2022** *Data:*	**End of activities:** *Fine prove:*	**Date:** **28/02/2022** *Data:*

PROVE RICHIESTE

☐ **TENSILE TEST**/*Trazione*	☐ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*
☐ **BEND TEST**/*Piega*	☐ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root */Dritto/Rovescio* ☐ Side/ *Laterale*
☐ **IMPACT TEST**/*Resilienza*	☐ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*
☒ **MACROEXAMINATION TEST /** *Macrografia*		
☒ **HARDNESS TEST**/ *Durezza*	☐ HV 5	☒ HV 10
☐ **FRACTURE TEST**/ *Frattura*	☐ Plate with/on Plate/ *Piastra con/su Piastra* ☐ Pipe with/on Pipe/*Tubo con/ su Tubo*	☐ Pipe on Plate/*Tubo su Piastra*
☐ **CHEMICAL ANALYSIS**/*Analisi Chimica*		
☐ **MICROEXAMINATION TEST /** *Micrografia*		
☐ **OTHER (Specify)**/*Altro/(Specificare)*		

Allegati /Attachments: NONE

NOTE/ Remarks: **REFERENCE CODE FROM CUSTOMER REQUEST: AWS D1.1: 2020 + SD-NOC-STR-301 Rev.03**
TEST WITNESSED BY ENG. GIANLUCA BRIGHI AND DARIO NAEIMI (DNV) AND ABDUL KARIM KHALIFA (ROSETTI)
Informazioni aggiuntive fornite dal cliente:
Additional information provided by the customer

Laboratory Responsible *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig. Giulio Bagnara - INSPECTA srl - Service Responsible 04/03/2022	ROSETTI MARINO SpA A. Khalifa Welding Dept.	BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 04/03/2022

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I risultati di prova si riferiscono al campione così come ricevuto, essendo il campionamento eseguito dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%. Quando emesso il Report in revisione, l'oggetto revisionato è identificabile mediante barra verticale posta sul lato sinistro e dal testo in formato corsivo sottolineato.
The results in this test report refers only to the specimen that has been tested. The customer undertakes to print out/reproduce the test report. Any partial reproduction is prohibited. Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory. The test results refer to the sample as received, since the sampling is performed by the customer. Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku=2 equivalent to a level of confidence of 95 %. When the Report under review is issued, the revised object can be identified by the vertical bar on the left side and by the text in italics underlined.

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::28/02/2022
Data esecuzione prova:

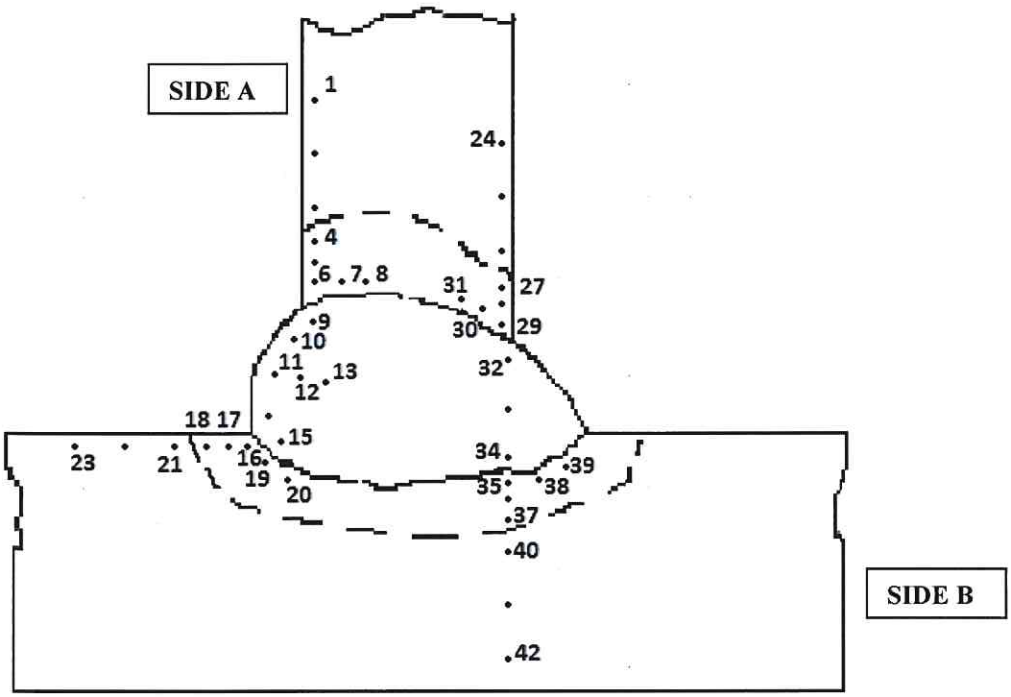
performed in accordance with the standard *eseguita in conformità alla norma* *SD-NOC-STR-301 Rev:03*

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	078/22 A	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	19,7°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13 – 14 – 15	16 – 17 – 18 – 19 – 20	21 – 22 – 23
24 – 25 – 26	27 – 28 – 29 – 30 – 31	32 – 33 – 34	35 – 36 – 37 – 38 – 39	40 – 41 – 42



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**153-154-171**	/	24 – 25 – 26	**175-173-178**	/
4 – 5 – 6 – 7 – 8	**194-233-260-272-262**	/	27 – 28 – 29 – 30 – 31	**183-201-203-201-207**	/
9 – 10 – 11 – 12 – 13 – 14 – 15	**260-269-236-238-236-244-241**	/	32 – 33 – 34	**223-220-228**	/
16 – 17 – 18 – 19 – 20	**203-177-153-176-176**	/	35 – 36 – 37 – 38 – 39	**167-143-138-167-173**	/
21 – 22 – 23	**141-138-135**	/	40 – 41 – 42	**137-135-136**	/

Remarks/ *Note:* **TAKEN AT H.6**

Laboratory Technician *Tecnica di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Buccheschi	Sig. Giulio Bagnara	ROSETTI MARINO SpA A. Khalifa Welding Dept	BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 04/03/2022
04/03/2022	04/03/2022 Service Responsible		

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::28/02/2022
Data esecuzione prova:

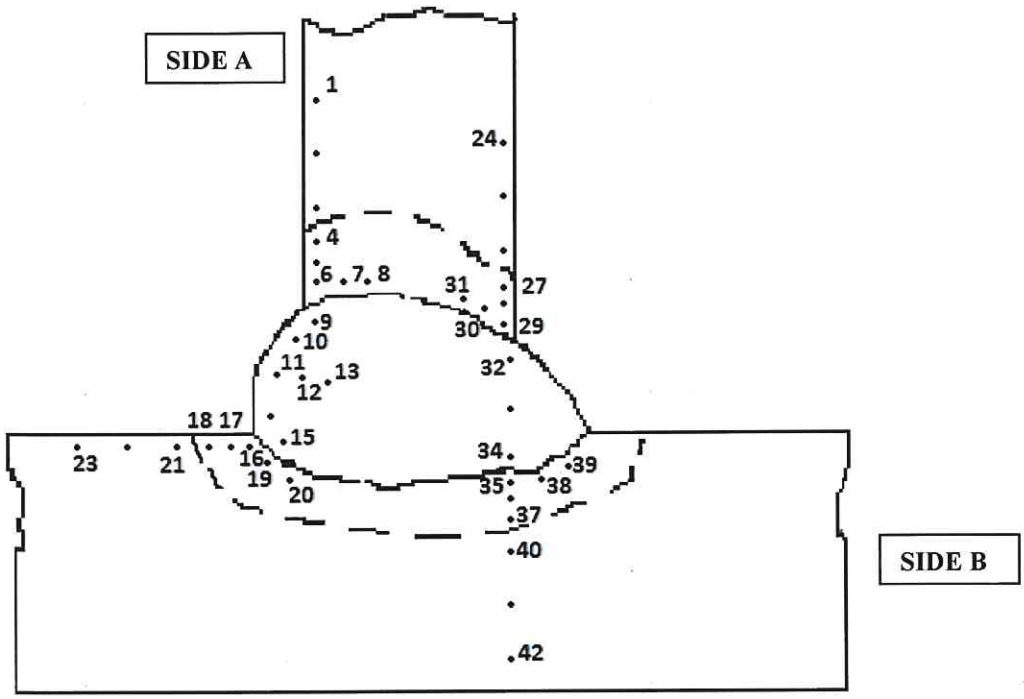
performed in accordance with the standard *eseguita in conformità alla norma* *SD-NOC-STR-301 Rev:03*

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	078/22 B	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	19,7°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13 – 14 – 15	16 – 17 – 18 – 19 – 20	21 – 22 – 23
24 – 25 – 26	27 – 28 – 29 – 30 – 31	32 – 33 – 34	35 – 36 – 37 – 38 – 39	40 – 41 – 42



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	154-158-174	/	24 – 25 – 26	171-175-169	/
4 – 5 – 6 – 7 – 8	219-279-274-290-250	/	27 – 28 – 29 – 30 – 31	175-192-198-200-212	/
9 – 10 – 11 – 12 – 13 – 14 – 15	262-272-228-245-230-253-254	/	32 – 33 – 34	235-239-237	/
16 – 17 – 18 – 19 – 20	178-175-163-178-173	/	35 – 36 – 37 – 38 – 39	159-148-142-166-175	/
21 – 22 – 23	148-128-133	/	40 – 41 – 42	135-132-126	/

Remarks/ *Note:* **TAKEN AT H.12**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara	A. Khalifa. Welding Dept	G. TESEI
04/03/2022	04/03/2022	ROSETTI MARINO SpA	WITNESSED SURVEYOR DATE 04/03/2022

MACRO EXAMINATION TEST
Prova Macrografica

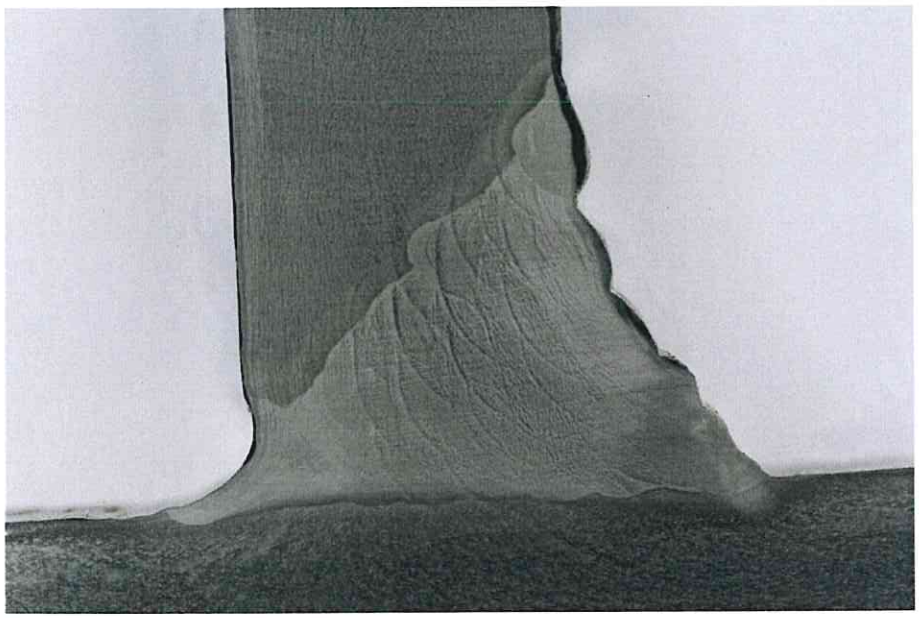
Date of Testing::28/02/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**19,7°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**078/22 A**	**Magnification:** *Ingrandimento:*	**Photo at: 1.80x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.6** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Bacchieschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SpA A. Khalifa Welding Dept	BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 04/03/2022
- INSPECTA srl - Lab. 04/03/2022	- INSPECTA srl - Service Responsible 04/03/2022		

MACRO EXAMINATION TEST
Prova Macrografica

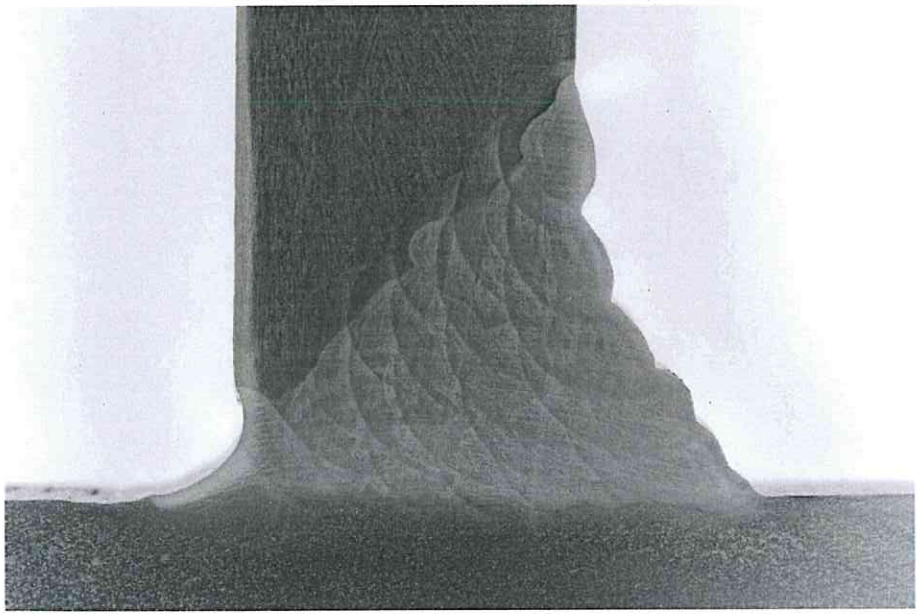
Date of Testing::28/02/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**22,7°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**078/22 B**	**Magnification:** *Ingrandimento:*	**Photo at: 1.90x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.12** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SpA A. Khalifa Welding Dept	RINA SERVICES S.p.A. ITALY WITNESSED SURVEYOR G. TESEI DATE 04/03/2022
- INSPECTA srl - 04/03/2022	- INSPECTA srl - 04/03/2022 Service Responsible		

END OF TEST REPORT
FINE DEL RAPPORTO DI PROVA

Manufacturer:
ArcelorMittal Tubular Products Roman S.A.
STEFAN CEL MARE STR, BL 15, SC. A, PARTER I
ROMAN, NEAMT ROMANIA

MILL TEST CERTIFICATE
according to EN 10204/3.2/2004
-

Page 1/3
B 22398/1
30.06.2021

ArcelorMittal

Buyer: T.A.L. S.P.A.con socio unico
VIA G. DI VITTORIO, 6, ZONA IND., 29017
FIORENZUOLA D'ARDA (PIACENZA)
ITALY

SEAMLESS STEEL LINE PIPES

Total weight:	Total Length:	Pieces	Bundles
22.262 tons - lbs	93.27 meters - feets	12	-

Standard: EN 10225-3-2019;

Buyer's reference: OF210231
Contract 50005005

Item	Item Client
1	-

Dimensions: 406.40 x 25.40 mm
-

Schedule: -

Length: 6.00 - 8.00 m
-

-
-

Hydro Test:

Bar	PSI	MPa	Time(sec)
205	-	20.5	5

Steel Grade: S355NLHHO
-

Bill:

Transport:

Chemical Analysis(%)

Heat	Bulletin No.	Product Req.		C	Mn	Si	S	P	Cr	Ni	Cu	As	Al	Mo	V	Nb	Ti	Ca	B	N	Sn	Pb	Sb	Bi
			Max	0.18	1.60	0.30	0.008	0.025	0.20	0.30	0.35	-	0.060	0.08	0.080	0.020	0.020	-	-	0.0200	-	-	-	-
			Min	-	0.90	0.15	-	-	-	-	-	-	0.020	-	0.060	-	-	-	-	-	-	-	-	-
808993		Heat analysis		0.14	1.20	0.20	0.004	0.008	0.07	0.06	0.17	0.009	0.028	0.02	0.061	0.003	0.003	0.0025	0.0001	0.0081	0.0100	0.0030	0.0010	0.0020
808999		Heat analysis		0.13	1.22	0.22	0.003	0.008	0.06	0.07	0.16	0.010	0.026	0.02	0.062	0.003	0.003	0.0027	0.0001	0.0099	0.0090	0.0030	0.0010	0.0020
808993	21-789	Product analysis		0.14	1.20	0.21	0.003	0.009	0.07	0.07	0.16	0.008	0.029	0.02	0.061	0.003	0.003	0.0024	0.0002	0.0084	0.0110	0.0030	0.0000	0.0000
808993	21-789	Product analysis		0.14	1.21	0.21	0.003	0.009	0.07	0.07	0.16	0.008	0.028	0.02	0.061	0.003	0.003	0.0026	0.0002	0.0086	0.0110	0.0030	0.0000	0.0000
808999	21-790	Product analysis		0.13	1.23	0.23	0.003	0.009	0.06	0.08	0.15	0.009	0.026	0.02	0.062	0.003	0.003	0.0029	0.0001	0.0097	0.0100	0.0030	0.0000	0.0000
808999	21-790	Product analysis		0.13	1.23	0.22	0.003	0.009	0.06	0.08	0.15	0.009	0.027	0.02	0.062	0.003	0.003	0.0031	0.0001	0.0099	0.0100	0.0030	0.0000	0.0000

Chemical Analysis(%)

Heat	Bulletin No.	Product Req.		Al / N	Nb + V	Nb + Ti + V	CE IIW
			Max	-	0.120	0.140	0.41
			Min	2.00	-	-	-
808993		Heat analysis		3.46	0.064	0.067	0.38
808999		Heat analysis		2.63	0.065	0.068	0.38
808993	21-789	Product analysis		3.45	0.064	0.067	0.39
808993	21-789	Product analysis		3.26	0.064	0.067	0.39
808999	21-790	Product analysis		2.68	0.065	0.068	0.38
808999	21-790	Product analysis		2.73	0.065	0.068	0.38

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.3756304.138
DATE: 11/02/2022
WITNESSED ☐ REVIEW ☐

CEpcm = C+Si/30+Mn/20+Cu/20+Ni/60+Cr/20+Mo/15+V/10+5B

CE_S = C+Mn/6

CEIIW = C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative
Fiz. Antonica Sergiu

Formular 12A2, rev. 3

ArcelorMittal Tubular Products Romans S.A. J27/88/91 Romania

Inspector/Buyer representative
Witnessed/Reviewed
Florin Hriscu
16.07.21

BUREAU VERITAS ROMANIA 20 PARIS 1828 INDUSTRY & FACILITIES

Manufacturer:
ArcelorMittal Tubular Products Roman S.A.
STEFAN CEL MARE STR, BL 15, SC. A, PARTER I
ROMAN, NEAMT ROMANIA

MILL TEST CERTIFICATE
according to EN 10204/3.2/2004
-

Page 2/3
B 22398/1
30.06.2021

ArcelorMittal

Buyer: T.A.L. S.P.A.con socio unico
VIA G. DI VITTORIO, 6, ZONA IND., 29017
FIORENZUOLA D'ARDA (PIACENZA)
ITALY

SEAMLESS STEEL LINE PIPES

Total weight:	Total Length:	Pieces	Bundles
22.262 tons - lbs	93.27 meters - feets	12	-

Standard:
EN 10225-3-2019;

Buyer's reference	OF210231
Contract	**50005005**

Item	Item Client
1	-

Dimensions: 406.40 x 25.40 mm
-

Schedule: -

Length: 6.00 - 8.00 m
-

-
-

Hydro Test:

Bar	PSI	MPa	Time(sec)
205	-	20.5	5

Steel Grade: S355NLHHO
-

Tensile Test

Heat	Orientation	Length		Width/Diameter		Thickness		Section		Mechanical test Bulletin No.	YS MPa	YS (PSI:1000)	UTS MPa	UTS (PSI:1000)	E %	YS/UTS max: 0.88
		mm	inch	mm	inch	mm	inch	mm²	inch²							
808993	Longitudinal Round	-	-	10.00	-	0.00	-	78.5	-	21-1497	403.80	-	509.60	-	35.30	0.79
808993	Longitudinal Round	-	-	10.00	-	0.00	-	78.5	-	21-1497	394.90	-	510.80	-	33.30	0.77
808999	Longitudinal Round	-	-	10.00	-	0.00	-	78.5	-	21-1497	397.50	-	505.70	-	34.50	0.79

Impact Test

Heat	Impact Test Bulletin No.	Orientation	Size (mm)	Temp. (°C)	Req.KV (min. J)	KV values (J)			Req.Avr. (min. J)	Avr. fracture energy (J)	KCU min:-J/cm² T:°C			Shear Area min. %			Lateral Expansion min. mm		
808993	21-2484	Transversal	10x10x55	-40	-	239	227	221	50.0	229	-	-	-	100	100	100	1.96	1.91	1.88
808993	21-2484	Transversal	10x10x55	-40	-	218	225	233	50.0	225	-	-	-	100	100	100	1.86	1.90	1.94
808999	21-2484	Transversal	10x10x55	-40	-	220	231	214	50.0	222	-	-	-	100	100	100	1.88	1.93	1.83

Heat

Heat	Pieces	Length (m)	Weight (kg)
808993	9	-	-
808999	3	-	-

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22 SF 3756304.138
DATE: 11/02/2022
WITNESSED ☐ REVIEW ☑

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative
Fiz. Antonica Sergiu

Formular 12A2, rev. 3

ArcelorMittal Tubular Products Roman S.A. J27/98/91 ★★★★★ România

Witnessed/Reviewed
Florin Hriscu
Inspector/Buyer
representative

16.02.21

BUREAU VERITAS ROMANIA 20 PARIS 1828 INDUSTRY & FACILITIES ROMAN

Manufacturer: ArcelorMittal Tubular Products Roman S.A. STEFAN CEL MARE STR, BL 15, SC. A, PARTER I ROMAN, NEAMT ROMANIA	**MILL TEST CERTIFICATE** according to EN 10204/3.2/2004 -	Page 3/3 B 22398/1 30.06.2021	ArcelorMittal

Buyer: T.A.L. S.P.A.con socio unico VIA G. DI VITTORIO, 6, ZONA IND., 29017 FIORENZUOLA D'ARDA (PIACENZA) ITALY	SEAMLESS STEEL LINE PIPES	Total weight: 22.262 tons - lbs	Total Length: 93.27 meters - feets	Pieces 12	Bundles -
Buyer's reference OF210231	**Standard:** EN 10225-3-2019:				
Contract 50005005	Dimensions: 406.40 x 25.40 mm -	Schedule: -	Length: 6.00 - 8.00 m -	- -	

Item	Item Client
1	-

Hydro Test:	Bar	PSI	MPa	Time(sec)
	205	-	20.5	5

Steel Grade: S355NLHHO -

Remarks Manufacturing process – hot rolling.
Hot finished, steel is fully killed and vacuum degassing, fine grained practice and produced by electric furnace.
Visual inspection and dimensional check without objection.
Heat treatment normalizing at temperature of 890-940°C, time soaking 35 min.
NDT full body pipes :
- automated electromagnetic inspection for longitudinal imperfections, outside & inside surface, acceptance level U4/C (12.5% from W.T)-acc. ISO 10893/3-satisfactory.
NDT for the pipe ends:
- automated ultrasonic inspection for longitudinal imperfections, outside & inside surface, acceptance level U3/C (10% from W.T)-acc. ISO 10893/10-satisfactory.
Hydrostatic test hold for 5 sec. no leakage noticed.
The products was manufactured, sampled, tested, marked and inspected in accordance with the Standards, the supplementary requirements, and any other requirements designated in the purchase order, and has been found to meet such requirements.
Heat no . 808993 Through Thickness Test Buletin No.21- 2205 - Z ≥ 25% values : 75.34; 74.17; 75.97
- Z ≥ 35% values : 75.16
- U TS (N/mm²) values: 488.3; 497.5; 502.5
Heat no . 808993 Through Thickness Test Buletin No.21-2204 - Z ≥ 25% values : 75.83; 72.43; 74.35
- Z ≥ 35% values : 74.20
- U TS (N/mm²) values: 484.8; 495.4; 488.3
Heat no . 808999 Through Thickness Test Buletin No.21-2203 - Z ≥ 25% values : 72.61; 75.65; 73.64
- Z ≥ 35% values : 73.97
- U TS (N/mm²) values: 502.5; 509.6; 495.4

BUREAU VERITAS ITALIA WELDING 48
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We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative
Fiz. Antonica Sergiu

Formular 12A2, rev. 3

ArcelorMittal Tubular Products Roman S.A. ArcelorMittal J27/80/91 Romania

Witnessed/Reviewed
Florin Hriscu

Inspector/Buyer representative
16.02.21

BUREAU VERITAS ROMANIA 20 PARIS 1828 INDUSTRY & FACILITIES ROMAN

Certificado Nº (Certificate No.) S/ According to EN 10204-3.2 Página (Page) Fecha (Date)	275047-D1-20180404 Pag 1 / 4 04/04/2018

AENOR ER Empresa Registrada UNE-EN ISO 9001 ER-0030/1992

ArcelorMittal España, S.A.
Residencia de la Granda
33418 - Gozón
Asturias - España

CERTIFICADO DE INSPECCIÓN
INSPECTION CERTIFICATE

ArcelorMittal

O. Suministro (Works Order No)	Cliente (Customer)	Destino (Destination)	Producto (Product)	Especificación (Specification)	Pedido cliente/Customer order:
BC8219	ARCELOR PROJECTS INT. BV	MANNESMANNWEG. 5 4794SL - HEIJNINGEN-HOLANDA	Chapa Gruesa / Heavy Plate	S355G10+M S355ML EN 10225 EN 10025-4 MOD NORSOK	FB74AMP01W 3200055705

Descripción del producto / Description of the product

ITEM 10

Colada (Heat No)	Chapa (Plate No)	Dimensiones, mm (Size, mm)	Peso, t (Weight)
705587	42843891	30 x 3050 x 12000	8,619

Colada (Heat No)	Chapa (Plate No)	Dimensiones, mm (Size, mm)	Peso, t (Weight)
705587	42843901	30 x 3050 x 12000	8,619

Colada (Heat No)	Chapa (Plate No)	Dimensiones, mm (Size, mm)	Peso, t (Weight)
705587	42844171	30 x 3050 x 12000	8,619

Colada (Heat No)	Chapa (Plate No)	Dimensiones, mm (Size, mm)	Peso, t (Weight)

Total chapas (plates)	3	Total peso (Weight)	25,86

Análisis de colada y producto / Heat and product analysis

SU02: Nb+V SU03: Nb+V+Ti PCM: C+Si/30+(Mn+Cu+Cr)/20+Ni/60+Mo/15+V/10+5B CEV: C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15

Nº Colada (Heat No)	Nº muestra (Sample No)	Composición química (Chemical analysis)% *(H=Colada / Heat P=Producto / Product)																									
		*H/P	C	Mn	Si	S	P	Al	N	Cu	Ni	Cr	Mo	Nb	V	Ti	B	As	Sn	Sb	Pb	Ca	Bi	Pcm	Cev	SU03	SU02
705587		H	0,06	1,52	0,274	0,002	0,013	0,024	0,0044	0,212	0,301	0,032	0,003	0,028	0,003	0,012	0,0001	0,002	0,0030	0,000	<0,001	0,0001	<0,002	0,16	0,35	0,04	0,03
	20171023081	P	0,06	1,53	0,273	0,003	0,012	0,022	0,0047	0,217	0,301	0,029	0,001	0,025	0,005	0,012	0,0001							0,17	0,36	0,04	0,03

(1) L=longitudinal T= Transversal Z= Through thickness D= Diagonal
(2) C=Cabeza (top) P=Pie (bottom) S= Superficie (surface) 4=1/4 esp. (1/4 thickness) 3=1/3 esp. (1/3 thickness) E=Esp. Completo (full thick.) N=Nucleo (midthickness)
(3) " " =BrutoLaminación (as rolled) - A= N +R - L=Conformado de Normalización (normalizing rolling) - T=Tratamiento Termomec.(termomec. rolling) - N=Normalizado(normalized) - R=Revenido(tempering)
Type of test: A: Ultrasonic test approved; Z35: Through thickness test; HV: Vickers hardness test;(HT)*: Postwelding heat treatment of test coupons: 580 +/- 20ºC Soaking time: 4h.
ISO-V: Toughness; ISO-V(S): Toughness after stretching 5%; ISO-V(S+A): Toughness after stretching 5% + 250ºC, 1 hour

Ensayos mecánicos / Mechanical test

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WITNESSED ☐ REVIEW ☑

Nº Chapa (Plate No.)	Nº Muestra (Sample No)	Esp. Thickness	Est.Sum (Delivered condition) (3)	UST (Us test)	Tipo ensayo (Type of test)		Orient. (Orientation) (1)	Local. (Location) (2)	Temp. (Temp) ºC	Ensayo de tracción (Tensile test) Reh Y.P. Mpa	Rm T.S. Mpa	Reh / Rm	%A Elong. (1) 5,65√So (2) 8 Inch	Ensayo Resiliencia (Charpy-V Impact test) Energía (Energy), j Individuales (Inviduals) 1	2	3	Media (Av.)	Otros ensayos (other test) Individuales (Inviduals) 1	2	3	Media (Av)	Doblado (Bend test) Mandril (Mandrel)	Angulo (Angle)	Result. (Result)
42843891	20171023065	30	T	A	ISO-V 10 (HT)	(j)	T	C S	-40					210	238	231	226								
	20171023065	30	T	A	ISO-V 10 (HT)	(j)	L	C S	-50					300	293	282	292								
	20171023065	30	T	A	ISO-V 10	(j)	T	C S	-40					257	300	270	276								
	20171023065	30	T	A	ISO-V 10	(j)	L	C S	-50					300	300	283	294								

B.O.S. Continuously cast slab.
Visual and dimensional inspection of plates: satisfactory
Surface quality according/ EN 10163 Class B Subclass 3+ ISO 8501 Class B
Dimensional tolerances according to EN 10029; thickness tolerances according to EN 10029 class C
Flatness: EN 10029 (2010) Class N
EN 10025: Options 2 and 4; EN 10225: Options 10, 12, 13 and 18
Ultrasonic inspection EN 10160 S2 E3

CE
0099
ArcelorMittal España,S.A.
Residencia la Granda
33418 Gozón (Asturias - España)
07
QP00033_CPR2013-07-01_FC_V006
EN 10025-4:2004
S355ML

Uso previsto: estructuras soldadas, atornilladas o remachadas. (Intented to be used in welded, bolted and riveted structures)
Límite elástico (Yield strength)*
Resistencia a tracción (Tensile strength)*
Alargamiento (Elongation)*
Resis. fa vidri chaque (Impact strength)*
Soldabilidad (Weldability)*
Durabilidad (Durability)*
* Expresado como se indica en el DdP (Expressed as indicated in the DoP)

Por / By Classification society
Javier Sánchez
Gijon Office
Lloyd's Register España SA

Por / By ArcelorMittal España
Juan Manual Vigil Fernández
Jefe Calidad Chapa Gruesa Heavy Plate Quality Manager
Flat Carbon Europe

ArcelorMittal España,S.A - Registro Mercantil de Asturias,Tomo 2279, Folio 115, Hoja AS- 17946-N.I.F.A81046856 - Oficina de certificados:certificados.gijon@arcelormittal.com-Tlf+ 34985187776

Certificado Nº (Certificate No.) S/ According to EN 10204-3.2 Página (Page) Fecha (Date)	275047-D1-20180404 Pag 2 / 4 04/04/2018

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ArcelorMittal España, S.A.
Residencia de la Granda
33418 - Gozón
Asturias - España

CERTIFICADO DE INSPECCIÓN
INSPECTION CERTIFICATE

ArcelorMittal

O. Suministro (Works Order No)	Cliente (Customer)	Destino (Destination)	Producto (Product)	Especificación (Specification)	Pedido cliente/Customer order:
BC8219	ARCELOR PROJECTS INT. BV	MANNESMANNWEG. 5 4794SL - HEIJNINGEN-HOLANDA	Chapa Gruesa / Heavy Plate	S355G10+M S355ML EN 10225 EN 10025-4 MOD NORSOK	FB74AMP01W 3200055705

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ISO-V: Toughness; ISO-V(S): Toughness after stretching 5%; ISO-V(S+A): Toughness after stretching 5% + 250ºC, 1 hour

Ensayos mecánicos / Mechanical test

Nº Chapa (Plate No.)	Nº Muestra (Sample No)	Esp. Thickness	Est.Sum (Delivered condition) (3)	UST (Us test)	Tipo ensayo (Type of test)	Orient. (Orientation) (1)	Local. (Location) (2)	Temp. (Temp) ºC	Ensayo de tracción (Tensile test) Reh Y.P. Mpa	Rm T.S. Mpa	Reh / Rm	%A Elong. (1) 5,65√So (2) 8 Inch	Ensayo Resiliencia (Charpy-V Impact test) Energia (Energy), j Individuales (Inviduals) 1	2	3	Media (Av.)	Otros ensayos (other test) Individuales (Inviduals) 1	2	3	Media (Av)	Doblado (Bend test) Mandril (Mandrel)	Angulo (Angle)	Result. (Result)
	20171023065	30	T	A	Tensile (HT)* (Mpa)	T	C E		440	509	0,86	31,9											
	20171023065	30	T	A	Tensile Z (Mpa)	Z	C E			587													
	20171023065	30	T	A	Tensile (Mpa)	T	C E		430	511	0,84	28,4											
	20171023065	30	T	A	Z35 (%)	Z	C E										75	44	65	61			
	20171023078	30	T	A	ISO-V(S+A) 10 (j)	T	C S	-40					174	42	182	133							
	20171023078	30	T	A	ISO-V(S) 10 (j)	T	C S	-40					248	207	221	225							
	20171023078	30	T	A	HV 10	T	C S	20									155	149	150	151			
	20171023081	30	T	A	HV 10	T	P S	20									149	151	150	150			
42843901	20171023072	30	T	A	ISO-V 10 (HT) (j)	T	C S	-40					193	233	281	236							
	20171023072	30	T	A	ISO-V 10 (HT) (j)	L	C S	-50					300	300	300	300							
	20171023072	30	T	A	ISO-V 10 (j)	T	C S	-40					300	300	300	300							
	20171023072	30	T	A	ISO-V 10 (j)	L	C S	-50					261	240	253	251							
	20171023072	30	T	A	Tensile (HT)* (Mpa)	T	C E		432	504	0,86	33,0											
	20171023072	30	T	A	Tensile Z (Mpa)	Z	C E			591													
	20171023072	30	T	A	Tensile (Mpa)	T	C E		453	514	0,88	31,9											

B.O.S. Continuously cast slab.
Visual and dimensional inspection of plates: satisfactory
Surface quality according/ EN 10163 Class B Subclass 3+ ISO 8501 Class B
Dimensional tolerances according to EN 10029; thickness tolerances according to EN 10029 Class C
Flatness: EN 10029 (2010) Class N
EN 10025: Options 2 and 4; EN 10225: Options 10, 12, 13 and 18
Ultrasonic inspection EN 10160 S2 E3

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.3756304.138
DATE 11/02/2022
WITNESSED ☐ REVIEW ☑

Por / By Classification society

Javier Sanchez
Gijon Office
Lloyd's Register España SA

Por / By ArcelorMittal España

Juan Manual Vigil Fernández
Jefe Calidad Chapa Gruesa Heavy Plate Quality Manager
Flat Carbon Europe

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ArcelorMittal España, S.A.
Residencia de la Granda
33418 - Gozón
Asturias - España

CERTIFICADO DE INSPECCIÓN
INSPECTION CERTIFICATE

ArcelorMittal

O. Suministro (Works Order No)	Cliente (Customer)	Destino (Destination)	Producto (Product)	Especificación (Specification)	Pedido cliente/Customer order:
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(3) " " =BrutoLaminación (as rolled) - A= N +R - L=Conformado de Normalización (normalizing rolling) - T=Tratamiento Termomec.(termomec. rolling) - N=Normalizado(normalized) - R=Revenido(tempering)
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ISO-V: Toughness; ISO-V(S): Toughness after stretching 5%; ISO-V(S+A): Toughness after stretching 5% + 250ºC, 1 hour

Ensayos mecánicos / Mechanical test

Nº Chapa (Plate No.)	Nº Muestra (Sample No)	Esp. Thickness	Est.Sum (Delivered condition) (3)	UST (Us test)	Tipo ensayo (Type of test)	Orient. (Orientation) (1)	Local. (Location) (2)	Temp. (Temp) ºC	Ensayo de tracción (Tensile test) Reh Y.P. Mpa	Rm T.S. Mpa	Reh / Rm	%A Elong. (1) 5,65√So (2) 8 Inch	Ensayo Resiliencia (Charpy-V Impact test) Energia (Energy), j Individuales (Inviduals) 1	2	3	Media (Av.)	Otros ensayos (other test) Individuales (Inviduals) 1	2	3	Media (Av)	Doblado (Bend test) Mandril (Mandrel)	Angulo (Angle)	Result. (Result)
	20171023072	30	T	A	Z35 (%)	Z	C E										75	72	72	73			
	20171023078	30	T	A	ISO-V(S+A) 10 (j)	T	C S	-40					174	42	182	133							
	20171023078	30	T	A	ISO-V(S) 10 (j)	T	C S	-40					248	207	221	225							
	20171023078	30	T	A	HV 10	T	C S	20									155	149	150	151			
	20171023081	30	T	A	HV 10	T	P S	20									149	151	150	150			
42844171	20171023078	30	T	A	ISO-V(S+A) 10 (j)	T	C S	-40					174	42	182	133							
	20171023078	30	T	A	ISO-V(S) 10 (j)	T	C S	-40					248	207	221	225							
	20171023078	30	T	A	HV 10	T	C S	20									155	149	150	151			
	20171023078	30	T	A	ISO-V 10 (HT) (j)	T	C S	-40					300	273	251	275							
	20171023078	30	T	A	ISO-V 10 (HT) (j)	L	C S	-50					213	228	226	222							
	20171023078	30	T	A	ISO-V 10 (j)	T	C S	-40					209	156	169	178							
	20171023078	30	T	A	ISO-V 10 (j)	L	C S	-50					280	300	287	289							
	20171023078	30	T	A	Tensile (HT)* (Mpa)	T	C E		401	501	0,80	31,9											
	20171023078	30	T	A	Tensile Z (Mpa)	Z	C E			582													
	20171023078	30	T	A	Tensile (Mpa)	T	C E		408	507	0,80	31,3											

B.O.S. Continuously cast slab.
Visual and dimensional inspection of plates: satisfactory
Surface quality according/ EN 10163 Class B Subclass 3+ ISO 8501 Class B
Dimensional tolerances according to EN 10029; thickness tolerances according to EN 10029 class C
Flatness: EN 10029 (2010) Class N
EN 10025: Options 2 and 4; EN 10225: Options 10, 12, 13 and 18
Ultrasonic inspection EN 10160 S2 E3

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.3756304.138
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WITNESSED ☐ REVIEW ☑

Por / By Classification society

Javier Sánchez
Gijon Office
Lloyd's Register España SA

Por / By ArcelorMittal España
Juan Manual Vigil Fernández
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Flat Carbon Europe

Certificado Nº (Certificate No.) S/ According to EN 10204-3.2 Página (Page) Fecha (Date)	275047-D1-20180404 Pag 4 / 4 04/04/2018

AENOR ER Empresa Registrada UNE-EN ISO 9001 ER-0030/1992

ArcelorMittal España, S.A.
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CERTIFICADO DE INSPECCIÓN
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ArcelorMittal

O. Suministro (Works Order No)	Cliente (Customer)	Destino (Destination)	Producto (Product)	Especificación (Specification)	Pedido cliente/Customer order:
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ISO-V: Toughness; ISO-V(S): Toughness after stretching 5%; ISO-V(S+A): Toughness after stretching 5% + 250°C, 1 hour

Ensayos mecánicos / Mechanical test

Nº Chapa (Plate No.)	Nº Muestra (Sample No)	Esp. Thickness	Est.Sum (Delivered condition) (3)	UST (Us test)	Tipo ensayo (Type of test)	Orient. (Orientation) (1)	Local. (Location) (2)	Temp. (Temp) °C	Ensayo de tracción (Tensile test) Reh Y.P. Mpa	Rm T.S. Mpa	Reh / Rm	%A Elong. (1) 5,65√So (2) 8 Inch	Ensayo Resiliencia (Charpy-V Impact test) Energia (Energy), j Individuales (Inviduals) 1	2	3	Media (Av.)	Otros ensayos (other test) Individuales (Inviduals) 1	2	3	Media (Av)	Doblado (Bend test) Mandril (Mandrel)	Angulo (Angle)	Result. (Result)
	20171023078	30	T	A	Z35 (%)	Z	C E										73	71	68	71			
	20171023081	30	T	A	HV 10	T	P S	20									149	151	150	150			

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.3756304.138
DATE: 11/02/2022
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B.O.S. Continuously cast slab.
Visual and dimensional inspection of plates: satisfactory
Surface quality according/ EN 10163 Class B Subclass 3+ ISO 8501 Class B
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Flatness: EN 10029 (2010) Class N
EN 10025: Options 2 and 4; EN 10225: Options 10, 12, 13 and 18
Ultrasonic inspection EN 10160 S2 E3

Por / By Classification society

Javier Sánchez
Gijon Office
Lloyd's Register España SA

Por / By ArcelorMittal España

Juan Manual Vigil Fernández
Jefe Calidad Chapa Gruesa Heavy
Plate Quality Manager
Flat Carbon Europe

ROSETTI MARINO	Welding Procedure Qualification Record (PQR) Verbale di Qualifica di Procedura di Saldatura	No. 30/22	Sheet/Foglio 1/2

Manufacturer's Welding Procedure. Ref. no.	30/22 REV. 0		
Manufacturer	ROSETTI MARINO S.p.A.		
Address	VIA TRIESTE 230 - 48121 RAVENNA		
Code, Testing Standard	Project Spec. SD-NOC-STR-301 Rev.03		
Date of welding	February 8th and 9th, 2022		
Examiner of examining body	Bureau Veritas Italy S.p.A.		
RANGE OF QUALIFICATION			
Welding process	FCAW	//	//
Type(s)	Semiautomatic	//	//
Welding Equipment Type	HF inverter type		
Actual parent Material side A	Pipe: API 5L X52+N PSL1 (Heat: H1192466)		
Actual parent Material side B	Plate: EN 10225: S355G10+M (Heat: 705587)		
Parent Material grade	AWS D1.1 - II / ISO 15608 1.2		
Supply condition	A) Normalized (+N) to B) Thermomechanically Rolled (+TM)		
Carbon equivalent/Pcm/C	Heat Values: A) 0,40/0,253/0,15 to B) 0,35/0,163/0,06		
Groove design/configuration	Half Vee Tubolar Joint (one side welding without backing), For groove dimension and details see Welding Table 30/22_2G and 30/22_5G		
Parent material thickness (mm)	A)12,00 mm (obtained from parent material of 12,70 mm thk.) to B)30,00 mm		
Weld metal thickness (mm)	12,00 mm	//	//
Single or Multi-pass	Multiple	//	//
Outside diameter	219,10 mm (8")		
Filler material Designation	AWS 5.29 E81T1-Ni1MJ	//	//
Filler material Maker	OK Tubrod 15.17 - ESAB	//	//
Filler material Size	∅ 1,2 mm	//	//
Shielding gas/Flux	80% Ar + 20% CO2	//	//
Shielding gas flow rate	16 l/min.	//	//
Backing gas (purging)	None		

Type of welding current & polarity	DC/SP	Heat input / Apporto termico (kJ/mm) - 25%	Pass	Diameter (mm)	2G	5G
			Root	∅ 1,2	1,62 to 2,74	0,68 to 1,44
			Hot	∅ 1,2	0,89 to 1,25	0,76 to 1,43
			Fill	∅ 1,2	0,77 to 1,39	0,88 to 1,51
			Cap	∅ 1,2	0,79 to 1,19	0,86 to 1,26

Welding position	2G and 5G - Uphill progression		
Preheat (°C)	25	Interpass temperature / Temp. di interpass (°C)	250 for 2G and 5G
Post-Weld Heat Treatment and/or ageing	None		
Weld bead width	Max. 12 mm		
Welder's detail	Benyo Ionel (GX17)		
Time lapse between root and hot pass	N.A.		
Other information / Altre informazioni	- Preheat performed by propane torch		

BUREAU VERITAS ITALY
WITNESSED
SURVEYOR G. TESEI
DATE 18/03/2022

ROSETTI MARINO	Welding Procedure Qualification Record (PQR) Verbale di Qualifica di Procedura di Saldatura	No. 30/22	Sheet/Foglio 2/2

Manufacturer's Welding Procedure. Ref. no.	30/22 REV. 0		
Test result (WPQR) N°	30/22	Date/Data	18/03/2022
Manufacturer's WPS No.	pWPS 30/22_2G REV. 1	Date/Data	08/02/2022
Manufacturer's WPS No.	pWPS 30/22_5G REV. 1	Date/Data	09/02/2022

TESTS CARRIED OUT ON SAMPLE 1/2 WELDED IN 2G POSITION AND ON SAMPLE 2/2 WELDED IN 5G POSITION

NON DESTRUCTIVE EXAMINATIONS		
	Judgement	Report No.
Visual examinations	Acceptable	VDR 10/2022 dated 12/02/2022 for 2G and VDR 16/2022 dated 12/02/2022 for 5G
Penetrant test	N.A.	N.A.
Magnetic particle test	Acceptable	22049 MT 10 RN Rev.01 dated 12/02/2022 for 2G and 22049 MT 16 RN Rev.01 dated 12/02/2022 for 5G
Radiographic test	N.A.	N.A.
Ultrasonic test	Acceptable	22049 UT 04 SZ Rev.01 dated 12/02/2022 for 2G and 22049 UT 07 SZ Rev.01 dated 12/02/2022 for 5G

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2] //	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] //	A [%]	Z [%]	Fracture Location	Remarks
//	//	//	//	//	//	//	//
//	//	//	//	//	//	//	//

BEND TEST

Type & N.	Bend angle	Remarks	Results
//	//	//	//

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] //			Avarage value [J] //	Remarks
//	//	//	//	//	//	//	//	//
//	//	//	//	//	//	//	//	//
//	//	//	//	//	//	//	//	//

OTHER TESTS	
Type of test / Tipo di prova	Results / Risultati
12 Macro examination and Hardness test	Satisfactory: See INSPECTA S.R.L. Test Report No. 059-00330-22 dated 18/03/2022
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	INSPECTA S.R.L. - Ravenna (RA)
Laboratory report reference N.	Report No. 059-00330-22 dated 18/03/2022
Test carried out in the presence of:	BUREAU VERITAS Italy

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Project Spec. SD-NOC-STR-301 Rev.03

Date/Data
18-03-2022

ROSETTI MARINO S.p.A.

Examiner or Examination Body
BUREAU VERITAS Italy
Giancarlo Tesei

Name and signature / Nome e firma

BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022

ROSETTI MARINO SpA A. Khalifa Welding Dept.

ROSETTI MARINO	PROJECT	Al-Shaheen Field, Gallaf Batch-3 Project - F-DBN EPCIC8 SOW	CLIENT	NOC QATAR
	DOC	pWPS Preliminary Welding Procedure Specification	JOB #:	121A20

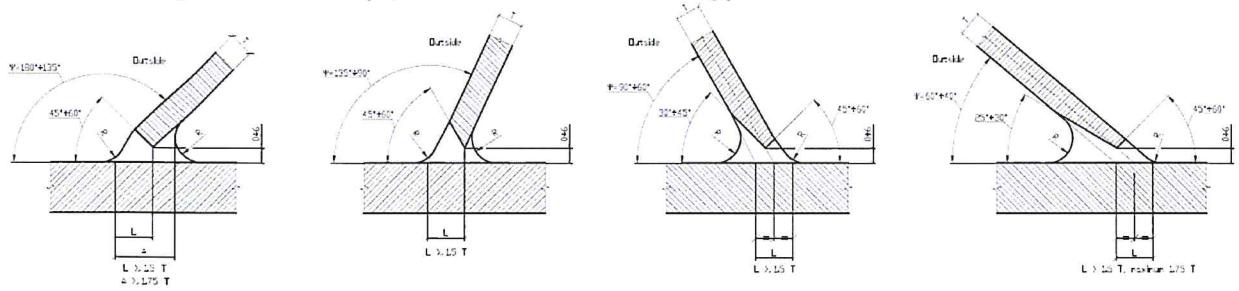
PQR ref.: 30/22	code Project Spec. SD-NOC-STR-301	WPS 30/22_2G	REV.: 1	Data /date 08/02/22

Procedimento di saldatura / Welding process: **GS FCAW** — Tipo / Type: **SEMIAUTOMATIC** — scopo / scope: **CJP,T-,K-,Y-**

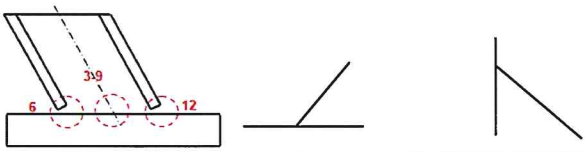
GIUNTO - JOINT

Tipo di giunto / Joint Design: **½ V** — ☐ DOUBLE SIDED WELD — ☒ SINGLE SIDED WELD (no backing on root)

Dettagli / Details: **sketch is only for bevel and shape, it does not indicate the welding position that is detailed in dedicated section below**



Connection shall simulate the widest and the narrowest configurations, where macro shall be taken. One weld shall be placed with axis of abutting member vertical (2G), one weld with axis horizontal (5G)



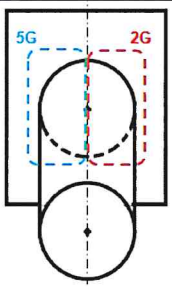
MATERIALE BASE - BASE MATERIAL

API 5L X52+N PSL1 to EN 10225: S355G10+M — **Material grade: +N to +TM** — **Max Cev 0.40 to 0.35**

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove: **12,00 mm obtained from 12,70 mm to 30,00 mm**

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove: **219,10 mm (8") to Plate**

METALLO D'APPORTO - FILLER METAL



	GS FCAW
Spec. N° (SFA)	5.29
AWS N° (CLASS)	E81T1-Ni1M
F-N°	6
A-N°	10
Diametro mat. d'apporto / Size of filler metal	1,2
Metallo depositato / Deposit weld metal	12,00 mm
Gamma spessori /Thick. range	Up to completion
Accoppiamento filo-flusso / Electrode-flux (CLASS)	N.A.
Denom. Comm. flusso / FLUX trade name	N.A.
Inserto consumabile / Consumable insert	N.A.
Altro / other	OK Tubrod 15.17 - ESAB

BUREAU VERITAS ITALIA WELDING 48 — IT FILE: 22.SA.335304.138 — DATE: 08/02/2022 — WITNESSED ☐ — REVIEW ☐

giunto / Joint: **Cianfrino / groove** — Posizione / position: **2G** — Progressione / weld progression: **N.A.**

PRERISCALDO - PRE-HEAT (QW406)

Temp.preriscaldo minima / Min. pre-heat temp: **25 °C** — Max temp. Di interpass / Max interpass temp.: **250 °C** — Preheat Method / Metodo preriscaldo: **Propane Torch**

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs): **N.A.** — Temperatura di stasi / Holding temperature °C: **N.A.** — Tempo di stasi / Holding time (min.): **N.A.** — Velocità di raffreddamento / Cooling rate (°C/Hrs): **N.A.**

GAS DI PROTEZIONE - GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar+CO2	80%+20%	16-18 lt/min
Protezione / Shielding:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current:	DC - CV	Polarità / Polarity	RP
Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type:			N.A.
Metodo di trasferimento per GMAW / GMAW metal tranfer mode:			Spray arc
Velocità alimentazione filo / Electr. Wire feed speed range:			Self regulated (CV)

TECNICA - TECHNIQUE

Passata / Bead: **Tirata-Larga/String-Wave** — Dimensione bocchello gas / Orifice of gas cup size: **3/4"** — Pulizia iniziale e fra le passate / Initial and interpass cleaning: **Spazzolatura e Molatura/Brushing Grinding**

Metodo di solcatura a rovescio / Method of back gouging: **N.A.** — Oscillazione / Oscillation: **N.A.** — Distanza tra zona di contatto e pezzo / Contact tube to work distance: **13 to 18 mm**

N°Passate / Passes nr.: **Multipla/Multiple** — Elettrodo multiplo o singolo / Multiple or single electrodes: **Singolo/Single** — Martellatura / Peening: **N.A.**

Altro / Other: **Max. width of weld bead 12 mm**

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range	Vel. avanzamento / Travel speed range (mm/min)	Apporto termico / Heat input (KJ/mm)
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. range			
Root	GS FCAW	E81T1-Ni1M	1,2	DC/RP	185 to 200	26 to 27	110 to 160	1,80 to 2,95
Hot	GS FCAW	E81T1-Ni1M	1,2	DC/RP	235 to 250	28 to 30	330 to 370	1,07 to 1,36
Fill	GS FCAW	E81T1-Ni1M	1,2	DC/RP	215 to 250	27 to 30	280 to 370	0,94 to 1,61
Cap	GS FCAW	E81T1-Ni1M	1,2	DC/RP	195 to 245	27 to 29	300 to 350	0,90 to 1,42

Preparato da / prepared by: ***D.Cenacchi*** — Approvato da / approved by: ***A. Khalifa***

ROSETTI MARINO	PROJECT	Al-Shaheen Field, Gallaf Batch-3 Project - F-DBN EPCIC8 SOW	CLIENT	NOC QATAR
	DOC	pWPS Preliminary Welding Procedure Specification	JOB #:	121A20

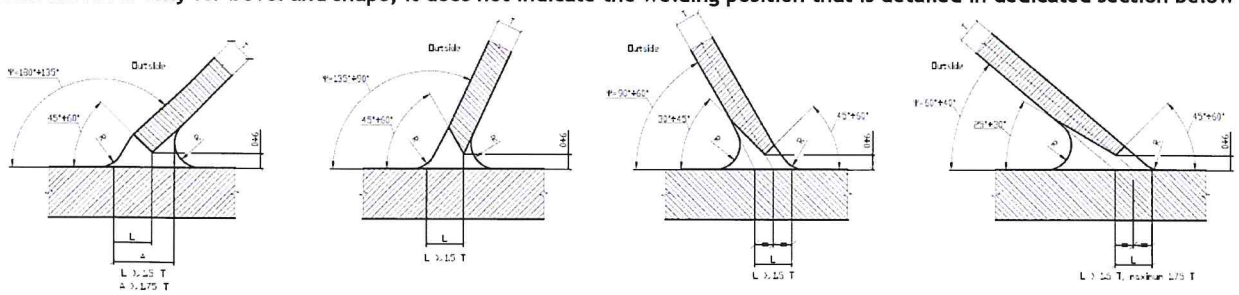
PQR ref.: 30/22	code Project Spec. SD-NOC-STR-301	WPS 30/22_5G	REV.: 1	Data /date 09/02/22

Procedimento di saldatura / Welding process: GS FCAW — Tipo / Type: SEMIAUTOMATIC — scopo / scope: CJP,T-,K-,Y-

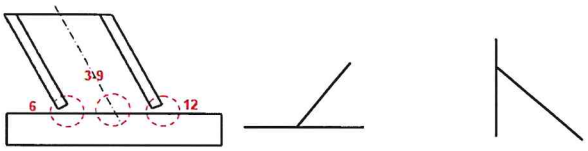
GIUNTO - JOINT

Tipo di giunto / Joint Design: ½ V — ☐ DOUBLE SIDED WELD — ☒ SINGLE SIDED WELD (no backing on root)

Dettagli / Details: sketch is only for bevel and shape, it does not indicate the welding position that is detailed in dedicated section below



Connection shall simulate the widest and the narrowest configurations, where macro shall be taken. One weld shall be placed with axis of abutting member vertical (2G), one weld with axis horizontal (5G)



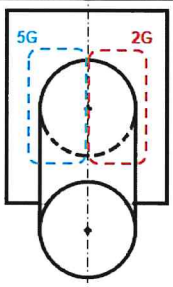
MATERIALE BASE - BASE MATERIAL

API 5L X52+N PSL1 to EN 10225: S355G10+M — Material grade: +N to +TM — Max Cev 0.40 to 0.35

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove: 12,00 mm obtained from 12,70 mm to 30,00 mm

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove: 219,10 mm (8") to Plate

METALLO D'APPORTO - FILLER METAL



	GS FCAW
Spec. N° (SFA)	5.29
AWS N° (CLASS)	E81T1-Ni1M
F-N°	6
A-N°	10
Diametro mat. d'apporto / Size of filler metal	1,2
Metallo depositato / Deposit weld metal	12,00 mm
Gamma spessori /Thick. range	Up to completion
Accoppiamento filo-flusso / Electrode-flux (CLASS)	N.A.
Denom. Comm. flusso / FLUX trade name	N.A.
Inserto consumabile / Consumable insert	N.A.
Altro / other	OK Tubrod 15.17 - ESAB

BUREAU VERITAS ITALIA WELDING 48 — IT FILE: 22_SA: 375634.138 — DATE: 09/02/2022 — WITNESSED ☐ — REVIEW ☐

giunto / Joint: Cianfrino / groove — Posizione / position: 5G — Progressione / weld progression: Uphill

PRERISCALDO - PRE-HEAT (QW406)

Temp.preriscaldo minima / Min. pre-heat temp: 25 °C — Max temp. Di interpass / Max interpass temp.: 250 °C — Preheat Method / Metodo preriscaldo: Propane Torch

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs): N.A. — Temperatura di stasi / Holding temperature °C: N.A. — Tempo di stasi / Holding time (min.): N.A. — Velocità di raffreddamento / Cooling rate (°C/Hrs): N.A.

GAS DI PROTEZIONE - GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar+CO2	80%+20%	16-18 lt/min
Protezione / Shielding:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current: DC - CV	Polarità / Polarity: RP
Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type:	N.A.
Metodo di trasferimento per GMAW / GMAW metal tranfer mode:	Spray arc
Velocità alimentazione filo / Electr. Wire feed speed range:	Self regulated (CV)

TECNICA - TECHNIQUE

Passata / Bead: Tirata-Larga/String-Wave — Dimensione bocchello gas / Orifice of gas cup size: 3/4" — Pulizia iniziale e fra le passate / Initial and interpass cleaning: Spazzolatura e Molatura/Brushing Grinding

Metodo di solcatura a rovescio / Method of back gouging: N.A. — Oscillazione / Oscillation: N.A. — Distanza tra zona di contatto e pezzo / Contact tube to work distance: 13 to 18 mm

N°Passate / Passes nr.: Multipla/Multiple — Elettrodo multiplo o singolo / Multiple or single electrodes: Singolo/Single — Martellatura / Peening: N.A.

Altro / Other: Max. width of weld bead 12 mm

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range	Vel. avanzamento / Travel speed range (mm/min)	Apporto termico / Heat input (KJ/mm)
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. range			
Root	GS FCAW	E81T1-Ni1M	1,2	DC/RP	175 to 190	23 to 25	170 to 310	0,78 to 1,68
Hot	GS FCAW	E81T1-Ni1M	1,2	DC/RP	185 to 200	24 to 26	190 to 300	0,89 to 1,64
Fill	GS FCAW	E81T1-Ni1M	1,2	DC/RP	210 to 230	25 to 27	200 to 300	1,05 to 1,86
Cap	GS FCAW	E81T1-Ni1M	1,2	DC/RP	200 to 230	25 to 27	250 to 300	1,00 to 1,49

Preparato da / prepared by: *D.Cenacchi*

Approvato da / approved by: *A. Khalifa*

PQR - AS- RUN PARAMETER SHEET

pWPS 30/22_2G	
PQR 30/22	
Coupon Nr. 1/2_2G	
Date: 08/02/22	Page: 1_ of _1

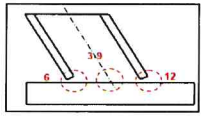
REFERENCE CODE AND PROJECT SPECIFICATIONS: **Project Spec. SD-NOC-STR-301 Rev.03**

Welder Name(s):	BENYO IONEL	Welder Id No(s):	GX17
Welding Process(es):	FCAW	Type(s):	SEMIAUTOMATIC
Welding Position:	2G	Progression:	N.A.
Base Materials:	a) API 5L X52+N PSL1 to b) EN 10225: S355G10+M	Wall Thickness:	a) 12,00 mm (*) to b) 30,00 mm
Heat No(s):	a) H1192466 to) 705587	Joint Type:	HALF VEE TUBOLAR JOINT; ONE SIDE WELDING WITHOUT BACKING

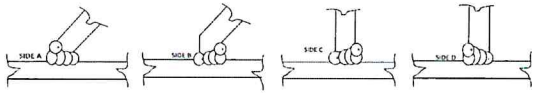
Diameter: 219,10 mm

WELD PREPARATION:





WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Hot	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Fill	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Cap	1,2	PNV4610432	OK Tubrod 15.17 - ESAB

GAS:

Shielding Gas:	Ar + CO2
Composition:	80% CO2 + 20% Ar
Flow:	16 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/4"
Tungsten Type:	N.A.
O2 Content of Back Purge:	N.A.

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
Max. width of weld bead 12	String and weave	Multiple	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
25°C	Propane Torch	250 °C	Contact Digital Thermometer	N.A.	N.A.	N.A.	N.A.	N.A.

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
N.A.	1	GS FCAW	1A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	185	205	195,0	25,5	27,5	26,5	-	-	12,5	2,48	-	65	Welding unit: INE KMP 5000 - TY4
N.A.	2	GS FCAW	2A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	228	248	238,0	28	30	29,0	-	-	35,0	1,18	-	95	Digital thermometer: HT Mod. A103 - Probe: TK100. Matr. 181103331 - 19/2353
N.A.	3	GS FCAW	3A-4A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	215	235	225,0	26,5	28,5	27,5	-	-	36,0	1,03	-	150	Ampherometer Clamp: HT Mod. 9020 Matr. 16121407
N.A.	4	GS FCAW	5A÷8A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	26,6	28,6	27,6	-	-	32,0	1,14	-	200	(*) Machined from Base Metal Thickness: 12,70 mm
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Side A (H. 12): Root gap 4,00 mm, Root face 0,00, bevel angle: 40°
N.A.	1	GS FCAW	1B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	185	205	195,0	25,5	27,5	26,5	-	-	13,0	2,39	-	60	Side B (H. 6): Root gap 4,00 mm, Root face 0,00, bevel angle: 40°
N.A.	2	GS FCAW	2B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	230	250	240,0	27,5	29,5	28,5	-	-	34,0	1,21	-	100	Side C (H. 9): Root gap 2,00 mm, Root face 0,00, bevel angle: 40°
N.A.	3	GS FCAW	3B-4B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	235	255	245,0	27,8	29,8	28,8	-	-	32,0	1,32	-	145	Side D (H. 3): Root gap 6,00 mm, Root face 0,00, bevel angle: 40°
N.A.	4	GS FCAW	5B-6B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	220	240	230,0	28	30	29,0	-	-	36,0	1,11	-	180	
N.A.	5	GS FCAW	7B÷9B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	222	242	232,0	27,5	29,5	28,5	-	-	28,5	1,39	-	225	
N.A.	6	GS FCAW	10B÷13B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	27,5	29,5	28,5	-	-	29,0	1,30	-	250	
N.A.	7	GS FCAW	14B÷17B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	190	210	200,0	27	29	28,0	-	-	32,0	1,05	-	195	
N.A.	7	GS FCAW	18B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	200	220	210,0	26,5	28,5	27,5	-	-	31,0	1,12	-	190	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
N.A.	1	GS FCAW	1C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	180	200	190,0	25,4	27,4	26,4	-	-	11,0	2,74	-	50	
N.A.	2	GS FCAW	2C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	235	255	245,0	28	30	29,0	-	-	35,0	1,22	-	170	
N.A.	3	GS FCAW	3C-4C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	220	240	230,0	27	29	28,0	-	-	30,5	1,27	-	200	
N.A.	4	GS FCAW	5C÷7C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	225	245	235,0	27,5	29,5	28,5	-	-	34,0	1,18	-	170	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
N.A.	1	GS FCAW	1D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	190	210	200,0	26	28	27,0	-	-	15,0	2,16	-	25	
N.A.	2	GS FCAW	2D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	240	260	250,0	29	31	30,0	-	-	36,0	1,25	-	190	
N.A.	3	GS FCAW	3D-4D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	220	240	230,0	27	29	28,0	-	-	30,0	1,29	-	170	
N.A.	4	GS FCAW	5D÷8D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	230	250	240,0	27,2	29,2	28,2	-	-	34,0	1,19	-	150	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature:	Signature:	Signature:	Signature:
Date:	Date:	Date:	Date:

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF375304.138
DATE: 08/02/2022
WITNESSED

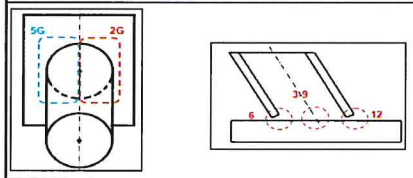
PQR - AS- RUN PARAMETER SHEET

pWPS 30/22_5G	
PQR 30/22	
Coupon Nr. 2/2_5G	
Date: 09/02/22	Page: 1_ of _1

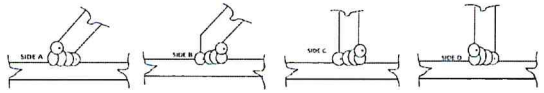
REFERENCE CODE AND PROJECT SPECIFICATIONS: **Project Spec. SD-NOC-STR-301 Rev.03**

Welder Name(s):	BENYO IONEL	Welder Id No(s):	GX17
Welding Process(es):	FCAW	Type(s):	SEMIAUTOMATIC
Welding Position:	5G	Progression:	UPHILL
Base Materials:	a) API 5L X52+N PSL1 to b) EN 10225: S355G10+M	Wall Thickness:	a) 12,00 mm (*) to b) 30,00 mm — Diameter: 219,10 mm
Heat No(s):	a) H1192466 to) 705587	Joint Type:	HALF VEE TUBOLAR JOINT; ONE SIDE WELDING WITHOUT BACKING

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Hot	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Fill	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Cap	1,2	PNV4610432	OK Tubrod 15.17 - ESAB

GAS:

Shielding Gas:	Ar + CO2
Composition:	80% CO2 + 20% Ar
Flow:	16 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/4"
Tungsten Type:	N.A.
O2 Content of Back Purge:	N.A.

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
Max. width of weld bead 12	String and weave	Multiple	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:
25°C — Propane Torch	250 °C	Contact Digital Thermometer

Heat Treatment Required	Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
N.A.	N.A.	N.A.	N.A.	N.A.

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficiency Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
N.A.	1	GS FCAW	1A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	175	195	185,0	23,5	25,5	24,5	-	-	30,0	0,91	-	65	Welding unit: INE KMP 5000 - TY4
N.A.	2	GS FCAW	2A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	182	202	192,0	24	26	25,0	-	-	26,0	1,11	-	110	Digital thermometer: HT Mod. A103 - Probe: TK100. Matr. 181103331 - 19/2353
N.A.	3	GS FCAW	3A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	205	225	215,0	24,5	26,5	25,5	-	-	28,0	1,17	-	190	Ampherometer Clamp: HT Mod. 9020 Matr. 16121407
N.A.	4	GS FCAW	4A-5A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	25	27	26,0	-	-	30,0	1,14	-	185	(*) Machined from Base Metal Thickness: 12,70 mm
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Side A (H. 12): Root gap 4,00 mm, Root face 0,00, bevel angle: 40°
N.A.	1	GS FCAW	1B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	178	198	188,0	23,5	25,5	24,5	-	-	26,0	1,06	-	60	Side B (H. 6): Root gap 4,00 mm, Root face 0,00, bevel angle: 40°
N.A.	2	GS FCAW	2B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	180	200	190,0	24	26	25,0	-	-	28,0	1,02	-	95	Side C (H. 9): Root gap 2,00 mm, Root face 0,00, bevel angle: 40°
N.A.	3	GS FCAW	3B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	215	235	225,0	25,4	27,4	26,4	-	-	25,0	1,43	-	180	Side D (H. 3): Root gap 6,00 mm, Root face 0,00, bevel angle: 40°
N.A.	4	GS FCAW	4B-5B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	205	225	215,0	24,8	26,8	25,8	-	-	29,0	1,15	-	195	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
N.A.	1	GS FCAW	1C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	170	190	180,0	23	25	24,0	-	-	20,0	1,30	-	50	
N.A.	2	GS FCAW	2C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	185	205	195,0	24	26	25,0	-	-	22,0	1,33	-	180	
N.A.	3	GS FCAW	3C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	25	27	26,0	-	-	25,0	1,37	-	250	
N.A.	4	GS FCAW	4C-5C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	215	235	225,0	25,2	27,2	26,2	-	-	28,0	1,26	-	185	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
N.A.	1	GS FCAW	1D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	170	190	180,0	23	25	24,0	-	-	18,0	1,44	-	25	
N.A.	2	GS FCAW	2D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	180	200	190,0	24	26	25,0	-	-	20,0	1,43	-	210	
N.A.	3	GS FCAW	3D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	25	27	26,0	-	-	23,0	1,49	-	190	
N.A.	4	GS FCAW	4D-5D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	205	225	215,0	24,8	26,8	25,8	-	-	22,0	1,51	-	150	
N.A.	5	GS FCAW	6D-7D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	200	220	210,0	24,5	26,5	25,5	-	-	26,0	1,24	-	185	

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature:	Signature:	Signature:	Signature:
Date:	Date:	Date:	Date:

BUREAU VERITAS ITALIA WELDING 48
IT FILE: EL.SF.375304-138
DATE: 09/02/2022
WITNESSED ☑ REVIEW ☐

ROSETTI MARINO	VERBALE DI CONTROLLO VISIVO/DIMENSIONALE visual/dimensional inspection report	VDR N° 10/2022 data: 12/02/2022

progetto project	F Location Debottlenecking (F-DBN)	cliente client	NORTH OIL COMPANY	commessa job	121A20

oggetto – item

Procedure Qualification Record (PQR) 30/2022

Certificato di Qualifica di Procedimento di Saldatura (PQR) 30/2022

WE CERTIFY THAT:

ITEMS INDICATED ABOVE HAVE UNDERGONE A VISUAL INSPECTION AND HAVE BEEN ACCEPTED ACCORDING TO THE SPECIFICATION / PROCEDURE MENTIONED AND TO ACCEPTANCE CRITERIA DEFINED IN IT

SI CERTIFICA CHE LE SALDATURE DEI SAGGI SOPRA CITATI SONO STATI SOTTOPOSTI AD ESAME VISIVO AL 100% ALLO STATO COME SALDATO IN ACCORDO ALLE SPECIFICHE E STANDARD CITATI.

note – remarks

Inspection on welds 8"x 12 mm WT in as welded condition.

1 Samples in 2G

No visible defects have been detected.

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

SOR-FY-19.257-ROMA-ASFYY-00-300025-0001

Operatore – Operator	Controllo Qualita' - Quality Control	Cliente - Client
RICCARDO NOCERA 2° Livello ISO9712 / SNT-TC-1A		BUREAU VERITAS ITALY REVIEWED SURVEYOR G. TESEI DATE 18/03/2022

ROSETTI MARINO	VERBALE DI CONTROLLO VISIVO/DIMENSIONALE visual/dimensional inspection report	VDR N° 16/2022 data: 12/02/2022
progetto project: F Location Debottlenecking (F-DBN)	cliente client: NORTH OIL COMPANY	commessa job: 121A20

oggetto – item

Procedure Qualification Record (PQR) 30/2022

Certificato di Qualifica di Procedimento di Saldatura (PQR) 30/2022

WE CERTIFY THAT:

ITEMS INDICATED ABOVE HAVE UNDERGONE A VISUAL INSPECTION AND HAVE BEEN ACCEPTED ACCORDING TO THE SPECIFICATION / PROCEDURE MENTIONED AND TO ACCEPTANCE CRITERIA DEFINED IN IT

SI CERTIFICA CHE LE SALDATURE DEI SAGGI SOPRA CITATI SONO STATI SOTTOPOSTI AD ESAME VISIVO AL 100% ALLO STATO COME SALDATO IN ACCORDO ALLE SPECIFICHE E STANDARD CITATI.

note – remarks

Inspection on welds 8"x 12 mm WT in as welded condition.

1 Samples in 5G

No visible defects have been detected.

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

SOR-FY-19.257-ROMA-ASFYY-00-300025-0001

Operatore – Operator	Controllo Qualita' - Quality Control	Cliente - Client
Stefano Zauli 3° Livello SNT-TC - 1A / ISO 9712		BUREAU VERITAS ITALY REVIEWED SURVEYOR G. TESEI DATE 18/03/2022

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n° 22049 MT 10 RN Rev. 01

RAPPORTO D'ESAME MAGNETOSCOPICO Magnetic Particle Test Report			DATA / Date 12/02/2022	FOGLIO / Sheet 1
CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	F Location Debottlenecking (F-DBN)	121A20	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	FASE Step
NORTH OIL COMPANY	PQR	/	/	/

ESECUZIONE / Execution		ACCETTABILITA' / Acceptance	
SOR-FY-19.257-ROMA-ASFYY-00-300026-0001		SOR-FY-19.257-ROMA-ASFYY-00-300026-0001	
MATERIALE/Material	TEMP. SUPERFICI Surface temperature	INTENSITA' LUMINOSA/ Light intensity	
C.S.	10°	☑ LUCE BIANCA >1076 Lux ☐ LUCE BIANCA >500 Lux	☐ LUCE NERA 1000 µW/cm²

STATO DELLA SUPERFICIE – Surface condition			
☑ COME SALDATO As welded	☐ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined	
☐ GREZZO – Forged	☐ LAMINATO – Rolled	☐ MOLATO – Ground	☐ SABBIATO – Blasted

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☑ GIOGO/Yoke	☐ PUNTALI/Prods	☐ BOBINA/Coil	☐ CONDUTTORE CENTRALE/Central conduttor

METODO / Method		SMAGNETIZZAZIONE/Demagnetization	
☑ CONTINUO/Continuous	☐ RESIDUO /Residual	☐ RICHIESTA/Required	☑ NON RICHIESTA/Not Required
TIPO DI MAGNETIZZAZIONE/magnetization type		DIREZIONE CAMPO MAGNETICO/magnetic field direction	
☑ MAGNETICO/magnetic	☐ ELETTRICO/electric	☐ CIRCOLARE/Circular	☑ LONGITUDINALE/longitudinal
TIPO APPARECCHIO/Type of equipment	MAGNETICONTROL	DISTANZA PUNTALI/Pole spacing	180 mm
NUMERO DI SERIE/Serial number	04.230-15		
TIPO DI CORRENTE/Current Type		POTERE DI SOLLEVAMENTO GIOGO / Lifting power	
☑ A.C.	☐ D.C.	☑ 4,5 kg	☐ 18 kg
MEZZO DI ISPEZIONE / Examination medium		INTENSITÀ DI CORRENTE / Intesity	
☑ UMIDO/Wet	☐ SECCO/Dry	☐ A/ mm	☐ / spira

PARTICELLE UTILIZZATE/Particle Type			
CONTRASTO DI COLOR/Color contrast	☐	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	☐ NDT BW2 ☐ NDT DRY	MARCA TIPO/Mark Type	NDT FW1
LOTTO/BACH	7755s	LOTTO/BACH	/
VERNICE DI CONTRASTO / Contrast Paint		☐ NDT WBL5	LOTTO/BACH U210325s

SALDATURE CONTROLLATE / Welds Verified

THE CONTROL HAS BEEN CARRIED OUT ON 100% OF THE WELD:

- PQR 30/2022 - 8"x 12 mm WT – 2G – WS GX17

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITÀ Quality Control	ISPETTORE CLIENTE Company Repr.
RICCARDO NOCERA 2° Livello ISO 9712 / SNT-TC-1A		BUREAU VERITAS ITALY REVIEWED SURVEYOR G. TESEI DATE 18/03/2022

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta.
I risultati delle prove si riferiscono unicamente ai particolari esaminati.
Partial reproduction of this certificate must be written authorized.
Test results relate only to examined items.

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QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n°	
		22049 MT 16 RN Rev. 01	
RAPPORTO D'ESAME MAGNETOSCOPICO Magnetic Particle Test Report		DATA / Date 12/02/2022	FOGLIO / Sheet 1

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	F Location Debottlenecking (F-DBN)	121A20	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	FASE Step
NORTH OIL COMPANY	PQR	/	/	/

ESECUZIONE / Execution		ACCETTABILITA' / Acceptance	
SOR-FY-19.257-ROMA-ASFYY-00-300026-0001		SOR-FY-19.257-ROMA-ASFYY-00-300026-0001	
MATERIALE/Material	TEMP. SUPERFICI Surface temperature	INTENSITA' LUMINOSA/ Light intensity	
C.S.	10°	☑ LUCE BIANCA >1076 Lux ☐ LUCE BIANCA >500 Lux	☐ LUCE NERA 1000 µW/cm²

STATO DELLA SUPERFICIE – Surface condition			
☑ COME SALDATO As welded	☐ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined	
☐ GREZZO – Forged	☐ LAMINATO – Rolled	☐ MOLATO – Ground	☐ SABBIATO – Blasted

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☑ GIOGO/Yoke	☐ PUNTALI/Prods	☐ BOBINA/Coil	☐ CONDUTTORE CENTRALE/Central conduttor

METODO / Method		SMAGNETIZZAZIONE/Demagnetization	
☑ CONTINUO/Continuous	☐ RESIDUO /Residual	☐ RICHIESTA/Required	☑ NON RICHIESTA/Not Required
TIPO DI MAGNETIZZAZIONE/magnetization type		DIREZIONE CAMPO MAGNETICO/magnetic field direction	
☑ MAGNETICO/magnetic	☐ ELETTRICO/electric	☐ CIRCOLARE/Circular	☑ LONGITUDINALE/longitudinal
TIPO APPARECCHIO/Type of equipment	MAGNETICONTROL	DISTANZA PUNTALI/Pole spacing	180 mm
NUMERO DI SERIE/Serial number	04.230-15		
TIPO DI CORRENTE/Current Type		POTERE DI SOLLEVAMENTO GIOGO / Lifting power	
☑ A.C.	☐ D.C.	☑ 4,5 kg	☐ 18 kg
MEZZO DI ISPEZIONE / Examination medium		INTENSITÀ DI CORRENTE / Intesity	
☑ UMIDO/Wet	☐ SECCO/Dry	☐ A/ mm	☐ / spira

PARTICELLE UTILIZZATE/Particle Type			
CONTRASTO DI COLOR/Color contrast	☐	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	☐ NDT BW2 ☐ NDT DRY	MARCA TIPO/Mark Type	NDT FW1
LOTTO/BACH	7755s	LOTTO/BACH	/
VERNICE DI CONTRASTO / Contrast Paint		☐ NDT WBL5	LOTTO/BACH U210325s

SALDATURE CONTROLLATE / Welds Verified

THE CONTROL HAS BEEN CARRIED OUT ON 100% OF THE WELD:

- PQR 30/2022 - 8"x 12 mm WT – 5G – WS GX17

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITÀ Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zauli 3° Livello SNT - TC - 1A/ISO 9712		BUREAU VERITAS ITALY REVIEWED SURVEYOR G. TESEI DATE 18/03/2022

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QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n° 22049 UT 04 SZ Rev. 01	
RAPPORTO D'ESAME CON ULTRASUONI Ultrasonic Examination report		DATA / Date 12/02/2022	FOGLIO / Sheet 1

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	F Location Debottlenecking (F-DBN)	121A20	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
NORTH OIL COMPANY	PQR	/	/	/

ESECUZIONE / Execution	ACCETTABILITA' / Acceptance level
SOR-FY-19.257-ROMA-ASFYY-00-300028-0001_revA	SOR-FY-19.257-ROMA-ASFYY-00-300028-0001_revA

MATERIALE Material	DIMENSIONI Dimension	SPESSORE NOMINALE / Thk
SD-NOC-STR-201-S355KL40	PIPE 8 INCH	WT PIPE 12 mm

STATO DELLA SUPERFICIE – Surface condition

☑ COME SALDATO As welded	☐ SPAZZOLATO - Brushed	☐ LAVORATO DI MACCHINA - Machined
☐ MOLATO - Ground	☐ LAMINATO - Rolled	☐ GREZZO - Forged

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG 700	No. SERIE Serial Number	I003937

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	AMPLIFICAZIONE dB value	ONDE Waves
KRAUTKRAMER	KNF	4	10	0°	36	Long.
DOPPLER	AT	4	8X9	70°	40	Shear
DOPPLER	AT	4	8X9	60°	40	Shear

BLOCCO DI CALIBRAZIONE Calibration block	IIW V2	BLOCCO DI RIFERIMENTO Reference block	BLOCCO QT 04
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity 3 mm	DAC SU FORI Ø 3 mm

SALDATURE CONTROLLATE / Welds Verified

Stamp	Procedure Qualification	WPS	Joit Type	Position	Bevel	Thk mm	Scan plan
GX17	30/2022	30/2022	T-Joint	2G	1\2V	12	IDL-QCI-UT-234
FOUND DEFECT IN MIDLE THICKNESS ON THE 30 mm SHEET FBH 2÷5 mm							

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Not According to specification ☐

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zauli 3° Livello SNT - TC - 1A / ISO 9712		BUREAU VERITAS ITALY REVIEWED SURVEYOR G. TESEI DATE 28/03/2022

E' vietata la riproduzione parziale del certificato senza l'autorizzazione scritta.
I risultati delle prove si riferiscono unicamente ai particolari esaminati.
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Test results relate only to examined items.

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QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n° 22049 UT 07 SZ Rev. 01

RAPPORTO D'ESAME CON ULTRASUONI Ultrasonic Examination report			DATA / Date 12/02/2022	FOGLIO / Sheet 1
CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	F Location Debottlenecking (F-DBN)	121A20	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
NORTH OIL COMPANY	PQR	/	/	/

ESECUZIONE / Execution	ACCETTABILITA' / Acceptance level
SOR-FY-19.257-ROMA-ASFYY-00-300028-0001_revA	SOR-FY-19.257-ROMA-ASFYY-00-300028-0001_revA

MATERIALE Material	DIMENSIONI Dimension	SPESSORE NOMINALE / Thk
SD-NOC-STR-201-S355KL40	PIPE 8 INCH	WT PIPE 12 mm

STATO DELLA SUPERFICIE – Surface condition

☑	COME SALDATO As welded	☐	SPAZZOLATO - Brushed	☐	LAVORATO DI MACCHINA - Machined
☐	MOLATO - Ground	☐	LAMINATO - Rolled	☐	GREZZO - Forged

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG 700	No. SERIE Serial Number	I003937

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	AMPLIFICAZIONE dB value	ONDE Waves
KRAUTKRAMER	KNF	4	10	0°	36	Long.
DOPPLER	AT	4	8X9	70°	40	Shear
DOPPLER	AT	4	8X9	60°	40	Shear

BLOCCO DI CALIBRAZIONE Calibration block	IIW V2	BLOCCO DI RIFERIMENTO Reference block	BLOCCO QT 04
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity 3 mm	DAC SU FORI Ø 3 mm

SALDATURE CONTROLLATE / Welds Verified

Stamp	Procedure Qualification	WPS	Joit Type	Bevel	Thk mm	Position	Scan plan
GX17	30/2022	30/2022	T-Joint	1\2V	12	5G	IDL-QCI-UT-222

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Not According to specification ☐

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zauli 3° Livello SNT - TC - 1A / ISO 9712		BUREAU VERITAS ITALY WITNESSED REVIEWED SURVEYOR G. TESEI DATE 18/03/2022

E' vietata la riproduzione parziale del certificato senza l'autorizzazione scritta.
I risultati delle prove si riferiscono unicamente ai particolari esaminati.
Partial reproduction of this certificate must be written authorized.
Test results relate only to examined items.

Z:\Qualita\5 modulistica\Validi\01 moduli cnd\validi\01 2020 rev.0\convenzionali volumetrici

Object: *Oggetto:*	**MECHANICAL TEST ON PQR 30-2022**		Pag. 1 di 25
Specimen: *Saggio:* **085/22**	**#Base Material:** *Materiale Base:*	**API 5L X52 + N PSL1 WITH EN 10225 S355 G10+M**	**PIPE Ø 8'' THK. 12,00 mm OBTAINED FROM THK. 12,70 mm WITH PLATE THK. 30,00 mm**
	# Informazione fornita dal cliente/ Information provided by the customer		
Customer: *Committente:* **Address:** *Indirizzo:*	**ROSETTI MARINO S.p.a.** **Via Trieste, 230 - 48122 Ravenna (RA)**		
Final customer:. *Cliente finale:*	//		

Your delivery note n°: *Vs. DDT di consegna*	**n°** *n°* //	**Date:** *Data:* //	**MD52** *MD 52* **012/2022**	**Date:** *Data:*	**10/02/2022**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **15/03/2022**	**End of activities:** *Fine prove:*		**Date:** *Data:*	**15/03/2022**

PROVE RICHIESTE

☐ **TENSILE TEST/***Trazione*	☐ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*
☐ **BEND TEST/***Piega*	☐ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root /*Dritto/Rovescio* ☐ Side/ *Laterale*
☐ **IMPACT TEST/***Resilienza*	☐ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*
☒ **MACROEXAMINATION TEST /** *Macrografia*		
☒ **HARDNESS TEST/** *Durezza*	☐ HV 5	☒ HV 10
☐ **FRACTURE TEST/** *Frattura*	☐ Plate with/on Plate/ *Piastra con/su Piastra* ☐ Pipe with/on Pipe/*Tubo con/ su Tubo*	☐ Pipe on Plate/*Tubo su Piastra*
☐ **CHEMICAL ANALYSIS/***Analisi Chimica*		
☐ **MICROEXAMINATION TEST /** *Micrografia*		
☐ **OTHER (Specify)/***Altro/(Specificare)*		

Allegati /Attachments: NONE

NOTE/ Remarks: **REFERENCE CODE FROM CUSTOMER REQUEST: AWS D1.1: 2020 + SD-NOC-STR-301 Rev.03 TEST WITNESSED BY ENG. GIANLUCA BRIGHI AND DARIO NAEIMI (DNV) AND ABDUL KARIM KHALIFA (ROSETTI)**
Informazioni aggiuntive fornite dal cliente:
Additional information provided by the customer

Laboratory Responsible *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig. Giulio Bagnara INSPECTA srl 18/03/2022 Service Responsible		BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I risultati di prova si riferiscono al campione così come ricevuto, essendo il campionamento eseguito dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%. Quando emesso il Report in revisione, l'oggetto revisionato è identificabile mediante barra verticale posta sul lato sinistro e dal testo in formato corsivo sottolineato.
The results in this test report refers only to the specimen that has been tested. The customer undertakes to print out/reproduce the test report. Any partial reproduction is prohibited. Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory. The test results refer to the sample as received, since the sampling is performed by the customer. Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku=2 equivalent to a level of confidence of 95 %. When the Report under review is issued, the revised object can be identified by the vertical bar on the left side and by the text in italics underlined.

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::15/03/2022
Data esecuzione prova:

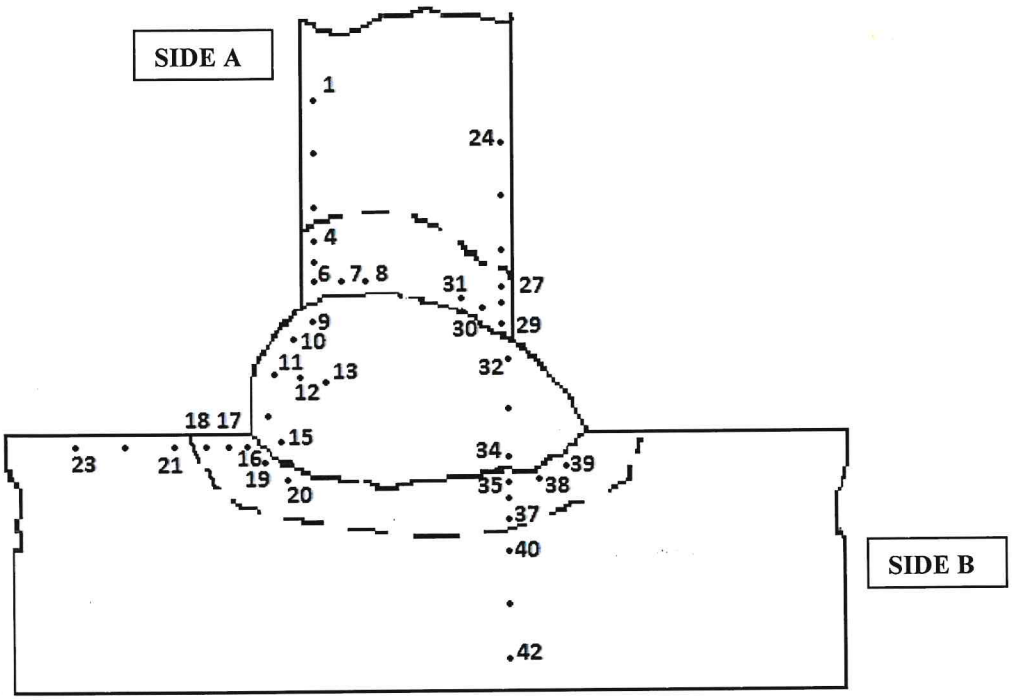
performed in accordance with the standard *eseguita in conformità alla norma* SD-NOC-STR-301 Rev:03

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	085/22 A	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	21,8°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13 – 14 – 15	16 – 17 – 18 – 19 – 20	21 – 22 – 23
24 – 25 – 26	27 – 28 – 29 – 30 – 31	32 – 33 – 34	35 – 36 – 37 – 38 – 39	40 – 41 – 42



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	154-155-158	/	24 – 25 – 26	158-163-169	/
4 – 5 – 6 – 7 – 8	177-182-278-274-258	/	27 – 28 – 29 – 30 – 31	185-209-223-221-224	/
9 – 10 – 11 – 12 – 13 – 14 – 15	263-257-249-241-237-257-262	/	32 – 33 – 34	206-209-205	/
16 – 17 – 18 – 19 – 20	168-155-144-163-169	/	35 – 36 – 37 – 38 – 39	186-163-158-185-180	/
21 – 22 – 23	136-136-137	/	40 – 41 – 42	137-138-137	/

Remarks/ *Note:* TAKEN AT H.3 – POSITION 2G

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara		RINA WITNESSED SURVEYOR G. TESEI DATE 18/03/2022
18/03/2022	18/03/2022		

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::15/03/2022
Data esecuzione prova:

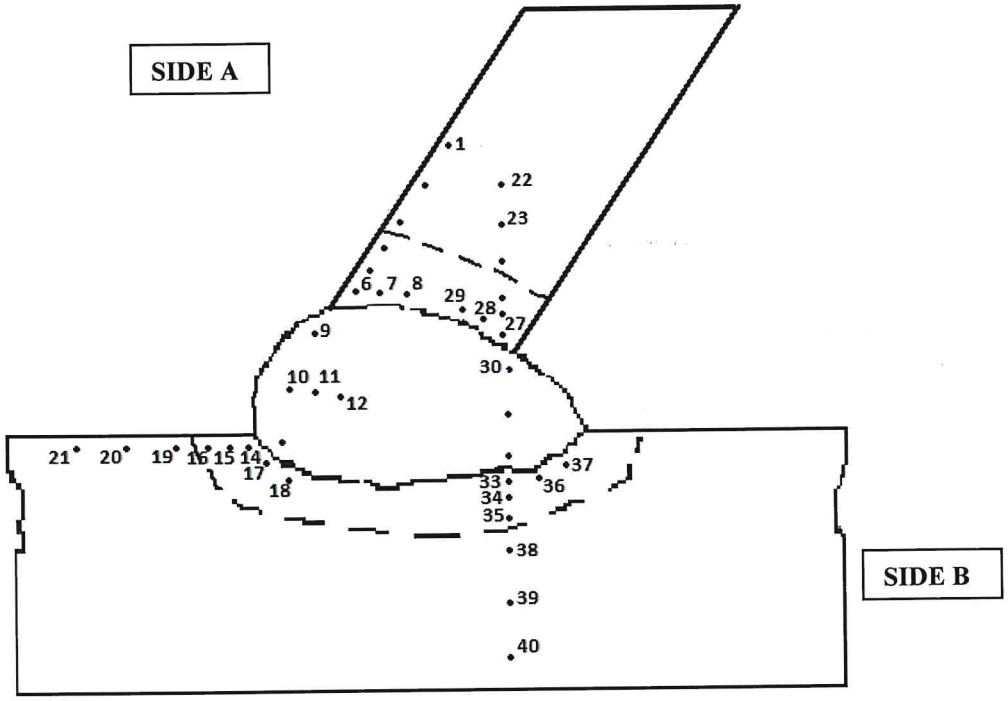
performed in accordance with the standard / eseguita in conformità alla norma SD-NOC-STR-301 Rev:03

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure / Procedura interna	PP10 rev.06	Sample Identification / Identificazione provino	085/22 B	Hardness test type / Tipo di durezza	HV10	Test Temp. / Temp.test	21,8°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13	14 – 15 – 16 – 17 – 18	19 – 20 – 21
22 – 23 – 24	25 – 26 – 27 – 28 – 29	30 – 31 – 32	33 – 34 – 35 – 36 – 37	38 – 39 – 40



Reference points / Punto di riferimento	Values measured / Valori misurati	U	Reference points / Punto di riferimento	Values measured / Valori misurati	U
1 – 2 - 3	164-160-166	/	22 – 23 – 24	156-163-184	/
4 – 5 – 6 – 7 – 8	174-238-257-260-257	/	25 – 26 – 27 – 28 – 29	204-221-230-224-221	/
9 – 10 – 11 – 12 – 13	264-260-257-262-265	/	30 – 31 – 32	224-225-221	/
14 – 15 – 16 – 17 – 18	174-151-144-181-175	/	33– 34 – 35 – 36 – 37	188-164-147-175-173	/
19 – 20 – 21	147-139-139	/	38 – 39 – 40	136-139-137	/

Remarks/ *Note:* TAKEN AT H.6 – POSITION 2G

Laboratory Technician / Tecnico di Laboratorio	Laboratory Responsible / Responsabile Laboratorio	Customer Inspector / Ispettore del cliente	Third part Inspector / Ispettore Terza parte
Dott. Ing. Mauro Bacchieschi	Sig. Giulio Bagnara		BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE: 18/03/2022
Laboratory Technician	Service Responsible		
18/03/2022	18/03/2022		

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::15/03/2022
Data esecuzione prova:

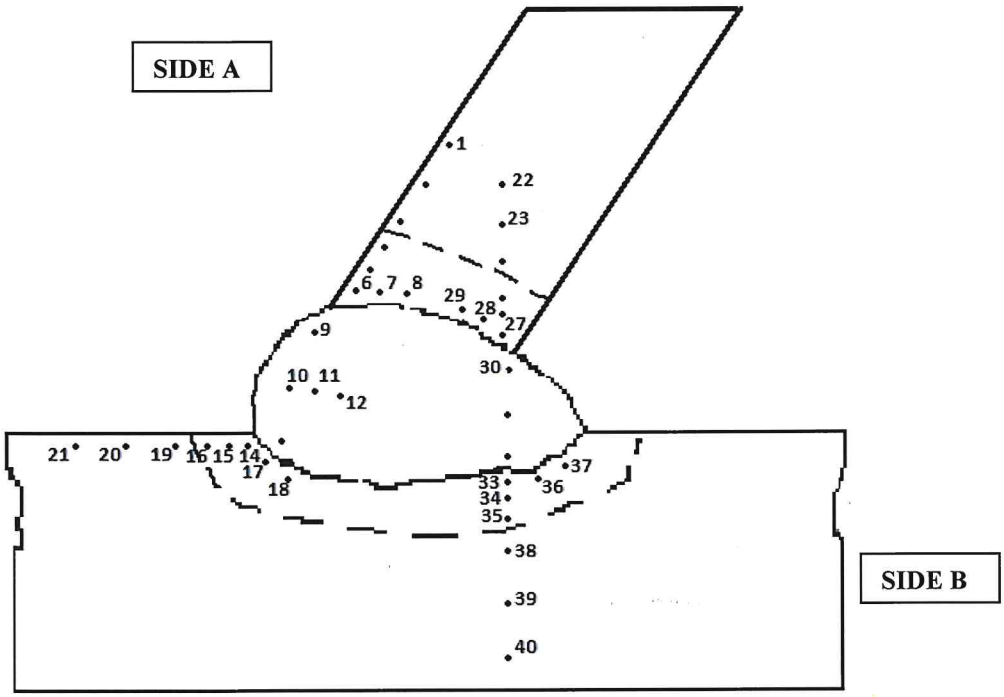
performed in accordance with the standard *eseguita in conformità alla norma* *SD-NOC-STR-301 Rev:03*

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	085/22 C	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	21,8°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13	14 – 15 – 16 – 17 – 18	19 – 20 – 21
22 – 23 – 24	25 – 26 – 27 – 28 – 29	30 – 31 – 32	33 – 34 – 35 – 36 – 37	38 – 39 – 40



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**159-164-162**	/	22 – 23 – 24	**159-164-186**	/
4 – 5 – 6 – 7 – 8	**184-229-254-260-256**	/	25 – 26 – 27 – 28 – 29	**198-213-224-227-232**	/
9 – 10 – 11 – 12 – 13	**258-254-246-246-252**	/	30 – 31 – 32	**217-212-215**	/
14 – 15 – 16 – 17 – 18	**182-164-142-183-180**	/	33– 34 – 35 – 36 – 37	**182-164-143-182-184**	/
19 – 20 – 21	**141-137-140**	/	38 – 39 – 40	**140-142-141**	/

Remarks/ *Note:* **TAKEN AT H.6 – POSITION 2G**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third-part Inspector *Ispettore Terza parte*
Dott.Ing. Mauro Macchesch	Sig. Giulio Bagnara		
Laboratory Technician	Service Responsible		
18/03/2022	18/03/2022		18/03/2022

Headquarter: Via Giolitti 10 – 48123 Ravenna (RA) Italy – Phone /Fax + 39 0544 451424
Registered Office: Via Ravegnana 379/A - 47122 Forlì (FC) Italy - Phone +39 0543 559027 - Phone/Fax +39 0543 724366
Mobile +39 393 9374013 - e-mail: inspectasrl@inspectasrl.com - www.inspectasrl.com - P.iva 03944480403
Capital Stock € 50.000 - Chamber of Commerce registration Forlì/Cesena No. 03944480403 - R.E.A. No. 323199

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::15/03/2022
Data esecuzione prova:

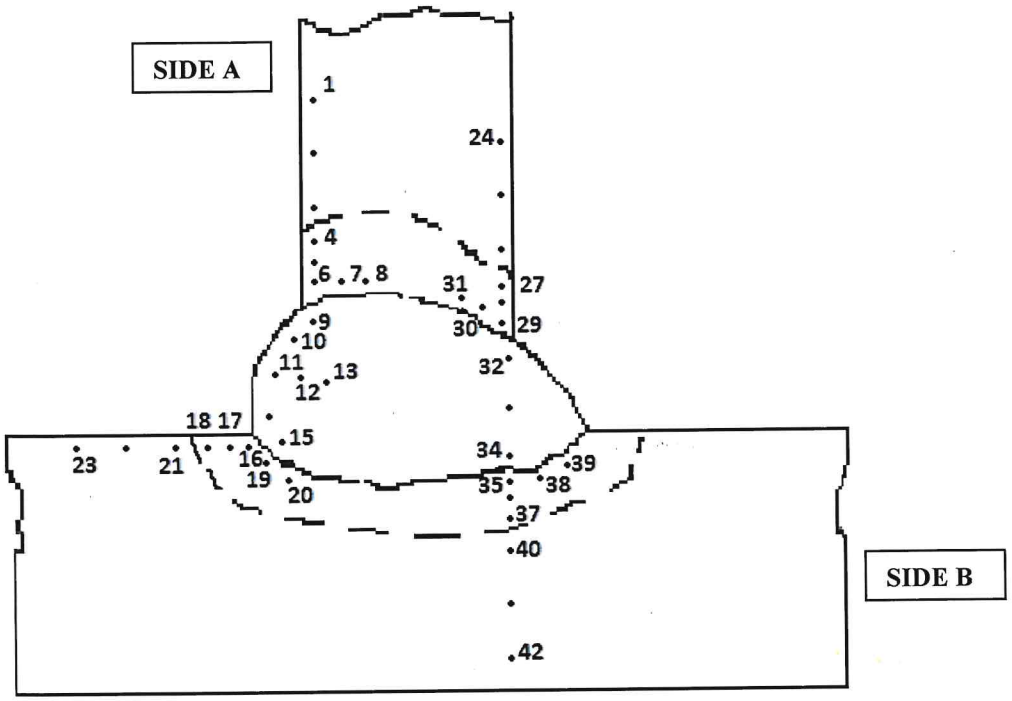
performed in accordance with the standard *eseguita in conformità alla norma* *SD-NOC-STR-301 Rev:03*

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	085/22 D	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	21,8°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13 – 14 – 15	16 – 17 – 18 – 19 – 20	21 – 22 – 23
24 – 25 – 26	27 – 28 – 29 – 30 – 31	32 – 33 – 34	35 – 36 – 37 – 38 – 39	40 – 41 – 42



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	161-160-162	/	24 – 25 – 26	158-159-174	/
4 – 5 – 6 – 7 – 8	168-174-206-216-219	/	27 – 28 – 29 – 30 – 31	197-211-226-227-230	/
9 – 10 – 11 – 12 – 13 – 14 – 15	245-241-224-221-213-232-235	/	32 – 33 – 34	219-223-211	/
16 – 17 – 18 – 19 – 20	156-155-144-166-166	/	35 – 36 – 37 – 38 – 39	179-169-149-169-168	/
21 – 22 – 23	135-136-135	/	40 – 41 – 42	135-135-136	/

Remarks/ *Note:* TAKEN AT H.9 – POSITION 2G

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara		BUREAU VERITAS WITNESSED SURVEYOR G. TESEI DATE 18/03/2022
Laboratory Technician 18/03/2022	Service Responsible 18/03/2022		

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::15/03/2022
Data esecuzione prova:

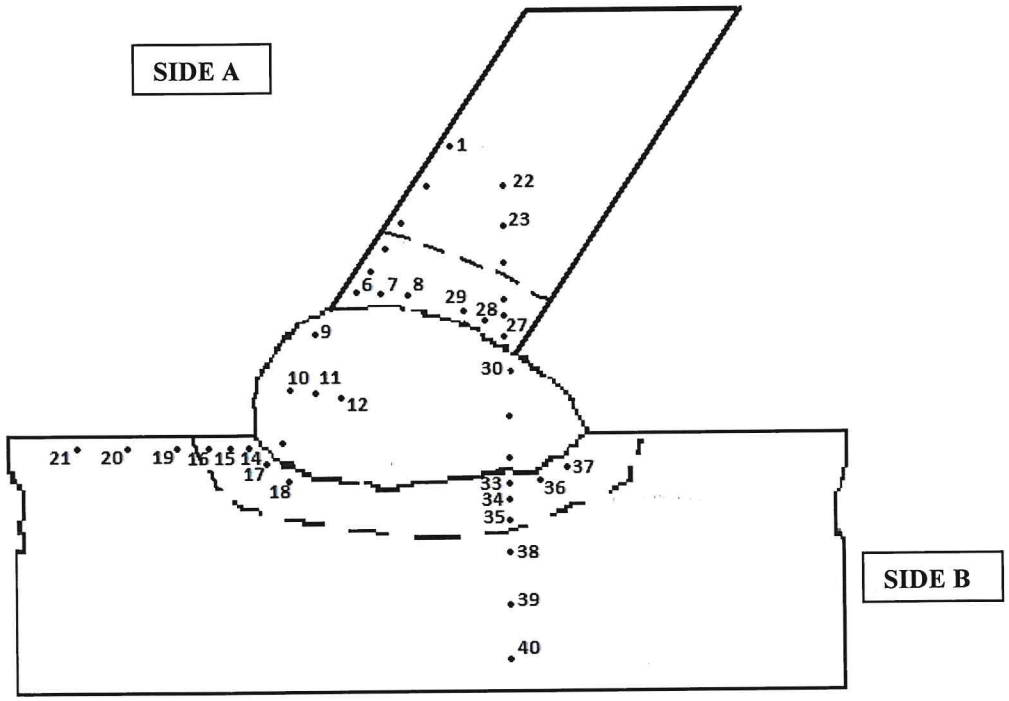
performed in accordance with the standard / *eseguita in conformità alla norma* SD-NOC-STR-301 Rev:03

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure / *Procedura interna*	PP10 rev.06	Sample Identification / *Identificazione provino*	085/22 E	Hardness test type / *Tipo di durezza*	HV10	Test Temp. / *Temp.test*	21,8°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13	14 – 15 – 16 – 17 – 18	19 – 20 – 21
22 – 23 – 24	25 – 26 – 27 – 28 – 29	30 – 31 – 32	33 – 34 – 35 – 36 – 37	38 – 39 – 40



Reference points / *Punto di riferimento*	Values measured / *Valori misurati*	U	Reference points / *Punto di riferimento*	Values measured / *Valori misurati*	U
1 – 2 - 3	**161-162-163**	/	22 – 23 – 24	**162-166-180**	/
4 – 5 – 6 – 7 – 8	**174-191-277-278-268**	/	25 – 26 – 27 – 28 – 29	**187-199-206-204-204**	/
9 – 10 – 11 – 12 – 13	**274-271-267-262-269**	/	30 – 31 – 32	**224-221-223**	/
14 – 15 – 16 – 17 – 18	**271-189-165-175-173**	/	33– 34 – 35 – 36 – 37	**183-164-154-170-171**	/
19 – 20 – 21	**147-143-140**	/	38 – 39 – 40	**143-138-140**	/

Remarks/ *Note:* **TAKEN AT H.12 – POSITION 2G**

Laboratory Technician / *Tecnico di Laboratorio*	Laboratory Responsible / *Responsabile Laboratorio*	Customer Inspector / *Ispettore del cliente*	Third part Inspector / *Ispettore Terza parte*
Dott. Ing. Mauro Buecheschi	Sig. Giulio Bagnara		BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI
18/03/2022	18/03/2022		18/03/2022
Laboratory Technician	Service Responsible		

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::15/03/2022
Data esecuzione prova:

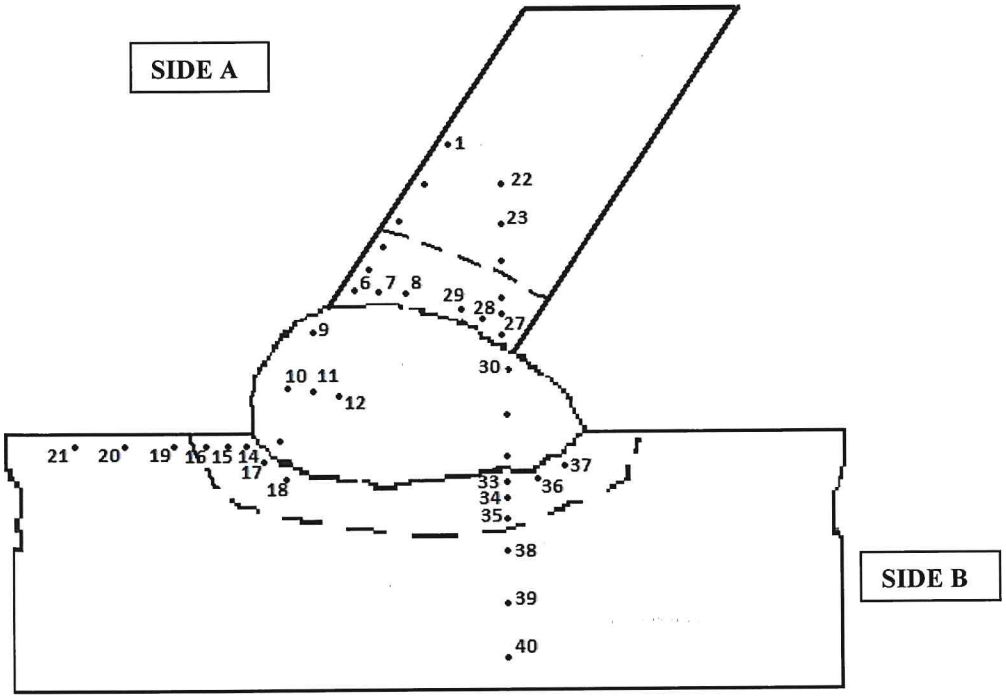
performed in accordance with the standard *eseguita in conformità alla norma* SD-NOC-STR-301 Rev:03

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	085/22 F	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	21,8°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13	14 – 15 – 16 – 17 – 18	19 – 20 – 21
22 – 23 – 24	25 – 26 – 27 – 28 – 29	30 – 31 – 32	33 – 34 – 35 – 36 – 37	38 – 39 – 40



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**162-164-162**	/	22 – 23 – 24	**162-167-187**	/
4 – 5 – 6 – 7 – 8	**173-198-265-273-270**	/	25 – 26 – 27 – 28 – 29	**194-204-222-226-223**	/
9 – 10 – 11 – 12 – 13	**262-265-263-258-250**	/	30 – 31 – 32	**227-225-223**	/
14 – 15 – 16 – 17 – 18	**187-155-148-164-167**	/	33– 34 – 35 – 36 – 37	**185-167-148-169-164**	/
19 – 20 – 21	**138-136-138**	/	38 – 39 – 40	**143-141-138**	/

Remarks/ *Note:* **TAKEN AT H.12 – POSITION 2G**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
- INSPECTA srl - Dott. Ing. Mauro Baccheschi 18/03/2022	Sig. Giulio Bagnara - INSPECTA srl - 18/03/2022		BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::15/03/2022
Data esecuzione prova:

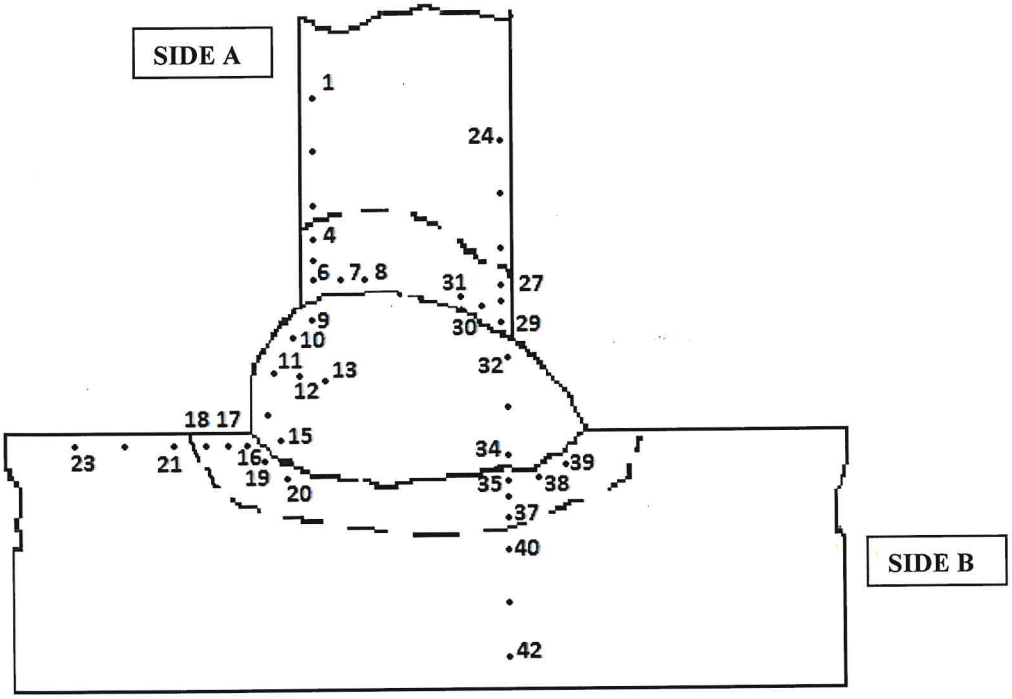
performed in accordance with the standard *eseguita in conformità alla norma* SD-NOC-STR-301 Rev:03

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	085/22 G	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	21,8°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13 – 14 – 15	16 – 17 – 18 – 19 – 20	21 – 22 – 23
24 – 25 – 26	27 – 28 – 29 – 30 – 31	32 – 33 – 34	35 – 36 – 37 – 38 – 39	40 – 41 – 42



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	164-159-163	/	24 – 25 – 26	159-161-169	/
4 – 5 – 6 – 7 – 8	166-183-233-230-238	/	27 – 28 – 29 – 30 – 31	183-208-218-221-220	/
9 – 10 – 11 – 12 – 13 – 14 – 15	235-234-232-228-226-236-239	/	32 – 33 – 34	209-211-208	/
16 – 17 – 18 – 19 – 20	164-155-144-167-170	/	35 – 36 – 37 – 38 – 39	183-166-151-188-171	/
21 – 22 – 23	136-136-137	/	40 – 41 – 42	141-139-138	/

Remarks/ *Note:* TAKEN AT H.3 – POSITION 5G

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Buecheschi	Sig. Giulio Bagnara		
Laboratory Technician	Service Responsible		WITNESSED SURVEYOR G. TESEI DATE 18/03/2022

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::15/03/2022
Data esecuzione prova:

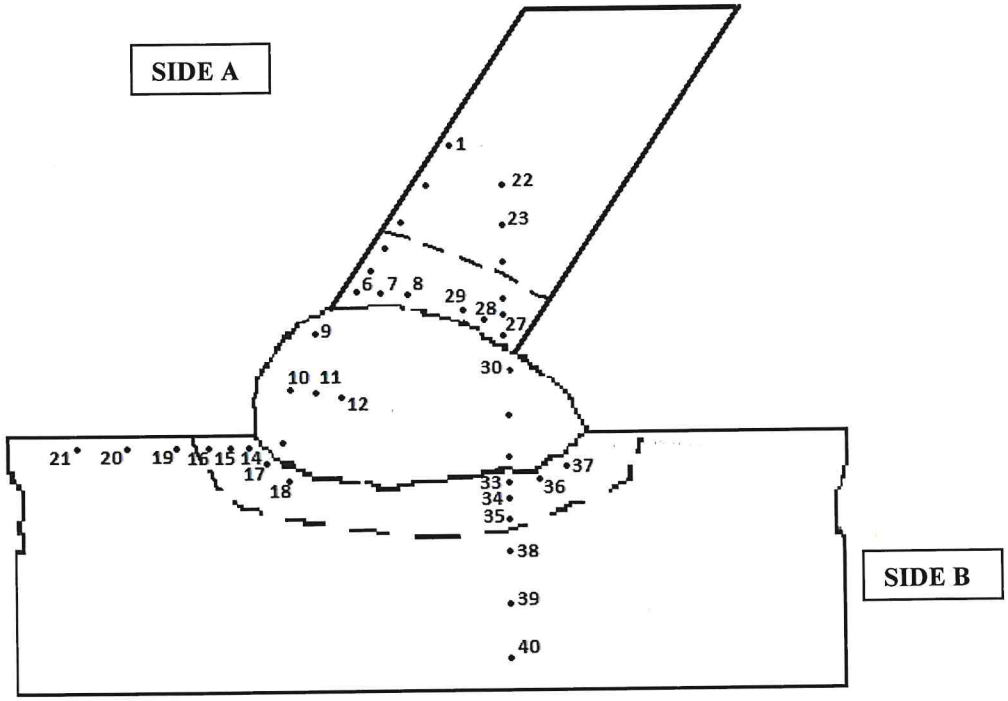
performed in accordance with the standard *eseguita in conformità alla norma* SD-NOC-STR-301 Rev:03

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	085/22 H	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	21,8°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13	14 – 15 – 16 – 17 – 18	19 – 20 – 21
22 – 23 – 24	25 – 26 – 27 – 28 – 29	30 – 31 – 32	33 – 34 – 35 – 36 – 37	38 – 39 – 40



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	165-163-165	/	22 – 23 – 24	163-165-170	/
4 – 5 – 6 – 7 – 8	182-211-271-269-265	/	25 – 26 – 27 – 28 – 29	182-189-226-228-233	/
9 – 10 – 11 – 12 – 13	272-269-258-255-267	/	30 – 31 – 32	218-216-220	/
14 – 15 – 16 – 17 – 18	184-163-149-183-180	/	33– 34 – 35 – 36 – 37	181-165-148-183-179	/
19 – 20 – 21	134-133-134	/	38 – 39 – 40	139-138-137	/

Remarks/ *Note:* TAKEN AT H.6 – POSITION 5G

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Bacchieschi	Sig. Giulio Bagnara		
Laboratory Technician	Service Responsible		WITNESSED SURVEYOR DATE 18/03/2022

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::15/03/2022
Data esecuzione prova:

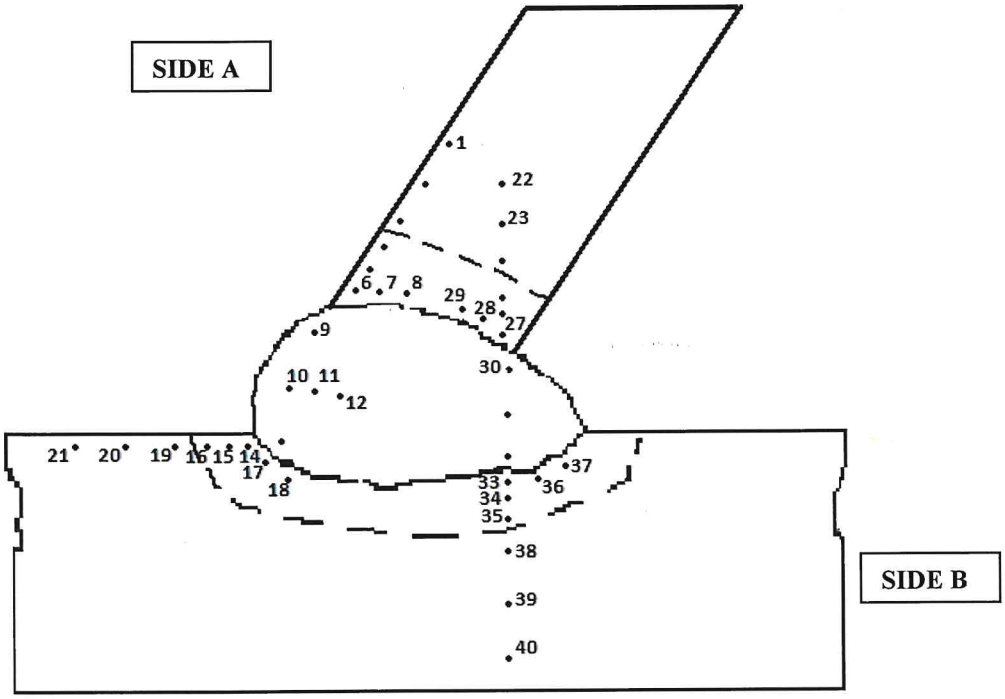
performed in accordance with the standard *eseguita in conformità alla norma* *SD-NOC-STR-301 Rev:03*

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	085/22 I	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	21,8°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13	14 – 15 – 16 – 17 – 18	19 – 20 – 21
22 – 23 – 24	25 – 26 – 27 – 28 – 29	30 – 31 – 32	33 – 34 – 35 – 36 – 37	38 – 39 – 40



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	161-166-163	/	22 – 23 – 24	163-168-201	/
4 – 5 – 6 – 7 – 8	205-225-257-261-258	/	25 – 26 – 27 – 28 – 29	213-226-235-237-235	/
9 – 10 – 11 – 12 – 13	264-256-250-247-254	/	30 – 31 – 32	221-223-225	/
14 – 15 – 16 – 17 – 18	176-158-149-173-177	/	33– 34 – 35 – 36 – 37	178-163-148-180-176	/
19 – 20 – 21	139-141-138	/	38 – 39 – 40	138-141-141	/

Remarks/ *Note:* TAKEN AT H.6 – POSITION 5G

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Bacheschi	Sig. Giulia Bagnara		
18/03/2022	18/03/2022		18/03/2022

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::15/03/2022
Data esecuzione prova:

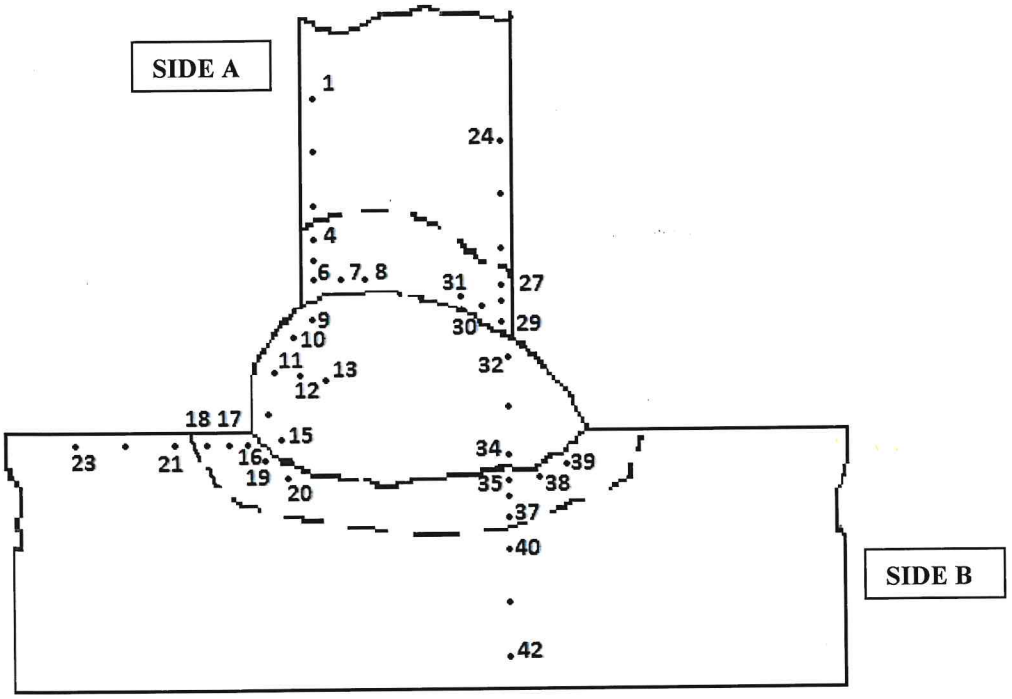
performed in accordance with the standard *eseguita in conformità alla norma* SD-NOC-STR-301 Rev:03

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	085/22 L	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	21,8°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13 – 14 – 15	16 – 17 – 18 – 19 – 20	21 – 22 – 23
24 – 25 – 26	27 – 28 – 29 – 30 – 31	32 – 33 – 34	35 – 36 – 37 – 38 – 39	40 – 41 – 42



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	162-161-164	/	24 – 25 – 26	161-164-156	/
4 – 5 – 6 – 7 – 8	185-202-257-261-256	/	27 – 28 – 29 – 30 – 31	202-211-228-230-226	/
9 – 10 – 11 – 12 – 13 – 14 – 15	257-250-245-237-234-249-243	/	32 – 33 – 34	225-222-220	/
16 – 17 – 18 – 19 – 20	178-164-158-181-185	/	35 – 36 – 37 – 38 – 39	183-168-157-181-178	/
21 – 22 – 23	138-141-140	/	40 – 41 – 42	143-141-140	/

Remarks/ *Note:* TAKEN AT H.9 – POSITION 5G

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Bacheschi	Sig. Giulio Bagnara		
18/03/2022	18/03/2022		18/03/2022
Laboratory Technician	Service Responsible		

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::15/03/2022
Data esecuzione prova:

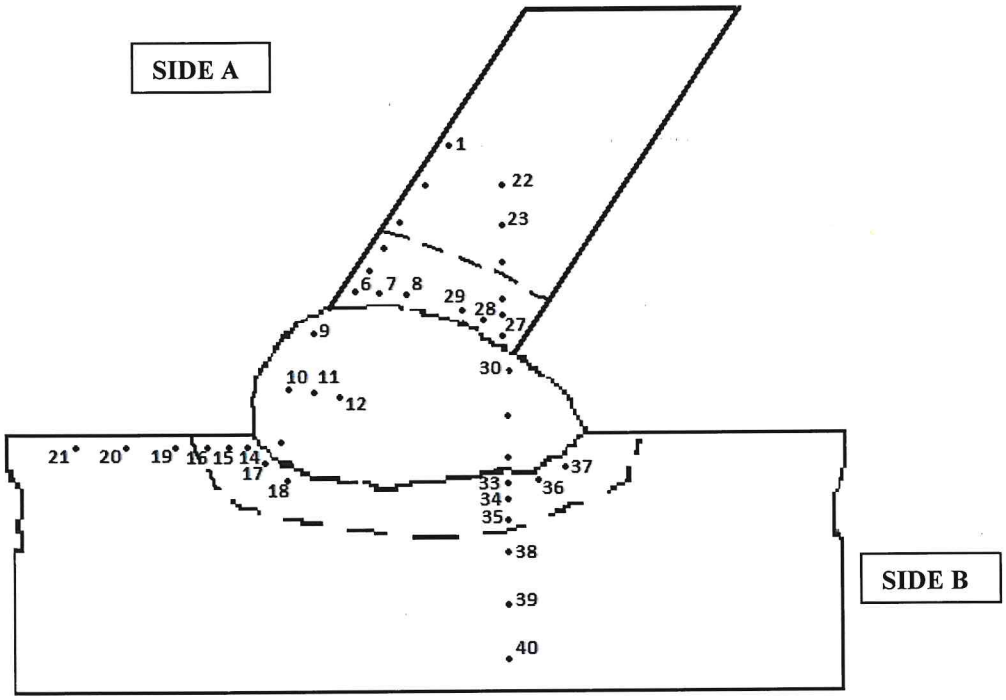
performed in accordance with the standard *eseguita in conformità alla norma* *SD-NOC-STR-301 Rev:03*

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	085/22 M	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	21,8°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13	14 – 15 – 16 – 17 – 18	19 – 20 – 21
22 – 23 – 24	25 – 26 – 27 – 28 – 29	30 – 31 – 32	33 – 34 – 35 – 36 – 37	38 – 39 – 40



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**163-161-165**	/	22 – 23 – 24	**162-163-177**	/
4 – 5 – 6 – 7 – 8	**185-218-253-258-255**	/	25 – 26 – 27 – 28 – 29	**183-187-211-208-209**	/
9 – 10 – 11 – 12 – 13	**267-261-254-252-264**	/	30 – 31 – 32	**210-214-209**	/
14 – 15 – 16 – 17 – 18	**175-163-152-185-187**	/	33– 34 – 35 – 36 – 37	**183-163-143-179-179**	/
19 – 20 – 21	**138-134-135**	/	38 – 39 – 40	**137-138-135**	/

Remarks/ *Note:* **TAKEN AT H.12 – POSITION 5G**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara		WITNESSED SURVEYOR G. TESEI DATE 18/03/2022
Laboratory Technician 18/03/2022	INSPECTA srl Service Responsible 18/03/2022		

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::15/03/2022
Data esecuzione prova:

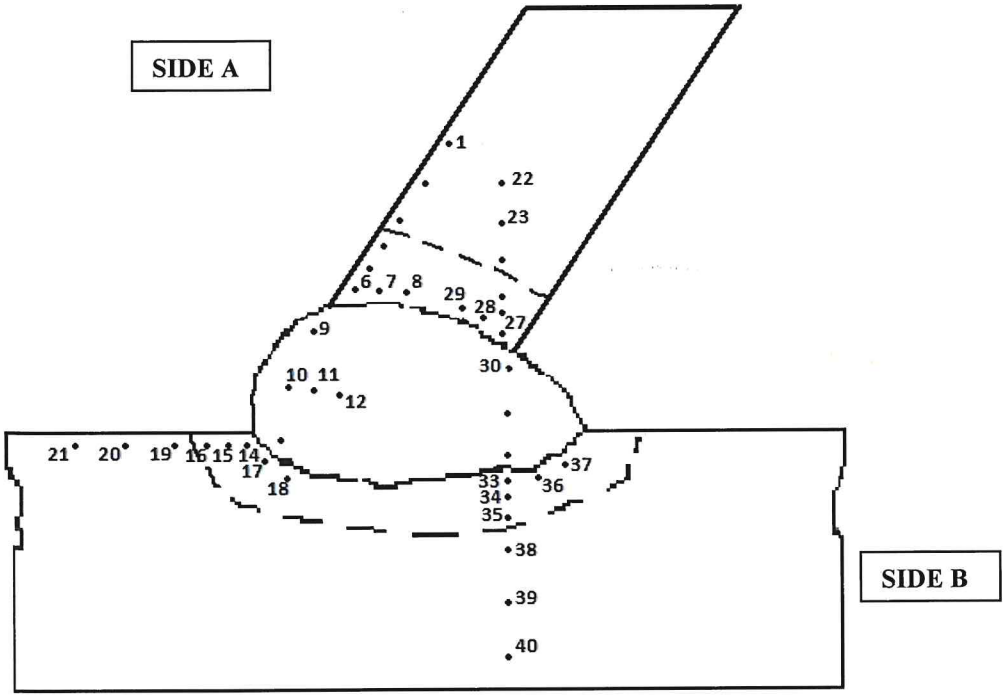
performed in accordance with the standard *eseguita in conformità alla norma* *SD-NOC-STR-301 Rev:03*

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	085/22 N	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	21,8°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13	14 – 15 – 16 – 17 – 18	19 – 20 – 21
22 – 23 – 24	25 – 26 – 27 – 28 – 29	30 – 31 – 32	33 – 34 – 35 – 36 – 37	38 – 39 – 40



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**161-160-164**	/	22 – 23 – 24	**161-164-170**	/
4 – 5 – 6 – 7 – 8	**189-218-255-257-262**	/	25 – 26 – 27 – 28 – 29	**176-193-218-223-225**	/
9 – 10 – 11 – 12 – 13	**251-248-244-240-250**	/	30 – 31 – 32	**220-222-219**	/
14 – 15 – 16 – 17 – 18	**176-167-153-172-173**	/	33– 34 – 35 – 36 – 37	**169-161-148-170-171**	/
19 – 20 – 21	**143-137-141**	/	38 – 39 – 40	**144-143-140**	/

Remarks/ *Note:* **TAKEN AT H.12 – POSITION 5G**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Bacchieschi	Sig. Giulio Bagnara		WITNESSED SURVEYOR G. TESEI DATE 18/03/2022
18/03/2022	- INSPECTA srl - 18/03/2022		
Laboratory Technician	Service Responsible		

MACRO EXAMINATION TEST
Prova Macrografica

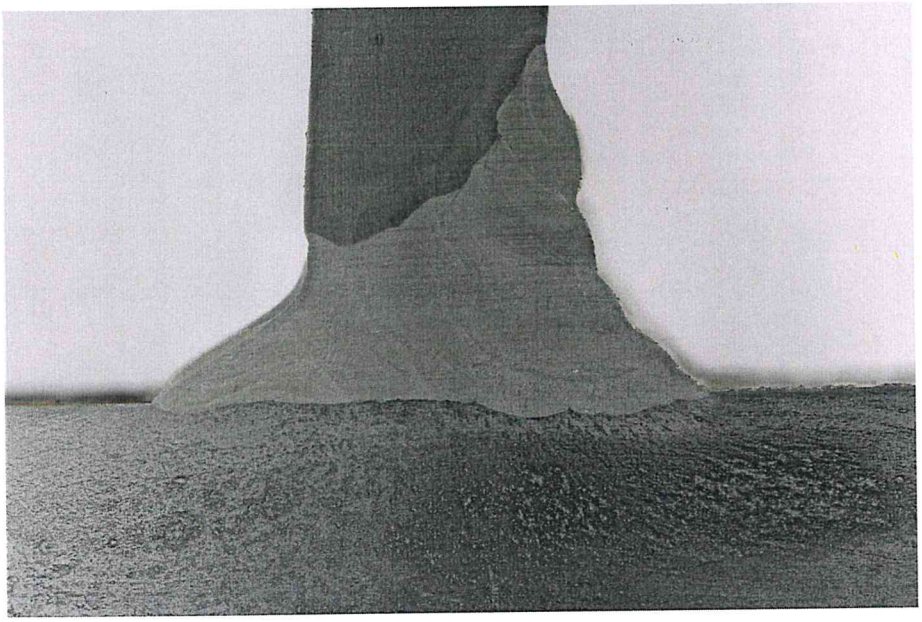
Date of Testing::15/03/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**21,8°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**085/22 A**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.3 – POSITION 2G** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Biacheschi	*Sig. Giulio Bagnara*		BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022
Laboratory Technician 18/03/2022	INSPECTA srl Service Responsible 18/03/2022		

MACRO EXAMINATION TEST
Prova Macrografica

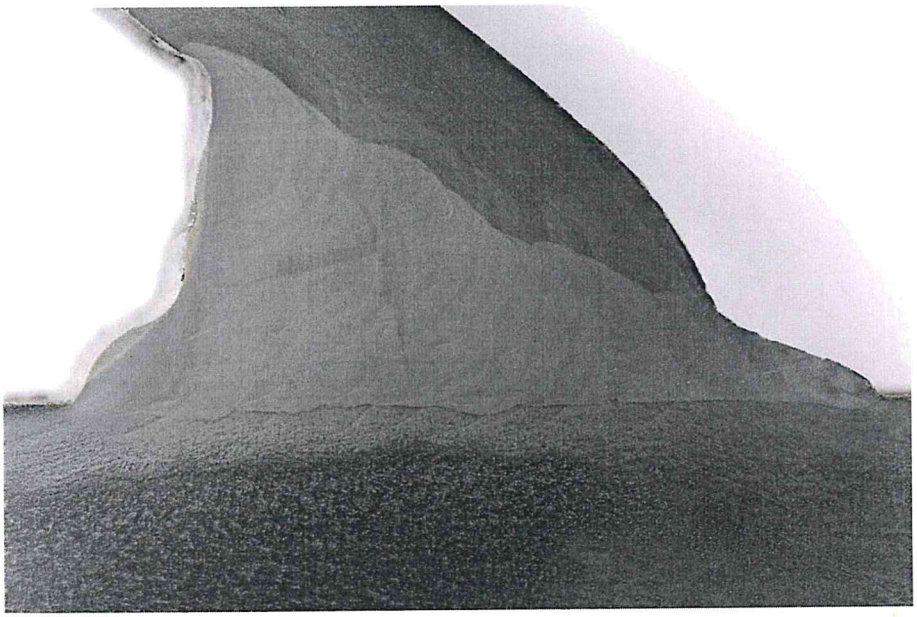
Date of Testing::15/03/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**21,8°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**085/22 B**	**Magnification:** *Ingrandimento:*	**Photo at: 2.50x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.6 – POSITION 2G** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio Dott. Ing. Mauro Bacchieschi	*Responsabile Laboratorio* Sig. Giulio Bagnara - INSPECTA srl -	*Ispettore del cliente*	*Ispettore Terza parte*
18/03/2022	18/03/2022 Service Responsible		BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022

MACRO EXAMINATION TEST
Prova Macrografica

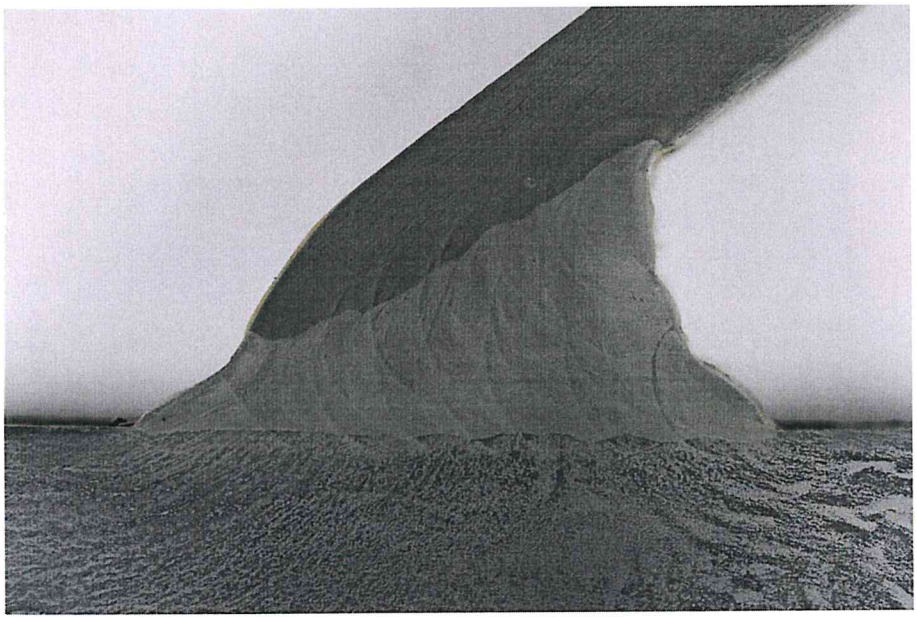
Date of Testing::15/03/2022
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* AWS D1.1/D1.1M:2020 par.6.10.4

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**21,8°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**085/22 C**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.6 – POSITION 2G** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*		BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022
INSPECTA srl Laboratory 18/03/2022	- INSPECTA srl - 18/03/2022 Service Responsible		

MACRO EXAMINATION TEST
Prova Macrografica

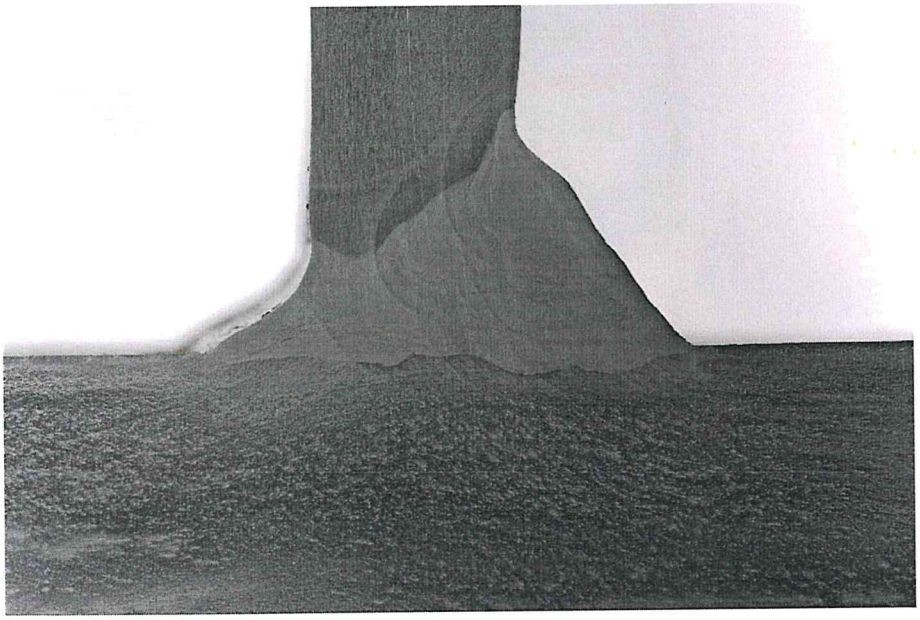
Date of Testing::15/03/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**21,8°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**085/22 D**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.9 – POSITION 2G** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara		BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022
Laboratory Technician 18/03/2022	Servizio Responsabile 18/03/2022		

MACRO EXAMINATION TEST
Prova Macrografica

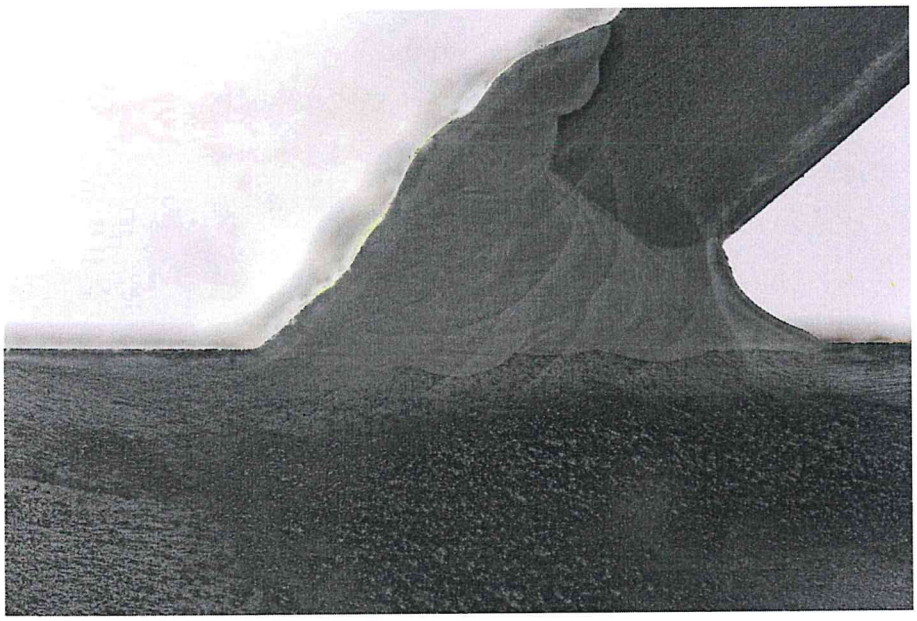
Date of Testing::15/03/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**21,8°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**085/22 E**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.12 – POSITION 2G** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*		BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022
- INSPECTA srl -	- INSPECTA srl -		
Laboratory Technician 18/03/2022	18/03/2022 Service Responsible		

MACRO EXAMINATION TEST
Prova Macrografica

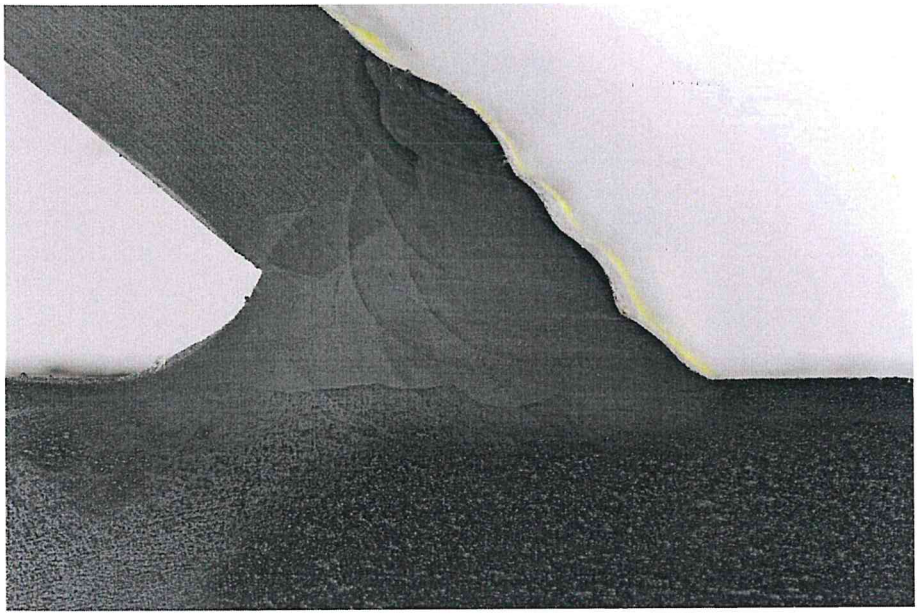
Date of Testing::15/03/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**21,8°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**085/22 F**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.12 – POSITION 2G** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*		
INSPECTA Laboratory Technician 18/03/2022	- INSPECTA srl - 18/03/2022 Service Responsible		BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022

MACRO EXAMINATION TEST
Prova Macrografica

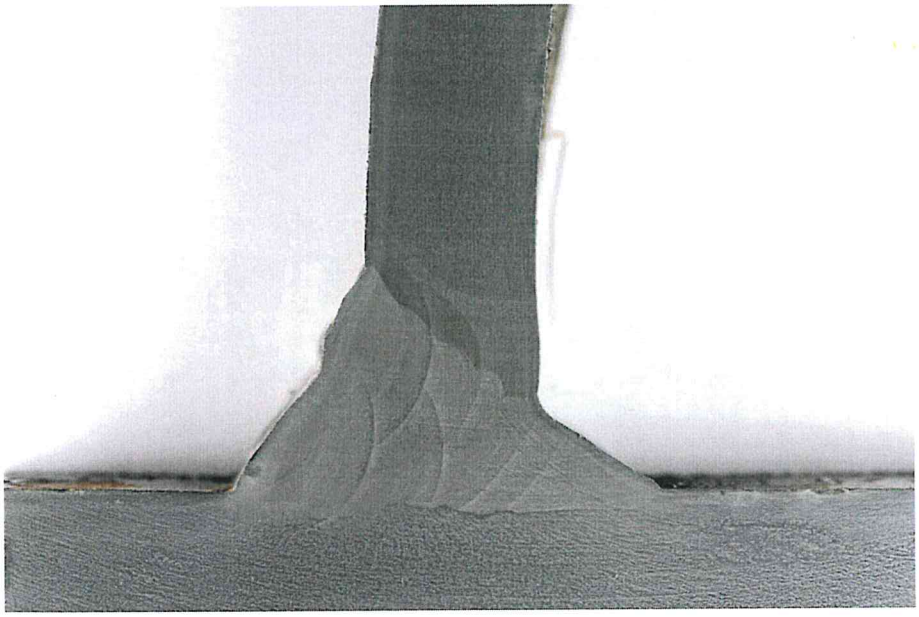
Date of Testing::15/03/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**21,8°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**085/22 G**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.3 – POSITION 5G** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*		BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022
INSPECTA srl Laboratory Technician 18/03/2022	INSPECTA srl Service Responsible 18/03/2022		

MACRO EXAMINATION TEST
Prova Macrografica

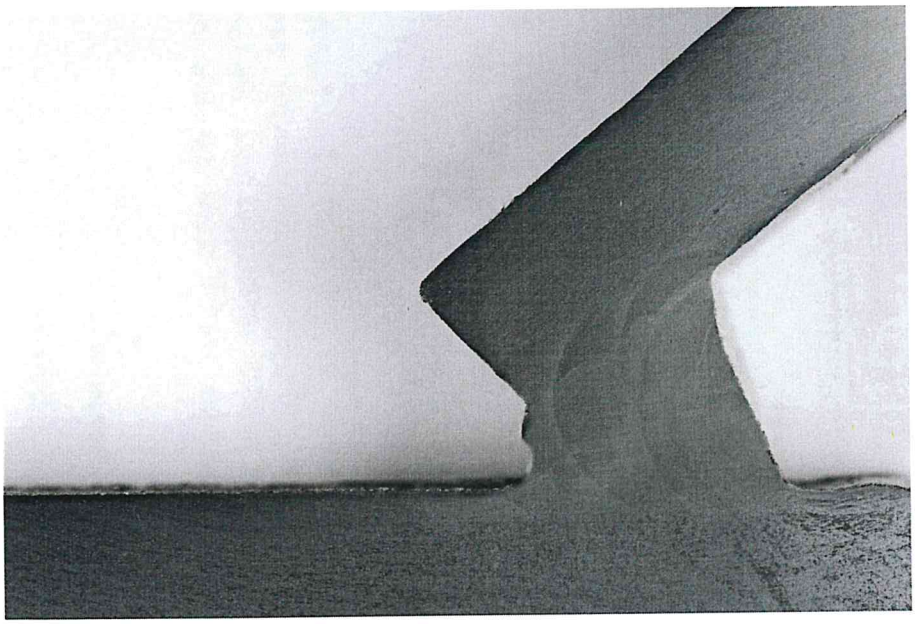
Date of Testing::15/03/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**21,8°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**085/22 H**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.6 – POSITION 5G** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Bacchieschi	*Sig. Giulio Bagnara*		BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022
- INSPECTA srl -	- INSPECTA srl -		
18/03/2022	18/03/2022		
Laboratory Technician	Service Responsible		

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::15/03/2022
Data esecuzione prova:

performed in accordance with the standard *AWS D1.1/D1.1M:2020 par.6.10.4*
eseguita in conformità alla norma

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**21,8°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**085/22 I**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.6 – POSITION 5G** **No defects have been found in macro examination.**

Laboratory Technician *Tecnico di Laboratorio* *Dott. Ing. Mauro Bacchieschi*	**Laboratory Responsible** *Responsabile Laboratorio* *Sig. Giulio Bagnara*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
INSPECTA 18/03/2022	- INSPECTA srl - 18/03/2022 Service Responsible		RINA SERVICES S.p.A. ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022

MACRO EXAMINATION TEST
Prova Macrografica

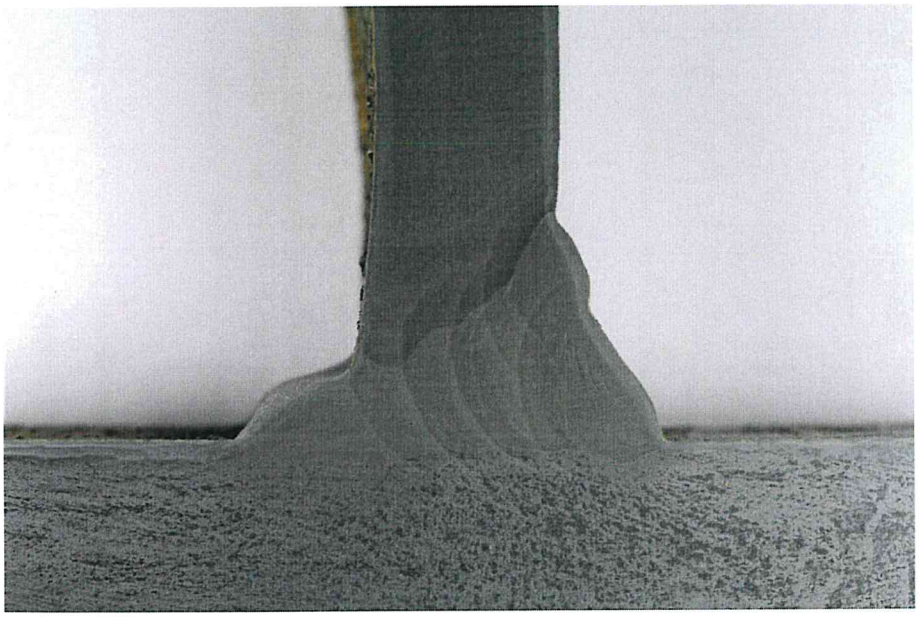
Date of Testing::15/03/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**21,8°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**085/22 L**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.9 – POSITION 5G** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio *Dott. Ing. Mauro Baccheschi*	*Responsabile Laboratorio* *Sig. Giulio Bagnara*	*Ispettore del cliente*	*Ispettore Terza parte*
INSPECTA srl Laboratory Technician 18/03/2022	INSPECTA srl Service Responsible 18/03/2022		BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022

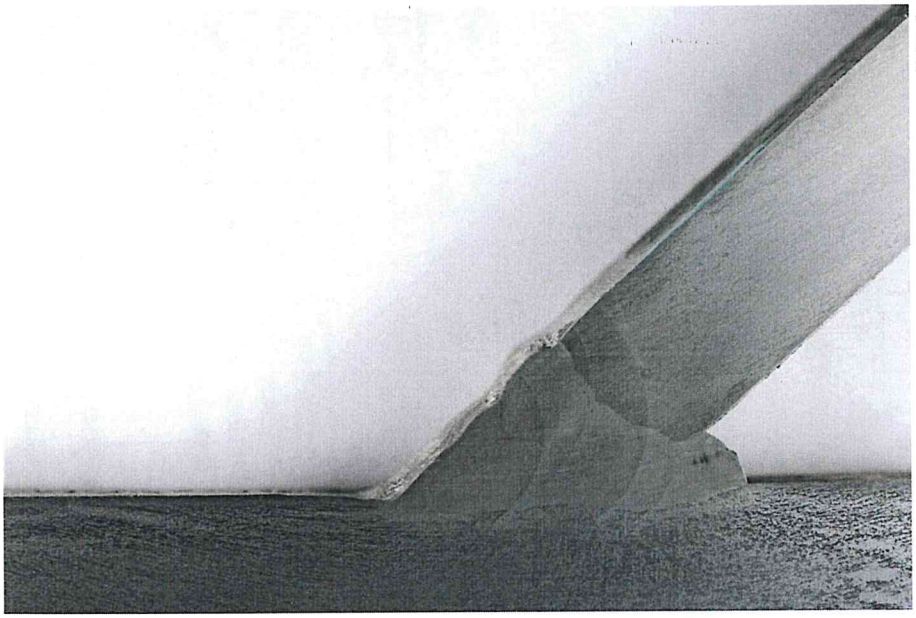
MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing::15/03/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**21,8°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**085/22 M**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		



SIDE A

SIDE B

Remarks / *Note:*	**TAKEN AT H.12 – POSITION 5G** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio *Dott. Ing. Mauro Bacelleschi* - INSPECTA srl - Laboratory Technician 18/03/2022	*Responsabile Laboratorio* *Sig. Giulio Bagnara* - INSPECTA srl - 18/03/2022 Service Responsible	*Ispettore del cliente*	*Ispettore Terza parte* RINA SERVICES S.p.A. ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022

MACRO EXAMINATION TEST
Prova Macrografica

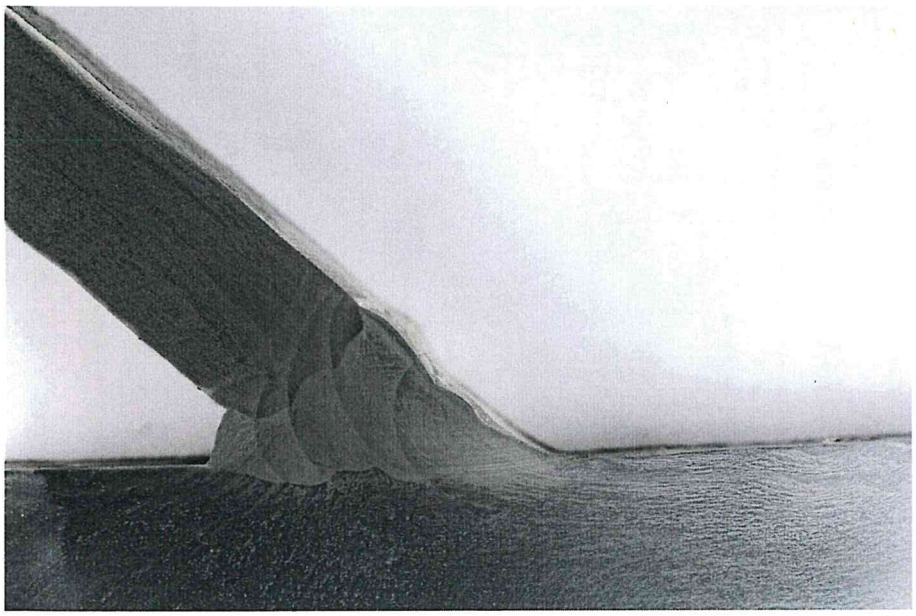
Date of Testing::15/03/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**21,8°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**085/22 N**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.12 – POSITION 5G** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio *Dott. Ing. Mauro Baccheschi*	*Responsabile Laboratorio* *Sig. Giulio Bagnara*	*Ispettore del cliente*	*Ispettore Terza parte*
Laboratory Technician 18/03/2022	- INSPECTA srl - 18/03/2022 Servizio Responsabile		BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022

END OF TEST REPORT
FINE DEL RAPPORTO DI PROVA

Manufacturer:
ArcelorMittal Tubular Products Roman S.A.
STEFAN CEL MARE STR, BL 15, SC. A, PARTER I
ROMAN, NEAMT ROMANIA

MILL TEST CERTIFICATE
according to EN 10204/3.1/2004
-

Page 1/3
B 17914/1
04.09.2019

ArcelorMittal

Buyer: T.A.L. S.P.A.con socio unico
VIA G. DI VITTORIO, 6, ZONA IND., 29017
FIORENZUOLA D'ARDA (PIACENZA)
ITALY

SEAMLESS STEEL LINE PIPES

Total weight:	Total Length:	Pieces	Bundles
21.593 tons - lbs	334.04 meters - feets	30	10

Standard: API 5L ed.46-2018-PSL 1; ISO 3183-2012/Amd.1:2017; ASTM A 333/A 333M-2018; ASME SA 333/SA 333M-2017; TS 02 REV.05/24.01.2012 with deviation as per our. TO No.4/2.10.2013; ASME B16.25-2017; ANSI/NACE MR 0103/ISO 17945-2015; NACE MR 0175/ISO 15156-1&2-2015

Buyer's reference: PO NO. : OF190514
Contract 50004296

Dimensions: 219.10 x 12.70 mm
-

Schedule: XS/80

Length: 10.00 - 11.80 m
-

-
-

Item	Item Client
32	-

Hydro Test:	Bar	PSI	MPa	Time(sec)
	205	-	20.5	5

Steel Grade: X52/6/L360
-

Chemical Analysis(%)

Heat	Bulletin No.	Product Req.		C	Mn	Si	S	P	Cr	Ni	Cu	Al	Mo	V	Nb	Ti	B
			Max	0.20	1.30	0.35	0.010	0.020	0.20	0.40	0.30	0.060	0.12	0.080	0.020	0.040	0.0010
			Min	-	-	0.15	-	-	-	-	-	0.015	-	0.060	-	-	-
1192466		Heat analysis		0.14	1.25	0.20	0.003	0.009	0.07	0.08	0.14	0.027	0.01	0.070	0.002	0.002	0.0004
1192466	19-1051	Product analysis		0.15	1.24	0.21	0.003	0.009	0.06	0.08	0.14	0.028	0.01	0.069	0.002	0.001	0.0003
1192466	19-1051	Product analysis		0.15	1.23	0.21	0.003	0.009	0.06	0.08	0.14	0.028	0.01	0.068	0.002	0.001	0.0003

Chemical Analysis(%)

Heat	Bulletin No.	Product Req.		Nb + V	Nb + Ti + V	Cr + Mo + Cu + Nb + V + Ti	CE_IIW
			Max	0.100	0.150	0.600	0.42
			Min	-	-	-	-
1192466		Heat analysis		0.072	0.074	0.295	0.39
1192466	19-1051	Product analysis		0.071	0.072	0.282	0.40
1192466	19-1051	Product analysis		0.070	0.071	0.281	0.40

CEpcm = C+Si/30+Mn/20+Cu/20+Ni/60+Cr/20+Mo/15+V/10+5B CE_S = C+Mn/6 CE_{IIW} = C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15

Tensile Test

Heat	Orientation	Length		Width/Diameter		Thickness		Section		Mechanical test Bulletin No.	YS MPa	YS (PSI:1000)	UTS MPa	UTS (PSI:1000)	E %	YS/UTS max: -
		mm	inch	mm	inch	mm	inch	mm²	inch²							
1192466	Longitudinal Flat	50.8	-	40.00	-	12.80	-	512.0	-	19-3483	404.00	-	538.00	-	41.20	0.75
1192466	Longitudinal Flat	50.8	-	40.00	-	12.80	-	512.0	-	19-3483	410.00	-	536.00	-	39.90	0.76

BUREAU VERITAS ITALIA WELDING 48
FILE: 22.SF.3756304.138
DATE: 08/02/2022
WITNESSED ☐ REVIEW ☑

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative

Formular 12A rev 9

TAL SPA - THIS DOCUMENT IS REPRODUCED BY A COMPUTERIZED SYSTEM AND IS CONFORM TO THE ORIGINAL

Approved by QUALITY1 on 11/09/19

Manufacturer:
ArcelorMittal Tubular Products Roman S.A.
STEFAN CEL MARE STR, BL 15, SC. A, PARTER I
ROMAN, NEAMT ROMANIA

MILL TEST CERTIFICATE
according to EN 10204/3.1/2004
-

B 17914/1
04.09.2019

ArcelorMittal

Buyer: T.A.L. S.P.A.con socio unico
VIA G. DI VITTORIO, 6, ZONA IND., 29017
FIORENZUOLA D'ARDA (PIACENZA)
ITALY

SEAMLESS STEEL LINE PIPES

Total weight:	Total Length:	Pieces	Bundles
21.593 tons - lbs	334.04 meters - feets	30	10

Standard: API 5L ed.46-2018-PSL 1; ISO 3183-2012/Amd.1:2017; ASTM A 333/A 333M-2018; ASME SA 333/SA 333M-2017; TS 02 REV.05/24.01.2012 with deviation as per our. TO No.4/2.10.2013; ASME B16.25-2017; ANSI/NACE MR 0103/ISO 17945-2015; NACE MR 0175/ISO 15156-1&2-2015

Buyer's reference: PO NO. : OF190514
Contract 50004296

Dimensions: 219.10 x 12.70 mm
-

Schedule: XS/80

Length: 10.00 - 11.80 m
-

-
-

Item	Item Client
32	-

Hydro Test:	Bar	PSI	MPa	Time(sec)
	205	-	20.5	5

Steel Grade: X52/6/L360
-

Impact Test

Heat	Impact Test Bulletin No.	Orientation	Size (mm)	Temp. (°C)	Req.KV (min. J)	KV values (J)			Req.Avr. (min. J)	Avr. fracture energy (J)	KCU min:-J/cm² T:°C			Shear Area min. %			Lateral Expansion min. mm		
1192466	19-4147	Longitudinal	10x10x55	-50	27.0	203	282	294	40.0	260	-	-	-	100	100	100	1.80	2.08	2.13

Hardness Test

Heat	Hardness Test Bulletin No.	HB max.-	HV 10 max.-	HV 10 max.-					HRC max.22
				OD	Midwall	ID	End A	End B	
1192466	19-2381	-	-	-	-	-	-	-	<22
1192466	19-2381	-	-	-	-	-	-	-	<22

Technological/Microstructure Test

Heat	Flattening Test Bulletin No.	Flattening Test
1192466	19-3193	OK
1192466	19-3193	OK

Heat

Heat	Pieces	Length (m)	Weight (kg)
1192466	30	334.04	21593

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.3756304-138
DATE: 08/02/2022
WITNESSED ☐ REVIEW ☑

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative

TAL SPA - THIS DOCUMENT IS REPRODUCED BY A COMPUTERIZED SYSTEM AND IS CONFORM TO THE ORIGINAL

Approved by QUALITY1 on 11/09/19

ROSETTI MARINO S.P.A. P.O.1719001717 117A30A TAL JOB N°319002343
N° 21 MT 234,9 HEAT 1192466 DIMENSIONS 219,1 x 12,7

Manufacturer: ArcelorMittal Tubular Products Roman S.A. STEFAN CEL MARE STR, BL 15, SC. A, PARTER I ROMAN, NEAMT ROMANIA	**MILL TEST CERTIFICATE** according to EN 10204/3.1/2004 -					Page 3/3			ArcelorMittal
						B 17914/1			
						04.09.2019			
Buyer: T.A.L. S.P.A.con socio unico VIA G. DI VITTORIO, 6, ZONA IND., 29017 FIORENZUOLA D'ARDA (PIACENZA) ITALY	SEAMLESS STEEL LINE PIPES					Total weight: 21.593 tons - lbs	Total Length: 334.04 meters - feets	Pieces 30	Bundles 10
	Standard: API 5L ed.46-2018-PSL 1; ISO 3183-2012/Amd.1:2017; ASTM A 333/A 333M-2018; ASME SA 333/SA 333M-2017; TS 02 REV.05/24.01.2012 with deviation as per our. TO No.4/2.10.2013; ASME B16.25-2017; ANSI/NACE MR 0103/ISO 17945-2015; NACE MR 0175/ISO 15156-1&2-2015								
Buyer's reference PO NO. : OF190514	Dimensions: 219.10 x 12.70 mm -		Schedule: XS/80			Length: 10.00 - 11.80 m -		- -	
Contract 50004296									

Item	Item Client	Hydro Test:	Bar	PSI	MPa	Time(sec)	Steel Grade: X52/6/L360 -
32	-		205	-	20.5	5	

Remarks PIPES IN COMPLIANCE WITH PED: 2014-68-EU/15.05.2014, ANNEX 1, SECTION 4.3.
Manufacturing process – hot rolling.
Hot finished, steel is fully killed and produced by electric furnace, source G300706
Steel is fully killed with a fine grain practice , size min.7.
Visual inspection and dimensional check without objection.
Heat treatment: normalizing at temperature: 890-920°C, time soaking 9 min.
Magnetism residual max.30 Gauss.
Hydrostatic test hold for 5 sec. no leakage noticed.
The products was manufactured, sampled, tested, marked and inspected in accordance with the Standards, the supplementary requirements, and any other requirements designated in the purchase order, and has been found to meet such requirements.

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.3756304-138
DATE: 08/02/2022
WITNESSED ☐ REVIEW ☑

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative

Formular 12A rev 9

TAL SPA - THIS DOCUMENT IS REPRODUCED BY A COMPUTERIZED SYSTEM AND IS CONFORM TO THE ORIGINAL

Approved by QUALITY1 on 11/09/19

Certificado Nº (Certificate No.) S/ According to EN 10204-3.2 Página (Page) Fecha (Date)	275047-D1-20180404 Pag 1 / 4 04/04/2018

AENOR ER Empresa Registrada UNE-EN ISO 9001 ER-0030/1992

ArcelorMittal España, S.A.
Residencia de la Granda
33418 - Gozón
Asturias - España

CERTIFICADO DE INSPECCIÓN
INSPECTION CERTIFICATE

ArcelorMittal

O. Suministro (Works Order No)	Cliente (Customer)	Destino (Destination)	Producto (Product)	Especificación (Specification)	Pedido cliente/Customer order:
BC8219	ARCELOR PROJECTS INT. BV	MANNESMANNWEG. 5 4794SL - HEIJNINGEN-HOLANDA	Chapa Gruesa / Heavy Plate	S355G10+M S355ML EN 10225 EN 10025-4 MOD NORSOK	FB74AMP01W 3200055705

Descripción del producto / Description of the product

ITEM 10

Colada (Heat No)	Chapa (Plate No)	Dimensiones, mm (Size, mm)	Peso, t (Weight)
705587	42843891	30 x 3050 x 12000	8,619

Colada (Heat No)	Chapa (Plate No)	Dimensiones, mm (Size, mm)	Peso, t (Weight)
705587	42843901	30 x 3050 x 12000	8,619

Colada (Heat No)	Chapa (Plate No)	Dimensiones, mm (Size, mm)	Peso, t (Weight)
705587	42844171	30 x 3050 x 12000	8,619

Colada (Heat No)	Chapa (Plate No)	Dimensiones, mm (Size, mm)	Peso, t (Weight)

Total chapas (plates)	3	Total peso (Weight)	25,86

Análisis de colada y producto / Heat and product analysis

SU02: Nb+V SU03: Nb+V+Ti PCM: C+Si/30+(Mn+Cu+Cr)/20+Ni/60+Mo/15+V/10+5B CEV: C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15

Nº Colada (Heat No)	Nº muestra (Sample No)	Composición química (Chemical analysis)% *(H=Colada / Heat P=Producto / Product)																								
		*H/P	C	Mn	Si	S	P	Al	N	Cu	Ni	Cr	Mo	Nb	V	Ti	B	As	Sn	Sb	Pb	Ca	Bi	Pcm	Cev	SU03	SU02
705587		H	0,06	1,52	0,274	0,002	0,013	0,024	0,0044	0,212	0,301	0,032	0,003	0,028	0,003	0,012	0,0001	0,002	0,0030	0,000	<0,001	0,0001	<0,002	0,16	0,35	0,04	0,03
	20171023081	P	0,06	1,53	0,273	0,003	0,012	0,022	0,0047	0,217	0,301	0,029	0,001	0,025	0,005	0,012	0,0001							0,17	0,36	0,04	0,03

(1) L=longitudinal T= Transversal Z= Through thickness D= Diagonal
(2) C=Cabeza (top) P=Pie (bottom) S= Superficie (surface) 4=1/4 esp. (1/4 thickness) 3=1/3 esp. (1/3 thickness) E=Esp. Completo (full thick.) N=Nucleo (midthickness)
(3) " " =BrutoLaminación (as rolled) - A= N +R - L=Conformado de Normalización (normalizing rolling) - T=Tratamiento Termomec.(termomec. rolling) - N=Normalizado(normalized) - R=Revenido(tempering)

Ensayos mecánicos / Mechanical test

Type of test: A: Ultrasonic test approved; Z35: Through thickness test; HV: Vickers hardness test;(HT)*: Postwelding heat treatment of test coupons: 580 +/- 20ºC Soaking time: 4h.
ISO-V: Toughness; ISO-V(S): Toughness after stretching 5%; ISO-V(S+A): Toughness after stretching 5% + 250ºC, 1 hour

Nº Chapa (Plate No.)	Nº Muestra (Sample No)	Esp. Thickness	Est.Sum (Delivered condition) (3)	UST (Us test)	Tipo ensayo (Type of test)		Orient. (Orientation) (1)	Local. (Location) (2)	Temp. (Temp) ºC	Ensayo de tracción (Tensile test) Reh Y.P. Mpa	Rm T.S. Mpa	Reh / Rm	%A Elong. (1) 5,65√So (2) 8 Inch	Ensayo Resiliencia (Charpy-V Impact test) Energia (Energy), j Individuales (Inviduals) 1	2	3	Media (Av.)	Otros ensayos (other test) Individuales (Inviduals) 1	2	3	Media (Av)	Doblado (Bend test) Mandril (Mandrel)	Angulo (Angle)	Result. (Result)
42843891	20171023065	30	T	A	ISO-V 10 (HT)	(j)	T	C S	-40					210	238	231	226							
	20171023065	30	T	A	ISO-V 10 (HT)	(j)	L	C S	-50					300	293	282	292							
	20171023065	30	T	A	ISO-V 10	(j)	T	C S	-40					257	300	270	276							
	20171023065	30	T	A	ISO-V 10	(j)	L	C S	-50					300	300	283	294							

BUREAU VERITAS ITALIA WELDING
IT FILE: 22.5.F.375630-138
DATE: 08/02/2022
WITNESSED ☐ REVIEW ☑
48

B.O.S. Continuously cast slab.
Visual and dimensional inspection of plates: satisfactory
Surface quality according/ EN 10163 Class B Subclass 3+ ISO 8501 Class B
Dimensional tolerances according to EN 10029; thickness tolerances according to EN 10029 class C
Flatness: EN 10029 (2010) Class N
EN 10025: Options 2 and 4; EN 10225: Options 10, 12, 13 and 18
Ultrasonic inspection EN 10160 S2 E3

CE
0099
ArcelorMittal España,S.A.
Residencia la Granda
33418 Gozón (Asturias - España)
07
QP00033_CPR2013-07-01_FC_V006
EN 10025-4:2004
S355ML

Uso previsto: estructuras soldadas, atornilladas o remachadas. (Intented to be used in welded, bolted and riveted structures)
Limite elástico (Yield strength)*
Resistencia a tracción (Tensile strength)*
Alargamiento (Elongation)*
Resis. flexión choque (Impact strength)*
Soldabilidad (Weldability)*
Durabilidad (Durability)*
* Expresado como se indica en el DdP (Expressed as indicated in the DoP)

Por / By Classification society

Javier Sánchez
Gijon Office
Lloyd's Register España SA

Por / By ArcelorMittal España

Juan Manuel Vigil Fernández
Jefe Calidad Chapa Gruesa Heavy Plate Quality Manager
Flat Carbon Europe

ArcelorMittal España,S.A - Registro Mercantil de Asturias,Tomo 2279, Folio 115, Hoja AS- 17946-N.I.F.A81046856 - Oficina de certificados:certificados.gijon@arcelormittal.com-Tlf+ 34985187776

Certificado Nº (Certificate No.) S/ According to EN 10204-3.2 Página (Page) Fecha (Date)	275047-D1-20180404 Pag 2 / 4 04/04/2018

AENOR ER Empresa Registrada UNE-EN ISO 9001 ER-0030/1992

ArcelorMittal España, S.A.
Residencia de la Granda
33418 - Gozón
Asturias - España

CERTIFICADO DE INSPECCIÓN
INSPECTION CERTIFICATE

ArcelorMittal

O. Suministro (Works Order No)	Cliente (Customer)	Destino (Destination)	Producto (Product)	Especificación (Specification)	Pedido cliente/Customer order:
BC8219	ARCELOR PROJECTS INT. BV	MANNESMANNWEG. 5 4794SL - HEIJNINGEN-HOLANDA	Chapa Gruesa / Heavy Plate	S355G10+M S355ML EN 10225 EN 10025-4 MOD NORSOK	FB74AMP01W 3200055705

(1) L=longitudinal T= Transversal Z= Through thickness D= Diagonal
(2) C=Cabeza (top) P=Pie (bottom) S= Superficie (surface) 4=1/4 esp. (1/4 thickness) 3=1/3 esp. (1/3 thickness) E=Esp. Completo (full thick.) N=Nucleo (midthickness)
(3) " " =BrutoLaminación (as rolled) - A= N +R - L=Conformado de Normalización (normalizing rolling) - T=Tratamiento Termomec.(termomec. rolling) - N=Normalizado(normalized) - R=Revenido(tempering)
Type of test: A: Ultrasonic test approved; Z35: Through thickness test; HV: Vickers hardness test;(HT)*: Postwelding heat treatment of test coupons: 580 +/- 20°C Soaking time: 4h.
ISO-V: Toughness; ISO-V(S): Toughness after stretching 5%; ISO-V(S+A): Toughness after stretching 5% + 250°C, 1 hour

Ensayos mecánicos / Mechanical test

Nº Chapa (Plate No.)	Nº Muestra (Sample No)	Esp. Thickness	Est.Sum (Delivered condition) (3)	UST (Us test)	Tipo ensayo (Type of test)	Orient. (Orientation) (1)	Local. (Location) (2)	Temp. (Temp) °C	Ensayo de tracción (Tensile test) Reh Y.P. Mpa	Rm T.S. Mpa	Reh / Rm	%A Elong. (1) 5,65√So (2) 8 Inch	Ensayo Resiliencia (Charpy-V Impact test) Energía (Energy), j Individuales (Inviduals) 1	2	3	Media (Av.)	Otros ensayos (other test) Individuales (Inviduals) 1	2	3	Media (Av)	Doblado (Bend test) Mandril (Mandrel)	Angulo (Angle)	Result. (Result)
	20171023065	30	T	A	Tensile (HT)* (Mpa)	T	C E		440	509	0,86	31,9											
	20171023065	30	T	A	Tensile Z (Mpa)	Z	C E			587													
	20171023065	30	T	A	Tensile (Mpa)	T	C E		430	511	0,84	28,4											
	20171023065	30	T	A	Z35 (%)	Z	C E										75	44	65	61			
	20171023078	30	T	A	ISO-V(S+A) 10 (j)	T	C S	-40					174	42	182	133							
	20171023078	30	T	A	ISO-V(S) 10 (j)	T	C S	-40					248	207	221	225							
	20171023078	30	T	A	HV 10	T	C S	20									155	149	150	151			
	20171023081	30	T	A	HV 10	T	P S	20									149	151	150	150			
42843901	20171023072	30	T	A	ISO-V 10 (HT) (j)	T	C S	-40					193	233	281	236							
	20171023072	30	T	A	ISO-V 10 (HT) (j)	L	C S	-50					300	300	300	300							
	20171023072	30	T	A	ISO-V 10 (j)	T	C S	-40					300	300	300	300							
	20171023072	30	T	A	ISO-V 10 (j)	L	C S	-50					261	240	253	251							
	20171023072	30	T	A	Tensile (HT)* (Mpa)	T	C E		432	504	0,86	33,0											
	20171023072	30	T	A	Tensile Z (Mpa)	Z	C E			591													
	20171023072	30	T	A	Tensile (Mpa)	T	C E		453	514	0,88	31,9											

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.375630 138
DATE: 08/02/2022
WITNESSED ☐ REVIEW ☑

B.O.S. Continuously cast slab.
Visual and dimensional inspection of plates: satisfactory
Surface quality according/ EN 10163 Class B Subclass 3+ ISO 8501 Class B
Dimensional tolerances according to EN 10029; thickness tolerances according to EN 10029 class C
Flatness: EN 10029 (2010) Class N
EN 10025: Options 2 and 4; EN 10225: Options 10, 12, 13 and 18
Ultrasonic inspection EN 10160 S2 E3

Por / By Classification society

Javier Sanchez
Gijon Office
Lloyd's Register España SA

Por / By ArcelorMittal España

Juan Manual Vigil Fernández
Jefe Calidad Chapa Gruesa Heavy Plate
Plate Quality Manager
Flat Carbon Europe

Certificado Nº (Certificate No.) S/ According to EN 10204-3.2 Página (Page) Fecha (Date)	275047-D1-20180404 Pag 3 / 4 04/04/2018

AENOR ER Empresa Registrada UNE-EN ISO 9001 ER-0030/1992

ArcelorMittal España, S.A.
Residencia de la Granda
33418 - Gozón
Asturias - España

CERTIFICADO DE INSPECCIÓN
INSPECTION CERTIFICATE

ArcelorMittal

O. Suministro (Works Order No)	Cliente (Customer)	Destino (Destination)	Producto (Product)	Especificación (Specification)	Pedido cliente/Customer order:
BC8219	ARCELOR PROJECTS INT. BV	MANNESMANNWEG. 5 4794SL - HEIJNINGEN-HOLANDA	Chapa Gruesa / Heavy Plate	S355G10+M S355ML EN 10225 EN 10025-4 MOD NORSOK	FB74AMP01W 3200055705

(1) L=longitudinal T= Transversal Z= Through thickness D= Diagonal
(2) C=Cabeza (top) P=Pie (bottom) S= Superficie (surface) 4=1/4 esp. (1/4 thickness) 3=1/3 esp. (1/3 thickness) E=Esp. Completo (full thick.) N=Nucleo (midthickness)
(3) " " =BrutoLaminación (as rolled) - A= N +R - L=Conformado de Normalización (normalizing rolling) - T=Tratamiento Termomec.(termomec. rolling) - N=Normalizado(normalized) - R=Revenido(tempering)
Type of test: A: Ultrasonic test approved; Z35: Through thickness test; HV: Vickers hardness test;(HT)*: Postwelding heat treatment of test coupons: 580 +/- 20°C Soaking time: 4h.
ISO-V: Toughness; ISO-V(S): Toughness after stretching 5%; ISO-V(S+A): Toughness after stretching 5% + 250°C, 1 hour

Ensayos mecánicos / Mechanical test

Nº Chapa (Plate No.)	Nº Muestra (Sample No)	Esp. Thickness	Est.Sum (Delivered condition) (3)	UST (Us test)	Tipo ensayo (Type of test)	Orient. (Orientation) (1)	Local. (Location) (2)	Temp. (Temp) °C	Ensayo de tracción (Tensile test) Reh Y.P. Mpa	Rm T.S. Mpa	Reh / Rm	%A Elong. (1) 5,65√So (2) 8 Inch	Ensayo Resiliencia (Charpy-V Impact test) Energia (Energy), j Individuales (Inviduals) 1	2	3	Media (Av.)	Otros ensayos (other test) Individuales (Inviduals) 1	2	3	Media (Av)	Doblado (Bend test) Mandril (Mandrel)	Angulo (Angle)	Result. (Result)
	20171023072	30	T	A	Z35 (%)	Z	C E										75	72	72	73			
	20171023078	30	T	A	ISO-V(S+A) 10 (j)	T	C S	-40					174	42	182	133							
	20171023078	30	T	A	ISO-V(S) 10 (j)	T	C S	-40					248	207	221	225							
	20171023078	30	T	A	HV 10	T	C S	20									155	149	150	151			
	20171023081	30	T	A	HV 10	T	P S	20									149	151	150	150			
42844171	20171023078	30	T	A	ISO-V(S+A) 10 (j)	T	C S	-40					174	42	182	133							
	20171023078	30	T	A	ISO-V(S) 10 (j)	T	C S	-40					248	207	221	225							
	20171023078	30	T	A	HV 10	T	C S	20									155	149	150	151			
	20171023078	30	T	A	ISO-V 10 (HT) (j)	T	C S	-40					300	273	251	275							
	20171023078	30	T	A	ISO-V 10 (HT) (j)	L	C S	-50					213	228	226	222							
	20171023078	30	T	A	ISO-V 10 (j)	T	C S	-40					209	156	169	178							
	20171023078	30	T	A	ISO-V 10 (j)	L	C S	-50					280	300	287	289							
	20171023078	30	T	A	Tensile (HT)* (Mpa)	T	C E		401	501	0,80	31,9											
	20171023078	30	T	A	Tensile Z (Mpa)	Z	C E			582													
	20171023078	30	T	A	Tensile (Mpa)	T	C E		408	507	0,80	31,3											

BUREAU VERITAS ITALIA WELDING 88
FILE: 22.SF.375.0306.138
DATE: 08/02/2022
WITNESSED ☐ REVIEW ☐

B.O.S. Continuously cast slab.
Visual and dimensional inspection of plates: satisfactory
Surface quality according/ EN 10163 Class B Subclass 3+ ISO 8501 Class B
Dimensional tolerances according to EN 10029; thickness tolerances according to EN 10029 class C
Flatness: EN 10029 (2010) Class N
EN 10025: Options 2 and 4; EN 10225: Options 10, 12, 13 and 18
Ultrasonic inspection EN 10160 S2 E3

Por / By Classification society

Lloyd's Register
Javier Sanchez
Gijon Office
Lloyd's Register España SA

Por / By ArcelorMittal España
Juan Manual Vigil Fernández
Jefe Calidad Chapa Gruesa Heavy
Plate Quality Manager
Flat Carbon Europe

Certificado Nº (Certificate No.) S/ According to EN 10204-3.2 Página (Page) Fecha (Date)	275047-D1-20180404 Pag 4 / 4 04/04/2018

AENOR ER Empresa Registrada UNE-EN ISO 9001 ER-0030/1992

ArcelorMittal España, S.A.
Residencia de la Granda
33418 - Gozón
Asturias - España

CERTIFICADO DE INSPECCIÓN
INSPECTION CERTIFICATE

ArcelorMittal

O. Suministro (Works Order No)	Cliente (Customer)	Destino (Destination)	Producto (Product)	Especificación (Specification)	Pedido cliente/Customer order:
BC8219	ARCELOR PROJECTS INT. BV	MANNESMANNWEG. 5 4794SL - HEIJNINGEN-HOLANDA	Chapa Gruesa / Heavy Plate	S355G10+M S355ML EN 10225 EN 10025-4 MOD NORSOK	FB74AMP01W 3200055705

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ISO-V: Toughness; ISO-V(S): Toughness after stretching 5%; ISO-V(S+A): Toughness after stretching 5% + 250°C, 1 hour

Ensayos mecánicos / Mechanical test

Nº Chapa (Plate No.)	Nº Muestra (Sample No)	Esp. Thickness	Est.Sum (Dellvered condition) (3)	UST (Us test)	Tipo ensayo (Type of test)	Orient. (Orientation) (1)	Local. (Location) (2)	Temp. (Temp) °C	Ensayo de tracción (Tensile test) Reh Y.P. Mpa	Rm T.S. Mpa	Reh / Rm	%A Elong. (1) 5,65√So (2) 8 Inch	Ensayo Resiliencia (Charpy-V Impact test) Energia (Energy), j Individuales (Inviduals) 1	2	3	Media (Av.)	Otros ensayos (other test) Individuales (Inviduals) 1	2	3	Media (Av)	Doblado (Bend test) Mandril (Mandrel)	Angulo (Angle)	Result. (Result)
	20171023078	30	T	A	Z35 (%)	Z	C E										73	71	68	71			
	20171023081	30	T	A	HV 10	T	P S	20									149	151	150	150			

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.$F.375630A-138
DATE: 08/02/2022
WITNESSED ☐ REVIEW ☑

B.O.S. Continuously cast slab.
Visual and dimensional inspection of plates: satisfactory
Surface quality according/ EN 10163 Class B Subclass 3+ ISO 8501 Class B
Dimensional tolerances according to EN 10029; thickness tolerances according to EN 10029 class C
Flatness: EN 10029 (2010) Class N
EN 10025: Options 2 and 4; EN 10225: Options 10, 12, 13 and 18
Ultrasonic inspection EN 10160 S2 E3

Por / By Classification society

Lloyd's Register
Javier Sánchez
Gijon Office
Lloyd's Register España SA

Por / By ArcelorMittal España

Juan Manual Vigil Fernández
Jefe Calidad Chapa Gruesa Heavy
Plate Quality Manager
Flat Carbon Europe

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2021-12-22

Numero certificato/Cert no: EC26661767 rev. 0

Nostro ordine/Our order:	0100420342	Vostro ordine/Your order:	437/21
Nostro riferimento/Our ref:	HYBRIS PRD account	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB01056	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20211221	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address
TECHNO SERVICE S.R.L.
VIA DELLA MERENDA32 FOR.ZARATTINI
48124 RAVENNA
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
TECHNO SERVICE S.R.L.
VIA DELLA MERENDA,32 FOR.ZARATTINI
48124 RAVENNA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PNV4610432 Quantità/Quantity: 896 KGM

PRODOTTO/PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK Tubrod 15.17 1.2mm 16kg
Codice/Item no:	**1517127730**

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.29: E81T1-Ni1CJ H4
SFA/AWS A5.29: E81T1-Ni1MJ
EN ISO 17632-A: T 46 3 1Ni P C1 2 H5
EN ISO 17632-A: T 46 4 1Ni P M21 2 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:	M21 (EN ISO 14175)
C	0.07%
Si	0.37%
Mn	1.15%
P	0.01%
S	0.02%
Cr	0.03%
Ni	1.1%
Mo	0.02%
Nb	0.02%
Cu	0.01%
V	0.02%

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: In accordo a/acc to EN 10204 - 2.2

Norma/Standard:	EN
Altro/Auxiliary:	M21 (EN ISO 14175)
Condizione/Condition:	As welded

TRAZIONE/TENSILE

ReL	Rm	A5
544 MPa	613 MPa	26 %

RESILIENZA/IMPACT

Temp	-40 °C
KV	124 J

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.375630 - 138
DATE: 08/02/2022
WITNESSED ☐ REVIEW ☑

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura S.p.A. | Str. Provinciale 34, n.37 - 20010 Ossona MI, Italy

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis		Validazione - altro/Validation - Others	
Piotr Grela	Quality Assurance Manager	Neil Farrow	Product Manager

ROSETTI MARINO	Welding Procedure Qualification Record (PQR) Verbale di Qualifica di Procedura di Saldatura	No. 31/22	Sheet/Foglio 1/2

Manufacturer's Welding Procedure. Ref. no.	31/22 REV. 0		
Manufacturer	ROSETTI MARINO S.p.A.		
Address	VIA TRIESTE 230 - 48121 RAVENNA		
Code, Testing Standard	Project Spec. SD-NOC-STR-301 Rev.03		
Date of welding	February 14th and 15th, 2022		
Examiner of examining body	Bureau Veritas Italy S.p.A.		
RANGE OF QUALIFICATION			
Welding process	FCAW	//	//
Type(s)	Semiautomatic	//	//
Welding Equipment Type	HF inverter type		
Actual parent Material side A	Pipe: EN 10225-3:2019: S355NLHHO (Heat: 808993)		
Actual parent Material side B	Plate: EN 10225: S355G10+M (Heat: 705587)		
Parent Material grade	AWS D1.1 - II / ISO 15608 1.2		
Supply condition	A) Normalized (+N) to B) Thermomechanically Rolled (+TM)		
Carbon equivalent/Pcm/C	Heat Values: A) 0,39/0,228/0,14 to B) 0,35/0,163/0,06		
Groove design/configuration	Half Vee Tubolar Joint (one side welding without backing), For groove dimension and details see Welding Table 31/22_2G and 31/22_5G		
Parent material thickness (mm)	A)25,40 mm to B)30,00 mm		
Weld metal thickness (mm)	25,40 mm	//	//
Single or Multi-pass	Multiple	//	//
Outside diameter	406,40 (16")		
Filler material Designation	AWS 5.29 E81T1-Ni1MJ	//	//
Filler material Maker	OK Tubrod 15.17 - ESAB	//	//
Filler material Size	∅ 1,2 mm	//	//
Shielding gas/Flux	80% Ar + 20% CO2	//	//
Shielding gas flow rate	16 l/min.	//	//
Backing gas (purging)	None		

Type of welding current & polarity	DC/SP	Heat input / Apporto termico (kJ/mm) - 25%	Pass	Diameter (mm)	2G	5G
			Root	∅ 1,2	1,18 to 2,19	0,90 to 1,63
			Hot	∅ 1,2	1,41 to 2,38	1,05 to 1,76
			Fill	∅ 1,2	1,10 to 1,91	0,99 to 1,87
			Cap	∅ 1,2	1,08 to 1,72	1,03 to 1,67

Welding position	2G and 5G - Uphill progression		
Preheat (°C)	50	Interpass temperature / Temp. di interpass (°C)	250 for 2G and 5G
Post-Weld Heat Treatment and/or ageing	None		
Weld bead width	Max. 12 mm		
Welder's detail	Benyo Ionel (GX17)		
Time lapse between root and hot pass	N.A.		
Other information / Altre informazioni	- Preheat performed by propane torch		

BUREAU VERITAS ITALY
WITNESSED
SURVEYOR G. TESEI
DATE 28/03/2022

Manufacturer's Welding Procedure. Ref. no.	31/22 REV. 0		
Test result (WPQR) N°	31/22	Date/Data	18/03/2022
Manufacturer's WPS No.	pWPS 31/22_2G REV. 1	Date/Data	14/02/2022
Manufacturer's WPS No.	pWPS 31/22_5G REV. 1	Date/Data	15/02/2022

TESTS CARRIED OUT ON SAMPLE 1/2 WELDED IN 2G POSITION AND ON SAMPLE 2/2 WELDED IN 5G POSITION

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 21/2022 dated 18/02/2022 for 2G and VDR 22/2022 dated 18/02/2022 for 5G
Penetrant test	N.A.	N.A.
Magnetic particle test	Acceptable	22049 MT 21 RN Rev.00 dated 18/02/2022 for 2G and 22049 MT 22 RN Rev.00 dated 18/02/2022 for 5G
Radiographic test	N.A.	N.A.
Ultrasonic test	Acceptable	22049 UT 12 SZ Rev.00 dated 18/02/2022 for 2G and 22049 UT 13 SZ Rev.00 dated 18/02/2022 for 5G

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2] //	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2] //	A [%]	Z [%]	Fracture Location	Remarks
//	//	//	//	//	//	//	//
//	//	//	//	//	//	//	//

BEND TEST

Type & N.	Bend angle	Remarks	Results
//	//	//	//

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J] //			Avarage value [J] //	Remarks
//	//	//	//	//	//	//	//	//
//	//	//	//	//	//	//	//	//
//	//	//	//	//	//	//	//	//

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
12 Macro examination and Hardness test	Satisfactory: See INSPECTA S.R.L. Test Report No. 060-00330-22 dated 18/03/2022
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	INSPECTA S.R.L. - Ravenna (RA)
Laboratory report reference N.	Report No. 060-00330-22 dated 18/03/2022
Test carried out in the presence of:	BUREAU VERITAS Italy

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Project Spec. SD-NOC-STR-301 Rev.03

Date/Data
18-03-2022

Examiner or Examination Body
BUREAU VERITAS Italy
Giancarlo Tesei

ROSETTI MARINO S.p.A.

Name and signature / Nome e firma

BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022

ROSETTI MARINO SpA A. Khalifa Welding Dept.

ROSETTI MARINO	PROJECT	Al-Shaheen Field, Gallaf Batch-3 Project - F-DBN EPCIC8 SOW	CLIENT	NOC QATAR
	DOC	pWPS Preliminary Welding Procedure Specification	JOB #:	121A20

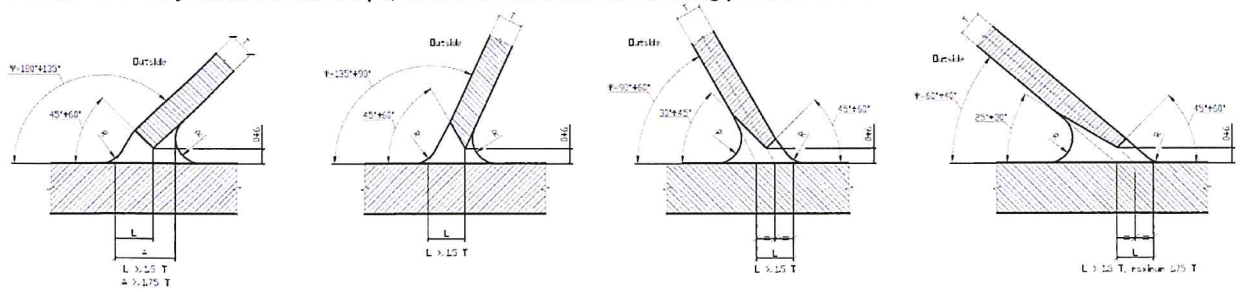
PQR ref.: 31/22	code Project Spec. SD-NOC-STR-301	WPS 31/22_2G	REV.: 1	Data /date 14/02/21

Procedimento di saldatura / Welding process: GS FCAW — Tipo / Type: SEMIAUTOMATIC — scopo / scope: CJP,T-,K-,Y-

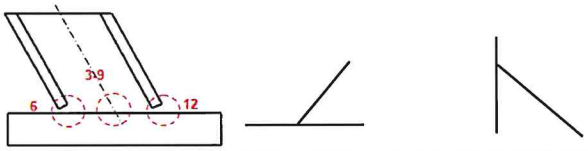
GIUNTO - JOINT

Tipo di giunto / Joint Design: ½ V — ☐ DOUBLE SIDED WELD — ☒ SINGLE SIDED WELD (no backing on root)

Dettagli / Details: sketch is only for bevel and shape, it does not indicate the welding position that is detailed in dedicated section below



Connection shall simulate the widest and the narrowest configurations, where macro shall be taken. One weld shall be placed with axis of abutting member vertical (2G), one weld with axis horizontal (5G)



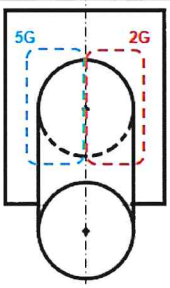
MATERIALE BASE - BASE MATERIAL

EN 10225-3:2019 : S355NLHHO to EN 10225: S355G10+M — Material grade: +N to +TM — Max Cev 0.39 to 0.35

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove 25,40 mm to 30,00 mm

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove 406,40 mm (16") to Plate

METALLO D'APPORTO - FILLER METAL



	GS FCAW
Spec. N° (SFA)	5.29
AWS N° (CLASS)	E81T1-Ni1M
F-N°	6
A-N°	10
Diametro mat. d'apporto / Size of filler metal	1,2
Metallo depositato / Deposit weld metal	25,40
Gamma spessori /Thick. range	Up to completion
Accoppiamento filo-flusso / Electrode-flux (CLASS)	N.A.
Denom. Comm. flusso / FLUX trade name	N.A.
Inserto consumabile / Consumable insert	N.A.
Altro / other	OK Tubrod 15.17 - ESAB

BUREAU VERITAS ITALIA WELDING — IT FILE: 22.SR.935.G304.135 — DATE 14/02/2022 — WITNESSED ☐ — REVIEWED 48

giunto / Joint: Cianfrino / groove — Posizione / position: 2G — Progressione / weld progression: N.A.

PRERISCALDO - PRE-HEAT (QW406)

Temp.preriscaldo minima / Min. pre-heat temp: 50°C — Max temp. Di interpass / Max interpass temp.: 250°C — Preheat Method / Metodo preriscaldo: Propane Torch

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs): N.A. — Temperatura di stasi / Holding temperature °C: N.A. — Tempo di stasi / Holding time (min.): N.A. — Velocità di raffreddamento / Cooling rate (°C/Hrs): N.A.

GAS DI PROTEZIONE - GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar+CO2	80%+20%	16-18 lt/min
Protezione / Shielding:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current: DC - CV — Polarità / Polarity: RP

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: N.A.

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: Spray arc

Velocità alimentazione filo / Electr. Wire feed speed range: Self regulated (CV)

TECNICA - TECHNIQUE

Passata / Bead: Tirata-Larga/String-Wave — Dimensione bocchello gas / Orifice of gas cup size: 3/4" — Pulizia iniziale e fra le passate / Initial and interpass cleaning: Spazzolatura e Molatura/Brushing Grinding

Metodo di solcatura a rovescio / Method of back gouging: N.A. — Oscillazione / Oscillation: N.A. — Distanza tra zona di contatto e pezzo / Contact tube to work distance: 13 to 18 mm

N°Passate / Passes nr.: Multipla/Multiple — Elettrodo multiplo o singolo / Multiple or single electrodes: Singolo/Single — Martellatura / Peening: N.A.

Altro / Other: Max. width of weld bead 12 mm

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range	Vel. avanzamento / Travel speed range (mm/min)	Apporto termico / Heat input (KJ/mm)
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. range			
Root	GS FCAW	E81T1-Ni1M	1,2	DC/RP	190 to 240	25 to 28	140 to 240	1,19 to 2,88
Hot	GS FCAW	E81T1-Ni1M	1,2	DC/RP	200 to 255	24 to 28	145 to 230	1,25 to 2,96
Fill	GS FCAW	E81T1-Ni1M	1,2	DC/RP	265 to 305	27 to 30	250 to 350	1,23 to 2,20
Cap	GS FCAW	E81T1-Ni1M	1,2	DC/RP	255 to 310	26 to 30	230 to 350	1,14 to 2,43

Preparato da / prepared by: *D.Cenacchi*

Approvato da / approved by: *A. Khalifa*

ROSETTI MARINO	PROJECT	Al-Shaheen Field, Gallaf Batch-3 Project - F-DBN EPCIC8 SOW	CLIENT	NOC QATAR
	DOC	pWPS Preliminary Welding Procedure Specification	JOB #:	121A20

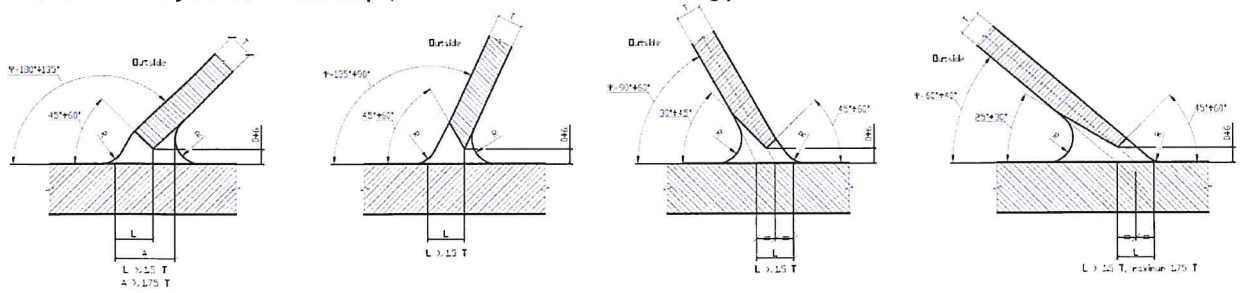
PQR ref.: 31/22	code Project Spec. SD-NOC-STR-301	WPS 31/22_5G	REV.: 1	Data /date 15/02/21

Procedimento di saldatura / Welding process: GS FCAW — Tipo / Type: SEMIAUTOMATIC — scopo / scope: CJP,T-,K-,Y-

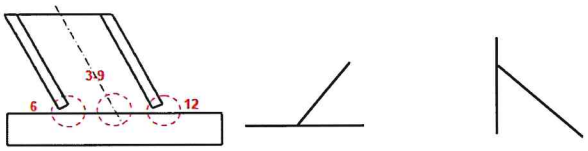
GIUNTO - JOINT

Tipo di giunto / Joint Design: ½ V — ☐ DOUBLE SIDED WELD — ☒ SINGLE SIDED WELD (no backing on root)

Dettagli / Details: sketch is only for bevel and shape, it does not indicate the welding position that is detailed in dedicated section below



Connection shall simulate the widest and the narrowest configurations, where macro shall be taken. One weld shall be placed with axis of abutting member vertical (2G), one weld with axis horizontal (5G)



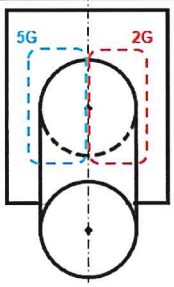
MATERIALE BASE - BASE MATERIAL

EN 10225-3:2019 : S355NLHHO to EN 10225: S355G10+M — Material grade: +N to +TM — Max Cev 0.39 to 0.35

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove 25,40 mm to 30,00 mm

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove 406,40 mm (16") to Plate

METALLO D'APPORTO - FILLER METAL



Spec. N° (SFA)	GS FCAW
AWS N° (CLASS)	5.29
F-N°	E81T1-Ni1M
A-N°	6
Diametro mat. d'apporto / Size of filler metal	10
Metallo depositato / Deposit weld metal	1,2
Gamma spessori /Thick. range	25,40
Accoppiamento filo-flusso / Electrode-flux (CLASS)	Up to completion
Denom. Comm. flusso / FLUX trade name	N.A.
Inserto consumabile / Consumable insert	N.A.
Altro / other	N.A.
	OK Tubrod 15.17 - ESAB

BUREAU VERITAS ITALIA WELDING — IT FILE: 22-55375594.48 — DATE: 15/03/2022 — WITNESSED ☐ — REVIEWED ☐

giunto / Joint: Cianfrino / groove — Posizione / position: 5G — Progressione / weld progression: Uphill

PRERISCALDO - PRE-HEAT (QW406)

Temp.preriscaldo minima / Min. pre-heat temp: 50 °C — Max temp. Di interpass / Max interpass temp.: 250 °C — Preheat Method / Metodo preriscaldo: Propane Torch

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs): N.A. — Temperatura di stasi / Holding temperature °C: N.A. — Tempo di stasi / Holding time (min.): N.A. — Velocità di raffreddamento / Cooling rate (°C/Hrs): N.A.

GAS DI PROTEZIONE - GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar+CO2	80%+20%	16-18 lt/min
Protezione / Shielding:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current: DC - CV	Polarità / Polarity: RP
Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type:	N.A.
Metodo di trasferimento per GMAW / GMAW metal tranfer mode:	Spray arc
Velocità alimentazione filo / Electr. Wire feed speed range:	Self regulated (CV)

TECNICA - TECHNIQUE

Passata / Bead: Tirata-Larga/String-Wave — Dimensione bocchello gas / Orifice of gas cup size: 3/4" — Pulizia iniziale e fra le passate / Initial and interpass cleaning: Spazzolatura e Molatura/Brushing Grinding

Metodo di solcatura a rovescio / Method of back gouging: N.A. — Oscillazione / Oscillation: N.A. — Distanza tra zona di contatto e pezzo / Contact tube to work distance: 13 to 18 mm

N°Passate / Passes nr.: Multipla/Multiple — Elettrodo multiplo o singolo / Multiple or single electrodes: Singolo/Single — Martellatura / Peening: N.A.

Altro / Other: Max. width of weld bead 12 mm

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range	Vel. avanzamento / Travel speed range (mm/min)	Apporto termico / Heat input (KJ/mm)
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. range			
Root	GS FCAW	E81T1-Ni1M	1,2	DC/RP	160 to 185	23,5 to 24,5	150 to 220	1,03 to 1,81
Hot	GS FCAW	E81T1-Ni1M	1,2	DC/RP	175 to 225	24 to 26	170 to 220	1,15 to 2,07
Fill	GS FCAW	E81T1-Ni1M	1,2	DC/RP	185 to 230	24 to 26	140 to 270	0,99 to 2,56
Cap	GS FCAW	E81T1-Ni1M	1,2	DC/RP	200 to 230	24 to 26	170 to 250	1,15 to 2,11

Preparato da / prepared by: *D.Cenacchi*

Approvato da / approved by: *A. Khalifa*

ROSETTI MARINO

PQR - AS- RUN PARAMETER SHEET

pWPS 31/22_2G	
PQR 31/22	
Coupon Nr. 1/2_2G	
Date: 14/02/22	Page: 1_ of _2

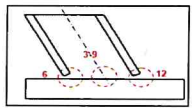
REFERENCE CODE AND PROJECT SPECIFICATIONS: **Project Spec. SD-NOC-STR-301 Rev.03**

Welder Name(s):	BENYO IONEL	Welder Id No(s):	GX17
Welding Process(es):	GS FCAW	Type(s):	SEMIAUTOMATIC
Welding Position:	2G	Progression:	N.A.
Base Materials:	a) EN 10225-3:2019 : S355NLHHO to b) EN 10225: S355G10+M	Wall Thickness:	a) 25,40 mm to b) 30,00 mm
Heat No(s):	a) 808993 to) 705587	Joint Type:	HALF VEE TUBOLAR JOINT; ONE SIDE WELDING WITHOUT BACKING

Diameter: 406,40 mm

WELD PREPARATION:





WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNV4610432	OK Tubrod 15,17 - ESAB
Hot Pass	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Filling Runs	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Cap	1,2	PNV4610432	OK Tubrod 15.17 - ESAB

GAS:

Shielding Gas:	Ar + CO2
Composition:	80% CO2 + 20% Ar
Flow:	16 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/4"
Tungsten Type:	N.A.
O2 Content of Back Purge:	N.A.

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
Max. width of weld bead 12 mm	String and weave	Multiple	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:
50°C	Propane Torch	250 °C	Contact Digital Thermometer

Heat Treatment Required	Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
N.A.	N.A.	N.A.	N.A.	N.A.

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
N.A.	1	GS FCAW	1A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	190	210	200,0	24,5	26,5	25,5	-	-	18,0	1,70	-	150	Welding unit: INE KMP 5000 - TY4
N.A.	2	GS FCAW	2A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	205	225	215,0	23,5	25,5	24,5	-	-	15,0	2,11	-	200	Digital thermometer: HT Mod. A103 - Probe: TK100. Matr. 181103331 - 19/2353
N.A.	2	GS FCAW	3A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	285	305	295,0	28,5	30,5	29,5	-	-	28,0	1,86	-	240	Ampherometer Clamp: HT Mod. 9020 Matr. 16121407
N.A.	3	GS FCAW	4A-5A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	290	310	300,0	28,5	30,5	29,5	-	-	32,0	1,66	-	230	Side A (H. 12): Root gap 4,00 mm, Root face 0,00, bevel angle: 40°
N.A.	3	GS FCAW	6A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	265	305	295,0	28,5	30,5	29,5	-	-	31,0	1,68	-	250	Side B (H. 6): Root gap 4,00 mm, Root face 0,00, bevel angle: 40°
N.A.	4	GS FCAW	7A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	280	300	290,0	28,5	30,5	29,5	-	-	30,0	1,71	-	220	
N.A.	4	GS FCAW	8A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	275	295	285,0	28,5	30,5	29,5	-	-	32,0	1,58	-	240	
N.A.	4	GS FCAW	9A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	260	280	270,0	28,5	30,5	29,5	-	-	28,0	1,71	-	250	
N.A.	5	GS FCAW	10A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	280	300	290,0	28,5	30,5	29,5	-	-	31,0	1,66	-	220	
N.A.	5	GS FCAW	11A-12A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	285	305	295,0	28,5	30,5	29,5	-	-	33,0	1,58	-	230	
N.A.	5	GS FCAW	13A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	265	285	275,0	26,5	28,5	27,5	-	-	31,0	1,46	-	240	
N.A.	6	GS FCAW	14A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	295	315	305,0	28,7	30,7	29,7	-	-	33,0	1,65	-	190	
N.A.	6	GS FCAW	15A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	275	295	285,0	27,5	29,5	28,5	-	-	33,0	1,48	-	180	
N.A.	6	GS FCAW	16A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	280	300	290,0	27	29	28,0	-	-	34,0	1,43	-	230	
N.A.	6	GS FCAW	17A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	250	270	260,0	25,5	27,5	26,5	-	-	26,0	1,59	-	200	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
N.A.	1	GS FCAW	1B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	197	217	207,0	25,5	27,5	26,5	-	-	15,0	2,19	-	150	
N.A.	2	GS FCAW	2B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	240	260	250,0	26	28	27,0	-	-	17,0	2,38	-	200	
N.A.	3	GS FCAW	3B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	280	300	290,0	28,3	30,3	29,3	-	-	28,0	1,82	-	190	
N.A.	3	GS FCAW	4B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	290	310	300,0	28,5	30,5	29,5	-	-	30,0	1,77	-	240	
N.A.	4	GS FCAW	5B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	290	310	300,0	28,5	30,5	29,5	-	-	29,0	1,83	-	230	
N.A.	4	GS FCAW	6B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	285	305	295,0	28,5	30,5	29,5	-	-	30,0	1,74	-	250	
N.A.	5	GS FCAW	7B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	280	300	290,0	28,5	30,5	29,5	-	-	30,0	1,71	-	240	
N.A.	5	GS FCAW	8B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	285	305	295,0	28,5	30,5	29,5	-	-	31,0	1,68	-	230	
N.A.	5	GS FCAW	9B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	260	280	270,0	28,5	30,5	29,5	-	-	31,0	1,54	-	250	
N.A.	6	GS FCAW	10B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	295	315	305,0	28,5	30,5	29,5	-	-	33,0	1,64	-	190	
N.A.	6	GS FCAW	11B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	275	295	285,0	27,4	29,4	28,4	-	-	32,0	1,52	-	200	
N.A.	6	GS FCAW	12B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	275	295	285,0	27	29	28,0	-	-	32,0	1,50	-	220	
N.A.	6	GS FCAW	13B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	250	270	260,0	25,5	27,5	26,5	-	-	25,0	1,65	-	190	

BUREAU VERITAS ITALIA WELDING
IT FILE: 22.SF.337563ch.138
DATE: 14/02/2022
WITNESSED
REVIEW

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA A. Khalifa Welding Dept.	Signature:	Signature:	Signature:
Date:	Date:	Date:	Date:

ROSETTI MARINO

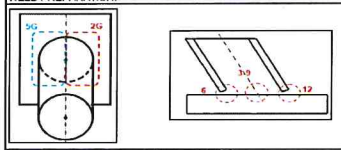
PQR - AS- RUN PARAMETER SHEET

pWPS 31/22_2G	
PQR 31/22	
Coupon Nr. 1/2_2G	
Date: 14/02/22	Page: 2_ of _2

REFERENCE CODE AND PROJECT SPECIFICATIONS: **Project Spec. SD-NOC-STR-301 Rev.03**

Welder Name(s):	BENYO IONEL	Welder Id No(s):	GX17
Welding Process(es):	GS FCAW	Type(s):	SEMIAUTOMATIC
Welding Position:	2G	Progression:	N.A.
Base Materials:	a) EN 10225-3:2019 : S355NLHHO to b) EN 10225: S355G10+M	Wall Thickness:	a) 25,40 mm to b) 30,00 mm — Diameter: 406,40 mm
Heat No(s):	a) 808993 to) 705587	Joint Type:	HALF VEE TUBOLAR JOINT; ONE SIDE WELDING WITHOUT BACKING

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Hot Pass	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Filling Runs	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Cap	1,2	PNV4610432	OK Tubrod 15.17 - ESAB

GAS:

Shielding Gas:	Ar + CO2
Composition:	80% CO2 + 20% Ar
Flow:	16 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/4"
Tungsten Type:	N.A.
O2 Content of Back Purge:	N.A.

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
Max. width of weld bead 12 mm	String and weave	Multiple	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
50°C	Propane Torch	250 °C	Contact Digital Thermometer	N.A.	N.A.	N.A.	N.A.

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
N.A.	1	GS FCAW	1C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	229	249	239,0	26,5	28,5	27,5	-	-	23,0	1,71	-	150	Welding unit: INE KMP 5000 - TY4
N.A.	2	GS FCAW	2C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	240	260	250,0	26,5	28,5	27,5	-	-	22,0	1,88	-	190	Digital thermometer: HT Mod. A103 - Probe: TK100, Matr. 181103331 - 19/2353
N.A.	3	GS FCAW	3C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	260	300	290,0	28,5	30,5	29,5	-	-	28,0	1,83	-	200	Amphere meter Clamp: HT Mod. 9020 Matr. 16121407
N.A.	3	GS FCAW	4C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	285	305	295,0	28,5	30,5	29,5	-	-	29,0	1,80	-	230	Side C (H. 9): Root gap 2,00 mm, Root face 0,00, bevel angle: 40°
N.A.	4	GS FCAW	5C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	290	310	300,0	28,5	30,5	29,5	-	-	30,0	1,77	-	220	Side D (H. 3): Root gap 6,00 mm, Root face 0,00, bevel angle: 40°
N.A.	4	GS FCAW	6C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	290	310	300,0	28,5	30,5	29,5	-	-	30,0	1,77	-	250	
N.A.	5	GS FCAW	7C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	280	300	290,0	28,5	30,5	29,5	-	-	30,0	1,71	-	250	
N.A.	5	GS FCAW	8C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	280	300	290,0	28,5	30,5	29,5	-	-	31,0	1,66	-	250	
N.A.	5	GS FCAW	9C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	260	280	270,0	28,5	30,5	29,5	-	-	31,0	1,54	-	250	
N.A.	6	GS FCAW	10C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	280	300	290,0	28,5	30,5	29,5	-	-	32,0	1,60	-	250	
N.A.	6	GS FCAW	11C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	280	300	290,0	28,5	30,5	29,5	-	-	32,0	1,60	-	250	
N.A.	6	GS FCAW	12C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	285	305	295,0	28,5	30,5	29,5	-	-	31,0	1,68	-	240	
N.A.	6	GS FCAW	13C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	260	280	270,0	27	29	28,0	-	-	31,0	1,46	-	250	
N.A.	7	GS FCAW	14C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	290	310	300,0	28,6	30,6	29,6	-	-	33,0	1,61	-	200	
N.A.	7	GS FCAW	15C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	275	295	285,0	27,5	29,5	28,5	-	-	33,0	1,48	-	190	
N.A.	7	GS FCAW	16C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	280	300	290,0	27	29	28,0	-	-	32,0	1,52	-	220	
N.A.	7	GS FCAW	17C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	250	270	260,0	25,5	27,5	26,5	-	-	26,0	1,59	-	190	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
N.A.	1	GS FCAW	1D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	185	205	195,0	24,5	26,5	25,5	-	-	19,0	1,57	-	150	
N.A.	2	GS FCAW	2D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	195	215	205,0	24,5	26,5	25,5	-	-	16,0	1,96	-	200	
N.A.	2	GS FCAW	3D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	270	290	280,0	28,5	30,5	29,5	-	-	26,0	1,91	-	190	
N.A.	3	GS FCAW	4D-5D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	280	300	290,0	28	30	29,0	-	-	27,5	1,83	-	230	
N.A.	3	GS FCAW	6D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	285	305	295,0	28,5	30,5	29,5	-	-	30,0	1,74	-	250	
N.A.	4	GS FCAW	7D-8D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	285	305	295,0	28,5	30,5	29,5	-	-	31,0	1,68	-	240	
N.A.	4	GS FCAW	9D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	260	280	270,0	28,5	30,5	29,5	-	-	32,0	1,49	-	250	
N.A.	5	GS FCAW	10D-11D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	285	305	295,0	28,5	30,5	29,5	-	-	32,0	1,63	-	250	
N.A.	5	GS FCAW	12D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	290	310	300,0	28,5	30,5	29,5	-	-	31,0	1,71	-	240	
N.A.	5	GS FCAW	13D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	265	285	275,0	27	29	28,0	-	-	31,0	1,49	-	250	
N.A.	6	GS FCAW	14D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	280	300	290,0	28,5	30,5	29,5	-	-	30,0	1,71	-	250	
N.A.	6	GS FCAW	15D-16D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	285	305	295,0	28,5	30,5	29,5	-	-	31,0	1,68	-	220	
N.A.	6	GS FCAW	17D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	290	310	300,0	28	30	29,0	-	-	32,0	1,63	-	250	
N.A.	7	GS FCAW	18D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	295	315	305,0	28,4	30,4	29,4	-	-	33,0	1,63	-	220	
N.A.	7	GS FCAW	19D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	275	295	285,0	27,5	29,5	28,5	-	-	32,0	1,52	-	210	
N.A.	7	GS FCAW	20D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	280	300	290,0	27	29	28,0	-	-	33,0	1,48	-	230	
N.A.	7	GS FCAW	21D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	250	270	260,0	25,5	27,5	26,5	-	-	24,0	1,72	-	200	

BUREAU VERITAS ITALIA WELDING
IT FILE: 22.54.325631.04.138
DATE: 14/02/2022
WITNESSED BY:
REVIEW

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA A. Khalifa Welding Dept	Signature:	Signature:	Signature:
Date:	Date:	Date:	Date:

ROSETTI MARINO

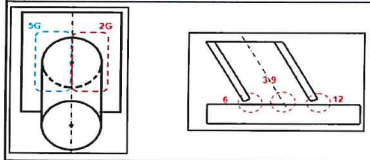
PQR - AS- RUN PARAMETER SHEET

pWPS 31/22_5G	
PQR 31/22	
Coupon Nr. 2/2_5G	
Date: 15/02/22	Page: 1_ of _2

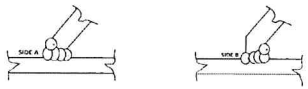
REFERENCE CODE AND PROJECT SPECIFICATIONS: **Project Spec. SD-NOC-STR-301 Rev.03**

Welder Name(s):	BENYO IONEL	Welder Id No(s):	GX17
Welding Process(es):	GS FCAW	Type(s):	SEMIAUTOMATIC
Welding Position:	5G	Progression:	UPHILL
Base Materials:	a) EN 10225-3:2019 : S355NLHHO to b) EN 10225: S355G10+M	Wall Thickness:	a) 25,40 mm to b) 30,00 mm — Diameter: 406,40 mm
Heat No(s):	a) 808993 to) 705587	Joint Type:	HALF VEE TUBOLAR JOINT; ONE SIDE WELDING WITHOUT BACKING

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Hot Pass	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Filling Runs	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Cap	1,2	PNV4610432	OK Tubrod 15.17 - ESAB

GAS:

Shielding Gas:	Ar + CO2
Composition:	80% CO2 + 20% Ar
Flow:	16 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/4"
Tungsten Type:	N.A.
O2 Content of Back Purge:	N.A.

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
Max. width of weld bead 12 mm	String and weave	Multiple	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
50°C	Propane Torch	250 °C	Contact Digital Thermometer	N.A.	N.A.	N.A.	N.A.	N.A.

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficiency Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
N.A.	1	GS FCAW	1A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	155	175	165,0	23	25	24,0	-	-	18,0	1,32	-	175	Welding unit: INE KMP 5000 - TY4
N.A.	2	GS FCAW	2A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	24,5	26,5	25,5	-	-	21,0	1,60	-	200	Digital thermometer: HT Mod. A103 - Probe: TK100. Matr. 181103331 - 19/2353
N.A.	3	GS FCAW	3A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	205	225	215,0	24,5	26,5	25,5	-	-	24,0	1,37	-	180	Amphenometer Clamp: HT Mod. 9020 Matr. 16121407
N.A.	4	GS FCAW	4A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	215	235	225,0	24,5	26,5	25,5	-	-	23,0	1,50	-	170	Side A (H. 12): Root gap 4,00 mm, Root face 0,00, bevel angle: 40°
N.A.	5	GS FCAW	5A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	24,2	26,2	25,2	-	-	25,0	1,33	-	190	Side B (H. 6): Root gap 4,00 mm, Root face 0,00, bevel angle: 40°
N.A.	5	GS FCAW	6A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	215	235	225,0	24,3	26,3	25,3	-	-	26,0	1,31	-	220	
N.A.	6	GS FCAW	7A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	215	235	225,0	24,3	26,3	25,3	-	-	22,5	1,52	-	190	
N.A.	6	GS FCAW	8A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	215	235	225,0	24,3	26,3	25,3	-	-	23,0	1,49	-	240	
N.A.	6	GS FCAW	9A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	215	235	225,0	24,5	26,5	25,5	-	-	22,0	1,56	-	200	
N.A.	7	GS FCAW	10A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	23,5	25,5	24,5	-	-	23,0	1,41	-	200	
N.A.	7	GS FCAW	11A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	205	225	215,0	23,5	25,5	24,5	-	-	24,0	1,32	-	150	
N.A.	7	GS FCAW	12A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	205	225	215,0	23,5	25,5	24,5	-	-	23,0	1,37	-	220	
N.A.	8	GS FCAW	13A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	24	26	25,0	-	-	24,0	1,36	-	250	
N.A.	8	GS FCAW	14A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	23,3	25,3	24,3	-	-	23,0	1,39	-	190	
N.A.	8	GS FCAW	15A	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	23,5	25,5	24,5	-	-	23,0	1,41	-	240	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
N.A.	1	GS FCAW	1B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	155	175	165,0	23,5	25,5	24,5	-	-	16,0	1,52	-	170	
N.A.	2	GS FCAW	2B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	170	190	180,0	23,5	25,5	24,5	-	-	18,0	1,47	-	230	
N.A.	3	GS FCAW	3B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	205	225	215,0	23,5	25,5	24,5	-	-	21,0	1,51	-	170	
N.A.	3	GS FCAW	4B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	205	225	215,0	23,5	25,5	24,5	-	-	21,0	1,51	-	220	
N.A.	4	GS FCAW	5B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	190	210	200,0	23,5	25,5	24,5	-	-	17,0	1,73	-	180	
N.A.	5	GS FCAW	6B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	195	215	205,0	23,5	25,5	24,5	-	-	20,0	1,51	-	210	
N.A.	6	GS FCAW	7B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	205	225	215,0	23,1	25,1	24,1	-	-	21,5	1,45	-	190	
N.A.	6	GS FCAW	8B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	205	225	215,0	23,6	25,6	24,6	-	-	22,0	1,44	-	250	
N.A.	7	GS FCAW	9B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	180	200	190,0	23,5	25,5	24,5	-	-	15,0	1,86	-	200	
N.A.	7	GS FCAW	10B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	200	220	210,0	23,3	25,3	24,3	-	-	18,0	1,70	-	250	
N.A.	8	GS FCAW	11B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	195	215	205,0	23,5	25,5	24,5	-	-	16,0	1,67	-	180	
N.A.	8	GS FCAW	12B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	195	215	205,0	23,3	25,3	24,3	-	-	18,0	1,66	-	240	
N.A.	8	GS FCAW	13B	-	5.29 E81T1-Ni1MJ	1,2	DC EP	195	215	205,0	23,3	25,3	24,3	-	-	18,0	1,66	-	230	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

BUREAU VERITAS ITALIA WELDING
IT FILE: 22.SF.375634.138
DATE: 15/02/2022
WITNESSED ☐
REVIEW ☐
48

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA A. Khalifa Welding Dept.	Signature:	Signature:	Signature:
Date:	Date:	Date:	Date:

ROSETTI MARINO

PQR - AS- RUN PARAMETER SHEET

pWPS 31/22_5G	
PQR 31/22	
Coupon Nr. 2/2_5G	
Date: 15/02/22	Page: 2_ of _2

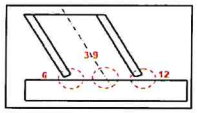
REFERENCE CODE AND PROJECT SPECIFICATIONS: **Project Spec. SD-NOC-STR-301 Rev.03**

Welder Name(s):	BENYO IONEL	Welder Id No(s):	GX17
Welding Process(es):	GS FCAW	Type(s):	SEMIAUTOMATIC
Welding Position:	5G	Progression:	UPHILL
Base Materials:	a) EN 10225-3:2019 : S355NLHHO to b) EN 10225: S355G10+M	Wall Thickness:	a) 25,40 mm to b) 30,00 mm
Heat No(s):	a) 808993 to) 705587	Joint Type:	HALF VEE TUBOLAR JOINT; ONE SIDE WELDING WITHOUT BACKING

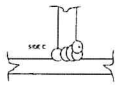
Diameter: 406,40 mm

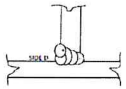
WELD PREPARATION:





WELDING SEQUENCE / PASS LOCATION:





WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Hot Pass	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Filling Runs	1,2	PNV4610432	OK Tubrod 15.17 - ESAB
Cap	1,2	PNV4610432	OK Tubrod 15.17 - ESAB

GAS:

Shielding Gas:	Ar + CO2
Composition:	80% CO2 + 20% Ar
Flow:	16 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/4"
Tungsten Type:	N.A.
O2 Content of Back Purge:	N.A.

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
Max. width of weld bead 12 mm	String and weave	Multiple	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:
50°C Propane Torch	250 °C	Contact Digital Thermometer

Heat Treatment Required	Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
N.A.	N.A.	N.A.	N.A.	N.A.

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficiency Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
N.A.	1	GS FCAW	1C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	170	190	180,0	23,1	25,1	24,1	-	-	16,0	1,63	-	175	Welding unit: INE KMP 5000 - TY4
N.A.	2	GS FCAW	2C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	24,4	26,4	25,4	-	-	19,0	1,76	-	230	Digital thermometer: HT Mod. A103 - Probe: TK100. Matr. 181103331 - 19/2353
N.A.	3	GS FCAW	3C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	205	225	215,0	24,5	26,5	25,5	-	-	19,0	1,73	-	210	Ampherometer Clamp: HT Mod. 9020 Matr. 16121407
N.A.	4	GS FCAW	4C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	24,5	26,5	25,5	-	-	24,0	1,40	-	150	Side C (H. 9): Root gap 2,00 mm, Root face 0,00, bevel angle: 40°
N.A.	5	GS FCAW	5C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	215	235	225,0	24,5	26,5	25,5	-	-	24,0	1,43	-	190	Side D (H. 3): Root gap 6,00 mm, Root face 0,00, bevel angle: 40°
N.A.	5	GS FCAW	6C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	215	235	225,0	24,4	26,4	25,4	-	-	23,5	1,46	-	180	
N.A.	6	GS FCAW	7C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	24,2	26,2	25,2	-	-	22,0	1,51	-	200	
N.A.	6	GS FCAW	8C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	24,2	26,2	25,2	-	-	22,0	1,51	-	230	
N.A.	7	GS FCAW	9C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	23,5	25,5	24,5	-	-	23,0	1,41	-	230	
N.A.	7	GS FCAW	10C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	215	235	225,0	23,5	25,5	24,5	-	-	23,0	1,44	-	240	
N.A.	7	GS FCAW	11C	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	23,5	25,5	24,5	-	-	22,0	1,47	-	230	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
N.A.	1	GS FCAW	1D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	165	185	175,0	23	25	24,0	-	-	21,0	1,20	-	170	
N.A.	2	GS FCAW	2D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	190	210	200,0	23,5	25,5	24,5	-	-	21,0	1,40	-	230	
N.A.	2	GS FCAW	3D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	205	225	215,0	24,5	26,5	25,5	-	-	19,0	1,73	-	180	
N.A.	3	GS FCAW	4D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	24,5	26,5	25,5	-	-	18,0	1,87	-	150	
N.A.	4	GS FCAW	5D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	200	220	210,0	23,6	25,6	24,6	-	-	21,0	1,48	-	170	
N.A.	4	GS FCAW	6D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	205	225	215,0	23,6	25,6	24,6	-	-	22,0	1,44	-	230	
N.A.	5	GS FCAW	7D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	23,6	25,6	24,6	-	-	20,0	1,62	-	200	
N.A.	5	GS FCAW	8D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	23,5	25,5	24,5	-	-	21,0	1,54	-	240	
N.A.	6	GS FCAW	9D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	215	235	225,0	24,2	26,2	25,2	-	-	23,0	1,48	-	210	
N.A.	6	GS FCAW	10D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	210	230	220,0	24,2	26,2	25,2	-	-	23,0	1,45	-	230	
N.A.	6	GS FCAW	11D	-	5.29 E81T1-Ni1MJ	1,2	DC EP	205	225	215,0	23,8	25,8	24,8	-	-	23,0	1,39	-	220	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
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BUREAU VERITAS ITALIA WEDING
IT FILE: 22-SF-375304.178
DATE: 15/02/2022
WITNESSED
REVIEW

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:	SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	Name:
Signature: ROSETTI MARINO SpA A. Khalifa	Signature:	Signature:	Signature:
Date:	Date:	Date:	Date:

ROSETTI MARINO	VERBALE DI CONTROLLO VISIVO/DIMENSIONALE visual/dimensional inspection report	VDR N° 21/2022 data: 18/02/2022
progetto project: F Location Debottlenecking (F-DBN)	cliente client: NORTH OIL COMPANY	commessa job: 121A20

oggetto – item

Procedure Qualification Record (PQR) 31/2022

Certificato di Qualifica di Procedimento di Saldatura (PQR) 31/2022

WE CERTIFY THAT:

ITEMS INDICATED ABOVE HAVE UNDERGONE A VISUAL INSPECTION AND HAVE BEEN ACCEPTED ACCORDING TO THE SPECIFICATION / PROCEDURE MENTIONED AND TO ACCEPTANCE CRITERIA DEFINED IN IT

SI CERTIFICA CHE LE SALDATURE DEI SAGGI SOPRA CITATI SONO STATI SOTTOPOSTI AD ESAME VISIVO AL 100% ALLO STATO COME SALDATO IN ACCORDO ALLE SPECIFICHE E STANDARD CITATI.

note – remarks

Inspection on welds 16"x 25.4 mm WT in as welded condition.

1 Samples in 2G

No visible defects have been detected.

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

SOR-FY-19.257-ROMA-ASFYY-00-300025-0001

Operatore – Operator	Controllo Qualita' - Quality Control	Cliente - Client
Stefano Zauli 3° Livello SNT-TC - 1A / ISO 9712	ROSETTI MARINO SpA A. Khelifa Welding Dept.	BUREAU VERITAS ITALY REVIEWED SURVEYOR G. TESEI DATE 18/03/2022

ROSETTI MARINO	VERBALE DI CONTROLLO VISIVO/DIMENSIONALE visual/dimensional inspection report	VDR N° 22/2022 data: 18/02/2022
progetto project: F Location Debottlenecking (F-DBN)	cliente client: NORTH OIL COMPANY	commessa job: 121A20

oggetto – item

Procedure Qualification Record (PQR) 31/2022

Certificato di Qualifica di Procedimento di Saldatura (PQR) 31/2022

WE CERTIFY THAT:

ITEMS INDICATED ABOVE HAVE UNDERGONE A VISUAL INSPECTION AND HAVE BEEN ACCEPTED ACCORDING TO THE SPECIFICATION / PROCEDURE MENTIONED AND TO ACCEPTANCE CRITERIA DEFINED IN IT

SI CERTIFICA CHE LE SALDATURE DEI SAGGI SOPRA CITATI SONO STATI SOTTOPOSTI AD ESAME VISIVO AL 100% ALLO STATO COME SALDATO IN ACCORDO ALLE SPECIFICHE E STANDARD CITATI.

note – remarks

Inspection on welds 16"x 25.4 mm WT in as welded condition.

1 Samples in 5G

No visible defects have been detected.

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

SOR-FY-19.257-ROMA-ASFYY-00-300025-0001

Operatore – Operator	Controllo Qualita' - Quality Control	Cliente - Client
Stefano Zauli 3° Livello SNT-TC - TA7 ISO 9712	ROSETTI MARINO SpA A. Khalifa Welding Dept.	BUREAU VERITAS ITALY REVIEWED SURVEYOR G. TESEI DATE 18/03/2022

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n°
		22049 MT 21 RN Rev. 00

RAPPORTO D'ESAME MAGNETOSCOPICO Magnetic Particle Test Report			DATA / Date 18/02/2022	FOGLIO / Sheet 1
CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	F Location Debottlenecking (F-DBN)	121A20	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	FASE Step
NORTH OIL COMPANY	PQR	/	/	/

ESECUZIONE / Execution		ACCETTABILITA' / Acceptance	
SOR-FY-19.257-ROMA-ASFYY-00-300026-0001		SOR-FY-19.257-ROMA-ASFYY-00-300026-0001	
MATERIALE/Material	TEMP. SUPERFICI Surface temperature	INTENSITA' LUMINOSA/ Light intensity	
C.S.	10°	☑ LUCE BIANCA >1076 Lux ☐ LUCE BIANCA >500 Lux	☐ LUCE NERA 1000 µW/cm²

STATO DELLA SUPERFICIE – Surface condition			
☑ COME SALDATO As welded	☐ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined	
☐ GREZZO – Forged	☐ LAMINATO – Rolled	☐ MOLATO – Ground	☐ SABBIATO – Blasted

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☑ GIOGO/Yoke	☐ PUNTALI/Prods	☐ BOBINA/Coil	☐ CONDUTTORE CENTRALE/Central conduttor

METODO / Method		SMAGNETIZZAZIONE/Demagnetization	
☑ CONTINUO/Continuous	☐ RESIDUO /Residual	☐ RICHIESTA/Required	☑ NON RICHIESTA/Not Required
TIPO DI MAGNETIZZAZIONE/magnetization type		DIREZIONE CAMPO MAGNETICO/magnetic field direction	
☑ MAGNETICO/magnetic	☐ ELETTRICO/electric	☐ CIRCOLARE/Circular	☑ LONGITUDINALE/longitudinal
TIPO APPARECCHIO/Type of equipment	MAGNETICONTROL	DISTANZA PUNTALI/Pole spacing	180 mm
NUMERO DI SERIE/Serial number	04.230-15		
TIPO DI CORRENTE/Current Type		POTERE DI SOLLEVAMENTO GIOGO / Lifting power	
☑ A.C.	☐ D.C.	☑ 4,5 kg	☐ 18 kg
MEZZO DI ISPEZIONE / Examination medium		INTENSITÀ DI CORRENTE / Intesity	
☑ UMIDO/Wet	☐ SECCO/Dry	☐ A/ mm	☐ / spira

PARTICELLE UTILIZZATE/Particle Type			
CONTRASTO DI COLOR/Color contrast	☑	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	☑ NDT BW2 ☐ NDT DRY	MARCA TIPO/Mark Type	NDT FW1
LOTTO/BACH	7755s	LOTTO/BACH	/
VERNICE DI CONTRASTO / Contrast Paint		☑ NDT WBL5	LOTTO/BACH U210325s

SALDATURE CONTROLLATE / Welds Verified

THE CONTROL HAS BEEN CARRIED OUT ON 100% OF THE WELD:

- PQR 31/2022 - 16"x 25,4 mm WT – 2G – WS GX17

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITÀ Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zauli 3° Livello SNT-TC-1A / ISO 9712	ROSETTI MARINO SpA A. Khalifa Welding Dept.	BUREAU VERITAS ITALY REVIEWED SURVEYOR G. TESEI DATE 18/03/2022

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta.
I risultati delle prove si riferiscono unicamente ai particolari esaminati.
Partial reproduction of this certificate must be written authorized.
Test results relate only to examined items.

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QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n° 22049 MT 22 RN Rev. 00

RAPPORTO D'ESAME MAGNETOSCOPICO Magnetic Particle Test Report			DATA / Date 18/02/2022	FOGLIO / Sheet 1
CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	F Location Debottlenecking (F-DBN)	121A20	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	FASE Step
NORTH OIL COMPANY	PQR	/	/	/

ESECUZIONE / Execution		ACCETTABILITA' / Acceptance	
SOR-FY-19.257-ROMA-ASFYY-00-300026-0001		SOR-FY-19.257-ROMA-ASFYY-00-300026-0001	
MATERIALE/Material	TEMP. SUPERFICI Surface temperature	INTENSITA' LUMINOSA/ Light intensity	
C.S.	10°	☑ LUCE BIANCA >1076 Lux ☐ LUCE BIANCA >500 Lux	☐ LUCE NERA 1000 µW/cm²

STATO DELLA SUPERFICIE – Surface condition			
☑ COME SALDATO As welded	☐ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined	
☐ GREZZO – Forged	☐ LAMINATO – Rolled	☐ MOLATO – Ground	☐ SABBIATO – Blasted

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☑ GIOGO/Yoke	☐ PUNTALI/Prods	☐ BOBINA/Coil	☐ CONDUTTORE CENTRALE/Central conduttor

METODO / Method		SMAGNETIZZAZIONE/Demagnetization	
☑ CONTINUO/Continuous	☐ RESIDUO /Residual	☐ RICHIESTA/Required	☑ NON RICHIESTA/Not Required
TIPO DI MAGNETIZZAZIONE/magnetization type		DIREZIONE CAMPO MAGNETICO/magnetic field direction	
☑ MAGNETICO/magnetic	☐ ELETTRICO/electric	☐ CIRCOLARE/Circular	☑ LONGITUDINALE/longitudinal
TIPO APPARECCHIO/Type of equipment	MAGNETICONTROL	DISTANZA PUNTALI/Pole spacing	180 mm
NUMERO DI SERIE/Serial number	04.230-15		
TIPO DI CORRENTE/Current Type		POTERE DI SOLLEVAMENTO GIOGO / Lifting power	
☑ A.C.	☐ D.C.	☑ 4,5 kg	☐ 18 kg
MEZZO DI ISPEZIONE / Examination medium		INTENSITÀ DI CORRENTE / Intesity	
☑ UMIDO/Wet	☐ SECCO/Dry	☐ A/ mm	☐ / spira

PARTICELLE UTILIZZATE/Particle Type			
CONTRASTO DI COLOR/Color contrast	☑	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	☑ NDT BW2 ☐ NDT DRY	MARCA TIPO/Mark Type	NDT FW1
LOTTO/BACH	7755s	LOTTO/BACH	/
VERNICE DI CONTRASTO / Contrast Paint		☑ NDT WBL5	LOTTO/BACH U210325s

SALDATURE CONTROLLATE / Welds Verified

THE CONTROL HAS BEEN CARRIED OUT ON 100% OF THE WELD:

- PQR 31/2022 - 16"x 25,4 mm WT – 5G – WS GX17

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITÀ Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zauli 3° Livello SNT - TC - 1A / ISO 9712	ROSETTI MARINO SpA A. Khalifa Welding Dept.	BUREAU VERITAS ITALY REVIEWED SURVEYOR G. TESEI DATE 18/03/2022

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QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n° 22049 UT 12 SZ Rev. 00

RAPPORTO D'ESAME CON ULTRASUONI Ultrasonic Examination report			DATA / Date 18/02/2022	FOGLIO / Sheet 1
CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	F Location Debottlenecking (F-DBN)	121A20	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
NORTH OIL COMPANY	PQR	/	/	/

ESECUZIONE / Execution	ACCETTABILITA' / Acceptance level
SOR-FY-19.257-ROMA-ASFYY-00-300028-0001_revA	SOR-FY-19.257-ROMA-ASFYY-00-300028-0001_revA

MATERIALE Material	DIMENSIONI Dimension	SPESSORE NOMINALE / Thk
SD-NOC-STR-201-S355KL40	PIPE 16 INCH	WT PIPE 25.4 mm

STATO DELLA SUPERFICIE – Surface condition

☑	COME SALDATO As welded	☐	SPAZZOLATO - Brushed	☐	LAVORATO DI MACCHINA - Machined
☐	MOLATO - Ground	☐	LAMINATO - Rolled	☐	GREZZO - Forged

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG 700	No. SERIE Serial Number	I003937

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	AMPLIFICAZIONE dB value	ONDE Waves
KRAUTKRAMER	KNF	4	10	0°	36	Long.
CASONI	NDT	4	8X9	70°	40	Shear
CASONI	NDT	4	8X9	60°	40	Shear
CASONI	NDT	4	8X9	45°	40	Shear

BLOCCO DI CALIBRAZIONE Calibration block	IIW V2	BLOCCO DI RIFERIMENTO Reference block	BLOCCO QT 04
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity 3 mm	DAC SU FORI Ø 3 mm

SALDATURE CONTROLLATE / Welds Verified

Stamp	Procedure Qualification	WPS	Joit Type	Bevel	Position	Thk mm	Scan plan
GX17	31/2022	31/2022	TKY	1\2V	2G	25,4	IDL-QCI-UT-235

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Not According to specification ☐

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zauli 3° Livello SNT - TC - 1A / ISO 9712	ROSETTI MARINO SpA A. Khalifa Welding Dept.	BUREAU VERITAS ITALY REVIEWED SURVEYOR G. TESEI DATE 18/03/2022

E' vietata la riproduzione parziale del certificato senza l'autorizzazione scritta. Partial reproduction of this certificate must be written authorized.
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QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	CERTIFICATO N° / Certificate n° 22049 UT 13 SZ Rev. 00

RAPPORTO D'ESAME CON ULTRASUONI Ultrasonic Examination report			DATA / Date 18/02/2022	FOGLIO / Sheet 1
CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	F Location Debottlenecking (F-DBN)	121A20	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
NORTH OIL COMPANY	PQR	/	/	/

ESECUZIONE / Execution	ACCETTABILITA' / Acceptance level
SOR-FY-19.257-ROMA-ASFYY-00-300028-0001_revA	SOR-FY-19.257-ROMA-ASFYY-00-300028-0001_revA

MATERIALE Material	DIMENSIONI Dimension	SPESSORE NOMINALE / Thk
SD-NOC-STR-201-S355KL40	PIPE 16 INCH	WT PIPE 25.4 mm

STATO DELLA SUPERFICIE – Surface condition

☑ COME SALDATO As welded	☐ SPAZZOLATO - Brushed	☐ LAVORATO DI MACCHINA - Machined
☐ MOLATO - Ground	☐ LAMINATO - Rolled	☐ GREZZO - Forged

APPARECCHIO Equipment	GILARDONI	TIPO Type	RDG 700	No. SERIE Serial Number	I003937

TRASDUTTORE Transducer	TIPO Type	FREQUENZA Frequency Mhz	SEZIONE Size mm	ANGOLO Angle	AMPLIFICAZIONE dB value	ONDE Waves
KRAUTKRAMER	KNF	4	10	0°	36	Long.
CASONI	NDT	4	8X9	70°	40	Shear
CASONI	NDT	4	8X9	60°	40	Shear
CASONI	NDT	4	8X9	45°	40	Shear

BLOCCO DI CALIBRAZIONE Calibration block	IIW V2	BLOCCO DI RIFERIMENTO Reference block	BLOCCO QT 04
TECNICA DI CONTROLLO Technical control	REFLECTION	SENSIBILITA' DI TARATURA Calibration sensitivity 3 mm	DAC SU FORI Ø 3 mm

SALDATURE CONTROLLATE / Welds Verified

Stamp	Procedure Qualification	WPS	Joit Type	Bevel	Position	Thk mm	Scan plan
GX17	31/2022	31/2022	TKY	1\2V	5G	25,4	IDL-QCI-UT-235

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Not According to specification ☐
TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.
Stefano Zauli 3° Livello SNT-TC - 1A / ISO 9712	ROSETTI MARINO SpA A. Khalifa Welding Dept.	BUREAU VERITAS ITALY REVIEWED SURVEYOR G. TESEI DATE 18/03/2022

E' vietata la riproduzione parziale del certificato senza l'autorizzazione scritta.
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Test results relate only to examined items.

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Object: *Oggetto:*	**MECHANICAL TEST ON PQR 31-2022**		Pag. 1 di 25
Specimen: *Saggio:* **086/22**	**#Base Material:** *Materiale Base:*	**EN 10225-3 S355 NLHHO WITH EN 10225 S355 G10+M**	**PIPE Ø 16'' THK. 25,40 mm WITH PLATE THK. 30,00 mm**
	# Informazione fornita dal cliente/ Information provided by the customer		
Customer: *Committente:* **Address:** *Indirizzo:*	**ROSETTI MARINO S.p.a.** **Via Trieste, 230 - 48122 Ravenna (RA)**		
Final customer:. *Cliente finale:*	//		

Your delivery note n°: *Vs. DDT di consegna*	**n°** *n°* //	**Date:** *Data:* //	**MD52** *MD 52* **013/2022**	**Date:** *Data:*	**15/02/2022**
Start of activities:: *Inizio prove :*	**Date:** *Data:* **16/03/2022**	**End of activities:** *Fine prove:*		**Date:** *Data:*	**16/03/2022**

PROVE RICHIESTE

☐ **TENSILE TEST/***Trazione*	☐ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*
☐ **BEND TEST/***Piega*	☐ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root */Dritto/Rovescio* ☐ Side/ *Laterale*
☐ **IMPACT TEST/***Resilienza*	☐ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*
☒ **MACROEXAMINATION TEST /** *Macrografia*		
☒ **HARDNESS TEST/** *Durezza*	☐ HV 5	☒ HV 10
☐ **FRACTURE TEST/** *Frattura*	☐ Plate with/on Plate/ *Piastra con/su Piastra* ☐ Pipe with/on Pipe/*Tubo con/ su Tubo*	☐ Pipe on Plate/*Tubo su Piastra*
☐ **CHEMICAL ANALYSIS/***Analisi Chimica*		
☐ **MICROEXAMINATION TEST /** *Micrografia*		
☐ **OTHER (Specify)/***Altro/(Specificare)*		

Allegati /Attachments: *NONE*

NOTE/ Remarks: **REFERENCE CODE FROM CUSTOMER REQUEST: AWS D1.1: 2020 + SD-NOC-STR-301 Rev.03**
TEST WITNESSED BY ENG. GIANLUCA BRIGHI AND DARIO NAEIMI (DNV) AND ABDUL KARIM KHALIFA (ROSETTI)
Informazioni aggiuntive fornite dal cliente:
Additional information provided by the customer

Laboratory Responsible	**Customer Inspector**	**Third part Inspector**
Responsabile Laboratorio	*Ispettore del cliente*	*Ispettore Terza parte*
Sig. Giulio Bagnara	ROSETTI MARINO SpA	BUREAU VERITAS ITALY
- INSPECTA srl -	A. Khalifa	WITNESSED
18/03/2022	Welding Dept.	SURVEYOR G. TESEI
Service Responsible		DATE 18/03/2022

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I risultati di prova si riferiscono al campione così come ricevuto, essendo il campionamento eseguito dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%. Quando emesso il Report in revisione, l'oggetto revisionato è identificabile mediante barra verticale posta sul lato sinistro e dal testo in formato corsivo sottolineato.
The results in this test report refers only to the specimen that has been tested. The customer undertakes to print out/reproduce the test report. Any partial reproduction is prohibited. Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory. The test results refer to the sample as received, since the sampling is performed by the customer. Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku=2 equivalent to a level of confidence of 95 %. When the Report under review is issued, the revised object can be identified by the vertical bar on the left side and by the text in italics underlined.

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::16/03/2022
Data esecuzione prova:

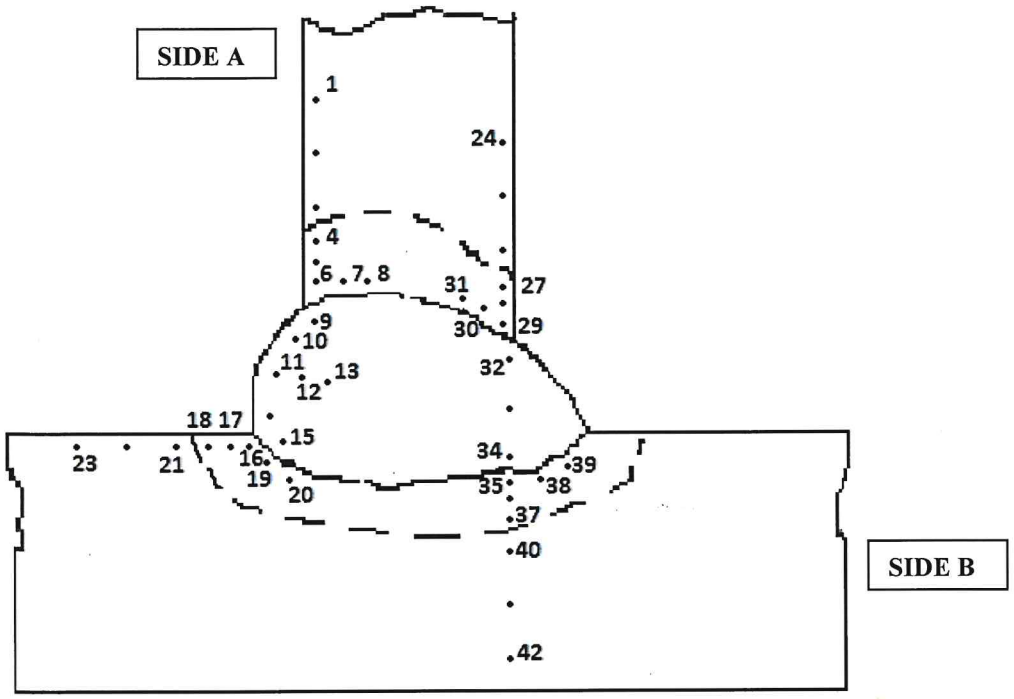
performed in accordance with the standard *eseguita in conformità alla norma* *SD-NOC-STR-301 Rev:03*

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	086/22 A	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	23,7°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13 – 14 – 15	16 – 17 – 18 – 19 – 20	21 – 22 – 23
24 – 25 – 26	27 – 28 – 29 – 30 – 31	32 – 33 – 34	35 – 36 – 37 – 38 – 39	40 – 41 – 42



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	161-163-164	/	24 – 25 – 26	162-164-169	/
4 – 5 – 6 – 7 – 8	185-197-251-249-247	/	27 – 28 – 29 – 30 – 31	203-210-218-212-213	/
9 – 10 – 11 – 12 – 13 – 14 – 15	250-247-252-245-239-247-241	/	32 – 33 – 34	222-220-221	/
16 – 17 – 18 – 19 – 20	186-158-151-176-172	/	35 – 36 – 37 – 38 – 39	184-165-157-183-187	/
21 – 22 – 23	141-142-141	/	40 – 41 – 42	142-141-142	/

Remarks/ *Note:* **TAKEN AT H.3 – POSITION 2G**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Bacchieschi	Sig. Giulio Bagnara	A. Khalifa	G. TESEI
Laboratory Technician	Service Responsible	Welding Dept.	WITNESSED
18/03/2022	18/03/2022	ROSETTI MARINO SpA	SURVEYOR DATE 18/03/2022

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::16/03/2022
Data esecuzione prova:

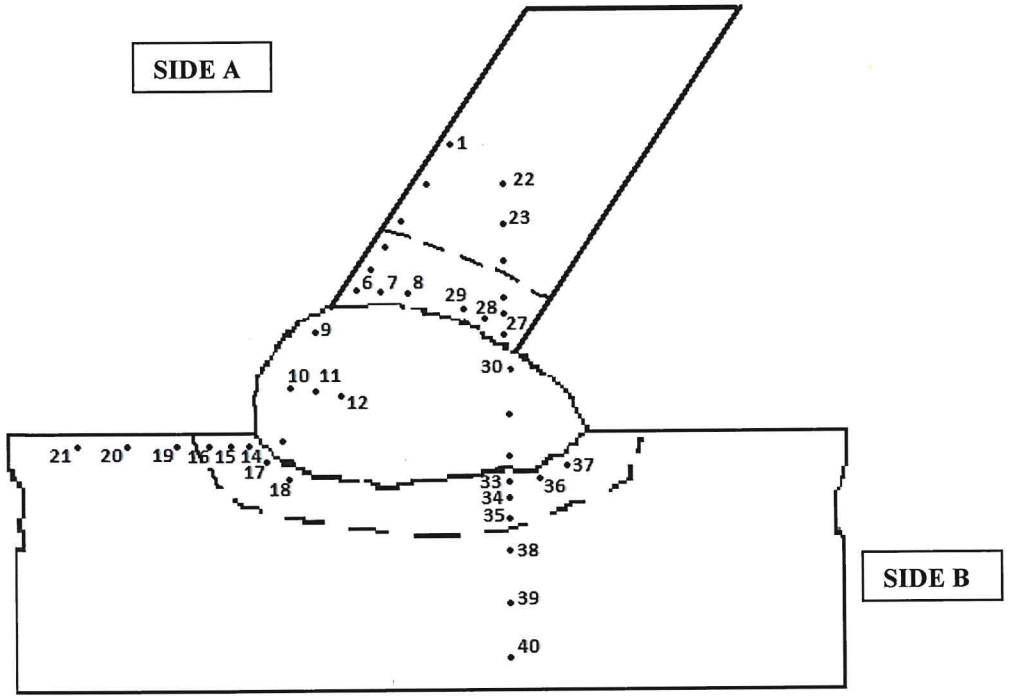
performed in accordance with the standard *eseguita in conformità alla norma* *SD-NOC-STR-301 Rev:03*

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	086/22 B	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	23,7°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13	14 – 15 – 16 – 17 – 18	19 – 20 – 21
22 – 23 – 24	25 – 26 – 27 – 28 – 29	30 – 31 – 32	33 – 34 – 35 – 36 – 37	38 – 39 – 40



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**160-163-164**	/	22 – 23 – 24	**163-168-199**	/
4 – 5 – 6 – 7 – 8	**185-223-262-263-265**	/	25 – 26 – 27 – 28 – 29	**205-216-228-233-231**	/
9 – 10 – 11 – 12 – 13	**256-255-246-240-253**	/	30 – 31 – 32	**231-232-233**	/
14 – 15 – 16 – 17 – 18	**185-163-142-178-174**	/	33– 34 – 35 – 36 – 37	**178-163-152-180-179**	/
19 – 20 – 21	**146-142-143**	/	38 – 39 – 40	**146-140-139**	/

Remarks/ *Note:* **TAKEN AT H.6 – POSITION 2G**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
- INSPECTA - Dott. Ing. Mauro Bacheschi Laboratory Technician 18/03/2022	Sig. Giulio Bagnara - INSPECTA srl - 18/03/2022 Service Responsible	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA SERVICES S.p.A. ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::16/03/2022
Data esecuzione prova:

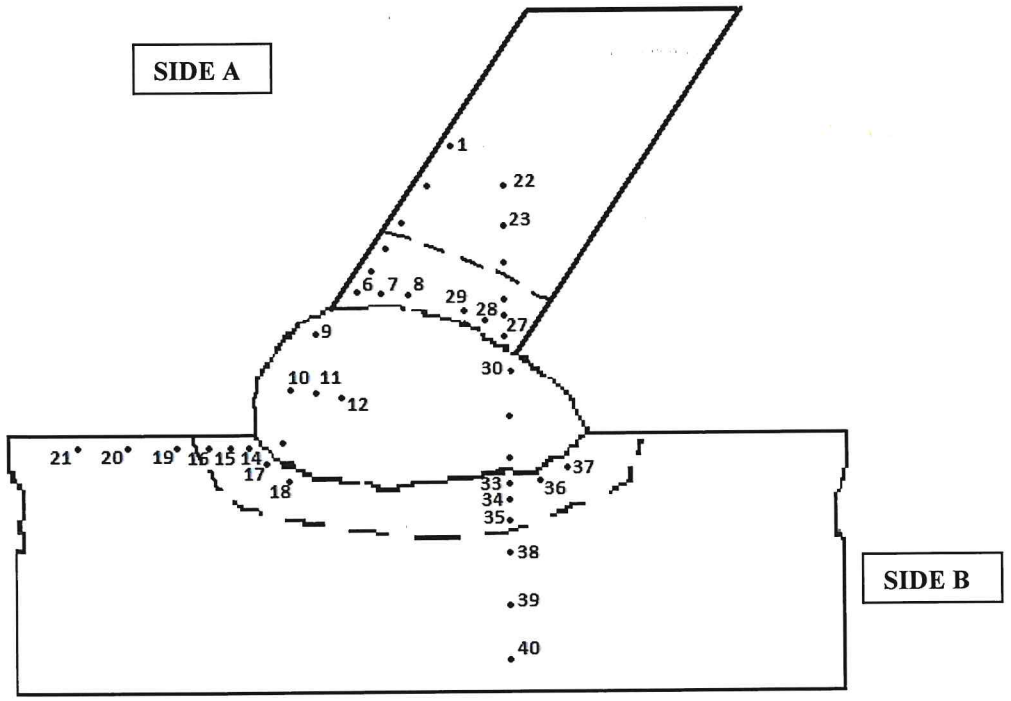
performed in accordance with the standard *eseguita in conformità alla norma* *SD-NOC-STR-301 Rev:03*

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	086/22 C	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	23,7°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13	14 – 15 – 16 – 17 – 18	19 – 20 – 21
22 – 23 – 24	25 – 26 – 27 – 28 – 29	30 – 31 – 32	33 – 34 – 35 – 36 – 37	38 – 39 – 40



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**162-164-169**	/	22 – 23 – 24	**169-164-186**	/
4 – 5 – 6 – 7 – 8	**189-229-264-264-259**	/	25 – 26 – 27 – 28 – 29	**209-222-232-233-234**	/
9 – 10 – 11 – 12 – 13	**264-264-259-254-261**	/	30 – 31 – 32	**223-224-222**	/
14 – 15 – 16 – 17 – 18	**182-164-142-181-182**	/	33– 34 – 35 – 36 – 37	**185-169-143-182-184**	/
19 – 20 – 21	**148-145-143**	/	38 – 39 – 40	**148-142-145**	/

Remarks/ *Note:* **TAKEN AT H.6 – POSITION 2G**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara	ROSETTI MARINO SpA A. Khalifa Welding Dept.	G. TESEI
Laboratory Technician 18/03/2022	Service Responsible 18/03/2022		WITNESSED SURVEYOR DATE 18/03/2022

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::16/03/2022
Data esecuzione prova:

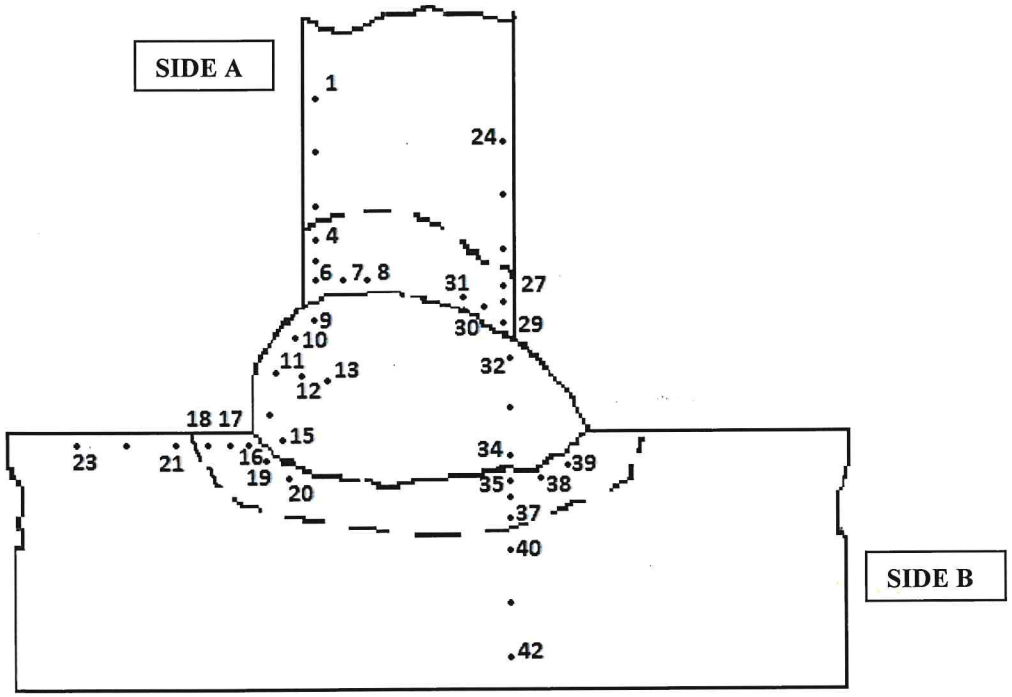
performed in accordance with the standard *eseguita in conformità alla norma* SD-NOC-STR-301 Rev:03

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	086/22 D	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	23,7°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13 – 14 – 15	16 – 17 – 18 – 19 – 20	21 – 22 – 23
24 – 25 – 26	27 – 28 – 29 – 30 – 31	32 – 33 – 34	35 – 36 – 37 – 38 – 39	40 – 41 – 42



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	165-163-167	/	24 – 25 – 26	169-163-169	/
4 – 5 – 6 – 7 – 8	177-182-255-258-263	/	27 – 28 – 29 – 30 – 31	185-209-222-225-226	/
9 – 10 – 11 – 12 – 13 – 14 – 15	259-267-261-253-249-265-270	/	32 – 33 – 34	223-217-219	/
16 – 17 – 18 – 19 – 20	168-154-149-167-169	/	35 – 36 – 37 – 38 – 39	187-163-154-185-180	/
21 – 22 – 23	144-142-145	/	40 – 41 – 42	146-143-142	/
Remarks/ *Note:*	TAKEN AT H.9 – POSITION 2G				

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Bacchieschi	Sig. Giulio Bagnara	OSETTI MARINO SpA A. Khalifa Welding Dept.	RINA SERVICES S.p.A. ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::16/03/2022
Data esecuzione prova:

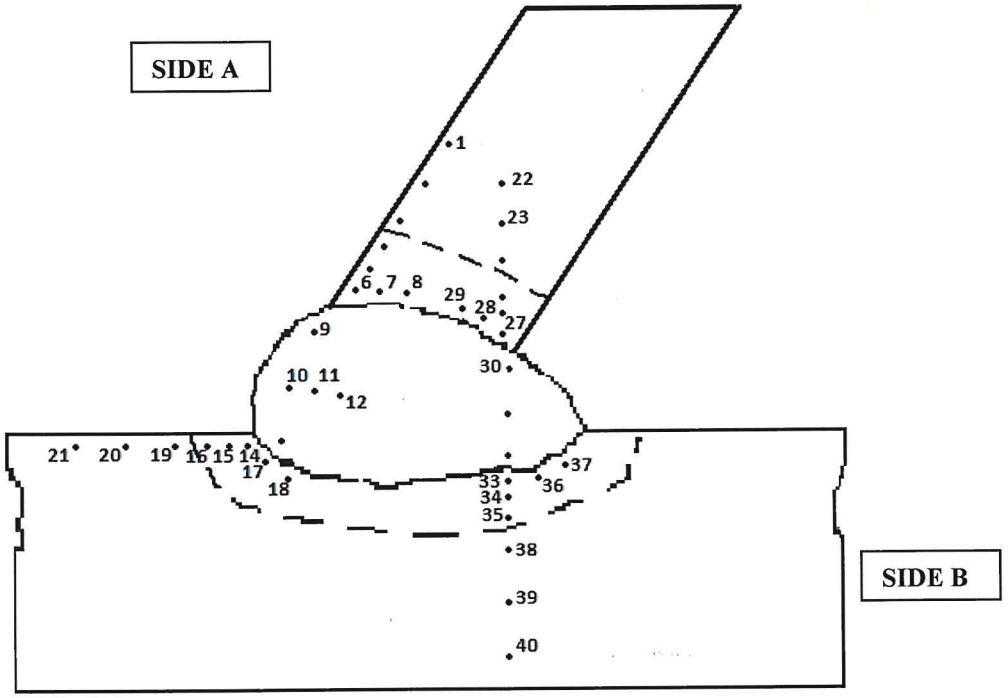
performed in accordance with the standard *eseguita in conformità alla norma* SD-NOC-STR-301 Rev:03

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	086/22 E	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	23,7°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13	14 – 15 – 16 – 17 – 18	19 – 20 – 21
22 – 23 – 24	25 – 26 – 27 – 28 – 29	30 – 31 – 32	33 – 34 – 35 – 36 – 37	38 – 39 – 40



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	161-160-163	/	22 – 23 – 24	161-163-175	/
4 – 5 – 6 – 7 – 8	179-203-254-254-257	/	25 – 26 – 27 – 28 – 29	183-191-224-221-219	/
9 – 10 – 11 – 12 – 13	262-258-253-249-258	/	30 – 31 – 32	224-215-221	/
14 – 15 – 16 – 17 – 18	178-163-155-178-177	/	33– 34 – 35 – 36 – 37	171-163-146-170-171	/
19 – 20 – 21	146-143-142	/	38 – 39 – 40	143-146-143	/

Remarks/ *Note:* TAKEN AT H.12 – POSITION 2G

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulia Bagnara		
Laboratory Technician	Service Responsible		
18/03/2022	18/03/2022		

OSETTI MARINO SpA
A. Khalifa
Welding Dept.

WITNESSED
SURVEYOR G. TESEI
DATE 18/03/2022

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::16/03/2022
Data esecuzione prova:

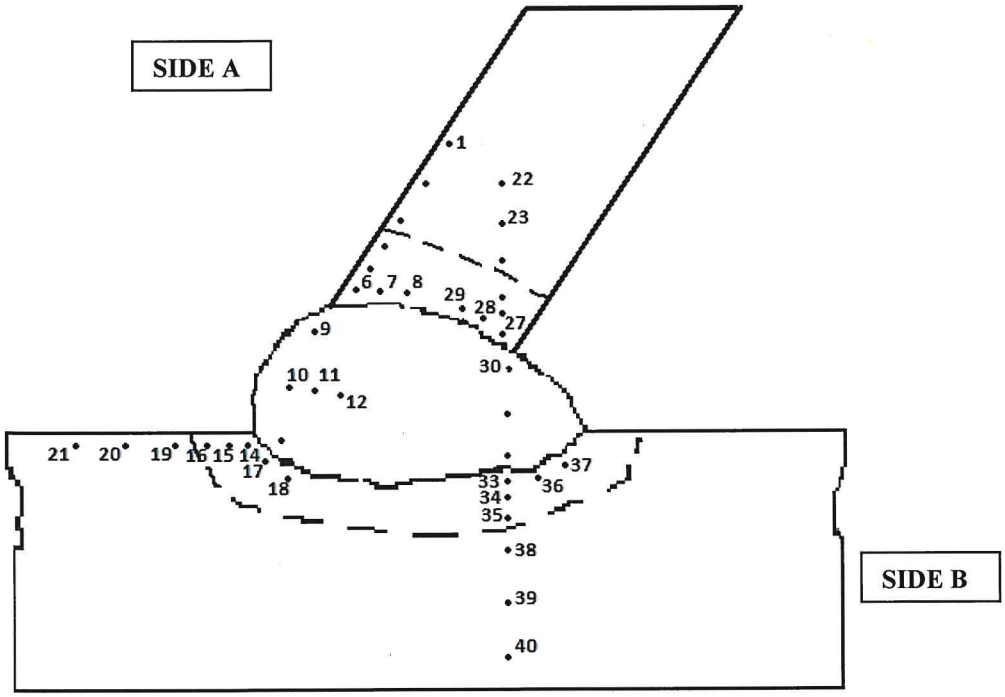
performed in accordance with the standard *eseguita in conformità alla norma* SD-NOC-STR-301 Rev:03

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	086/22 F	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	23,7°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13	14 – 15 – 16 – 17 – 18	19 – 20 – 21
22 – 23 – 24	25 – 26 – 27 – 28 – 29	30 – 31 – 32	33 – 34 – 35 – 36 – 37	38 – 39 – 40



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	164-160-163	/	22 – 23 – 24	164-166-170	/
4 – 5 – 6 – 7 – 8	171-200-257-262-259	/	25 – 26 – 27 – 28 – 29	176-200-224-221-219	/
9 – 10 – 11 – 12 – 13	260-262-255-250-260	/	30 – 31 – 32	231-229-225	/
14 – 15 – 16 – 17 – 18	177-166-147-179-181	/	33– 34 – 35 – 36 – 37	184-161-152-180-184	/
19 – 20 – 21	144-142-147	/	38 – 39 – 40	147-142-144	/
Remarks/ *Note:*	TAKEN AT H.12 – POSITION 2G				

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Bacchieschi	Sig. Giulio Bagnara		
18/03/2022	18/03/2022		
Laboratory Technician	Service Responsible		
		TOSETTI MARINO SpA A. Khalifa Welding Dept.	WITNESSED SURVEYOR G. TESEI DATE 18/03/2022

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::16/03/2022
Data esecuzione prova:

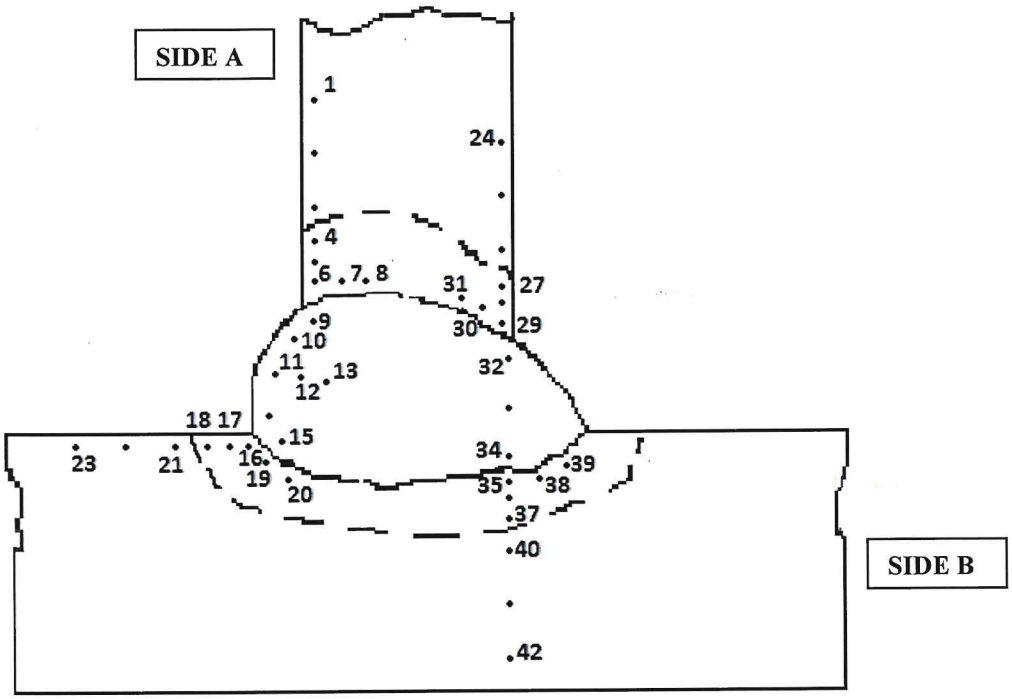
performed in accordance with the standard *eseguita in conformità alla norma* *SD-NOC-STR-301 Rev:03*

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	**Sample Identification** *Identificazione provino*	086/22 G	**Hardness test type** *Tipo di durezza*	HV10	**Test Temp.** *Temp.test*	23,7°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13 – 14 – 15	16 – 17 – 18 – 19 – 20	21 – 22 – 23
24 – 25 – 26	27 – 28 – 29 – 30 – 31	32 – 33 – 34	35 – 36 – 37 – 38 – 39	40 – 41 – 42



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	163-161-165	/	24 – 25 – 26	165-163-166	/
4 – 5 – 6 – 7 – 8	187-220-257-259-262	/	27 – 28 – 29 – 30 – 31	202-215-217-224-221	/
9 – 10 – 11 – 12 – 13 – 14 – 15	254-252-250-249-242-250-251	/	32 – 33 – 34	223-223-220	/
16 – 17 – 18 – 19 – 20	187-164-158-179-178	/	35 – 36 – 37 – 38 – 39	178-165-149-174-176	/
21 – 22 – 23	144-142-141	/	40 – 41 – 42	146-142-147	/
Remarks/ *Note:*	TAKEN AT H.3 – POSITION 5G				

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Bacchereschi	Sig. Giulio Bagnara	ROSETTI MARINO SpA A.Khalifa Welding Dept.	BUREAU VERITAS ITALY WITNESSED REVIEWED SURVEYOR G. TESEI DATE 18/03/2022
INSPECTA srl 18/03/2022	INSPECTA srl 18/03/2022 Service Responsible		

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::16/03/2022
Data esecuzione prova:

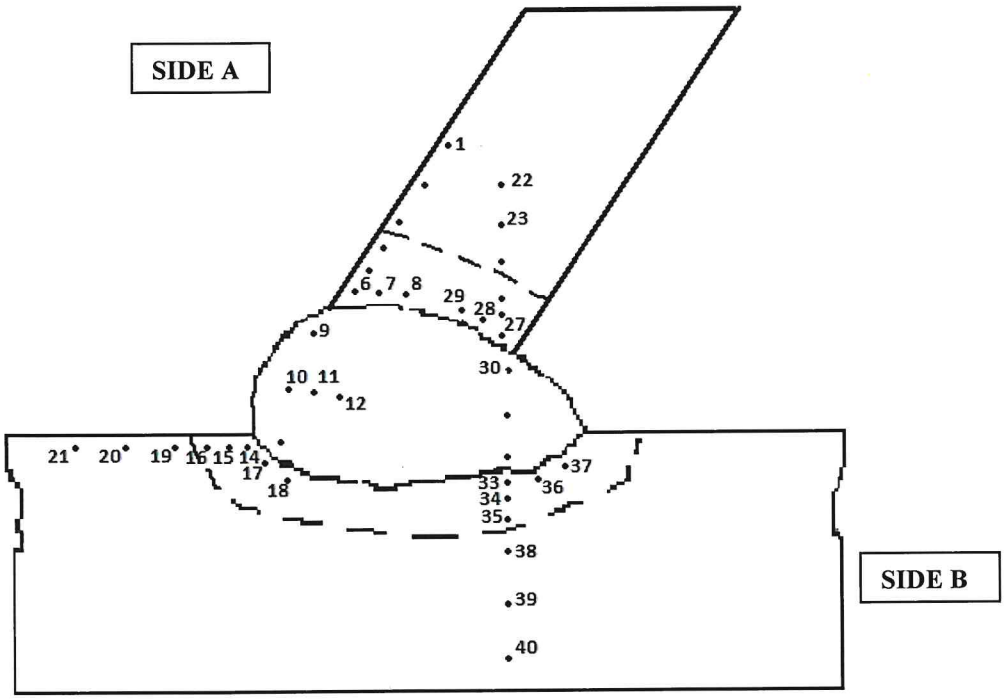
performed in accordance with the standard *eseguita in conformità alla norma* SD-NOC-STR-301 Rev:03

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	086/22 H	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	23,7°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13	14 – 15 – 16 – 17 – 18	19 – 20 – 21
22 – 23 – 24	25 – 26 – 27 – 28 – 29	30 – 31 – 32	33 – 34 – 35 – 36 – 37	38 – 39 – 40



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**163-165-167**	/	22 – 23 – 24	**163-164-196**	/
4 – 5 – 6 – 7 – 8	**196-215-257-263-265**	/	25 – 26 – 27 – 28 – 29	**204-215-229-232-230**	/
9 – 10 – 11 – 12 – 13	**260-257-252-254-258**	/	30 – 31 – 32	**232-223-221**	/
14 – 15 – 16 – 17 – 18	**188-158-149-186-183**	/	33– 34 – 35 – 36 – 37	**186-157-148-181-178**	/
19 – 20 – 21	**144-145-141**	/	38 – 39 – 40	**146-144-141**	/

Remarks/ *Note:* **TAKEN AT H.6 – POSITION 5G**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara	A. Khalifa	G. TESEI
18/03/2022	18/03/2022	Welding Dept.	18/03/2022

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::16/03/2022
Data esecuzione prova:

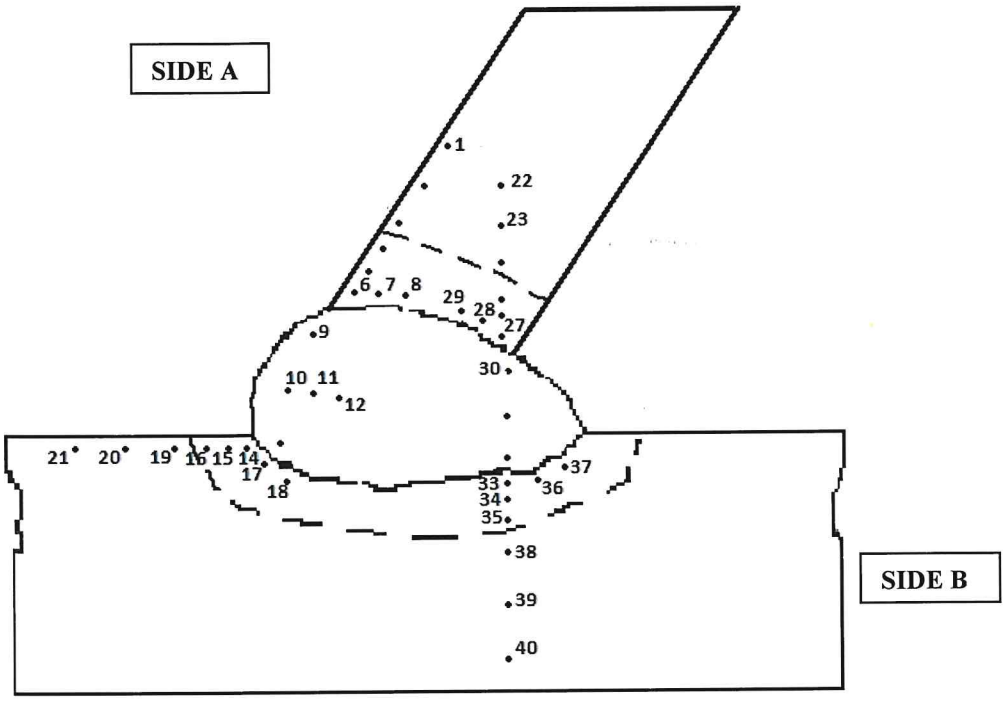
performed in accordance with the standard *eseguita in conformità alla norma* SD-NOC-STR-301 Rev:03

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	086/22 I	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	23,7°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13	14 – 15 – 16 – 17 – 18	19 – 20 – 21
22 – 23 – 24	25 – 26 – 27 – 28 – 29	30 – 31 – 32	33 – 34 – 35 – 36 – 37	38 – 39 – 40



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	162-161-165	/	22 – 23 – 24	165-168-199	/
4 – 5 – 6 – 7 – 8	193-213-266-261-257	/	25 – 26 – 27 – 28 – 29	213-223-244-246-248	/
9 – 10 – 11 – 12 – 13	259-257-248-245-254	/	30 – 31 – 32	235-232-229	/
14 – 15 – 16 – 17 – 18	182-161-142-181-180	/	33– 34 – 35 – 36 – 37	178-166-143-180-179	/
19 – 20 – 21	146-144-142	/	38 – 39 – 40	146-144-142	/
Remarks/ *Note:*	TAKEN AT H.6 – POSITION 5G				

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Maura Buccheschi	Sig. Giulio Bagnara	ROSETTI MARINO SpA A. Khalifa Welding Dept.	RINA SERVICES S.p.A. ITALY WITNESSED G. TESEI SURVEYOR DATE 18/03/2022
Laboratory Technician	Service Responsible		

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::16/03/2022
Data esecuzione prova:

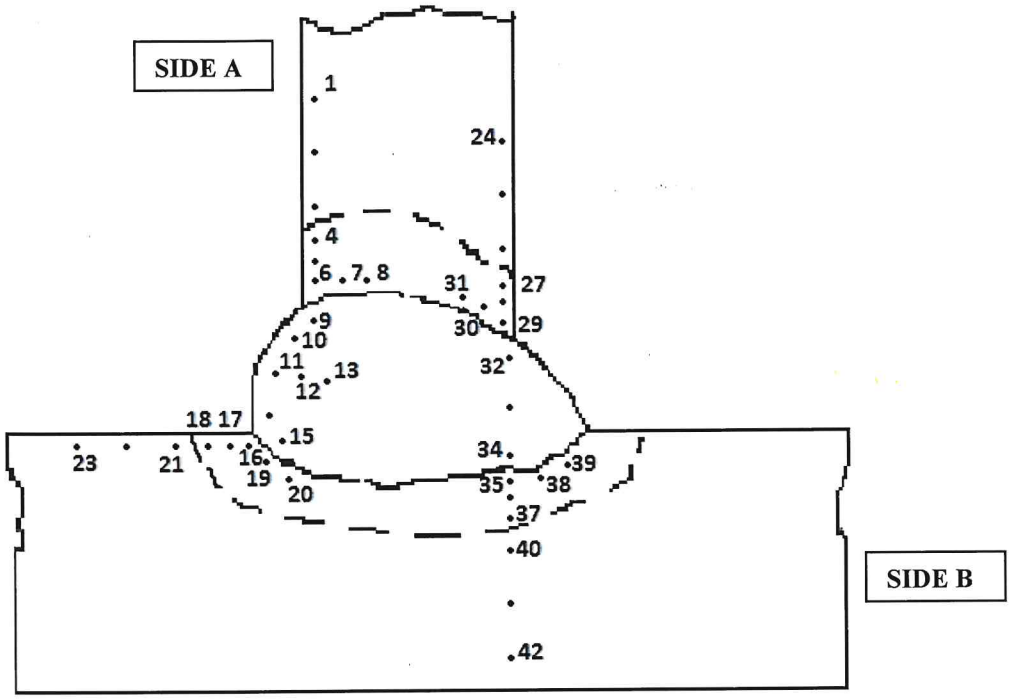
performed in accordance with the standard *eseguita in conformità alla norma* SD-NOC-STR-301 Rev:03

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	086/22 L	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	23,7°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13 – 14 – 15	16 – 17 – 18 – 19 – 20	21 – 22 – 23
24 – 25 – 26	27 – 28 – 29 – 30 – 31	32 – 33 – 34	35 – 36 – 37 – 38 – 39	40 – 41 – 42



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	161-160-163	/	24 – 25 – 26	162-163-169	/
4 – 5 – 6 – 7 – 8	181-195-254-257-252	/	27 – 28 – 29 – 30 – 31	181-196-213-216-214	/
9 – 10 – 11 – 12 – 13 – 14 – 15	254-251-252-250-244-247-247	/	32 – 33 – 34	217-215-216	/
16 – 17 – 18 – 19 – 20	184-158-151-181-172	/	35 – 36 – 37 – 38 – 39	183-170-151-184-187	/
21 – 22 – 23	145-145-141	/	40 – 41 – 42	142-141-145	/

Remarks/ *Note:* TAKEN AT H.9 – POSITION 5G

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara	A. Khalifa	G. TESEI
18/03/2022	18/03/2022	Welding Dept.	18/03/2022

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::16/03/2022
Data esecuzione prova:

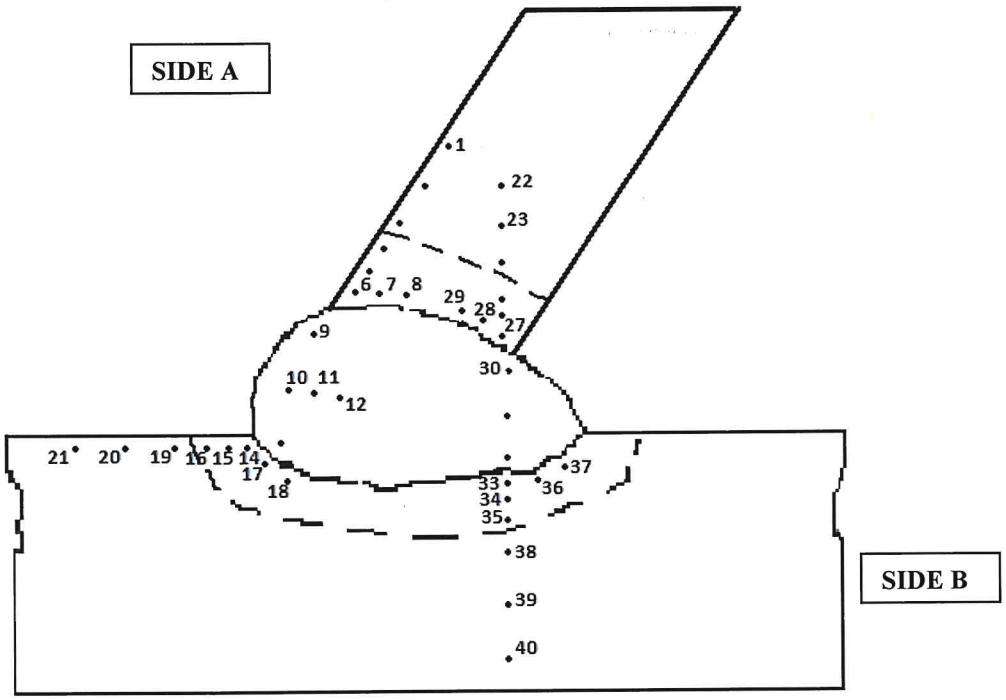
performed in accordance with the standard *eseguita in conformità alla norma* SD-NOC-STR-301 Rev:03

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	086/22 M	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	23,7°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13	14 – 15 – 16 – 17 – 18	19 – 20 – 21
22 – 23 – 24	25 – 26 – 27 – 28 – 29	30 – 31 – 32	33 – 34 – 35 – 36 – 37	38 – 39 – 40



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	155-160-163	/	22 – 23 – 24	163-163-177	/
4 – 5 – 6 – 7 – 8	170-210-263-259-264	/	25 – 26 – 27 – 28 – 29	159-181-220-216-216	/
9 – 10 – 11 – 12 – 13	260-262-251-249-258	/	30 – 31 – 32	225-223-225	/
14 – 15 – 16 – 17 – 18	177-163-152-180-178	/	33– 34 – 35 – 36 – 37	176-163-148-178-181	/
19 – 20 – 21	144-140-145	/	38 – 39 – 40	145-143-144	/

Remarks/ *Note:* TAKEN AT H.12 – POSITION 5G

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del Cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Bacheschi	Sig. Giulio Bagnara	A. Khalifa Welding Dept.	G. TESEI
Laboratory Technician	Service Responsible		WITNESSED SURVEYOR DATE 18/03/2022

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing::16/03/2022
Data esecuzione prova:

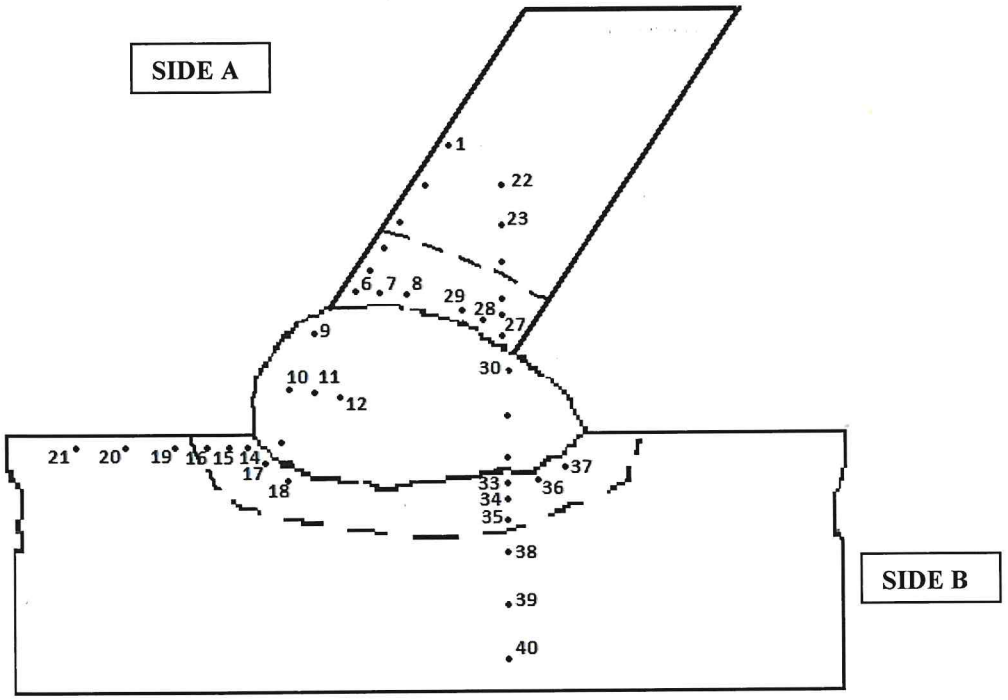
performed in accordance with the standard *eseguita in conformità alla norma* *SD-NOC-STR-301 Rev:03*

The test was performed using Innovatest durometer machine, model 4303, s.n. 43030614C
La prova è stata eseguita utilizzando macchina durometro marca Innovatest, modello 4303, s.n. 43030614C

Internal procedure *Procedura interna*	PP10 rev.06	Sample Identification *Identificazione provino*	086/22 N	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	23,7°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A			Base Material Side B	
BM	**HAZ**	**WM**	**HAZ**	**BM**
1 – 2 – 3	4 – 5 – 6 – 7 – 8	9 – 10 – 11 – 12 – 13	14 – 15 – 16 – 17 – 18	19 – 20 – 21
22 – 23 – 24	25 – 26 – 27 – 28 – 29	30 – 31 – 32	33 – 34 – 35 – 36 – 37	38 – 39 – 40



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**162-160-164**	/	22 – 23 – 24	**162-164-177**	/
4 – 5 – 6 – 7 – 8	**170-208-264-268-271**	/	25 – 26 – 27 – 28 – 29	**159-181-218-209-207**	/
9 – 10 – 11 – 12 – 13	**267-265-255-250-262**	/	30 – 31 – 32	**230-233-231**	/
14 – 15 – 16 – 17 – 18	**169-162-147-172-175**	/	33– 34 – 35 – 36 – 37	**169-159-148-175-176**	/
19 – 20 – 21	**147-142-144**	/	38 – 39 – 40	**142-144-147**	/

Remarks/ *Note:* **TAKEN AT H.12 – POSITION 5G**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara	ROSETTI MARINO SpA A. Khalifa Welding Dept	WITNESSED SURVEYOR G. TESEI
Laboratory Technician	Service Responsible		

MACRO EXAMINATION TEST
Prova Macrografica

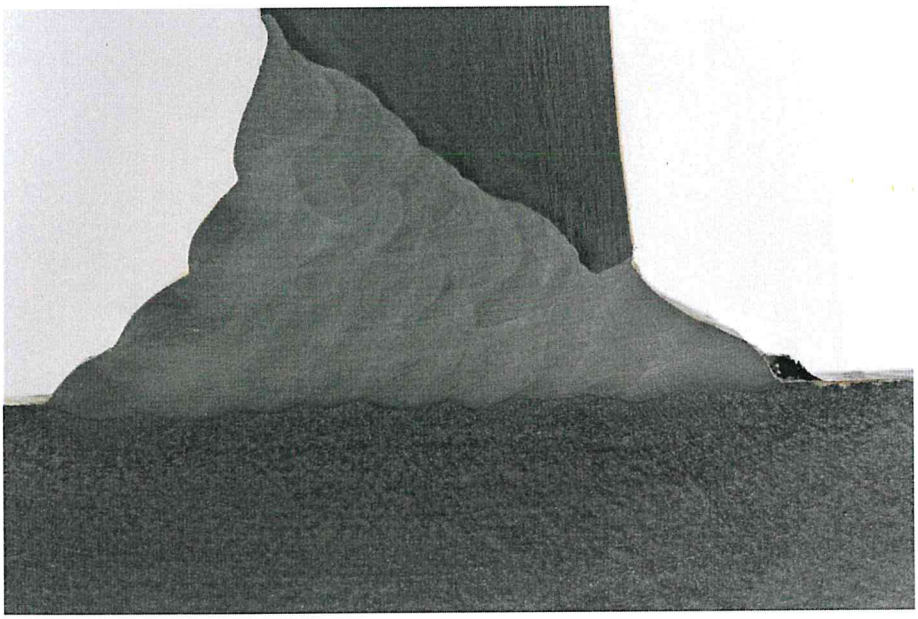
Date of Testing::16/03/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**23,7°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**086/22 A**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.3 – POSITION 2G** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SpA A. Khalifa Welding Dept.	BUREAU VERITAS ITALY WITNESSED REVIEWED SURVEYOR G. TESEI DATE 18/03/2022
18/03/2022	18/03/2022		

MACRO EXAMINATION TEST
Prova Macrografica

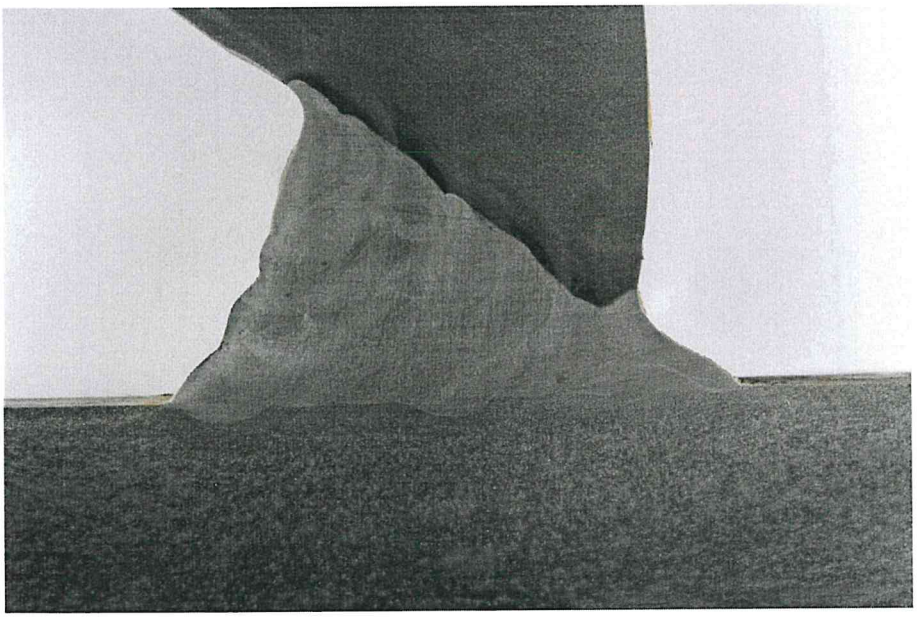
Date of Testing::16/03/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**23,7°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**086/22 B**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.6 – POSITION 2G** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara		
- INSPECTA srl -	- INSPECTA srl -	ROSETTI MARINO SpA	BUREAU VERITAS ITALY
Laboratory Technician	Service Responsible	A. Khalifa	WITNESSED
18/03/2022	18/03/2022	Welding Dept.	SURVEYOR G. TESEI
			DATE 18/03/2022

MACRO EXAMINATION TEST
Prova Macrografica

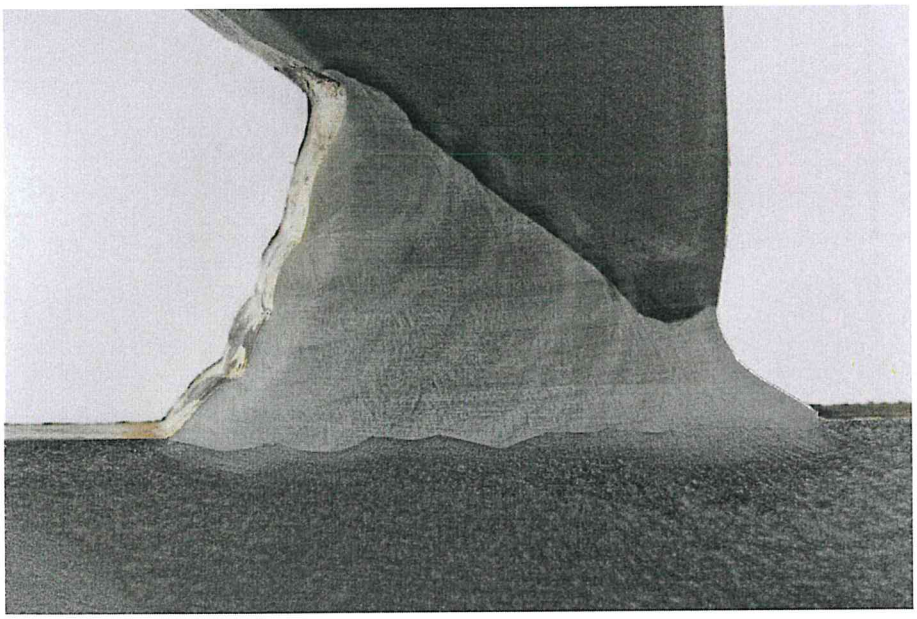
Date of Testing::16/03/2022
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* AWS D1.1/D1.1M:2020 par.6.10.4

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**23,7°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**086/22 C**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.6 – POSITION 2G** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SpA A. Khalifa Welding Dept.	BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 28/03/2022
Laboratory Technician 18/03/2022	- INSPECTA srl - 18/03/2022 Service Responsible		

MACRO EXAMINATION TEST
Prova Macrografica

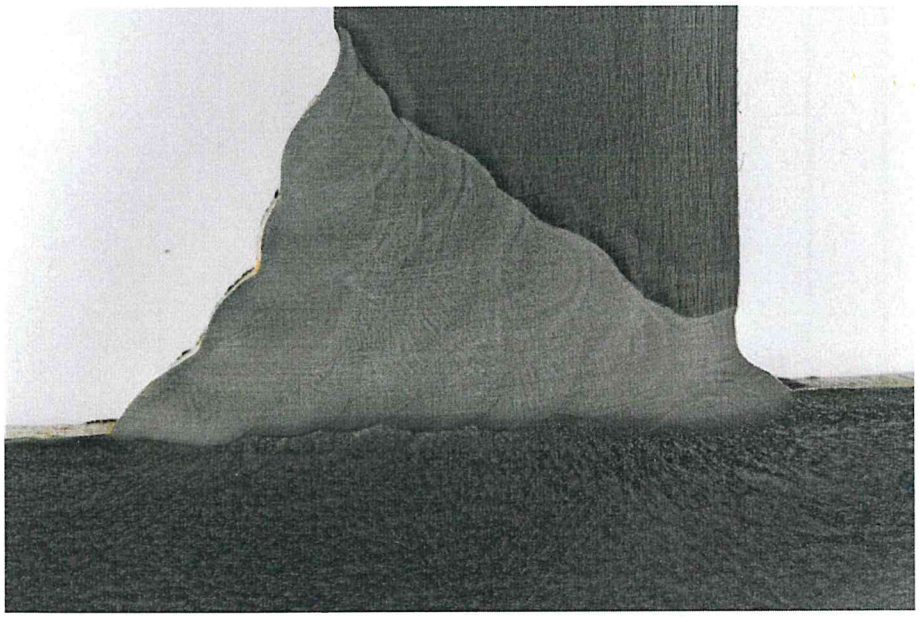
Date of Testing::16/03/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**23,7°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**086/22 D**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.9 – POSITION 2G** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SpA A. Khalifa Welding Dept.	BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022
18/03/2022	Service Responsible 18/03/2022		

MACRO EXAMINATION TEST
Prova Macrografica

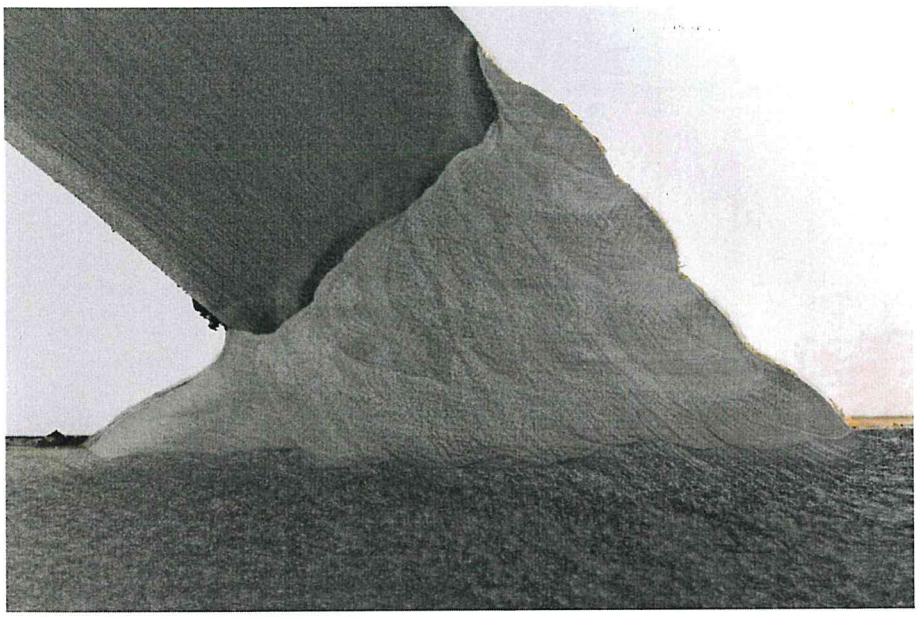
Date of Testing::16/03/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**23,7°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**086/22 E**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.12 – POSITION 2G** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	*Sig. Giulio Bagnara*	ROSETTI MARINO Spa	BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE
- INSPECTA srl -	- INSPECTA srl -	A. Khalifa	
Laboratory Technician	Service Responsible	Welding Dept	
18/03/2022	18/03/2022		18/03/2022

MACRO EXAMINATION TEST
Prova Macrografica

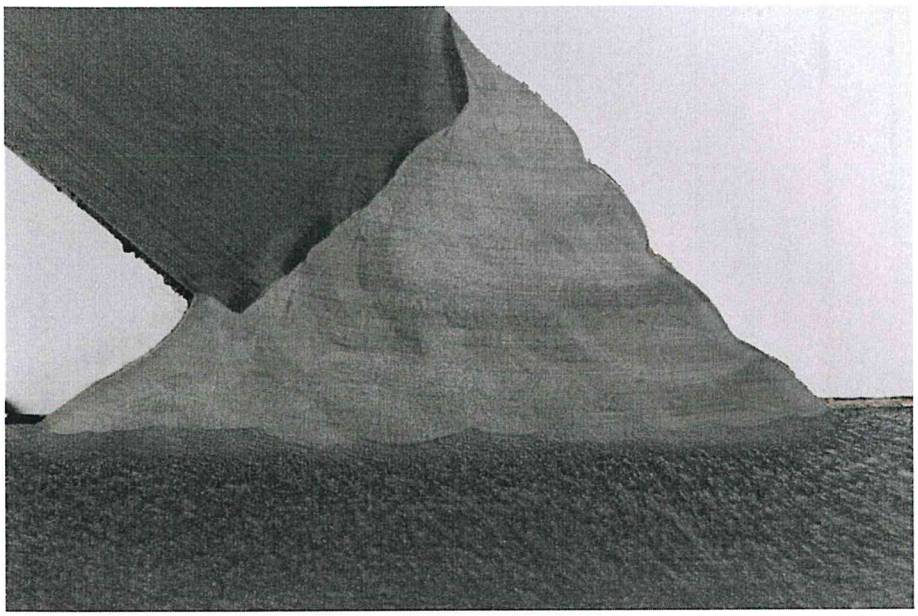
Date of Testing::16/03/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**23,7°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**086/22 F**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.12 – POSITION 2G** **No defects have been found in macro examination.**

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi - INSPECTA srl - Laboratory Technician 18/03/2022	Sig. Giulio Bagnara - INSPECTA srl - 18/03/2022 Service Responsible	ROSETTI MARINO SpA A. Khalifa Welding Dept	BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022

MACRO EXAMINATION TEST
Prova Macrografica

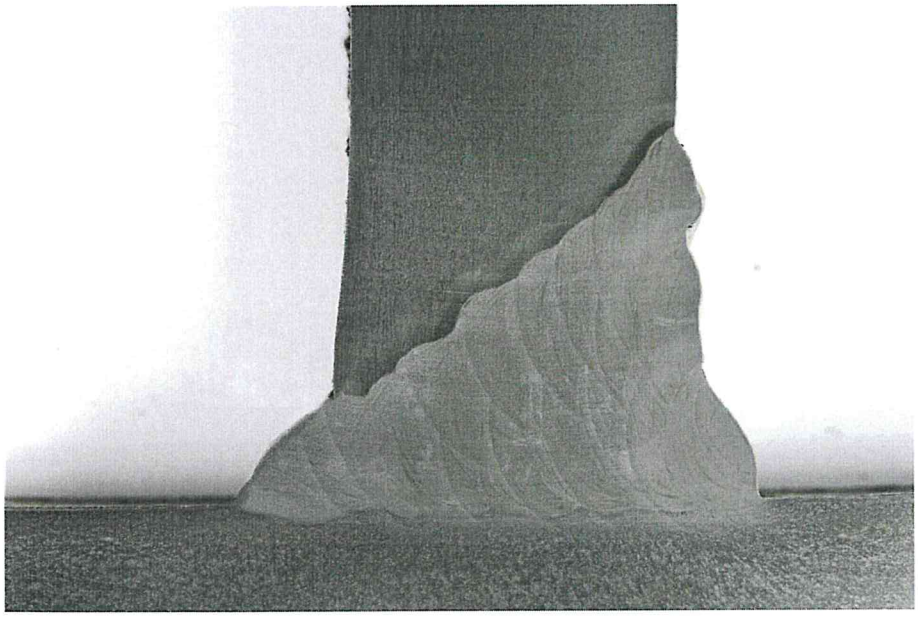
Date of Testing::16/03/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**23,7°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**086/22 G**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.3 – POSITION 5G** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Baecheschi	Sig. Giulio Bagnara	ROSETTI MARINO SpA A. Khalifa Welding Dept.	BUREAU VERITAS ITALY WITNESSED REVIEWED SURVEYOR G. TESEI DATE 18/03/2022
Laboratory Technician 18/03/2022	- INSPECTA srl - Service Responsible 18/03/2022		

MACRO EXAMINATION TEST
Prova Macrografica

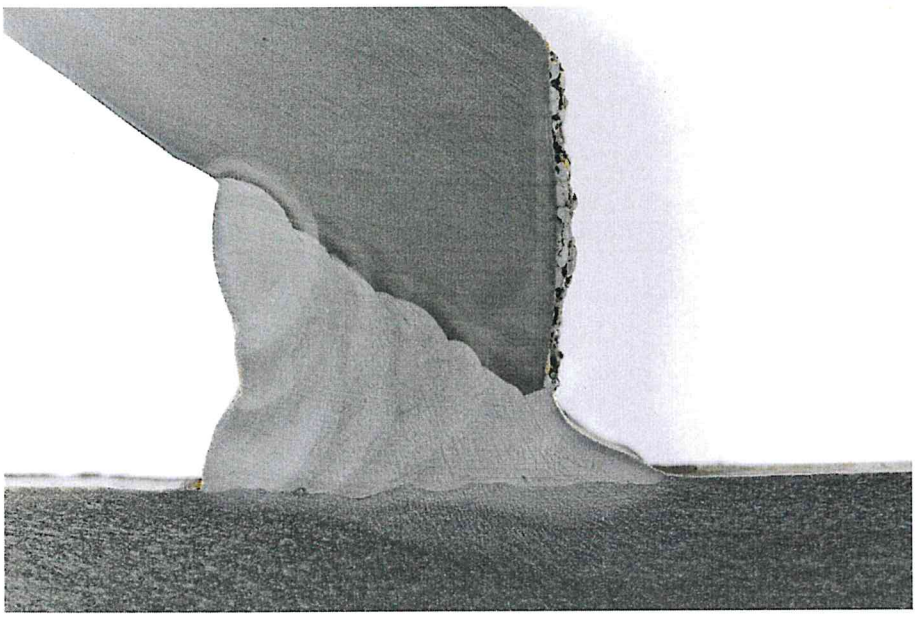
Date of Testing::16/03/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**23,7°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**086/22 H**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.6 – POSITION 5G** **No defects have been found in macro examination.**

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi - INSPECTA srl - Laboratory Technician 18/03/2022	Sig. Giulio Bagnara - INSPECTA srl - 18/03/2022 Service Responsible	ROSETTI MARINO SpA A.Khalifa Welding Dept.	BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022

MACRO EXAMINATION TEST
Prova Macrografica

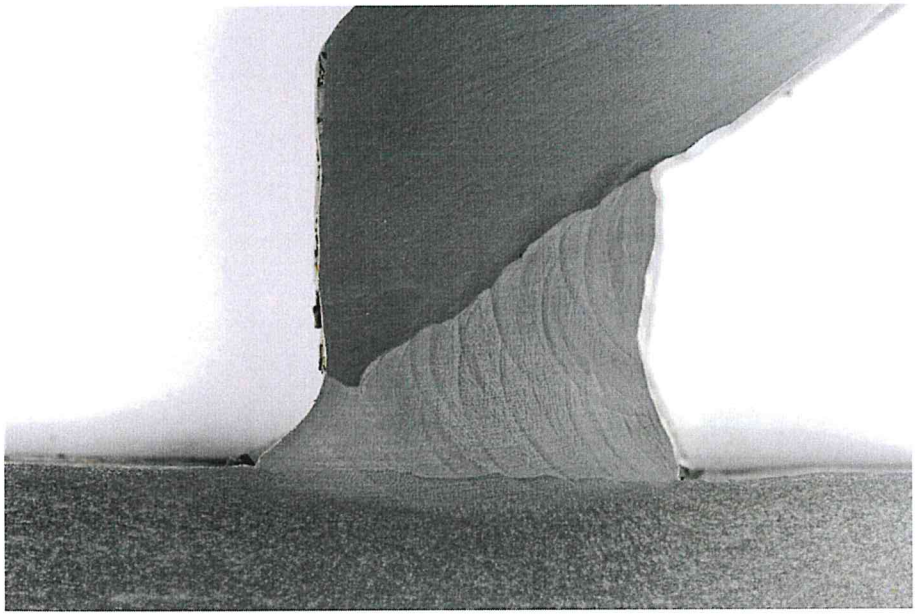
Date of Testing::16/03/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**23,7°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**086/22 I**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.6 – POSITION 5G** **No defects have been found in macro examination.**

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi INSPECTA Laboratory Technician 18/03/2022	Sig. Giulio Bagnara - INSPECTA srl - 18/03/2022 Service Responsible	SOSETTI MARINO SpA A. Khalifa Welding Dept.	BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022

MACRO EXAMINATION TEST
Prova Macrografica

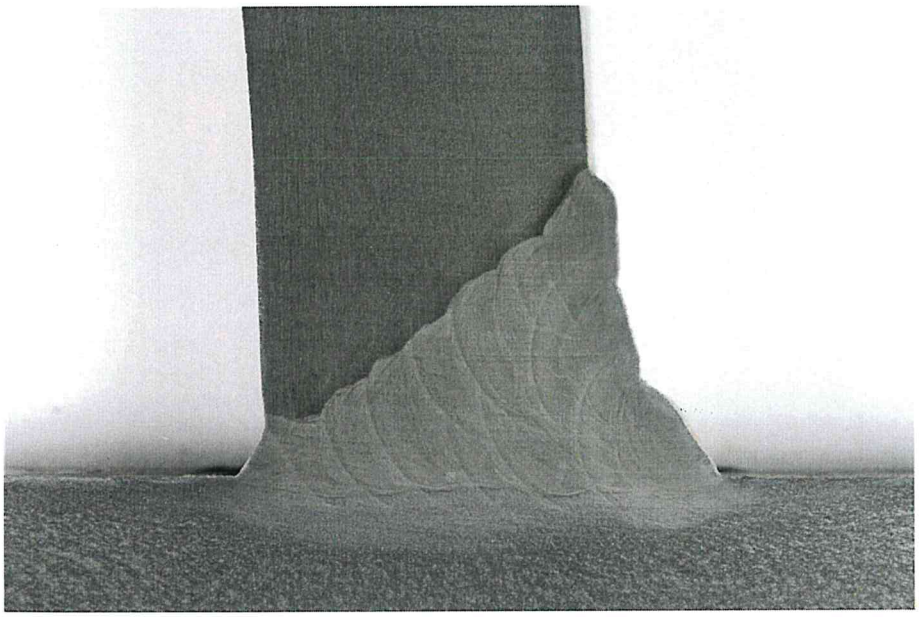
Date of Testing::16/03/2022
Data esecuzione prova:

performed in accordance with the standard / *eseguita in conformità alla norma* AWS D1.1/D1.1M:2020 par.6.10.4

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**23,7°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**086/22 L**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.9 – POSITION 5G** **No defects have been found in macro examination.**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio	*Responsabile Laboratorio*	*Ispettore del cliente*	*Ispettore Terza parte*
Dott. Ing. Mauro Bacchieschi	*Sig. Giulio Bagnara*	ROSETTI MARINO SpA A. Khalifa Welding Dept	BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022
Laboratory Technician 18/03/2022	Service Responsible 18/03/2022		

MACRO EXAMINATION TEST
Prova Macrografica

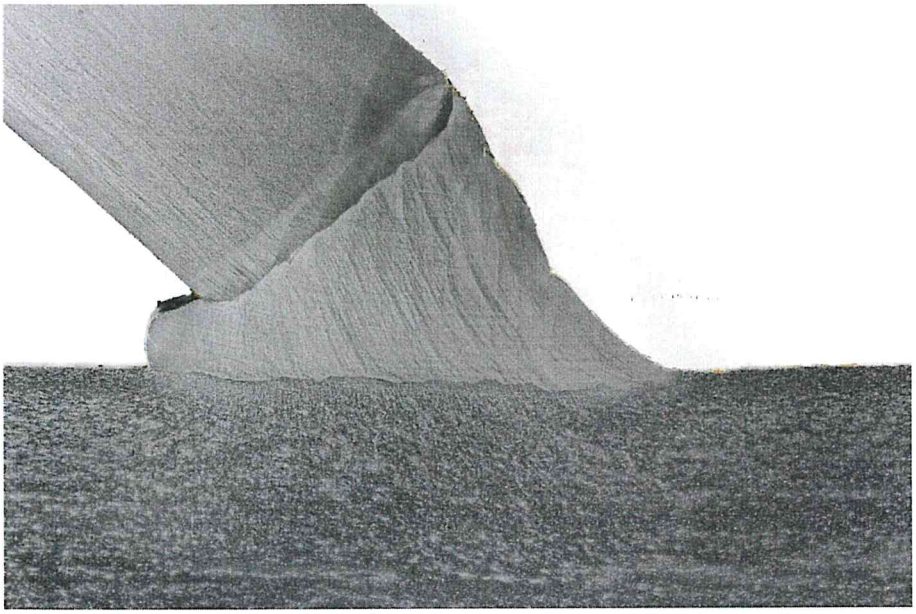
Date of Testing::16/03/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**23,7°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**086/22 M**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.12 – POSITION 5G** **No defects have been found in macro examination.**

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Bacchereschi Laboratory Technician 18/03/2022	Sig. Giulio Bagnara - INSPECTA srl - 18/03/2022 Service Responsible	ROSETTI MARINO SpA A. Khalifa Welding Dept	BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022

MACRO EXAMINATION TEST
Prova Macrografica

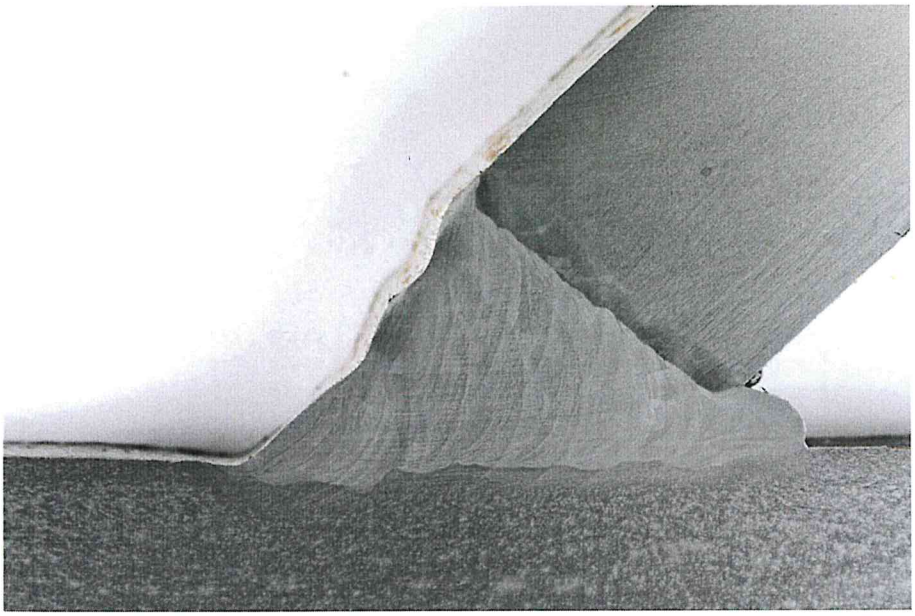
Date of Testing::16/03/2022
Data esecuzione prova:

performed in accordance with the standard *eseguita in conformità alla norma* *AWS D1.1/D1.1M:2020 par.6.10.4*

The photo was taken using a CANON camera, model EOS 650D/EFS and a MACRO CANON EF-S 60 mm lens.
La fotografia è stata eseguita utilizzando macchina fotografica marca CANON, modello EOS 650D/EFS e obiettivo MACRO CANON EF-S 60 mm.

Internal procedure *PP12 rev.04* *Procedura internal*		**Test temperatura** *Temperature Test*	**23,7°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER**	**Type and chemical composition:** *Tipo e composizione chimica:*	**Nital 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**086/22 N**	**Magnification:** *Ingrandimento:*	**Photo at: 2.00x** **Examination at: 21.0x**
Designation: *Designazione:*	//		

SIDE A



SIDE B

Remarks / *Note:*	**TAKEN AT H.12 – POSITION 5G** **No defects have been found in macro examination.**

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Dott. Ing. Mauro Baccheschi	Sig. Giulio Bagnara	ROSETTI MARINO SpA A. Khalifa Welding Dept.	BUREAU VERITAS ITALY WITNESSED SURVEYOR G. TESEI DATE 18/03/2022
18/03/2022	- INSPECTA srl - 18/03/2022		

END OF TEST REPORT
FINE DEL RAPPORTO DI PROVA

Manufacturer: ArcelorMittal Tubular Products Roman S.A. STEFAN CEL MARE STR, BL 15, SC. A, PARTER I ROMAN, NEAMT ROMANIA	**MILL TEST CERTIFICATE** according to EN 10204/3.2/2004 -	Page 1/3 B 22398/1 30.06.2021	ArcelorMittal

Buyer: T.A.L. S.P.A.con socio unico VIA G. DI VITTORIO, 6, ZONA IND., 29017 FIORENZUOLA D'ARDA (PIACENZA) ITALY	SEAMLESS STEEL LINE PIPES	Total weight: 22.262 tons - lbs	Total Length: 93.27 meters - feets	Pieces 12	Bundles -

Buyer's reference OF210231	Standard: EN 10225-3-2019;
Contract 50005005	

Item	Item Client
1	-

Dimensions: 406.40 x 25.40 mm -	Schedule: -	Length: 6.00 - 8.00 m -	- -

Hydro Test:	Bar	PSI	MPa	Time(sec)	Steel Grade: S355NLHHO -
	205	-	20.5	5	
			Bill:		Transport:

Chemical Analysis(%)

Heat	Bulletin No.	Product Req.		C	Mn	Si	S	P	Cr	Ni	Cu	As	Al	Mo	V	Nb	Ti	Ca	B	N	Sn	Pb	Sb	Bi
			Max	0.18	1.60	0.30	0.008	0.025	0.20	0.30	0.35	-	0.060	0.08	0.080	0.020	0.020	-	-	0.0200	-	-	-	-
			Min	-	0.90	0.15	-	-	-	-	-	-	0.020	-	0.060	-	-	-	-	-	-	-	-	-
808993		Heat analysis		0.14	1.20	0.20	0.004	0.008	0.07	0.06	0.17	0.009	0.028	0.02	0.061	0.003	0.003	0.0025	0.0001	0.0081	0.0100	0.0030	0.0010	0.0020
808999		Heat analysis		0.13	1.22	0.22	0.003	0.008	0.06	0.07	0.16	0.010	0.026	0.02	0.062	0.003	0.003	0.0027	0.0001	0.0099	0.0090	0.0030	0.0010	0.0020
808993	21-789	Product analysis		0.14	1.20	0.21	0.003	0.009	0.07	0.07	0.16	0.008	0.029	0.02	0.061	0.003	0.003	0.0024	0.0002	0.0084	0.0110	0.0030	0.0000	0.0000
808993	21-789	Product analysis		0.14	1.21	0.21	0.003	0.009	0.07	0.07	0.16	0.008	0.028	0.02	0.061	0.003	0.003	0.0026	0.0002	0.0086	0.0110	0.0030	0.0000	0.0000
808999	21-790	Product analysis		0.13	1.23	0.23	0.003	0.009	0.06	0.08	0.15	0.009	0.026	0.02	0.062	0.003	0.003	0.0029	0.0001	0.0097	0.0100	0.0030	0.0000	0.0000
808999	21-790	Product analysis		0.13	1.23	0.22	0.003	0.009	0.06	0.08	0.15	0.009	0.027	0.02	0.062	0.003	0.003	0.0031	0.0001	0.0099	0.0100	0.0030	0.0000	0.0000

Chemical Analysis(%)

Heat	Bulletin No.	Product Req.		Al/N	Nb + V	Nb + Ti + V	CE_IIW
			Max	-	0.120	0.140	0.41
			Min	2.00	-	-	-
808993		Heat analysis		3.46	0.064	0.067	0.38
808999		Heat analysis		2.63	0.065	0.068	0.38
808993	21-789	Product analysis		3.45	0.064	0.067	0.39
808993	21-789	Product analysis		3.26	0.064	0.067	0.39
808999	21-790	Product analysis		2.68	0.065	0.068	0.39
808999	21-790	Product analysis		2.73	0.065	0.068	0.38

$CEpcm = C+Si/30+Mn/20+Cu/20+Ni/60+Cr/20+Mo/15+V/10+5B$

$CE_S = C+Mn/6$

$CE_{IIW} = C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15$

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative

Fiz. Antonica Sergiu

Formular 12A2, rev. 3

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.3756304.138
DATE: 14/02/2022
WITNESSED ☐ REVIEW ☑

ArcelorMittal Tubular Products Roman S.A. ArcelorMittal J27/88/91 ★★★★★★ Romania

Inspector/Buyer representative

Witnessed/Reviewed
Florin Hriscu
16.07.21

BUREAU VERITAS ROMANIA 20 PARIS 1828 ROMAN INDUSTRY & FACILITIES

Manufacturer: ArcelorMittal Tubular Products Roman S.A. STEFAN CEL MARE STR, BL 15, SC. A, PARTER I ROMAN, NEAMT ROMANIA	**MILL TEST CERTIFICATE** **according to EN 10204/3.2/2004** -	Page 2/3 **B 22398/1** **30.06.2021**	ArcelorMittal

Buyer: T.A.L. S.P.A.con socio unico VIA G. DI VITTORIO, 6, ZONA IND., 29017 FIORENZUOLA D'ARDA (PIACENZA) ITALY	SEAMLESS STEEL LINE PIPES	Total weight: 22.262 tons - lbs	Total Length: 93.27 meters - feets	Pieces: 12 Bundles: -
Buyer's reference: OF210231 **Contract 50005005**	**Standard:** EN 10225-3-2019;			

Item	Item Client	Dimensions: 406.40 x 25.40 mm -	Schedule: -	Length: 6.00 - 8.00 m -	-	
1	-	Hydro Test:	Bar: 205	PSI: -	MPa: 20.5	Time(sec): 5
					Steel Grade: S355NLHHO -	

Tensile Test

Heat	Orientation	Length		Width/Diameter		Thickness		Section		Mechanical test Bulletin No.	YS MPa	YS (PSI:1000)	UTS MPa	UTS (PSI:1000)	E %	YS/UTS max: 0.88
		mm	inch	mm	inch	mm	inch	mm²	inch²							
808993	Longitudinal Round	-	-	10.00	-	0.00	-	78.5	-	21-1497	403.80	-	509.60	-	35.30	0.79
808993	Longitudinal Round	-	-	10.00	-	0.00	-	78.5	-	21-1497	394.90	-	510.80	-	33.30	0.77
808999	Longitudinal Round	-	-	10.00	-	0.00	-	78.5	-	21-1497	397.50	-	505.70	-	34.50	0.79

Impact Test

Heat	Impact Test Bulletin No.	Orientation	Size (mm)	Temp. (°C)	Req.KV (min. J)	KV values (J)			Req.Avr. (min. J)	Avr. fracture energy (J)	KCU min:-J/cm² T:°C			Shear Area min. %			Lateral Expansion min. mm		
808993	21-2484	Transversal	10x10x55	-40	-	239	227	221	50.0	229	-	-	-	100	100	100	1.96	1.91	1.88
808993	21-2484	Transversal	10x10x55	-40	-	218	225	233	50.0	225	-	-	-	100	100	100	1.86	1.90	1.94
808999	21-2484	Transversal	10x10x55	-40	-	220	231	214	50.0	222	-	-	-	100	100	100	1.88	1.93	1.83

Heat

Heat	Pieces	Length (m)	Weight (kg)
808993	9	-	-
808999	3	-	-

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22 N°.3756306.138
DATE: 14/02/2022
WITNESSED ☐ REVIEW ☑

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative
Fiz. Antonica Sergiu

Formular 12A2, rev. 3

ArcelorMittal Tubular Products Roman S.A. J27/88/91 Romania

Witnessed/Reviewed
Florin Hriscu
Inspector/Buyer representative

16.02.21

BUREAU VERITAS ROMANIA 20 PARIS 1828 INDUSTRY & FACILITIES ROMAN

Manufacturer: ArcelorMittal Tubular Products Roman S.A. STEFAN CEL MARE STR, BL 15, SC. A, PARTER I ROMAN, NEAMT ROMANIA	**MILL TEST CERTIFICATE** **according to EN 10204/3.2/2004** -	Page 3/3 **B 22398/1** **30.06.2021**	ArcelorMittal

Buyer: T.A.L. S.P.A.con socio unico VIA G. DI VITTORIO, 6, ZONA IND., 29017 FIORENZUOLA D'ARDA (PIACENZA) ITALY	SEAMLESS STEEL LINE PIPES	Total weight: 22.262 tons - lbs	Total Length: 93.27 meters - feets	Pieces 12	Bundles -
Buyer's reference OF210231	**Standard:** EN 10225-3-2019;				
Contract 50005005	Dimensions: 406.40 x 25.40 mm -	Schedule: -	Length: 6.00 - 8.00 m -		-

Item	Item Client
1	-

Hydro Test:	Bar	PSI	MPa	Time(sec)
	205	-	20.5	5

Steel Grade: S355NLHHO
-

Remarks Manufacturing process – hot rolling.
Hot finished, steel is fully killed and vacuum degassing, fine grained practice and produced by electric furnace.
Visual inspection and dimensional check without objection.
Heat treatment normalizing at temperature of 890-940°C, time soaking 35 min.
NDT full body pipes :
- automated electromagnetic inspection for longitudinal imperfections, outside & inside surface, acceptance level U4/C (12.5% from W.T)-acc. ISO 10893/3-satisfactory.
NDT for the pipe ends:
- automated ultrasonic inspection for longitudinal imperfections, outside & inside surface, acceptance level U3/C (10% from W.T)-acc. ISO 10893/10-satisfactory.
Hydrostatic test hold for 5 sec. no leakage noticed.
The products was manufactured, sampled, tested, marked and inspected in accordance with the Standards, the supplementary requirements, and any other requirements designated in the purchase order, and has been found to meet such requirements.
Heat no . 808993 Through Thickness Test Buletin No.21- 2205 - Z ≥ 25% values : 75.34; 74.17; 75.97
- Z ≥ 35% values : 75.16
- U TS (N/mm²) values: 488.3; 497.5; 502.5
Heat no . 808993 Through Thickness Test Buletin No.21-2204 - Z ≥ 25% values : 75.83; 72.43; 74.35
- Z ≥ 35% values : 74.20
- U TS (N/mm²) values: 484.8; 495.4; 488.3
Heat no . 808999 Through Thickness Test Buletin No.21-2203 - Z ≥ 25% values : 72.61; 75.65; 73.64
- Z ≥ 35% values : 73.97
- U TS (N/mm²) values: 502.5; 509.6; 495.4

BUREAU VERITAS ITALIA WELDING
IT FILE: 2[illegible]3756304.138 48
DATE: 14/02/2022
WITNESSED ☐ REVIEW ☑

Witnessed/Reviewed
Florin Hriscu
Inspector/Buyer representative
16.02.21

BUREAU VERITAS ROMANIA 20 PARIS 1828 INDUSTRY & FACILITIES ROMAN

We state on our sole responsibility that the delivered products are in conformity with the order requirements.

Quality Control Representative
Fiz. Antonica Sergiu

ArcelorMittal Tubular Products Roman S.A. J27/00/91 Romania

Formular 12A2, rev. 3

Certificado Nº (Certificate No.) S/ According to EN 10204-3.2 Página (Page) Fecha (Date)	275047-D1-20180404 Pag 1 / 4 04/04/2018

AENOR ER Empresa Registrada UNE-EN ISO 9001 ER-0030/1992

ArcelorMittal España, S.A.
Residencia de la Granda
33418 - Gozón
Asturias - España

CERTIFICADO DE INSPECCIÓN
INSPECTION CERTIFICATE

ArcelorMittal

O. Suministro (Works Order No)	Cliente (Customer)	Destino (Destination)	Producto (Product)	Especificación (Specification)	Pedido cliente/Customer order:
BC8219	ARCELOR PROJECTS INT. BV	MANNESMANNWEG. 5 4794SL - HEIJNINGEN-HOLANDA	Chapa Gruesa / Heavy Plate	S355G10+M S355ML EN 10225 EN 10025-4 MOD NORSOK	FB74AMP01W 3200055705

Descripción del producto / Description of the product

ITEM 10

Colada (Heat No)	Chapa (Plate No)	Dimensiones, mm (Size, mm)	Peso, t (Weight)
705587	42843891	30 x 3050 x 12000	8,619

Colada (Heat No)	Chapa (Plate No)	Dimensiones, mm (Size, mm)	Peso, t (Weight)
705587	42843901	30 x 3050 x 12000	8,619

Colada (Heat No)	Chapa (Plate No)	Dimensiones, mm (Size, mm)	Peso, t (Weight)
705587	42844171	30 x 3050 x 12000	8,619

Colada (Heat No)	Chapa (Plate No)	Dimensiones, mm (Size, mm)	Peso, t (Weight)

Total chapas (plates)	3	Total peso (Weight)	25,86

Análisis de colada y producto / Heat and product analysis

SU02: Nb+V SU03: Nb+V+Ti PCM: C+Si/30+(Mn+Cu+Cr)/20+Ni/60+Mo/15+V/10+5B CEV: C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15

Nº Colada (Heat No)	Nº muestra (Sample No)	Composición química (Chemical analysis)% *(H=Colada / Heat P=Producto / Product)																									
		*H/P	C	Mn	Si	S	P	Al	N	Cu	Ni	Cr	Mo	Nb	V	Ti	B	As	Sn	Sb	Pb	Ca	Bi	Pcm	Cev	SU03	SU02
705587		H	0,06	1,52	0,274	0,002	0,013	0,024	0,0044	0,212	0,301	0,032	0,003	0,028	0,003	0,012	0,0001	0,002	0,0030	0,000	<0,001	0,0001	<0,002	0,16	0,35	0,04	0,03
	20171023081	P	0,06	1,53	0,273	0,003	0,012	0,022	0,0047	0,217	0,301	0,029	0,001	0,025	0,005	0,012	0,0001							0,17	0,36	0,04	0,03

(1) L=longitudinal T= Transversal Z= Through thickness D= Diagonal
(2) C=Cabeza (top) P=Pie (bottom) S= Superficie (surface) 4=1/4 esp. (1/4 thickness) 3=1/3 esp. (1/3 thickness) E=Esp. Completo (full thick.) N=Nucleo (midthickness)
(3) " " =BrutoLaminación (as rolled) - A= N +R - L=Conformado de Normalización (normalizing rolling) - T=Tratamiento Termomec.(termomec. rolling) - N=Normalizado(normalized) - R=Revenido(tempering)

Ensayos mecánicos / Mechanical test

Type of test: A: Ultrasonic test approved; Z35: Through thickness test; HV: Vickers hardness test;(HT)*: Postwelding heat treatment of test coupons: 580 +/- 20ºC Soaking time: 4h.
ISO-V: Toughness; ISO-V(S): Toughness after stretching 5%; ISO-V(S+A): Toughness after stretching 5% + 250ºC, 1 hour

Nº Chapa (Plate No.)	Nº Muestra (Sample No)	Esp. Thickness	Est.Sum (Delivered condition) (3)	UST (Us test)	Tipo ensayo (Type of test)		Orient. (Orientation) (1)	Local. (Location) (2)	Temp. (Temp) ºC	Ensayo de tracción (Tensile test) Reh Y.P. Mpa	Rm T.S. Mpa	Reh / Rm	%A Elong. (1) 5,65√So (2) 8 Inch	Ensayo Resiliencia (Charpy-V Impact test) Energía (Energy), j Individuales (Inviduals) 1	2	3	Media (Av.)	Otros ensayos (other test) Individuales (Inviduals) 1	2	3	Media (Av.)	Doblado (Bend test) Mandril (Mandrel)	Angulo (Angle)	Result. (Result)
42843891	20171023065	30	T	A	ISO-V 10 (HT)	(j)	T	C S	-40					210	238	231	226							
	20171023065	30	T	A	ISO-V 10 (HT)	(j)	L	C S	-50					300	293	282	292							
	20171023065	30	T	A	ISO-V 10	(j)	T	C S	-40					257	300	270	276							
	20171023065	30	T	A	ISO-V 10	(j)	L	C S	-50					300	300	283	294							

BUREAU VERITAS ITALIA WELDING
IT FILE: 22 SC. 375 6304 138
DATE: 14/02/2018
WITNESSED ☐ REVIEW ☑

B.O.S. Continuously cast slab.
Visual and dimensional inspection of plates: satisfactory
Surface quality according/ EN 10163 Class B Subclass 3+ ISO 8501 Class B
Dimensional tolerances according to EN 10029; thickness tolerances according to EN 10029 class C
Flatness: EN 10029 (2010) Class N
EN 10025: Options 2 and 4; EN 10225: Options 10, 12, 13 and 18
Ultrasonic inspection EN 10160 S2 E3

CE 0099 ArcelorMittal España,S.A. Residencia la Granda 33418 Gozón (Asturias - España) 07 QP00033_CPR2013-07-01_FC_V006 EN 10025-4:2004 S355ML

Uso previsto: estructuras soldadas, atornilladas o remachadas. (intented to be used in welded, bolted and riveted structures)
Límite elástico (Yield strength)*
Resistencia a tracción (Tensile strength)*
Alargamiento (Elongation)*
Resis. flexión choque (Impact strength)*
Soldabilidad (Weldability)*
Durabilidad (Durability)*
* Expresado como se indica en el DdP (Expressed as indicated in the DoP)

Por / By Classification society
Javier Sánchez Gijon Office Lloyd's Register España SA

Por / By ArcelorMittal España
Juan Manual Vigil Fernández
Jefe Calidad Chapa Gruesa Heavy Plate Quality Manager Flat Carbon Europe

ArcelorMittal España,S.A - Registro Mercantil de Asturias,Tomo 2279, Folio 115, Hoja AS- 17946-N.I.F.A81046856 - Oficina de certificados:certificados.gijon@arcelormittal.com-Tlf+ 34985187776

Certificado Nº (Certificate No.) S/ According to EN 10204-3.2 Página (Page) Fecha (Date)	275047-D1-20180404 Pag 2 / 4 04/04/2018

AENOR ER Empresa Registrada UNE-EN ISO 9001 ER-0030/1992

ArcelorMittal España, S.A.
Residencia de la Granda
33418 - Gozón
Asturias - España

CERTIFICADO DE INSPECCIÓN
INSPECTION CERTIFICATE

ArcelorMittal

O. Suministro (Works Order No)	Cliente (Customer)	Destino (Destination)	Producto (Product)	Especificación (Specification)	Pedido cliente/Customer order:
BC8219	ARCELOR PROJECTS INT. BV	MANNESMANNWEG. 5 4794SL - HEIJNINGEN-HOLANDA	Chapa Gruesa / Heavy Plate	S355G10+M S355ML EN 10225 EN 10025-4 MOD NORSOK	FB74AMP01W 3200055705

(1) L=longitudinal T= Transversal Z= Through thickness D= Diagonal
(2) C=Cabeza (top) P=Pie (bottom) S= Superficie (surface) 4=1/4 esp. (1/4 thickness) 3=1/3 esp. (1/3 thickness) E=Esp. Completo (full thick.) N=Nucleo (midthickness)
(3) " " =BrutoLaminación (as rolled) - A= N +R - L=Conformado de Normalización (normalizing rolling) - T=Tratamiento Termomec.(termomec. rolling) - N=Normalizado(normalized) - R=Revenido(tempering)
Type of test: A: Ultrasonic test approved; Z35: Through thickness test; HV: Vickers hardness test;(HT)*: Postwelding heat treatment of test coupons: 580 +/- 20ºC Soaking time: 4h.
ISO-V: Toughness; ISO-V(S): Toughness after stretching 5%; ISO-V(S+A): Toughness after stretching 5% + 250ºC, 1 hour

Ensayos mecánicos / Mechanical test

Nº Chapa (Plate No.)	Nº Muestra (Sample No)	Esp. Thickness	Est.Sum (Delivered condition) (3)	UST (Us test)	Tipo ensayo (Type of test)	Orient. (Orientation) (1)	Local. (Location) (2)	Temp. (Temp) ºC	Ensayo de tracción (Tensile test) Reh Y.P. Mpa	Rm T.S. Mpa	Reh / Rm	%A Elong. (1) 5,65√So (2) 8 Inch	Ensayo Resiliencia (Charpy-V Impact test) Energía (Energy), j Individuales (Inviduals) 1	2	3	Media (Av.)	Otros ensayos (other test) Individuales (Inviduals) 1	2	3	Media (Av)	Doblado (Bend test) Mandril (Mandrel)	Angulo (Angle)	Result. (Result)
	20171023065	30	T	A	Tensile (HT)* (Mpa)	T	C E		440	509	0,86	31,9											
	20171023065	30	T	A	Tensile Z (Mpa)	Z	C E			587													
	20171023065	30	T	A	Tensile (Mpa)	T	C E		430	511	0,84	28,4											
	20171023065	30	T	A	Z35 (%)	Z	C E										75	44	65	61			
	20171023078	30	T	A	ISO-V(S+A) 10 (j)	T	C S	-40					174	42	182	133							
	20171023078	30	T	A	ISO-V(S) 10 (j)	T	C S	-40					248	207	221	225							
	20171023078	30	T	A	HV 10	T	C S	20									155	149	150	151			
	20171023081	30	T	A	HV 10	T	P S	20									149	151	150	150			
42843901	20171023072	30	T	A	ISO-V 10 (HT) (j)	T	C S	-40					193	233	281	236							
	20171023072	30	T	A	ISO-V 10 (HT) (j)	L	C S	-50					300	300	300	300							
	20171023072	30	T	A	ISO-V 10 (j)	T	C S	-40					300	300	300	300							
	20171023072	30	T	A	ISO-V 10 (j)	L	C S	-50					261	240	253	251							
	20171023072	30	T	A	Tensile (HT)* (Mpa)	T	C E		432	504	0,86	33,0											
	20171023072	30	T	A	Tensile Z (Mpa)	Z	C E			591													
	20171023072	30	T	A	Tensile (Mpa)	T	C E		453	514	0,88	31,9											

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.375304.138
DATE: 14/02/2022
WITNESSED ☐ REVIEW ☑

B.O.S. Continuously cast slab.
Visual and dimensional inspection of plates: satisfactory
Surface quality according/ EN 10163 Class B Subclass 3+ ISO 8501 Class B
Dimensional tolerances according to EN 10029; thickness tolerances according to EN 10029 class C
Flatness: EN 10029 (2010) Class N
EN 10025: Options 2 and 4; EN 10225: Options 10, 12, 13 and 18
Ultrasonic inspection EN 10160 S2 E3

Por / By Classification society

Javier Sánchez
Gijón Office
Lloyd's Register España SA

Por / By ArcelorMittal España

Juan Manual Vigil Fernández
Jefe Calidad Chapa Gruesa Heavy Plate Quality Manager
Flat Carbon Europe

Certificado Nº (Certificate No.) S/ According to EN 10204-3.2 Página (Page) Fecha (Date)	275047-D1-20180404 Pag 3 / 4 04/04/2018

AENOR ER Empresa Registrada UNE-EN ISO 9001 ER-0030/1992

ArcelorMittal España, S.A.
Residencia de la Granda
33418 - Gozón
Asturias - España

CERTIFICADO DE INSPECCIÓN
INSPECTION CERTIFICATE

ArcelorMittal

O. Suministro (Works Order No)	Cliente (Customer)	Destino (Destination)	Producto (Product)	Especificación (Specification)	Pedido cliente/Customer order:
BC8219	ARCELOR PROJECTS INT. BV	MANNESMANNWEG. 5 4794SL - HEIJNINGEN-HOLANDA	Chapa Gruesa / Heavy Plate	S355G10+M S355ML EN 10225 EN 10025-4 MOD NORSOK	FB74AMP01W 3200055705

(1) L=longitudinal T= Transversal Z= Through thickness D= Diagonal
(2) C=Cabeza (top) P=Pie (bottom) S= Superficie (surface) 4=1/4 esp. (1/4 thickness) 3=1/3 esp. (1/3 thickness) E=Esp. Completo (full thick.) N=Nucleo (midthickness)
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Type of test: A: Ultrasonic test approved; Z35: Through thickness test; HV: Vickers hardness test;(HT)*: Postwelding heat treatment of test coupons: 580 +/- 20°C Soaking time: 4h.
ISO-V: Toughness; ISO-V(S): Toughness after stretching 5%; ISO-V(S+A): Toughness after stretching 5% + 250°C, 1 hour

Ensayos mecánicos / Mechanical test

Nº Chapa (Plate No.)	Nº Muestra (Sample No)	Esp. Thickness	Est.Sum (Delivered condition) (3)	UST (Us test)	Tipo ensayo (Type of test)	Orient. (Orientation) (1)	Local. (Location) (2)	Temp. (Temp) °C	Ensayo de tracción (Tensile test) Reh Y.P. Mpa	Rm T.S. Mpa	Reh / Rm	%A Elong. (1) 5,65√So (2) 8 Inch	Ensayo Resiliencia (Charpy-V Impact test) Energia (Energy), j Individuales (Inviduals) 1	2	3	Media (Av.)	Otros ensayos (other test) Individuales (Inviduals) 1	2	3	Media (Av)	Doblado (Bend test) Mandril (Mandrel)	Angulo (Angle)	Result. (Result)
	20171023072	30	T	A	Z35 (%)	Z	C E										75	72	72	73			
	20171023078	30	T	A	ISO-V(S+A) 10 (j)	T	C S	-40					174	42	182	133							
	20171023078	30	T	A	ISO-V(S) 10 (j)	T	C S	-40					248	207	221	225							
	20171023078	30	T	A	HV 10	T	C S	20									155	149	150	151			
	20171023081	30	T	A	HV 10	T	P S	20									149	151	150	150			
42844171	20171023078	30	T	A	ISO-V(S+A) 10 (j)	T	C S	-40					174	42	182	133							
	20171023078	30	T	A	ISO-V(S) 10 (j)	T	C S	-40					248	207	221	225							
	20171023078	30	T	A	HV 10	T	C S	20									155	149	150	151			
	20171023078	30	T	A	ISO-V 10 (HT) (j)	T	C S	-40					300	273	251	275							
	20171023078	30	T	A	ISO-V 10 (HT) (j)	L	C S	-50					213	228	226	222							
	20171023078	30	T	A	ISO-V 10 (j)	T	C S	-40					209	156	169	178							
	20171023078	30	T	A	ISO-V 10 (j)	L	C S	-50					280	300	287	289							
	20171023078	30	T	A	Tensile (HT)* (Mpa)	T	C E		401	501	0,80	31,9											
	20171023078	30	T	A	Tensile Z (Mpa)	Z	C E			582													
	20171023078	30	T	A	Tensile (Mpa)	T	C E		408	507	0,80	31,3											

BUREAU VERITAS ITALIA WELDING
IT FILE: 22.SF.37.6306.138
DATE: 14/02/2018
WITNESSED ☐ REVIEW ☑

B.O.S. Continuously cast slab.
Visual and dimensional inspection of plates: satisfactory
Surface quality according/ EN 10163 Class B Subclass 3+ ISO 8501 Class B
Dimensional tolerances according to EN 10029; thickness tolerances according to EN 10029 class C
Flatness: EN 10029 (2010) Class N
EN 10025: Options 2 and 4; EN 10225: Options 10, 12, 13 and 18
Ultrasonic inspection EN 10160 S2 E3

Por / By Classification society

Lloyd's Register
Javier Sánchez
Gijon Office
Lloyd's Register España SA

Por / By ArcelorMittal España

Juan Manual Vigil Fernández
Jefe Calidad Chapa Gruesa Heavy Plate Quality Manager
Flat Carbon Europe

Certificado Nº (Certificate No.) S/ According to EN 10204-3.2 Página (Page) Fecha (Date)	275047-D1-20180404 Pag 4 / 4 04/04/2018

AENOR ER Empresa Registrada UNE-EN ISO 9001 ER-0030/1992

ArcelorMittal España, S.A.
Residencia de la Granda
33418 - Gozón
Asturias - España

CERTIFICADO DE INSPECCIÓN
INSPECTION CERTIFICATE

ArcelorMittal

O. Suministro (Works Order No)	Cliente (Customer)	Destino (Destination)	Producto (Product)	Especificación (Specification)	Pedido cliente/Customer order:
BC8219	ARCELOR PROJECTS INT. BV	MANNESMANNWEG. 5 4794SL - HEIJNINGEN-HOLANDA	Chapa Gruesa / Heavy Plate	S355G10+M S355ML EN 10225 EN 10025-4 MOD NORSOK	FB74AMP01W 3200055705

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Type of test: A: Ultrasonic test approved; Z35: Through thickness test; HV: Vickers hardness test;(HT)*: Postwelding heat treatment of test coupons: 580 +/- 20ºC Soaking time: 4h.
ISO-V: Toughness; ISO-V(S): Toughness after stretching 5%; ISO-V(S+A): Toughness after stretching 5% + 250ºC, 1 hour

Ensayos mecánicos / Mechanical test

Nº Chapa (Plate No.)	Nº Muestra (Sample No)	Esp. Thickness	Est.Sum (Delivered condition) (3)	UST (Us test)	Tipo ensayo (Type of test)	Orient. (Orientation) (1)	Local. (Location) (2)	Temp. (Temp) ºC	Ensayo de tracción (Tensile test) Reh Y.P. Mpa	Rm T.S. Mpa	Reh / Rm	%A Elong. (1) 5,65√So (2) 8 Inch	Ensayo Resiliencia (Charpy-V Impact test) Energía (Energy), j Individuales (Inviduals) 1	2	3	Media (Av.)	Otros ensayos (other test) Individuales (Inviduals) 1	2	3	Media (Av)	Doblado (Bend test) Mandril (Mandrel)	Angulo (Angle)	Result. (Result)
	20171023078	30	T	A	Z35 (%)	Z	C E										73	71	68	71			
	20171023081	30	T	A	HV 10	T	P S	20									149	151	150	150			

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.5F.375304.13B
DATE: 14/02/2022
WITNESSED ☐ REVIEW ☐

B.O.S. Continuously cast slab.
Visual and dimensional inspection of plates: satisfactory
Surface quality according/ EN 10163 Class B Subclass 3+ ISO 8501 Class B
Dimensional tolerances according to EN 10029; thickness tolerances according to EN 10029 class C
Flatness: EN 10029 (2010) Class N
EN 10025: Options 2 and 4; EN 10225: Options 10, 12, 13 and 18
Ultrasonic inspection EN 10160 S2 E3

Por / By Classification society

Lloyd's Register
Javier Sánchez
Gijón Office
Lloyd's Register España SA

Por / By ArcelorMittal España

Juan Manual Vigil Fernández
Jefe Calidad Chapa Gruesa Heavy
Plate Quality Manager
Flat Carbon Europe

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2021-12-22

Numero certificato/Cert no: EC26661767 rev. 0

Nostro ordine/Our order:	0100420342	Vostro ordine/Your order:	437/21
Nostro riferimento/Our ref:	HYBRIS PRD account	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB01056	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20211221	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address
TECHNO SERVICE S.R.L.
VIA DELLA MERENDA32 FOR.ZARATTINI
48124 RAVENNA
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
TECHNO SERVICE S.R.L.
VIA DELLA MERENDA,32 FOR.ZARATTINI
48124 RAVENNA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PNV4610432 Quantità/Quantity: 896 KGM

PRODOTTO/PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK Tubrod 15.17 1.2mm 16kg
Codice/Item no:	**1517127730**

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.29: E81T1-Ni1CJ H4
SFA/AWS A5.29: E81T1-Ni1MJ
EN ISO 17632-A: T 46 3 1Ni P C1 2 H5
EN ISO 17632-A: T 46 4 1Ni P M21 2 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:	M21 (EN ISO 14175)
C	0.07%
Si	0.37%
Mn	1.15%
P	0.01%
S	0.02%
Cr	0.03%
Ni	1.1%
Mo	0.02%
Nb	0.02%
Cu	0.01%
V	0.02%

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: In accordo a/acc to EN 10204 - 2.2

Norma/Standard:	EN
Altro/Auxiliary:	M21 (EN ISO 14175)
Condizione/Condition:	As welded

TRAZIONE/TENSILE

ReL	Rm	A5
544 MPa	613 MPa	26 %

RESILIENZA/IMPACT

Temp	-40 °C
KV	124 J

BUREAU VERITAS ITALIA WELDING 48
IT FILE: 22.SF.375830.138
DATE: 14/02/2022
WITNESSED ☐ REVIEW ☑

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura S.p.A. | Str. Provinciale 34, n.37 - 20010 Ossona MI, Italy

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis		Validazione - altro/Validation - Others	
Piotr Grela	Quality Assurance Manager	Neil Farrow	Product Manager

ROSETTI MARINO SPA

PQR N° 13 / 98

SHEET 1 OF 2

PROCEDURE QUALIFICATION RECORD

PREPARED BY G.P.R DATE 03.03.98

COMPANY NAME ROSETTI MARINO S.p.A.

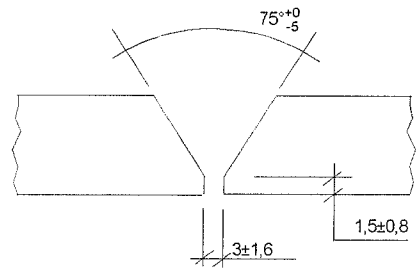
PROCEDURE QUALIFICATION RECORD No. 13/98 DATE 03.03.98

WPS No 13/98

WELDING PROCESS (ES) GMAW

TYPES (MANUAL,AUTOMATIC,SEMI-AUTO.) SEMIAUTOMATIC + MACHINE

JOINTS (QW-402)



Groove Design of Test Coupon

BASE METALS (QW-403)

Material Spec A 333 Gr 6 / API 5L X60

Type or Grade

P No 1.1 to P No 1.2

Thickness of Test Coupon 6 mm

Diameter of Test Coupon 6"

Other

FILLER METALS (QW-404)

GMAW

SFA Specification 5.18

AWS Classification ER 70 S-6

Filler Metal F-No 6

Weld Metal Analysis A-No 1

Size of Filler Metal 1,0 mm

Other FILCORD C (FRO)

Deposited Weld Metal 6 mm

POSITION (QW-405)

Position of Groove 1 GR

Weld Progression (Uphill,Downhill) N.A.

Other N.A.

PREHEAT (QW-406)

Preheat Temp 20°C

Interpass Temp 240°C

Other N.A.

POSTWELD HEAT TREATMENT (QW-407)

Temperature N.A.

Time N.A.

Other

GAS (QW-408)

Percent Composition

	Gas(es)	(Mixture)	Flow Rate
Shielding	$Ar+CO_2$	92-8%	15 l/min
Trailing	$Ar+CO_2$	92-8%	22 l/min
Backing	N.A.	N.A.	N.A.

ELECTRICAL CHARACTERISTICS (QW-409)

Current D.C.

Polarity REV

Amps 120÷140 / 130÷150 Volts 18÷20 / 24÷26

Tungsten Electrode Size N.A.

Other N.A.

TECHNIQUE (QW-410)

Travel Speed 16÷20 cm/1'

String or Weave Bead STRING (MAX WEAVE 15 mm)

Oscillation MAX 15 mm

Multipass or Single Pass (per side) MULTIPLE

Single or Multiple Electrodes SINGLE

Other FIRST PASS SEMIAUTOMATIC

H.I. MAX 14,6 KJ/cm

REGISTRO ITALIANO NAVALE

V. Ravagli

MOD41.PRE REV.0 DEL 01.03.93

PQR-13-98 PRE

ROSETTI MARINO SPA

PQR N° 13 / 98

SHEET 2 OF 2

PREPARED BY G.P.R DATE 03.03.98

PROCEDURE QUALIFICATION RECORD

TENSILE TEST (QW-150)

SPECIMEN No	WIDTH mm	THICKNESS mm	AREA mmq	ULTIMATE TOTAL LOAD KN	ULTIMATE UNIT STRESS N/mmq	TYPE OF FAILURE & LOCATION
TT 1	19,3	6	115,8		562	DUCTILE OUT WELD
TT 2	19,2	6	115,2		510	DUCTILE OUT WELD

GUIDED BEND TESTS (QW-160)

TYPE AND FIGURE NO	RESULT
2 F B	180° SATISFACTORY
2 R B	180° SATISFACTORY

TOUGHNESS TESTS (QW-170)

SPECIMEN No	NOTCH LOCATION	NOTCH TYPE	TEST TEMP	IMPACT VALUES J	LATERAL EXP		DROP WEIGHT	
					% SHEAR	MILS	BREAK	NO BREAK
5 X 10	WM	KV	-40°C	37-42-42(40)				
5 X 10	HAZ P1.1	KV	-40°C	89-94-92(91)				
5 X 10	HAZ P1.2	KV	-29°C	96-106-96(99)				

FILLET WELD TEST (QW-180)

Result - Satisfactory; Yes _____ No _____ Penetration into Parent Metal: Yes _____ No _____

Macro - Results _____

OTHER TESTS

Type of test VISUAL, MAGNETIC PARTICLE AND X-RAY EXAMINATION: SATISFACTORY

Deposit Analysis NONE

Other HARDNESS TEST HV10: SATISFACTORY

Welder's Name DONDI FRANCO (SEMIAUTOMATIC) DESTRI ROBERTO (MACHINE) Clock No _____ Stamp No _____

Tests conducted by: EUROLAB Laboratory Test No 15465

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code

REGISTRO ITALIANO NAVALE V. Ravagli

Manufacturer ROSETTI MARINO SpA Agostino Mordenti (Welding Engineer)

Date 03.03.98 By _____

MOD41A.PRE REV.0 DEL 01.03.93

PQR-13-98 PRE

ROSETTI MARINO SPA	SPEC N° 13 / 98	PAGE pagina
	REV 0	SHEET foglio 1 di 2

CUSTOMER Cliente	JOB Lavoro	PREP'D Comp. G.P.R
		APPR'D Appr A.M.

WELDING PROCEDURE SPECIFICATION (QW-482)

Specifica di saldatura

COMPANY NAME Società: ROSETTI MARINO S.p.A. BY di:

WELDING PROCEDURE SPECIFICATION N° Specifica di saldatura: 13 / 98 DATE Data: 12.02.98 SUPPORTING PQR N° (S) Qualificata da verb: 13/98

REVISION N° Revisione: 0 DATE data:

WELDING PROCESS (ES) Procedimento (i) di saldatura: GMAW TYPE (S) tipo (i): SEMIAUTOMATIC + MACHINE

JOINTS (QW-402) Giunti

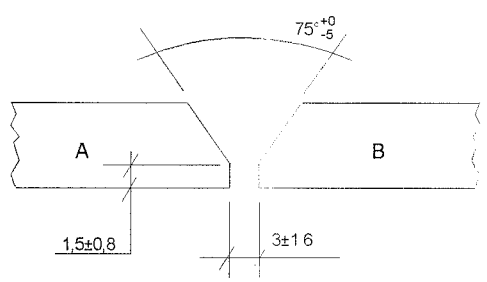
JOINT DESIGN Tipo di Giunto: SINGLE VEE GROOVE

BACKING (YES) Supporto (si): N.A. (NO) (no): NO

BACKING MATERIAL (TYPE) Materiale di Supp (tipo): N.A.

- [x] METAL Metallico
- [ ] NON FUSING METAL Metallo non fondente
- [ ] NON METALLIC Non Metallico
- [ ] OTHER Altro

DETAILS Dettagli



BASE METALS (QW-403) Materiale Base

P-N° 1 GROUP N° 1 TO P-N° 1 GROUP N° 2

OR / Oppure

SPECIFICATION TYPE AND GRADE Tipo e Grado: SA 333 Gr 6 (P1.1) SIDE A

TO SPECIFICATION TYPE AND GRADE A Tipo e Grado: API 5L X60 (P1.2) SIDE B

OR / Oppure

CHEM ANALYSIS AND MECH PROP Analisi Chimica e Proprietà Meccaniche: N.A.

TO CHEM ANALYSIS AND MECH PROP Ad Analisi Chimica e Proprietà Meccaniche: N.A.

THICKNESS RANGE: Gamma Spessori:

BASE METAL: Metallo Base:	GROOVE Piena Pen	6 mm	FILLET Cord. d'angolo	N.A.
PIPE DIA. RANGE: Gamma Diametri:	GROOVE Piena Pen	6"	FILLET Cord. d'angolo	N.A.

OTHER Altro:

FILLER METALS (QW-404) Metallo d'apporto: GMAW

SPEC N°(SFA): A 5.18

AWS N° (CLASS): ER 70 S-6

F-N°: 6

A N°: 1

SIZE OF FILLER METALS Diametro Materiale d'apporto: 1,0 mm

DEPOSITED WELD METAL Metallo depositato: 6 mm

THICKNESS RANGE Gamma Spessori

GROOVE Piena Pen: 6 mm

FILLET Cord. d'angolo: N.A.

ELECTRODE-FLUX(CLASS) Accoppiamento Filo-Flusso: N.A.

FLUX TRADE NAME Denom comm Flusso: N.A.

CONSUMABLE INSERT Inserto Consumabile: N.A.

OTHER Altro: FILCORD C (FRO)

3034106.PRE

WPS-13-98.PRE

ROSETTI MARINO SPA

SPEC N°	13 / 98	PAGE pagina	
REV.	0	SHEET foglio	2 of di 2

CUSTOMER Cliente	JOB Lavoro	PREP.'D Comp	G.P.R.
		APPR 'D Appr	A.M.

QW-482 (BACK)

POSITION (QW-405)
Posizioni

POSITION(S) OF GROOVE (Posizione (i) cianfrino): 1G ROTATED

WELDING PROGRESSION: UP (ascendente) N.A. DOWN (discendente) N.A.
Progressione Saldatura:

POSITION(S) OF FILLET (Posiz cord d'angolo): N.A.

PREHEAT (QW-406)
Preriscaldo

PREHEAT TEMP MIN (Temp di prerisc min): 20°C

INTERPASS TEMP MAX (Temp Max di Interpass): 240°C

PREHEAT MAINTENANCE (Manten Preriscaldo): N.A.

POSTWELD HEAT TREATMENT (QW-407)
Trattamento Termico

TEMPERATURE RANGE (temperatura): N.A.

TIME RANGE (Tempo): N.A.

GAS (QW-408)
Gas protettivo

	GAS(ES) Gas	(MIXTURE) (miscela)	FLOW RATE Portata
	PERCENT COMPOSITION composiz percentuale		
SHIELDING protezione	Ar+CO_2	92-8	15 l/min (SEMIAUTOMATIC)
TRAILING Prot al seguito	Ar+CO_2	92-8	22 l/min (MACHINE)
BACKING Prot al rovescio	N.A.	N.A.	N.A.

ELECTRICAL CHARACTERISTICS (QW-409)
Caratteristiche Elettriche

CURRENT AC OR DC (Corrente alt o cont.): D.C.

POLARITY (Polarità): REV

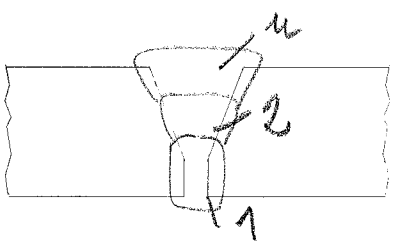
AMPS (RANGE) (Amperaggio): SEE TABLE

VOLTS (RANGE) (Voltaggio): SEE TABLE

TUNGSTEN ELECTRODE SIZE AND TYPE (Diametro e Tipo Elettrodo di Tungsteno): N.A.

MODE FOR METAL TRANSFER FOR GMAW (Metodo di trasferimento per GMAW): PULSATING ARC

ELETTRODE WIRE FEED SPEED RANGE (Velocità di alimentazione Filo): N.A.



TECHNIQUE (QW-410)
Tecnica

STRING OR WEAVE BEAD (Passata tirata o a maglia larga): STRING (MAX WEAVE 15 mm)

ORIFICE OR GAS CUP SIZE (Dimensione Bocchello Gas): 3/8"

INITIAL AND INTERPASS CLEANING (BRUSHING,GRINDING,ETC.) (Pulizia iniziale e fra le passate): BRUSHING or GRINDING

METHOD OF BACK GOUGING (Metodo di Solcatura a rovescio): N.A.

OSCILLATION (Oscillazione): N.A.

CONTACT TUBE TO WORK DISTANCE (Distanza tra Tubo di contatto e Pezzo): N.A.

MULTIPLE OR SINGLE PASS (PER SIDE) (Passata multipla o singola (per lato)): MULTIPLE

MULTIPLE OR SINGLE ELECTRODES (Elettrodo multiplo o singolo): SINGLE

TRAVEL SPEED (RANGE) (Velocità): SEE TABLE

PEENING (Martellatura): NONE

OTHER (Altro):

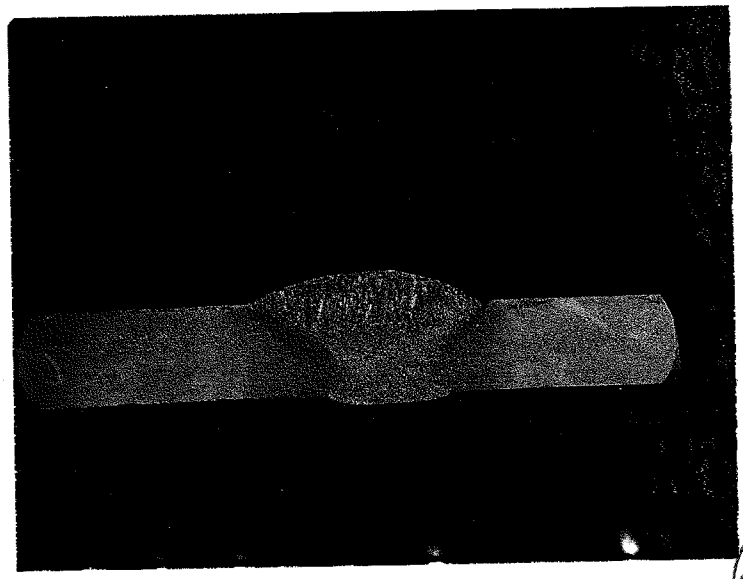
WELD LAYER(S) Passata(e)	PROCESS Procedim	FILLER METAL Metallo d'apporto CLASS Classe	FILLER METAL DIA Diam	CURRENT TYPE POLAR Polarita	CURRENT AMP. RANGE Amperaggio	VOLT RANGE Voltaggio	TRAVEL SPEED RANGE Velocità Avanzam	OTHER Altro HI MAX
1	GMAW*	ER 70S-6	1,0	DC/REV	120÷140	18÷20	18÷20 cm/1'	9,3 KJ/cm
2÷n	GMAW**	ER 70S-6	1,0	DC/REV	130÷150	24÷26	16÷18 cm/1'	14,6 KJ/cm
* MANUAL TYPE								
** MACHINE TYPE								

3034106.PRE

Rapporto di Prova *Test Report*	15465/1 Pag. 2 di 2	Data *Date*	27-02-98

EUROLAB

ESAME MACROGRAFICO
Macrographic Test
UNI 3138/84 - UNI 7686/77 - EN 1321



Macrografia *Macrophotograph*	1
Attacco chimico *Macrophotograph*	Nital 10%
Ingrandimenti *Magnificat*	2X
Campione *Sample*	PQR13
Sezione *Section*	Trasversale *Transverse*

Giudizio *Result*	FUSIONE ACCETTABILE--NO DIFETTI *SATISFACTORY -- NO DEFECT*

PROVA DI DUREZZA VICKERS
HARDNESS TEST
UNI 1955/90 - EN 1043/1
Durometro VEB - Codice Du01
Certificato di taratura Sit n° 8304 del 01.10.97
Procedura di Prova n° 13

DUREZZE HV_{10}

1	142	*11*	212	*21*	206	*31*		*41*	
2	145	*12*	201	*22*	171	*32*		*42*	
3	146	*13*	169	*23*	170	*33*		*43*	
4	212	*14*	170	*24*	170	*34*		*44*	
5	215	*15*	170	*25*	209	*35*		*45*	
6	227	*16*	183	*26*	206	*36*			
7	177	*17*	181	*27*	198	*37*			
8	176	*18*	180	*28*	181	*38*			
9	176	*19*	186	*29*	175	*39*			
10	218	*20*	196	*30*	175	*40*			



REGISTRO ITALIANO NAVALE
V. Ravaglia

I dati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova.
Il committente si impegna a riprodurre integralmente il rapporto di prova: è vietata ogni forma di riproduzione parziale

EUROLAB GARANZIA QUALITA' s.r.l.
via Della Resistenza 7/4 - 41011 Campogalliano (Modena) - Italy
telefono 059/527775 - fax 059/527773 - Partita IVA 02413300361

EUROLAB

Rapporto di Prova Test Report	15465/1 Pag. 1 di 2	Data Date	27-02-98
Committente Customer	**ROSETTI MARINO Spa** Via Trieste, 230 48100 RAVENNA - RA		

***Vostro riferimento**/Reference*	D.61 T.C.M.I. del 24-02-98
***Campione**/Sample*	***PQR13***
***Descrizione**/Description*	QUALIFICA PROCEDIMENTO
***Data ricevimento**/Receiving date*	26-02-98
***Ns. codice campione**/Sample code*	7818
***Prova richiesta**/Test*	***GIUNTI TESTA-TESTA < 14mm***
***Data esecuzione prova**/Test date*	27-02-98

***Oggetto**/Object*	PQR13		
***Ordine N°**/Order Nr.*		***Materiale**/Material*	API5L-X60//SA333Gr6
***Norme**/Specifications*	ESME IX	***Ente collaudo**/Inspector*	RINA

PROVE MECCANICHE
MECHANICAL TESTS

Norme di riferimento			UNI EN 10002-1/92 EN 895				UNI 4714/68 UNI EN 10045/92 - EN 875			UNI564 EN910
APPARECCHIATURE IMPIEGATE ***Macchina Universale Galdabini PM200 - Cod. PM01*** ***Carico Massimo 200kN - Cert. SIT 8299 del 01.10.97*** ***Martello a Pendolo Galdabini CH30 - Cod. PR01*** ***Cert. SIT 8302 del 01.10.97***			***Carico rottura*** *Tensile Strength*	***Carico snervam.*** *Yeld Stress*	***Allung.*** *Elong*		***Temp.*** *Temp*	***Resilienza*** *Impact Test*	***Media*** *Average*	***Piega*** *Bend Test*
			MPa	MPa	%		°C	J	J	a/D
***CARAT. RICHIESTE** / REQUIREMENTS*			>415					>19	>27	
Campione *Specimen*	***Dimensioni*** *Size*	***Sezione*** *Section So*	***L.Utile*** *Useful L. Lo*	***CARATTERISTICHE RILEVATE*** *RESULTS*							
	mm	*mm²*	*mm*	Rm	Rp	A			KV	KV	180°/4t
TT1	19.3X6	115.8		562			M.B				
TT2	19.2X6	115.2		510			M.B				
PTD1	38X6										OK
PTD2	38X6										OK
PTR1	38X6										OK
PTR2	38X6										OK
VWT	5X10X55							-40°	37-42-42	40	
VHT API	5X10X55							-29°	96-106-96	40	
VHT A333	5X10X55							-40°	89-94-92	99	

Responsabile prova
Test responsible
Per. Ind. Alberto Montagnani

Responsabile Laboratorio
Laboratory responsible
Dr. Paolo Moscatti

Ispettore
Inspector
REGISTRO ITALIANO NAVALE
V. Ravagli

I dati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova
Il committente si impegna a riprodurre integralmente il rapporto di prova è vietata ogni forma di riproduzione parziale

EUROLAB GARANZIA QUALITA' s.r.l.
via Della Resistenza 7/4 - 41011 Campogalliano (Modena) - Italy
telefono 059/527775 - fax 059/527773 - Partita IVA 02492540368

EUROLAB

Rapporto di Prova Test Report	15465/2 Pag. 1 di 1	Data Date	27-02-98
Committente Customer	**ROSETTI MARINO Spa** Via Trieste, 230 48100 RAVENNA - RA		

***Vostro riferimento**/Reference*	D.61 T.C.M.I. del 24-02-98
***Campione**/Sample*	***PQR13***
***Descrizione**/Description*	QUALIFICA PROCEDIMENTO
***Data ricevimento**/Receiving date*	26-02-98
***Ns. codice campione**/Sample code*	7818
***Prova richiesta**/Test*	***ESAME MAGNETOSCOPICO***
***Data esecuzione prova**/Test date*	27-02-98

***Oggetto**/Object*	PQR13		
***Ordine N°**/Order Nr.*		***Materiale**/Material*	API5L-X60//SA333Gr6
***Norme**/Specifications*	EN 1290 - UNI 7704-8930	***Ente collaudo**/Inspector*	RINA

***Preparazione superficie** / Surface preparations*		**COME SALDATO** / As welded	
***Metodo di magnetizzazione** / Magnetization method*		**GIOGO** / Joke	
***Corrente** / Current*	**C.C.**	***Apparecchio** / Flow Detector*	**CGM JOKE**
***Distanza** / Spacing*	**150 mm**		
***Mezzo di controllo** / Control by*	**LACCA BIANCA**	***Polvere** / Powder*	**NERA SPRAY** / Black
***Marca** / Trade-mark*	**CGM**	***Marca** / Trade-mark*	**CGM**
***Note**/Remarks*	Non si rileva la presenza di indicazioni di difettosità- No defects.		

RISULTATO
RESULTS

***CONFORME** / IN ACCORDING TO SPECIFICATIONS*

Tecnico II° Livello ASNT
Level II° Technicien ASNT
Per. Ind. Alberto Montagnani

Responsabile Laboratorio
Laboratory responsible
Dr. Paolo Moscatti

Ispettore
Inspector
REGISTRO ITALIANO NAVALE
V. Ragagli

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EUROLAB GARANZIA QUALITA' s.r.l.
via Della Resistenza 7/4 - 41011 Campogalliano (Modena) - Italy
telefono 059/527775 - fax 059/527773 - Partita IVA 03151310368

REGISTRO ITALIANO NAVALE 98|VE|1768|IN

VERBALE PROVE DI SALDATURA

SOCIETA' : ROSETTI MARINO SPA

PROCEDIMENTO : GMAW - SEMIAUTOMATICO + AUTOMATICO - ASME-IX

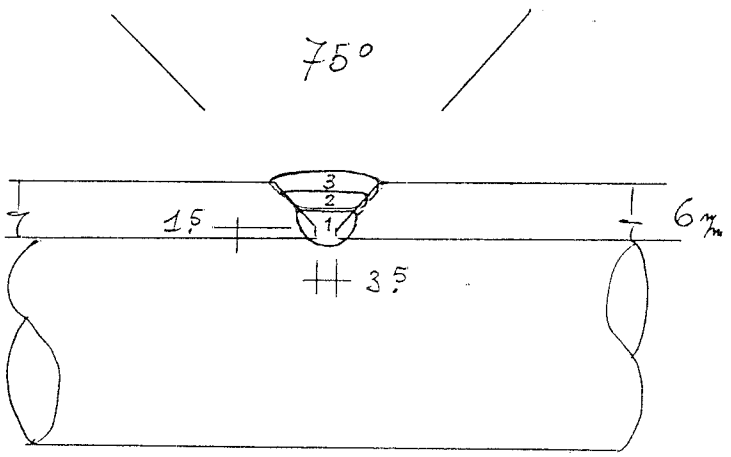
IMPIANTO SALDATURA : WEMI- 375-FX / MEGATRONIC- BDH-320

TECNICA DI IMPIEGO : 13/98

SAGGIO N° : 13 Spessore mm 6m Eseguito il 23.02.98

OPERATORE : DONDI FRANCO NATO A FINALE EMILIA il 24.09.48 - SEMIAUTOMATICO
DESTRI ROBERTO " A BONDENO (FE) il 26.04.46 - AUTOMATICO

PREPARAZIONE (e macro eventuale) N° 1 SAGGIO



CONDIZIONI OPERATIVE POS. 1GR

TUBO ⌀ 168.3 x 6

Materiale base : A 333-GR. 6 / API-5L-X60

Tipo di filo : FRO = FILCORD-C LOTTO = 260 2530 AAE374DN

Tipo di flusso : —

Preriscaldo : 20°C / TEMP. INTERPASS - 240°C MAX

Trattamento di distensione :

Eliminaz. idrogeno :

Controlli non distruttivi :

Passate	filo diam.	A	V	cm/1'	OSCILLAZ.
1A	1m	135	19	20	—
2A	"	140	24	17	6m
3A	"	145	25	16	10m

REGISTRO ITALIANO NAVALE
V. Ravagli

+ AUTOMATICO ANCO PULSATO

TAD JOB N. It 013305 94 POS. 004 NR 3 MT 23,81 KG 1002,00 HEAT/COLATA N.944640
ITEM 001.004

Dalmine

PLANT:
DALMINE

INSPECTION CERTIFICATE

(UNI EN 10204 3.1.B)

N. 94/21838

Page 1

CUSTOMER'S ORDER C941220

MILL ORDER / ITEM 1793669/002

T.A.D. TUBI ACCIAIO E DERIVATI COMMERCIALE SPA
VIA CANOVA 36
20020 LAINATE MI

PRODUCT SEAMLESS STEEL PIPES HOT FINISHED FOR LOW TEMPERATURE SERVICES ACC. TO ASTM A 333 - ASME SA 333 AND SSQ02 SPEC. REV. 0 - STEEL GR. 6 ASTM A 333 - NORMALIZED - BEVELLED ENDS TO ANSI B 16.25

DIMENSIONS: Lg. From 6000 Lg. To 8000 O.D. mm 168,300 W.T. mm 10,970

QUANTITY : Nr 64 Mt 493,79 Kg 20946 Ft 1620' 1" Lbs 46177,9

TEST N. P7733 HEAT N. 944640

TENSION TEST + 20,0°C
TEST SPEC. : LONGITUDINAL WIDTH 25,5 THICK. 11,50 SECTION 293,3 mm2
YIELD POINT 0,5% (MPA): requir min 240 result 343,0
TENSILE STRENGTH (MPA): requir min 415 result 493,0
ELONGATION : CALIBRATED ON 2" 50,0 mm
(%): requir.min 30,0 result 40,0

IMPACT TEST - 50,0°C REMARKS OR SPEC. : KCV LONG. -50 GR.C
TEST SPECIMEN : LONGIT. 10 X 10,00 MM requ.J/CM2 min 28,0 med 35,0
result 305,0 295,0 292,5

HARDNESS HRC requ. max 22,0 result 1,0

TECNOLOGICAL TESTS PERFORMED WITH SATISFACTORY RESULTS:
FLATTENING TEST : TEST PERFORMED AT ONE END OF 1 PIPE OF TEE LOT

TEST N. P7733/1 HEAT N. 944640

TENSION TEST + 20,0°C
TEST SPEC. : LONGITUDINAL WIDTH 25,7 THICK. 11,40 SECTION 293,0 mm2
YIELD POINT 0,5% (MPA): requir min 240 result 342,0
TENSILE STRENGTH (MPA): requir min 415 result 492,0
ELONGATION : CALIBRATED ON 2" 50,0 mm
(%): requir.min 30,0 result 40,0

HARDNESS HRC requ. max 22,0 result 1,0

TECNOLOGICAL TESTS PERFORMED WITH SATISFACTORY RESULTS:
FLATTENING TEST : TEST PERFORMED AT ONE END OF 1 PIPE OF TEE LOT

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alterazioni e/o falsificazioni saranno perseguite a termini di legge

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DATE	DALMINE TUBI INDUSTRIALI S.R.L. CON UN UNICO SOCIO	CHIEF OF INSPECTION DPT Antonio ANTONINI
16/09/1994		

Follows

Ceq225

TAD COMMERCIALE
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Dalmine

PLANT:
DALMINE.

INSPECTION CERTIFICATE

(UNI EN 10204 3.1.B)

N. 94/21838

Page 2

HEAT N. 944640

HEAT ANALYSIS %

C	0,100	Mn	0,95	Si	0,45	P	0,011	S	0,004	Cu	0,18
Ni	0,10	Cr	0,13	Mo	0,03	Al	0,021	V	0,005		

CARBON EQUIVALENT : L.F. (C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15) 0,31

La Societe' DALMINE garantit que tous les produits, objet du Certificat susdit, respectent en leur totalite' les Specifications de l' Article 15 de l' Arrete' Ministeriel du 24 Mars 1978 modifie':

C max 0.25% P max 0.05% S max 0.05%
Rm (N/mm2) max 700 A (Lo=5.65VSo) min 16% long Rm (A-2) min 10500
E max 0.9 A (Lo=5.65VSo) min 14% trans RA min 10500

LEAK-TIGHTNESS TEST PERFORMED WITH SATISFACTORY RESULTS BY:
HYDRAULIC TEST PRESSURE 18,9 MPA FOR 5 Sec

VISUAL AND DIMENSIONAL CONTROL OF THE TUBES HAS BEEN CARRIED OUT WITH SATISFACTORY RESULT

STEEL IS FULLY KILLED AND PRODUCED BY ELECTRIC FURNACE

REMARKS:
ACCORDING TO SPEC. ASTM/ASME LAST ED. - CONFORMITY TO NACE MR 0175-90
TUBES HAVE BEEN NORMALIZED AT 920°C FOR 17'.

CERTIFIED FACTORY UNI EN 29002 (ISO 9002): I.G.Q. Nr. 8603

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Toute altération ou contrefaction seront susceptibles d'entrainer des poursuites légales.

DATE	DALMINE TUBI INDUSTRIALI S.R.L. CON UN UNICO SOCIO	CHIEF OF INSPECTION DPT Antonio ANTONINI
15/09/1994		

End

Cad225

TAD COMMERCIALE
QUESTO DOCUMENTO È RIPRODOTTO MEDIANTE UN SISTEMA COMPIUTERIZZATO ED È CONFORME ALL'ORIGINALE
THIS DOCUMENT IS REPRODUCED BY A COMPUTERIZED SYSTEM AND IS CONFORM TO THE ORIGINAL

PLANT: DALMINE

CUSTOMER'S ORDER: IA205/92
T.A.D.-TUBI ACCIAIO E DERIVATI COMMERCIALE SPA
C/SO PORTANUOVA 13/15
20121 MILANO MI

MILL ORDER N./ITEM: 1713790/001

PRODUCT: SEAMLESS HOT ROLLED STEEL LINE PIPE ACC. TO API 5L, IN STEEL GRADE X 60 ACC. TO API 5L, NORMALIZED, BEVELLED ENDS ACC. TO API

DIMENSIONS: Lg. From 8000 Lg. To 12000 O.D. mm 168,300 W.T. mm 10,970

QUANTITY: Nr 7 Mt 60,99 Kg 2543 Ft 200' 1" Lbs 5606,3

TEST N. 5208F HEAT N. 18320

TENSION TEST + 20,0°C
TEST SPEC. : LONGITUDINAL WIDTH 25,2 THICK. 10,30 SECTION 259,0 mm2
YIELD POINT 0,5% (MPA): requir min 413 result 477,0
TENSILE STRENGTH (MPA): requir min 517 result 581,0
ELONGATION : CALIBRATED ON 2" 50,8 mm
(%): requir.min 23,5 result 41,3

HEAT N. 18320

HEAT ANALYSIS %
C 0,240 Mn 1,32 Si 0,23 P 0,012 S 0,013 Ti 0,006
Nb 0,005 V 0,080

* La Societa' DALMINE garantit que tous les produits, objet du Certificat susdit, respectent en leur totalite' les Specifications de l' Article 1b de l' Arrete' Ministeriel du 24 Mars 1978 modifie':
* C max 0.25% P max 0.035% S max 0.05%
* Rm (N/mm2) max 760 A (Lo=5.65VSo) min 16% long Rm (A-2) min 10600
* R max 0.9 A (Lo=5.65VSo) min 14% trans Rm (A-2) min 10200

LEAK-TIGHTNESS TEST PERFORMED WITH SATISFACTORY RESULT
HYDRAULIC TEST PRESSURE - 20,7 MPA - FOR 5 Se

VISUAL AND DIMENSIONAL CONTROL OF THE TUBES HAS BEEN CARRIED OUT WITH SATISFACTORY RESULT

STEEL IS FULLY KILLED AND PRODUCED BY ELECTRIC FURNACE

REMARKS:
TUBES HAVE BEEN NORMALIZED AT 920°C FOR 20'.

ROSETTI MARINO S.p.A.
Conforme alla copia

Certificate valid for:
Customer
Order N° 1221 - AGIP 43020
Pieces N° 7 Mts 60,94 Kgs
T.A.D.'S Job N° IA-1221-21
Lloyd's IMO date 03-08-92

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DATE 30/07/1992

DALMINE S.p.A.
COPIA CONFORME ALL'ORIGINALE

INSPECTION DEPT
Antonio ANTONINI

Inspection certificate(Certificato di collaudo/ DATA DI [illegible]

ESAB Saldatura SpA

CERTIFICAZIONE / CERTIFICATION

No 357664

Bolla N°/Our ref. 703004 Msg. A Del 11/02/97

Vs. rif./Your ref. 701875 Del 31/01/97

Vostro ordine N°/Your Order No. Del 0/00/00

Cliente/Customer

FIORENTINI WELDING SRL

VIA CA' DELL'ORBO 15/2

40050 VILLANOVA BO

Prodotto Marchio: SIDEROTERMICA
Inf.Suppl.

Pos. No.	Art. No.	Descrizione/Description	Lotto/Lot	Commessa
	301624R590	SIDERFIL ARGON 2,4 MM	706114	A3658

Analisi/Analysis

	C	Mn	Si	P	S	Cr	Ni	Mo
	0,07	1,13	0,61	0,010	0,010	0,04	0,02	0,01
	Cu							
	0,12							

Trazione/Tensile test.

	Rp 0,2 N/mm²	Rm N/mm²	Rm N/mm²	Rs N/mm²	A5 %
Metallo d'apporto All weld metal				539	30

Resilienza/Impact test.

	Temp. °C	media/average J	J		
Metallo d'apporto All weld metal	- 46	82	82	84	80

Note/Remarks

Il prodotto è conforme alle norme / This welding consumable conforms to

1. SFA-A5.18 ER70S-3
2.
3.

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Località/Locality

Data/Date 20/02/98

Direzione Tecnica

Certificazione - Certification

Certifichiamo che i consumabili saldanti sono costruiti e forniti in accordo con ns. Sistema di Qualità approvato secondo ISO 9002/EN29002 da Rina, Certificato N. 5788, e che i dati riportati sono stati ottenuti in accordo a quanto stabilito all'atto della vendita.

We hereby certify that the above stated products conform to the sales contract and are supplied in Accordance with our Quality System approved to ISO 9002/EN29002 by Rina, Certificate N. 5788, and that the values with indicated results have been obtained according to the stipulations in the sales contract.

20010 BAREGGIO (MI)
Via Milano, 24
Tel. (02) 9796671

Amministrazione: Fax (02) 9780969
Direzione Commerciale Stabilimento: Fax (02) 9796500
Direzione Commerciale Impianti: Fax (02) 9789165
Assistenza servizio Impianti: Fax (02) 9789140
Direzione Generale: Fax (02) 9789950

Codice Fiscale/Partita IVA 00777941158
Capitale Sociale Lit. 6.000.000.000
Sede Legale: Via V. Emeri, 16 Milano
Tribunale Milano 35507 - C.C.I.A.A. 250795

TOTALE P.02

FRO SALDATURA S.R.A.
STABILIMENTO DI CITTADELLA
35013 CITTADELLA (PD) - VIA VERDI, 39
TEL. (049) 9401511 - FAX (049) 9401500

ATTESTATO DI CONTROLLO

(UNI-EN 10204 Tipo 2.2) (FRO Tipo F11)

CERTIFICATO N.	ORDINE N.	CLIENTE
6009800341		FIORENTINI WELDING SRL
DATA	DATA	
23-02-98		VIA CA'DELL'ORBO,15/2
	FAX 051/782090	
	NS. BOLLA	40050 VILLANOVA BO

PRODOTTO	LOTTO N.
FILCORD C φ 1.00 mm	AAE8790N

RISULTATI OTTENUTI CON:
Miscela Ar/CO2 (M21-EN439)

ANALISI CHIMICA PRODOTTO (%)

C	≥	0.060	≤	0.130
Mn	≥	1.300	≤	1.600
Si	≥	0.700	≤	1.000
P			≤	0.025
S			≤	0.025
Cu			≤	0.300

PROPRIETA' MECCANICHE

			CORE BALDATO			DOPO TRATT. TERMICO (°C / min.)
Carico di rottura	Rm	[N/mm²]	≥	510	≤ 560	
Snervamento	ReH	[N/mm²]	≥	420		
Allungamento	A	[%]	≥	24		
Resilienza	KV (-20°C)	[J]	≥	70		
Resilienza	KV (-40°C)	[J]	≥	50		

RISULTATI CONFORMI A:

EN 440-94	G3Si1

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Il presente certificato non deve essere modificato o reso incompleto senza l'autorizzazione scritta del fabbricante.
Il presente certificato è valido anche se trasmesso via fax (da considerarsi a non necessità di firma).

AIR LIQUIDE

ROSETTI MARINO SPA

VERBALE RADIOGRAFICO
Radiographic Report

VERB. n°
R.T. No G 044/98

CLIENTE/Client	ORDINE /Order	COMMESSA/Job	DATA/Date	P.F.C./Q.C.P.	FASE/Phase	FOGLIO Sheet	DI Of
PQR		970620	24/02/98				

RIFERIMENTI/References						DIFETTI/Discontinuities														ESPOSIZIONE/Exposure														NOTE/Notes
Disegno Dwg / Identificazione pezzo Identification of parts	N° Saldatura Weld N°	Saldatore N° Welder N°	Posizioni Film location	DIAMETRI Diameters / SPESSORI Thicknesses	Materiale Material	Cricche Cracks	Mancata penetrazione Incomplete penetrat.	Mancanza di fusione Lack of fusion	Porosità Porosity	Inclusione di scoria Slag inclusion	Cordone irregolare Irregular seam	Tarli Wormholes	Insellamento Concavity	Slivellamento Misalignment	Ripresa difettosa Start/stop defect	Incisioni marginali Undercuttings	Sgocciolamenti Tears	Eccesso di penetrazione Excess of penetration	Inclusioni di W Tungsten inclusions	RIPRESA Exp. type: Panoramica Panoramic	Diretta Direct	Contatto Contact	N° film per cassette N° of films	Visione singola parete Single wall viewing	Visione doppia parete Double wall viewing	Tipo pellicola Film type	N° di esposizione Exposure N°	Kv-Ma	Cl. Attività Activity	Tempo esposizione min. Exposure time min.	Distanza cm Distance	I.Q.I. Type	Densità Density	Risultato Result	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34		
PQR10A			0-1	6"/10,97																									35	0,8	D	10/16		A	
			1-2																															A	
			2-0																															A	
11A			0-1																															A	
			1-2						X																									B	
			2-0																															A	
12			0-1																															A	
			1-2																															A	
			2-0																															D	
13			0-1																															A	
			1-2									X																						A	
			2-0																															A	

ROSETTI MARINO SpA
RAVENNA

RADIOISOTOPO Isotope type: Ir 192	TECNICO I LIVELLO Level I technician: GIANCARLO RICCARDO CERTIFICATO N° IIW-IIS SNT-TC-1A	ISPETTORI A.I. Inspection Agency Repr.	SPECIFICA Specification: ASME V
GRUPPO RX X-ray equipment	TECNICO II LIVELLO Level II technician	REGISTRO ITALIANO NAVALE V. Ravaglia	CRITERI ACCETT. Acceptance criteria: ASME IX
MACCHIA FOCALE Source size	CONTROLLO QUALITA' Quality Control Insp.		

A : ACCETTABILE Acceptable
R: RIPARARE Repair
T: TAGLIARE Cut
RR: RIFARE FILM Repeat film

ROSETTI MARINO SPA	PQR N°	23B/10
PROCEDURE QUALIFICATION RECORD	Sheet: 1	Of:2
	Prepared by: SS	Date:21/06/2010

COMPANY NAME: ROSETTI MARINO SPA

WPS N° 23B/10 (for weld metal CTOD test only) DATE: 14/04/2010

WELDING PROCESS(ES): GS FCAW

TYPES: SEMIAUTOMATIC

See welding table for details of passes

BASE METAL

Material Specification: BS 7191
Type or grade: 450EM (thermomechanical)

Thickness of Test Coupon: t= 80 mm
Diameter of Test Coupon: ∅= /
Base metal maker DILLINGER HÜTTE
Base metal heat No. 68704
CEQ: 0,38

FILLER METALS **GS FCAW**

SFA Specification	5.29
AWS Classification	E 81 T1 Ni1
Filler Metal F-No	6
Weld Metal Analysis A-No.	10
Size of Filler Metal	∅1,2

Other: Wire FCAW: ESAB Tubrod 15.17 Heat No. PN950036

Deposited Weld Metal 80 mm

POSITION

Position of Groove 2G

Weld progression (Uphill, Downhill) N.A.
Other NONE

PREHEAT

Preheat temperature: 100°
Interpass temperature: 200°
OTHER: NONE

POSTWELD HEAT TREATMENT

Temperature: N.A.
Time: N.A.
Other N.A.

GAS	Gas(es)	Percent composition (Mixture)	Flow rate
Shielding	Ar+CO2	80%+20%	20 lt/1"
Backing	N.A.		

ELECTRICAL CHARACTERISTICS

Current DC
Polarity RP
Amps. GS FCAW: 175÷230 *Volts* 22÷26
Tungsten Electrode Size N.A.
HEAT INPUT: GS FCAW: 0.87÷2.06 Kj/mm

TECHNIQUE

Travel speed GS FCAW: 150÷320 mm/1'

String or Weave Bead	STRING
Oscillation	N.A.
Multipass or single pass	MULTIPASS
Single or multiple electrodes	SINGLE
Stick-Out Length:	14÷16 mm
Orifice of gas cup size	1/2"
wire feed speed range	Self regulated with current
Other	

RINA S.Sabatino

29 GIU. 2010

EWF EUROPEAN WELDING TECHNOLOGIST S. SOLMI I EWT-30416

ROSETTI MARINO SPA	PQR N°	23B/10
PROCEDURE QUALIFICATION RECORD	Sheet: 2	Of: 2
	Prepared by: SS	Date: 18/05/2010

TENSILE TEST

SPECIMEN No.	WIDTH (mm)	THICKNESS (mm)	AREA (mm^2)	ULTIMATE TOTAL LOAD (N)	ULTIMATE UNIT STRESS N/mm2	TYPE OF FAILURE & LOCATION
N.A.						

ALL WELD METAL TENSILE TEST	AREA	YIELD LOAD (Rp 0,2%)	ULTIMATE LOAD	YIELD UNIT STRESS	ULTIMATE UNIT STRESS	ELONGATION
TWL				665		20,8

GUIDED BEND TEST

TYPE & FIGURE No.	RESULT
N.A.	/

TOUGHNESS TESTS

SPECIMEN No.	NOTCH LOCATION	NOTCH TYPE	TEST TEMP.	Individual values	average	LATERAL EXP.		DROP WEIGHT	
						% SHEAR	MILS	BREAK	No. BREAK
For info									
10X10x55	WELD METAL (cap)	KV	-40°C	94-106-114	105	/		/	
10X10x55	WELD METAL (root)	KV	-40°C	68-84-71	74	/		/	

FILLET WELD

Result – Satisfactory; Yes N.A. No. N.A. Penetration into Parent Metal; Yes N.A. No. N.A.

Macro – Results N.A.

OTHER TESTS

Type of test **VISUAL EXAMINATION TEST**:..... ACCEPTABLE

ULTRASONIC EXAMINATION TEST:..... ACCEPTABLE, see CONTROL Certificate No. 23B/10

MACROGRAPHIC EXAMINATION:..... For information max. 273HV10.

CTOD TEST at –10°C :..... SATISFACTORY see EXOVA certificate No. 155628 dated 06/05/2010 and 155644 dated 11/05/2010, min 0,25mm

Deposit Analysis N.A.

Other

Welder's Name Gurioli Mattia - Piccoli Alessio Clock No. Stamp No.

Test conducted by **EXOVA**

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of EEMUA 158 Ed.1994, amended 2005.

RINA S. Sabatino

Date: 21/06/2010

PROVISIONAL

29 GIU. 2010

Manufacturer By:

EWF S. SOLMI I.EWT 30416 EUROPEAN WELDING TECHNOLOGIST

ROSETTI MARINO S.P.A. Responsabile saldatura Welding Engineer S. Solmi

Exova Srl
Via della Pierina 9/11
26013 Crema (CR)
Italy

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W: www.exova.com

Test report n° 155644 **Rev.0**
EN 10204, type : 3.2

Mrs
Cod. 1737

ROSETTI MARINO S.P.A
VIA TRIESTE, 230
48100 RAVENNA RA
Italy

Your ref.	Order n.	D.D.T. n.1VTS100305	data	19/04/2010
Our ref.	Report n.	**155644**	data	**11/05/2010**
	Job n.	49941	data	20/04/2010

Remarks Job No. 110A20
Test No. 23B/10 FCAW pos. 2G
Dimensions : 80mm

Project Jasmine Jacket

Client Reference EEMUA 158:1994 (Reprinted 2005) & Client's Request
Test standard UNI EN 876:1997 - UNI EN ISO 6892-1:2009 - BS 7448:Part 1:1991 - BS 7448:Part 2:1997

This Report is made of n° 9 **pages including this cover plus the following pages**

Test	Pag.
Tensile test	2
Fracture mechanics type Senb geometry	6

This Report (RPR) contains tests results on the following materials

Ref.	Identification	Material	DN / Thk [mm]	Remarks
97008	PQR 23B/10	BS 7191 450EM		

Laboratory Manager | Customer | Inspector | Inspector

Exova s.r.l.

ROSETTI MARINO S.p.A
Responsabile saldatura
Welding Engineer
S. Solmi

RINA 1861

RINA
S.Sabatino
16.05.2010

General conditions:
1. The Customer accepts general conditions and prices fixed by the laboratory to perform the tests.
2. Test results will be communicated only by means of test report except for different contractual agreement.
3. Tests sample will be destroyed 10 days after test except for different written Client request.
4. The spare will be destroyed 90 days after date of receipt for different written Client request.
5. The test results described in the following test report are referring only to the sample mentioned in it.
6. The date of material receivement is the same as the date of job opening. The date of testing is the same as the date of test report, except for different info.
7. If not specified the test is performed on material as received.

This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory

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Test report n° 155644 Rev.0

Equipment n. 1151-1152

TENSILE TEST

Internal procedure POI-01

Richiesti *Required*	AWM		>=506						info	info				
	BM		>=450						500÷700	>=19				

Test *Ref.*		T *Test*	Posizione *Position*	Dimensioni *Dimensions*			Lo	Re	Rp0.2%	Rp0.5%	Rt0.2%	Rt0.35%	Rt0.5%	E	Rm	A	Z	Rif. *Ref.*
Lab.	Client	°C		mm			mm	N/mm²	N/mm²	N/mm²	N/mm²	N/mm²	N/mm²		N/mm²	%	%	
008.TR1.01	23B/10 Fig.7	+20	AWM(t/3)			ø	10.00	50.0	-	665	-	-	-	-		708	20.8		

Standard ref. EEMUA 158:1994 (Reprinted 2005) & Client's Request - UNI EN 876:1997 - UNI EN ISO 6892-1:2009

Remarks

If not specified the test considered proportional type

Operator | Customer | Inspector | Inspector

EXOVA S.r.l.

ROSETTI MARINO S.p.A.
Responsabile saldatura
Welding Engineer
S. Solmi

RINA
S. Sabatino

This page is binded to references n. 155644 (Job 49941) whose details are indicated on the cover

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Via della Pierina 9/11
26013 Crema (CR)
Italy

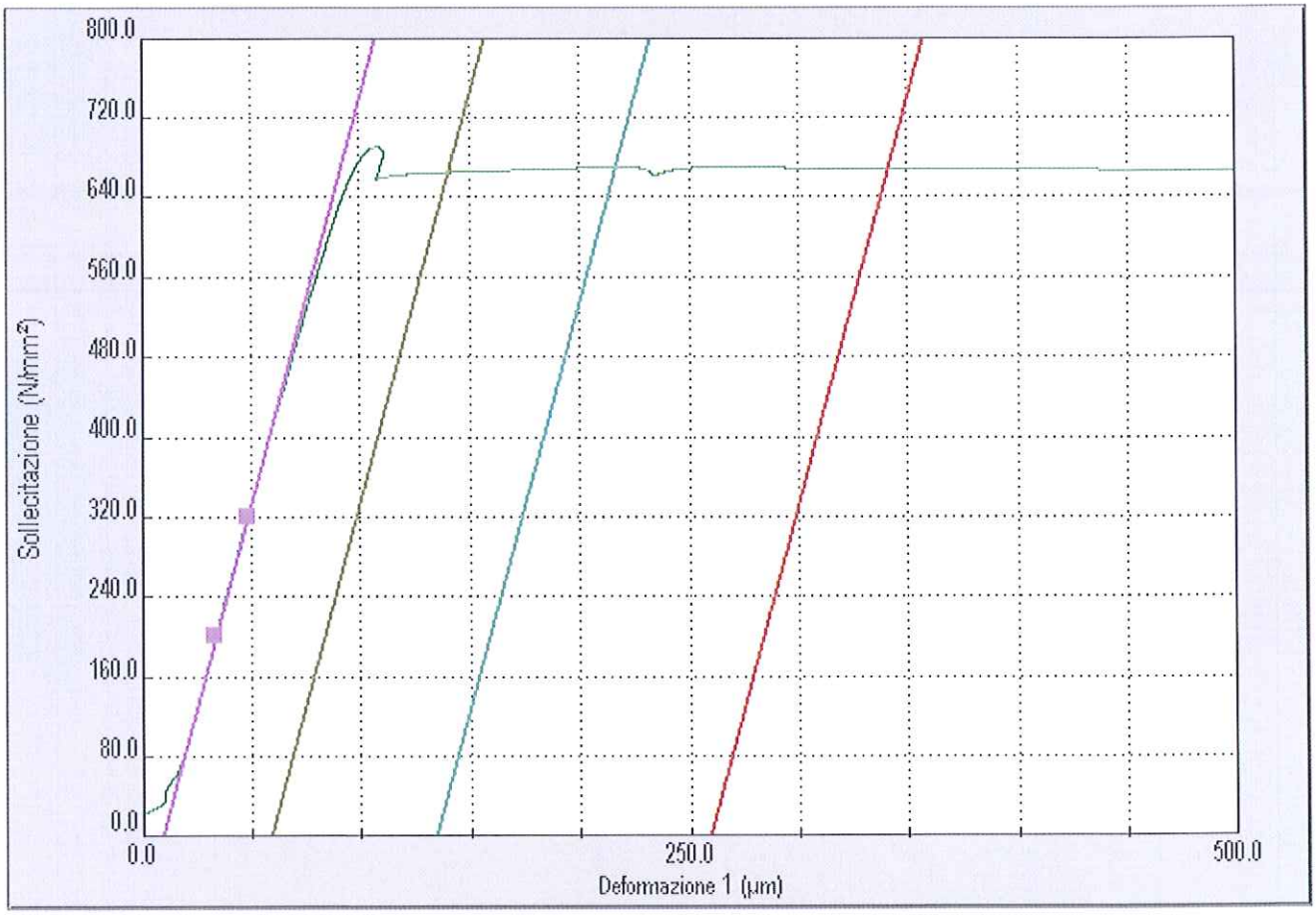
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Test report n° 155644 Rev.0

Equipment n.	**TENSILE TEST**	Pag. 2 of 2
1151-1152		

Richiesti *Required*	AWM		>=506						info	info				
	BM		>=450						500÷700	>=19				

Test *Ref.*		T *Test*	Posizione *Position*	Dimensioni *Dimensions*	Lo	Re	Rp0.2%	Rp0.5%	Rt0.2%	Rt0.35%	Rt0.5%	E	Rm	A	Z	Rif. Ref.
Lab.	Client	°C		mm	mm	N/mm²	N/mm²	N/mm²	N/mm²	N/mm²	N/mm²		N/mm²	%	%	
008.TR1.01	3B/10 Fig.1	+20	AWM(t/3)	ø 10.00	50	-	665	-	-	-	-	-	708	20.8	-	-



Standard ref. EEMUA 158:1994 (Reprinted 2005) & Client's Request - UNI EN 876:1997 - UNI EN ISO 6892-1:2009

Remarks

If not specified the test considered proportional type

Operator	Customer	Inspector	Inspector
Exova s.r.l.	ROSETTI MARINO S.p.A. Responsabile Saldatura Welding Engineer S. Solmi	RINA S. Sabatino	

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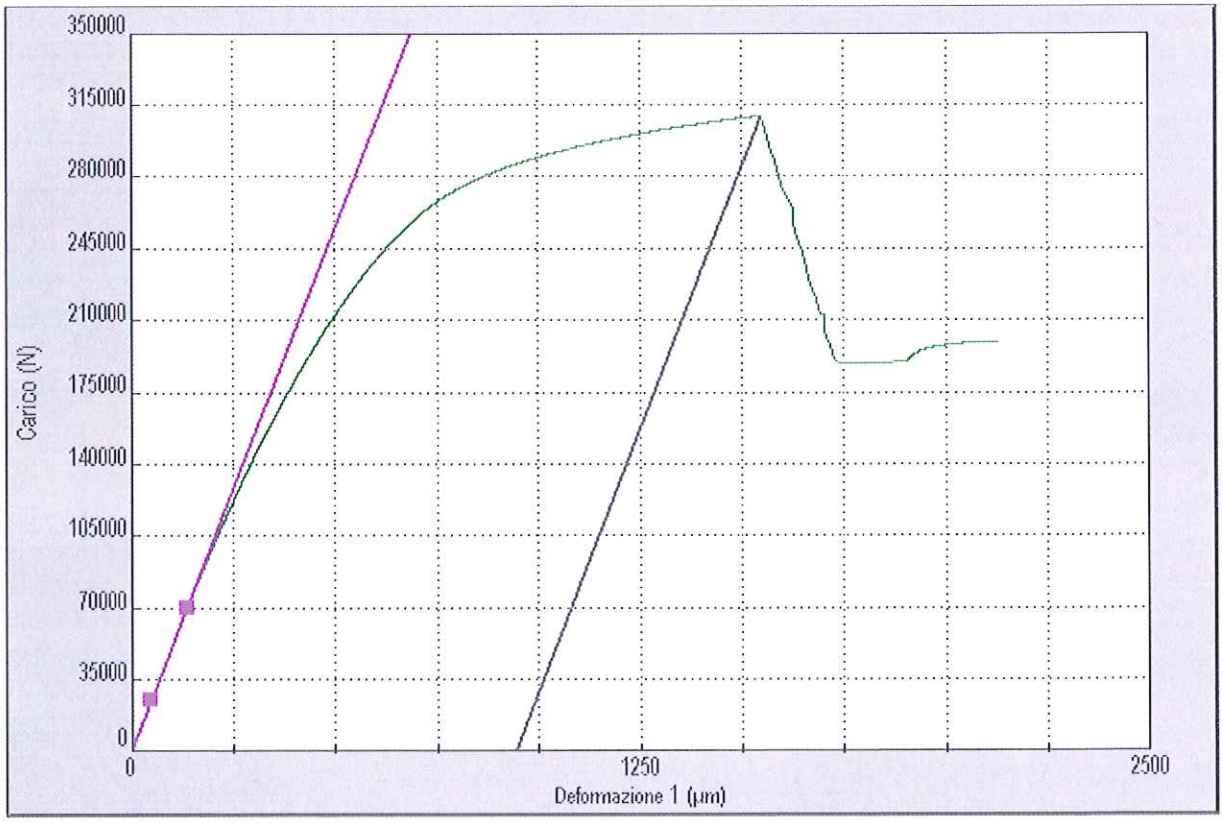
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Test report n° 155644 Rev.0

Equipment n.	**Fracture mechanics toughness test**	Pag. 1 of 6
340/1513		

Rif. test Lab. n. *Internal ref. n.*	008.CT2.01		Rif. test Client n. *Client ref. n.*	23B/10		Temperatura *Test Temperature*	°C	-10
Pos. intaglio *Position notch*	WM	Through Thk Notch	Y.S. (N/mm²) *Yield strength*	687		Modulo (N/mm²) *Young's modulus*	E	206000
Thk coltelli (mm) *Knife thickness*		Z	Spessore (mm) *Thickness*	74.5	B	Larghezza (mm) *Width*	W	75.0
Appoggi 4 W (mm) *Loading span*	300.0	S	Intaglio (mm) *Notch depth*	33.0	M	Precriccatura (N) *Precracking force*	Ff	97094
Forza di fatica *Fatique force ratio*	0.1	R	Media lunghezza cricca (mm) *Average crack length*	35.89	a0	Rapporto *Crack ratio*	a0/W	0.48
Precompressione *Precompression*	1.0	%	Carico *Applied force*	309535 N	F	Apertura (mm) *Plastic crack opening displacement*	Vp	0.94
Fattore di stress Mpa.m$^{0.5}$ s^{-1} *Stress intensity factor*	1.5	K	Richiesti C.T.O.D. (mm) *Required*	0.25Min.		**C.T.O.D.** *Crack Tip opening Displacement*	0.36 mm	m
J-critical *J-Critical*	-	Fmax -	**Valore previsto KIc** *Previsional value of KIc*	-	KQ	**Tenacità della frattura** *Plane strain fracture toughness*	KIc	-



Standard ref. EEMUA 158:1994 (Reprinted 2005) & Client's Request - UNI EN 876:1997 - BS 7448:Part1:1991-BS7448:Part2:1997

Remarks

Operator	Customer	Inspector	Inspector
Exova S.r.l.	ROSETTI MARINO S.p.A. Responsabile saldatura Welding Engineer S. Solmi	RINA 1861	RINA S. Sabatino

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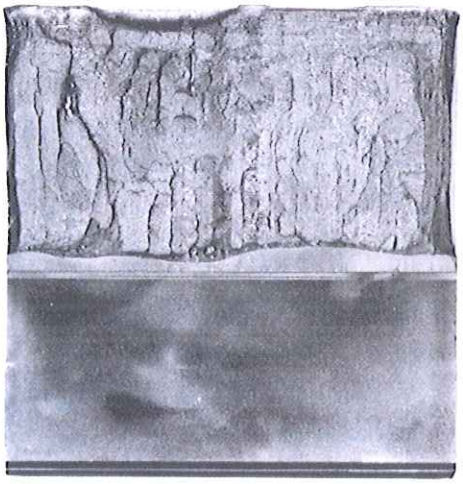
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Test report n° 155644 Rev.0

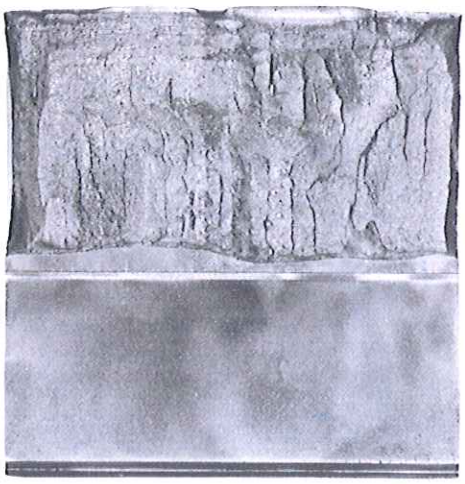
Equipment n.	**Fracture mechanics toughness test**	Pag. 2 of 6
340/1513		

Test Lab. n. *Internal ref. n.* 008.CT2.01	Client *Client ref. n.* 23B/10	Intaglio: *Position notch* WM rough Thk No	Temp. prova °C : *Test Temperature* -10

Face A



Face B



Fmax/FQ	Factor	a0	B	W - a0	Fmax	FQ	KQ	KIc	J-critical	CTOD
-	2.5(KQ/σYS)²	**35.89**	**74.5**	**39.1**	-	-	-	-	-	**0.36**
req. <=1.10	-	req. < Factor								
-		[mm]	[mm]	[mm]	[N]	[N]	[N.mm-3/2]	[N.mm-3/2]	[N.mm]	[mm]
Criteria for calculation of KIc										

Valori di cricca / Crack values

0	1	2	3	4	5	6	7	8	a max	a min	a 0
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
35.79	**35.95**	**37.03**	**36.91**	**35.54**	**35.10**	**35.56**	**35.34**	**35.57**	**37.03**	**35.10**	**35.89**

Envelope	Angle	(a max - a min) / a0	(a min - M)	(a min - M) / W%	a0 / W	Δ a
YES	**YES**	**5.4** Weld < 20% BM < 10%	**2.1** req. > 1.3	**2.8** req. > 2.5%	**0.48**	**0.87**
	[°]	[mm]	[mm]	[mm]	[mm]	[mm]

Standard ref. EEMUA 158:1994 (Reprinted 2005) & Client's Request - UNI EN 876:1997 - BS 7448:Part1:1991-BS7448:Part2:1997

Remarks

Operator	Customer	Inspector	Inspector
Exova s.r.l.	ROSETTI MARINO S.p.A. Responsabile saldatura Welding Engineer S. Solmi	RINA S. Sabatino 14.05.10	

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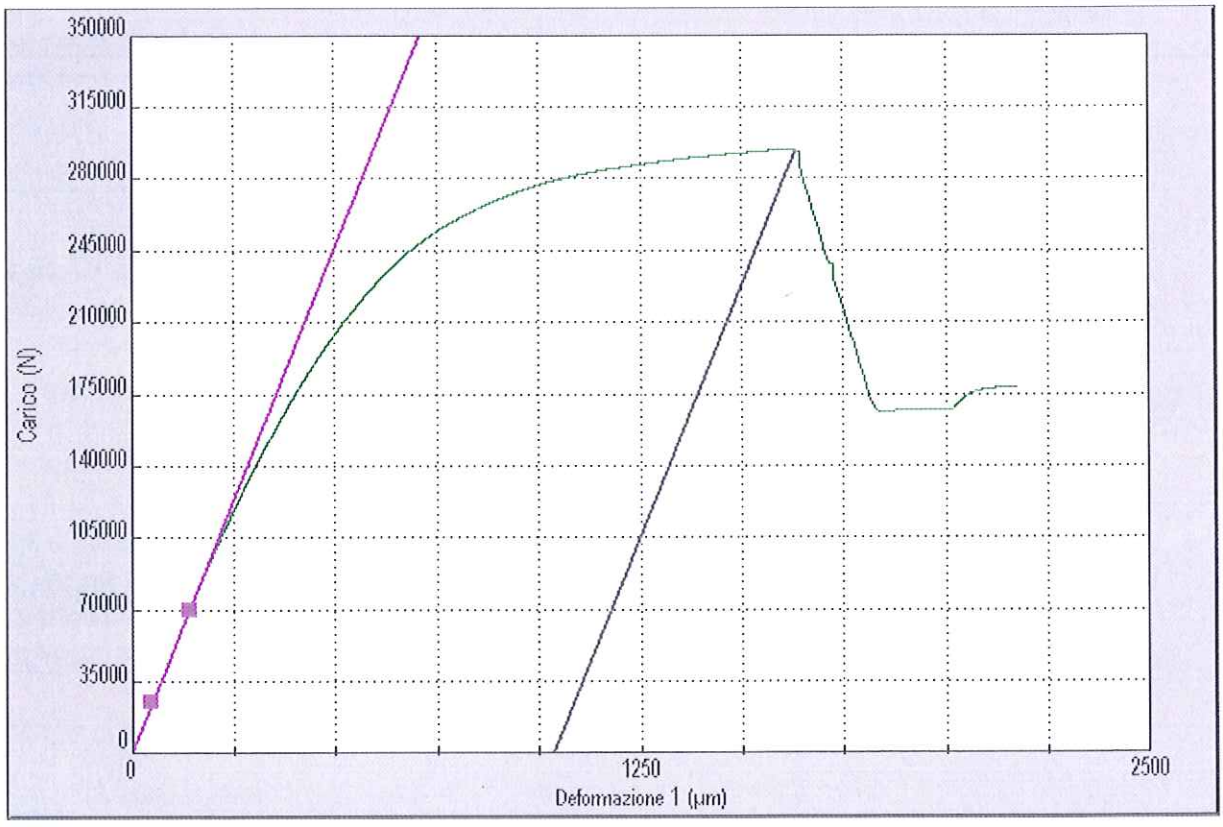
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Test report n° 155644 Rev.0

Equipment n.	**Fracture mechanics toughness test**	Pag. 3 of 6
340/1513		

Rif. test Lab. n. *Internal ref. n.*	008.CT2.02		Rif. test Client n. *Client ref. n.*	23B/10		Temperatura *Test Temperature*	°C	-10
Pos. intaglio *Position notch*	WM	Through Thk Notch	Y.S. (N/mm²) *Yield strength*	687		Modulo (N/mm²) *Young's modulus*	E	206000
Thk coltelli (mm) *Knife thickness*	Z		Spessore (mm) *Thickness*	B	74.5	Larghezza (mm) *Width*	W	75.0
Appoggi 4 W (mm) *Loading span*	S	300.0	Intaglio (mm) *Notch depth*	M	33.0	Precriccatura (N) *Precracking force*	Ff	97094
Forza di fatica *Fatique force ratio*	R	0.1	Media lunghezza cricca (mm) *Average crack length*	a0	37.07	Rapporto *Crack ratio*	a0/W	0.49
Precompressione *Precompression*	%	1.0	Carico *Applied force*	F	294230 N	Apertura (mm) *Plastic crack opening displacement*	Vp	1.03
Fattore di stress $Mpa.m^{0.5}$ *Stress intensity factor*	S $^{-1}$	K 1.5	Richiesti C.T.O.D. (mm) *Required*		0.25Min.	**C.T.O.D.** *Crack Tip opening Displacement*		0.37 mm m
J-critical *J-Critical*	-	Fmax -	**Valore previsto KIc** *Previsional value of KIc*	KQ	-	**Tenacità della frattura** *Plane strain fracture toughness*	KIc	-



Standard ref. EEMUA 158:1994 (Reprinted 2005) & Client's Request - UNI EN 876:1997 - BS 7448:Part1:1991-BS7448:Part2:1997

Remarks

Operator	Customer	Inspector	Inspector
Exova s.r.l.	ROSETTI MARINO S.p.A. Responsabile saldatura Welding Engineer S. Solmi	RINA 186	RINA S. Sabatino

This page is binded to references n. *155644 (job 49941)* *whose details are indicated on the cover*

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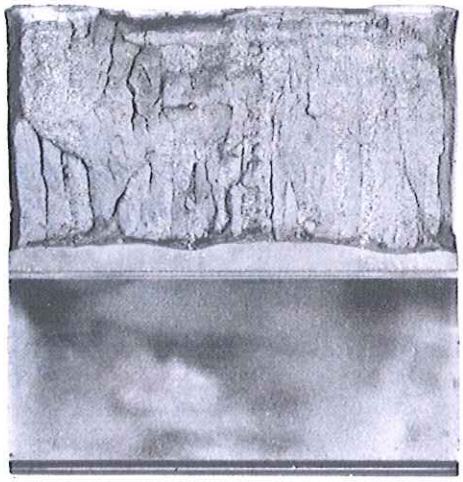
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Test report n° 155644 Rev.0

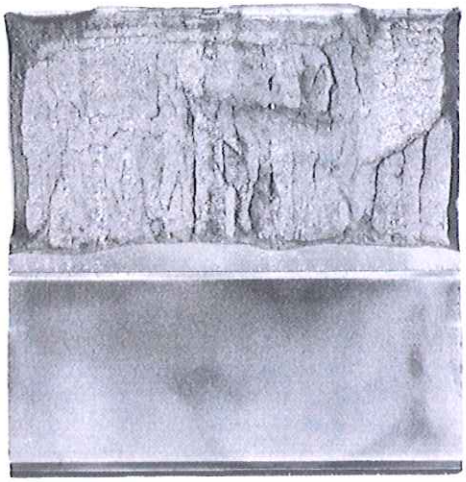
Equipment n.	Fracture mechanics toughness test	Pag. 4 of 6
340/1513		

Test Lab. n. *Internal ref. n.*	008.CT2.02	Client *Client ref. n.*	23B/10	Intaglio: *Position notch*	WM	rough Thk No	Temp. prova °C : *Test Temperature*	-10

Face A



Face B



Fmax/FQ	Factor	a0	B	W - a0	Fmax	FQ	KQ	KIc	J-critical	CTOD
-	2.5(KQ/σYS)²	**37.07**	**74.5**	**37.9**	-	-	-	-	-	**0.37**
req. <=1.10	-	req. < Factor								
-		[mm]	[mm]	[mm]	[N]	[N]	[N.mm-3/2]	[N.mm-3/2]	[N.mm]	[mm]
Criteria for calculation of KIc										

Valori di cricca / Crack values

0	1	2	3	4	5	6	7	8	a max	a min	a 0
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
36.25	**36.01**	**37.35**	**37.99**	**37.66**	**36.99**	**37.37**	**36.94**	**36.31**	**37.99**	**36.01**	**37.07**

Envelope	Angle	(a max - a min) / a0	(a min - M)	(a min - M) / W%	a0 / W	Δ a
YES	**YES**	**5.3** Weld < 20% BM < 10%	**3.0** req. > 1.3	**4.0** req. > 2.5%	**0.49**	**1.15**
	[°]	[mm]	[mm]	[mm]	[mm]	[mm]

Standard ref. EEMUA 158:1994 (Reprinted 2005) & Client's Request - UNI EN 876:1997 - BS 7448:Part1:1991-BS7448:Part2:1997

Remarks

Operator	Customer	Inspector	Inspector
Exova S.r.l.	ROSETTI MARINO S.p.A. Responsabile saldatura Welding Engineer S. Solmi	RINA S. Sabatino 4/05/10	

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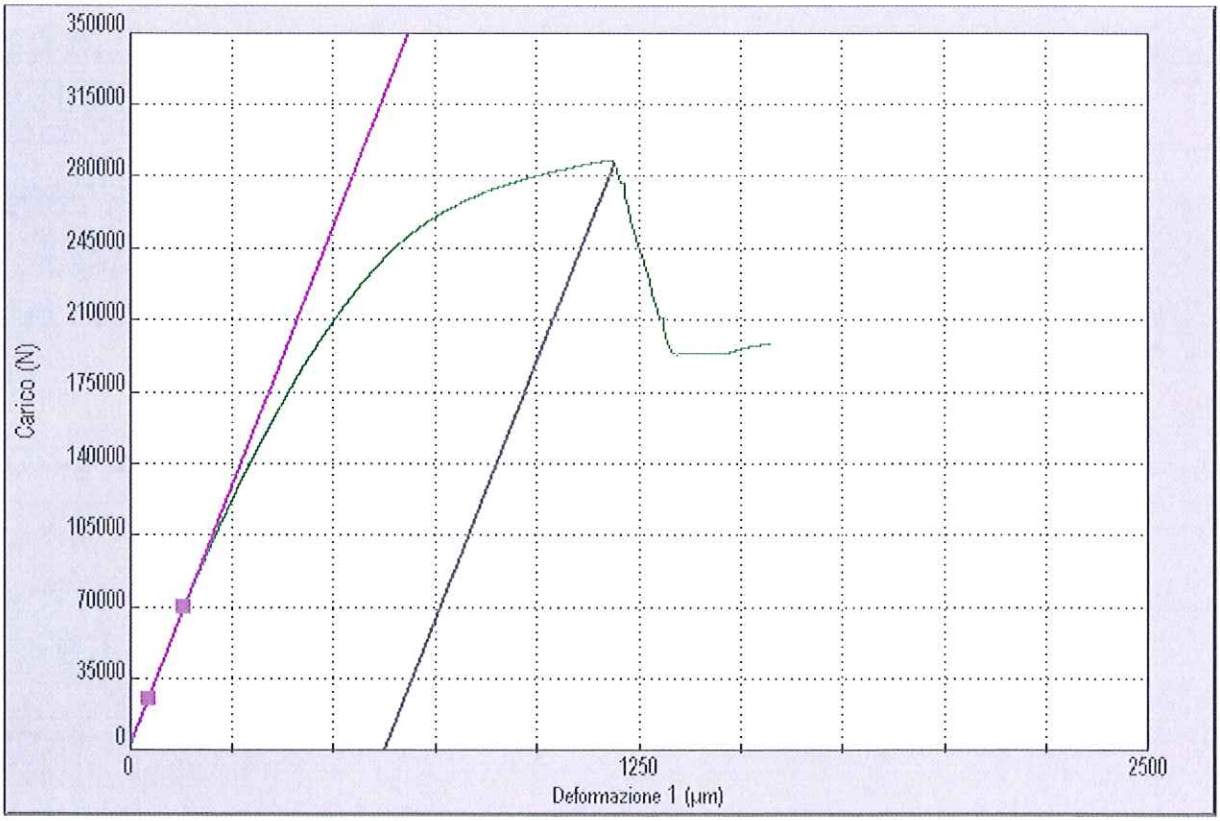
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Test report n° 155644 Rev.0

Equipment n.	**Fracture mechanics toughness test**	Pag. 5 of 6
340/1513		

Rif. test Lab. n. *Internal ref. n.*	008.CT2.03		Rif. test Client n. *Client ref. n.*	23B/10		Temperatura *Test Temperature*	°C	-10
Pos. intaglio *Position notch*	WM	Through Thk Notch	Y.S. (N/mm²) *Yield strength*	687		Modulo (N/mm²) *Young's modulus*	E	206000
Thk coltelli (mm) *Knife thickness*		Z	Spessore (mm) *Thickness*	74.5	B	Larghezza (mm) *Width*	W	75.0
Appoggi 4 W (mm) *Loading span*	300.0	S	Intaglio (mm) *Notch depth*	33.0	M	Precriccatura (N) *Precracking force*	Ff	97094
Forza di fatica *Fatique force ratio*	0.1	R	Media lunghezza cricca (mm) *Average crack length*	36.68	a0	Rapporto *Crack ratio*	a0/W	0.49
Precompressione *Precompression*	1.0	%	Carico *Applied force*	288005 N	F	Apertura (mm) *Plastic crack opening displacement*	Vp	0.62
Fattore di stress Mpa.m$^{0.5}$ s^{-1} *Stress intensity factor*	1.5	K	Richiesti C.T.O.D. (mm) *Required*	0.25Min.		**C.T.O.D.** *Crack Tip opening Displacement*	0.25 mm	m
J-critical *J-Critical*	-	Fmax -	**Valore previsto KIc** *Previsional value of KIc*	-	KQ	**Tenacità della frattura** *Plane strain fracture toughness*	KIc	-



Standard ref. EEMUA 158:1994 (Reprinted 2005) & Client's Request - UNI EN 876:1997 - BS 7448:Part1:1991-BS7448:Part2:1997

Remarks

Operator	Customer	Inspector	Inspector
Exova S.r.l.	ROSETTI MARINO S.p.A. Responsabile saldatura Welding Engineer S. Solmi	RINA S.Sabatino	

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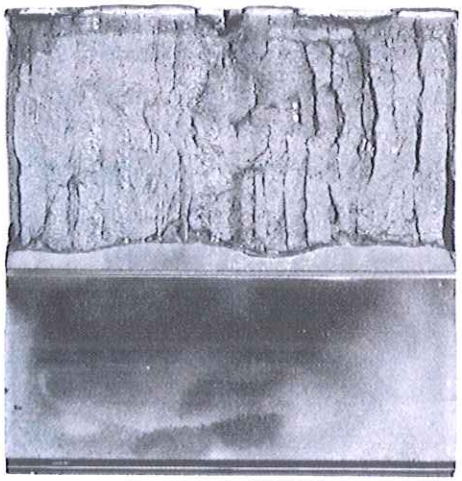
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Test report n° 155644 Rev.0

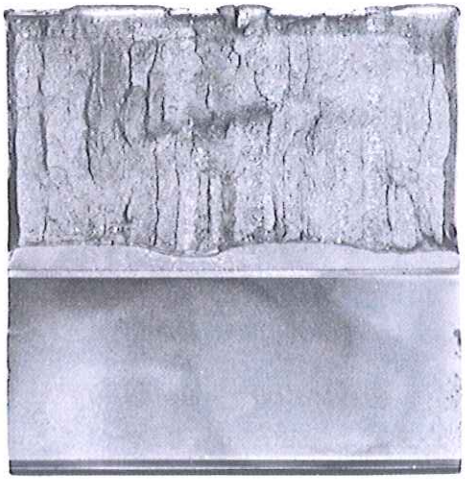
Equipment n.	**Fracture mechanics toughness test**	Pag. 6 of 6
340/1513		

Test Lab. n. *Internal ref. n.* 008.CT2.03	Client *Client ref. n.* 23B/10	Intaglio: WM rough Thk No *Position notch*	Temp. prova °C : -10 *Test Temperature*

Face A



Face B



Fmax/FQ	Factor	a0	B	W - a0	Fmax	FQ	KQ	KIc	J-critical	CTOD
-	2.5(KQ/σYS)²	**36.68**	**74.5**	**38.3**	-	-	-	-	-	**0.25**
req. <=1.10	-	req. < Factor								
-		[mm]	[mm]	[mm]	[N]	[N]	[N.mm-3/2]	[N.mm-3/2]	[N.mm]	[mm]
Criteria for calculation of KIc										

Valori di cricca / Crack values

0	1	2	3	4	5	6	7	8	a max	a min	a 0
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
36.74	**37.14**	**37.34**	**35.36**	**36.80**	**37.64**	**36.96**	**35.86**	**35.99**	**37.64**	**35.36**	**36.68**

Envelope	Angle	(a max - a min) / a0	(a min - M)	(a min - M) / W%	a0 / W	Δ a
YES	**YES**	**6.2** Weld < 20% BM < 10%	**2.4** req. > 1.3	**3.1** req. > 2.5%	**0.49**	**0.77**
	[°]	[mm]	[mm]	[mm]	[mm]	[mm]

Standard ref. EEMUA 158:1994 (Reprinted 2005) & Client's Request - UNI EN 876:1997 - BS 7448:Part1:1991-BS7448:Part2:1997

Remarks

Operator	Customer	Inspector	Inspector
Exova S.r.l.	ROSETTI MARINO S.p.A. Responsabile saldatura Welding Engineer S. Solmi	RINA S. Sabatino 14.05.10	

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Test report n° 155628 **Rev.0**
EN 10204, type : 3.2

Mrs
Cod. 1737

ROSETTI MARINO S.P.A
VIA TRIESTE, 230
48100 RAVENNA RA
Italy

Your ref.	Order n.	D.D.T. n.1VTS100305	data	19/04/2010
Our ref.	Report n.	**155628**	data	**06/05/2010**
	Job n.	49941	data	20/04/2010

Remarks Job No. 110A20
Test No. 23B/10 FCAW pos. 2G
Dimensions : 80mm

Project Jasmine Jacket

Client Reference EEMUA 158:1994 (Reprinted 2005) & Client's Request

Test standard UNI EN 875:1997 - UNI EN 10045-1:1992 - UNI EN ISO 6507-1:2006

This Report is made of n° **4** **pages including this cover plus the following pages**

Test	Pag.
(*) Macrographic examination	1
Hardness test	1
Impact test	1

This Report (RPR) contains tests results on the following materials

Ref.	Identification	Material	DN / Thk [mm]	Remarks
96992	PQR 23B/10	BS 7191 450EM		

Laboratory Manager | Customer | Inspector | Inspector

Exova s.r.l.

ROSETTI MARINO S.p.A.
Responsabile Saldatura
Welding Engineer
S. Solmi

RINA
G. Cortini

General conditions:

1. The Customer accepts general conditions and prices fixed by the laboratory to perform the tests.
2. Test results will be communicated only by means of test report except for different contractual agreement.
3. Tests sample will be destroyed 10 days after test except for different written Client request.
4. The spare will be destroyed 90 days after date of receipt for different written Client request.
5. The test results described in the following test report are referring only to the sample mentioned in it.
6. The date of material receivement is the same as the date of job opening. The date of testing is the same as the date of test report, except for different info.
7. If not specified the test is performed on material as received.

This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory

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Test Report

Test according to:	EEMUA 158:1994 (Reapproved 2000) & Client's Request			
Equipments:	1005			
Initial test date:	06 / 05 / 2010	Due test date:	06 / 05 / 2010	

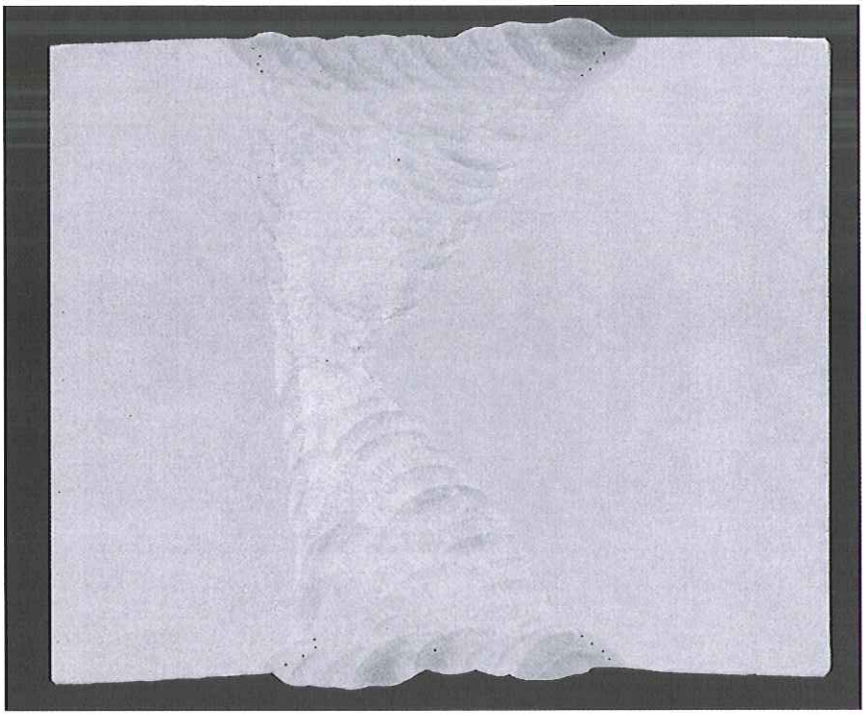
MACROGRAPHIC EXAMINATION

Laboratory	Client
992.FO01.1	PQR 23B/10 FCAW 2G

Etching: NITAL 3%

Magnification : x 1

PQR 23B/10 FCAW 2G



M1

Comments: The macrographic examination at 25x of the weld, relevant to the subject welding procedure test, has shown no defects.

MOD5 - P9 - SO - RO

Operator.	Client.	Inspector.	Inspector.
Exova s.r.l.	ROSETTI MARINO S.p.A. Responsabile saldatura Welding Engineer G. Solmi		RINA G. Cortini

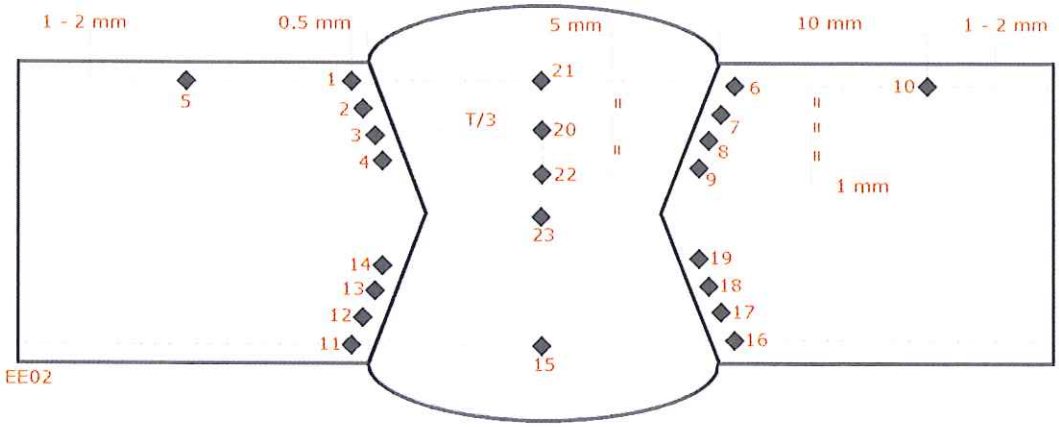
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Test report n° 155628 Rev.0

Equipment n.	**HARDNESS TEST**	Pag. 1 of 1
1311	**Internal procedure POI-07**	



23B/10
M1

HV 10		HV 10		-		-		-	
Point #	**Value**	**Point #**	**Value**	**Point #**	**Value**	**Point #**	**Value**	**Point #**	**Value**
#1	244	#21	203	-	-	-	-	-	-
#2	233	#22	196	-	-	-	-	-	-
#3	218	#23	245	-	-	-	-	-	-
#4	208	-	-	-	-	-	-	-	-
#5	246	-	-	-	-	-	-	-	-
#6	200	-	-	-	-	-	-	-	-
#7 Max	273	-	-	-	-	-	-	-	-
#8	231	-	-	-	-	-	-	-	-
#9	223	-	-	-	-	-	-	-	-
#10	233	-	-	-	-	-	-	-	-
#11	238	-	-	-	-	-	-	-	-
#12	210	-	-	-	-	-	-	-	-
#13	220	-	-	-	-	-	-	-	-
#14	212	-	-	-	-	-	-	-	-
#15	236	-	-	-	-	-	-	-	-
#16 Max	273	-	-	-	-	-	-	-	-
#17	261	-	-	-	-	-	-	-	-
#18	253	-	-	-	-	-	-	-	-
#19	212	-	-	-	-	-	-	-	-
#20	194	-	-	-	-	-	-	-	-

Standard ref. EEMUA 158:1994 (Reprinted 2005) & Client's Request - UNI EN ISO 6507-1:2006

Remarks

Operator	Customer	Inspector	Inspector
Exova s.r.l.	ROSETTI MARINO S.p.A. Responsabile saldatura Welding Engineer S. Solmi		RINA G. Cortini

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Test report n° 155628 Rev.0

Equipment n. 814

IMPACT TEST

Internal procedure POI-02

Nominal machine energy : 450J

Test Ref. Lab.	Test Ref. Client	T Test °C	Posizione Position	Dimensioni Dimensions mm			Intaglio Notch	Richiesti Required	A Single Valore Value J	A Single Shear %	A Single Lateral E.	B Single Valore Value J	B Single Shear %	B Single Lateral E.	C Single Valore Value J	C Single Shear %	C Single Lateral E.	Media Average J	Rif. Ref.
									32			32			32			45	
992.RE2.01	23B/10	-40	WM(2mm cap)	10	x	10.00	KV		94			106			114			105	
992.RE2.02	23B/10	-40	WM(Root)	10	x	10.00	KV		68			84			71			74	

Standard ref. EEMUA 158:1994 (Reprinted 2005) & Client's Request - UNI EN 875:1997 - UNI EN 10045-1:1992

Remarks

Operator: Exova S.r.l.

Customer: ROSETTI MARINO S.p.A. Responsabile Saldatura Welding Engineer S. Solmi

Inspector

Inspector: RINA G. Cortini

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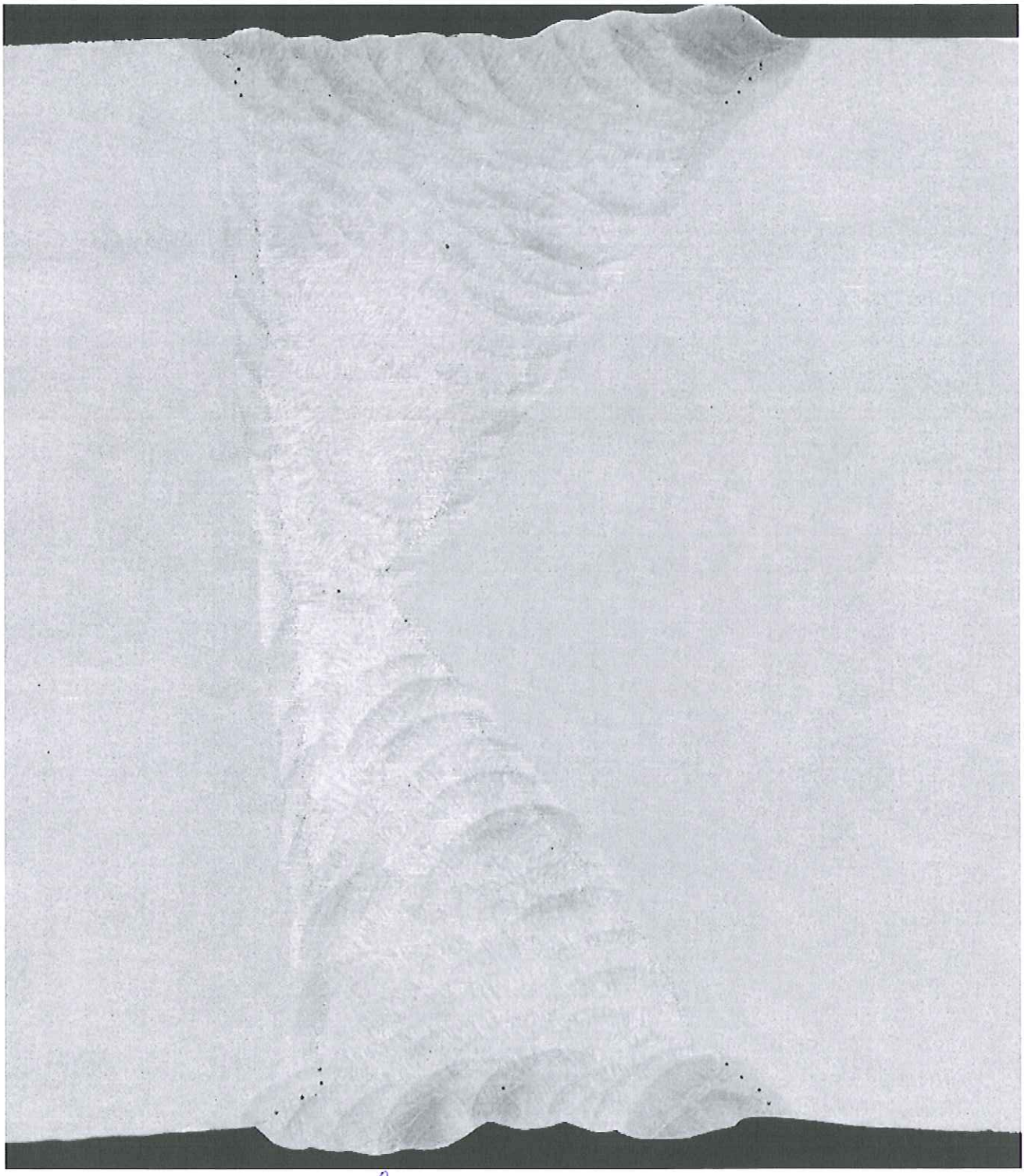
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Annex Test Report

Test according to:	EEMUA 158:1994 (Reapproved 2000) & Client's Request			
Equipments:	1005			
Initial test date:	13 / 05 / 2010	Due test date:	13 / 05 / 2010	

MACROGRAPHIC EXAMINATION



MC01_1 PQR 23B/10 FCAW 2G

Magnification: ~ 2.5x

MOD5 - P9 - SO - RO

Operator.	Client.	Inspector.	Inspector.
Exova s.r.l.	ROSETTI MARINO S.p.A. Responsabile saldatura Welding Engineer S. Solmi		

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ROSETTI MARINO

TABELLA DI SALDATURA
Welding sheet

WPS N.	Pwps 23B-10	Posizione Position	2G
Tipo di saldatura Welding Process	GS FCAW	Cliente Client	CONOCO PHILLIPS
Elettrodo Electrode		Commessa Job	110A20 — Jacket Jasmine
Flux Flusso	/	Materiale base Base material	Plate 80 mm, BS 7191EM 450, heat 68704

	Gas Gas (es)	Miscela Mixture	Portata Flow Rate
Protezione/Shielding	Ar+CO2	80-20	20
Protezione/Shielding	N.A.	N.A.	N.A.
Al rovescio/Backing	N.A.	N.A.	N.A.

Saldatore/Operatore: Welder Name/Welding Operator	PICCOLI ALESSIO, GURIOLI MATTIA		
Prerisc: Preheat	100°C	Temp. Max. interpass:	200°C
Filo Wire	ESAB Tubrod 15.17 1,2mm heat PN950036	RAVENNA	13-14/04/2010
Corrente AC o DC Current AC or DC	DC		
Polarità Polarity	RP		
Preparazione Joint Design	See details		

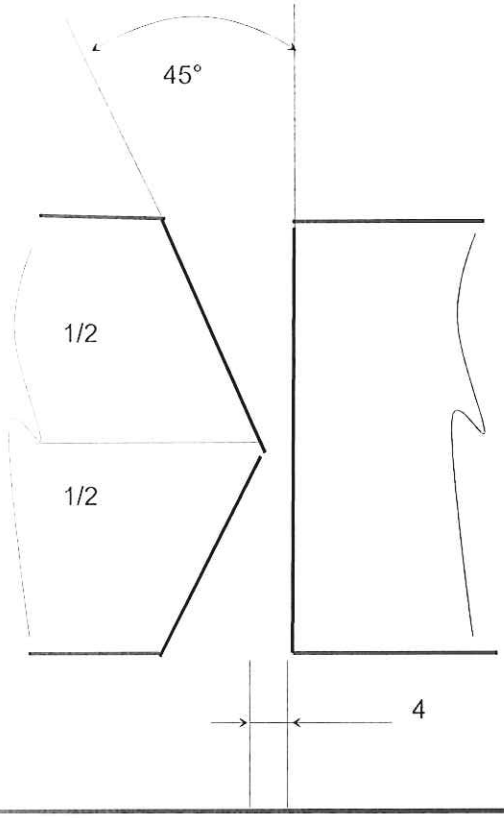
TEST 23B-10

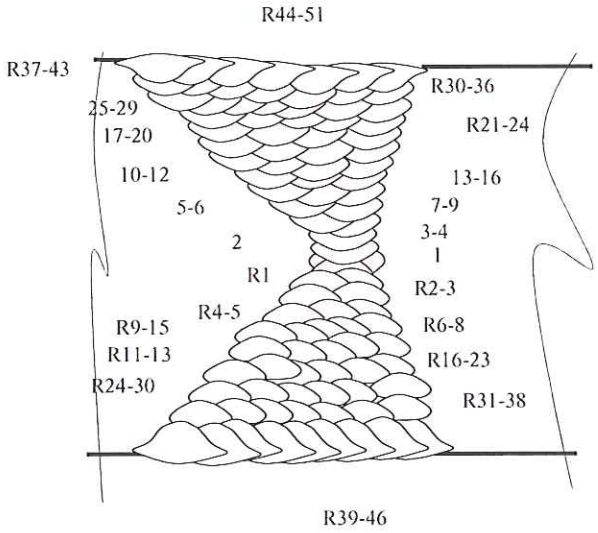
Pass. N. Pass N.	Proced. Process	Elettr. Electr.	Ampere Amps	Volts Volts	Vel.mm/1 Trav.Sp.	H.I. KJ/mm
1	FCAW	1,2	175	22	150	1,54
2	FCAW	1,2	190	26	160	1,85
3-4	FCAW	1,2	195	25	220	1,33
5-6	FCAW	1,2	200	25	230	1,30
7-9	FCAW	1,2	200	24	230	1,25
10-12	FCAW	1,2	205	24	230	1,28
13-20	FCAW	1,2	205	24	230	1,28
21-29	FCAW	1,2	205	24	230	1,28
30-36	FCAW	1,2	205	24	230	1,28
37-43	FCAW	1,2	205	24	300	0,98
44-51	FCAW	1,2	190	23	300	0,87
Grind to sound metal						
R1	FCAW	1,2	185	25	140	1,98
R2-3	FCAW	1,2	225	26	170	2,06
R4-5	FCAW	1,2	230	26	200	1,79
R6-8	FCAW	1,2	230	26	320	1,12
R9-15	FCAW	1,2	230	26	320	1,12
R16-23	FCAW	1,2	230	26	320	1,12
R24-R30	FCAW	1,2	210	24	250	1,21
R31-R38	FCAW	1,2	210	24	250	1,21
R39-46	FCAW	1,2	210	24	250	1,21

ROSETTI MARINO S.p.A.
Responsabile saldatura
Welding Engineer
S. Sabatino

RINA
S. Sabatino

ROSETTI MARINO	TABELLA DI SALDATURA Welding sheet	
	WPS N. **Pwps 23A-10**	Posizione / Position **3G Uphill**
Tipo di saldatura / Welding Process **SMAW**	Cliente / Client **CONOCO PHILLIPS**	





RINA S. Sabatino

ROSETTI MARINO S.p.A.
Responsabile saldatura
Welding Engineer
S. Sorbi

ROSETTI MARINO

PROCEDURA DI SALDATURA (in accordo EEMUA 158)
Welding Procedure Specification (according EEMUA 158)

WPS N°:	23B/10
PQR ref.:	23B10 to qualify
REV.:	0
Data /date	14-04-2010

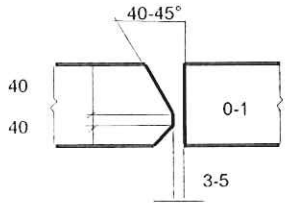
Procedimento di saldatura / Welding process: **GS FCAW +** Tipo / Type: **SEMIAUTOMATIC +**

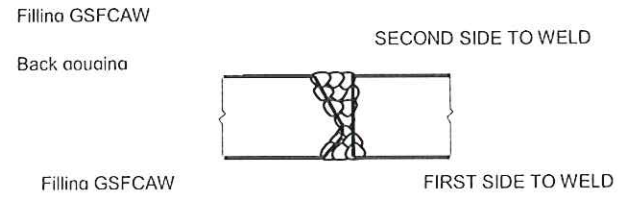
GIUNTO – JOINT (QW-402)

Tipo di giunto / Joint Design: **K** Supporto / Backing: ☒ Si / Yes **Only for second and other passes** ☒ No **Only for first pass**

Materiale di supporto (tipo) / Backing material (type): ☒ Metallico / Metal ☐ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:





MATERIALE BASE – BASE MATERIAL (QW-403)

Da / from P-N°:	NA	Group N°:	3 (as per EN 10225)	A / to P-N°: NA	Group N° 3 (as per EN 10225)
Da Tipo e grado / From type and grade	BS 7191 450EM (heat number 68704 Ceq 0,38)				
A Tipo e grado / To type and grade	BS 7191 450EM (heat number 68704 Ceq 0,38)				

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove **80 mm For CTOD weld metal only.**

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove **> 600 mm**

METALLO D'APPORTO – FILLER METAL (QW-404)

	GS FCAW	
Spec. N° (SFA)	5.29	
AWS N° (CLASS)	E81T1-Ni1M	
F-N°	6	
A-N°	10	
Diametro mat. d'apporto / Size of filler metal	1,2	
Metallo depositato / Deposit weld metal		
Gamma spessori /Thick. range Piena penetrazione / Groov	80 mm	
Accoppiamento filo-flusso / Electrode-flux (CLASS)	N.A.	
Denom. Comm. flusso / FLUX trade name	N.A.	
Inserto consumabile / Consumable insert	N.A.	
Altro / other	WIRE: ESAB OK Autrod 15.17	

POSIZIONI – POSITION (QW 405)

Posizione del giunto / Joint position:	Cianfrino / groove	Posizione / position 2G — Progressione / weld progression: N.A.

PRERISCALDO – PRE-HEAT (QW406)

Temp preriscaldo minima / Min. pre-heat temp:	100 °C	Max temp. Di interpass / Max interpass temp.: 200°C	Mantenimento posriscaldo / Postheat maintenance: N.A. — Tempo di mantenimento posriscaldo.: / Postheat time: NA

TRATTAMENTO TERMICO DOPO SALDATURA – POST WELD HEAT TREATMENT(QW 407)

Riscaldamento / Heating rate (°C/Hrs):	NA	Temperatura di stasi / Holding temperature °C: NA	Tempo di stasi / Holding time (min.): NA — Velocità di raffreddamento / Cooling rate (°C/Hrs): NA

GAS DI PROTEZIONE – GAS (QW 408)

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar+CO2	80-20 %	16-20 lt/min.
Protezione al seguito / Trailing:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS (QW –409)

Corrente / Current: DC	Polarità / Polarity RP
Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type:	N.A.
Metodo di trasferimento per GMAW / GMAW metal tranfer mode:	Spray arc
Velocità alimentazione filo / Electr. Wire feed speed range:	Self controlled

TECNICA – TECHNIQUE (QW-410)

Passata / Bead: Tirata/String	Dimensione bocchello gas / Orifice of gas cup size: 1/2"	Pulizia iniziale e fra le passate / Initial and interpass cleaning: Spazzolatura e Molatura/Brushing Grinding
Metodo di solcatura a rovescio / Method of back gouging: Molatura/Grinding	Oscillazione / Oscillation: N.A.	Distanza tra zona di contatto e pezzo / Contact zone to work distance: N.A.
N°Passate / Passes nr.: Multipla/Multiple	Elettrodo multiplo o singolo / Multiple or single electrodes: Singolo/Single	Martellatura / Peening: N.A.

Altro / Other: None

N° Passate Weld layers nr.	Processo Process	Materiale d'apporto Filler metal		Corrente Current		Voltaggio Volt range	Vel. avanzamento Travel speed range (mm/min)	Apporto termico Heat input (KJ/mm)
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. range			
1	GS-FCAW	E81T1-Ni1	1,2	RP	150-170	22-24	150 ÷ 170	1,2-1,7
2	GS-FCAW	E81T1-Ni1	1,2	RP	180-200	24-26	180 ÷ 200	1,3-1,7
3-N	GS-FCAW	E81T1-Ni1	1,2	RP	200-220	24-26	250 ÷ 300	0,9-1,4
Back gouge								
R	GS-FCAW	E81T1-Ni1	1,2	RP	180-200	24-26	150 ÷ 180	1,4-2,0
R-N	GS-FCAW	E81T1-Ni1	1,2	RP	210-230	24-26	250 ÷ 300	1,0-1,4

Preparato da / prepared by: *A.KARIM*

Approvato da / approved by: *S.SOLMI*

RINA S.p.A. 1861

ROSETTI MARINO

MT N°: MT 23B/10

RAPPORTO D'ESAME MAGNETOSCOPICO
Magnetic Particle Examination Report

DATA - Date: 18/04/10

FOGLIO - Sheet: 1/1

CLIENTE - Customer	ORDINE - Order	PROGETTO - Project	COMMESSA - Job
CONOCO PHILIPS	/	JASMINE JACKET	110A20
OGGETTO - Object	**DISEGNO - Dwg**	**P.F.C. / Q.C.P.**	**FASE - Step**
PQR 23B/10	/	/	/

STATO SUPERFICIE - Surface Condition

- [x] COME SALDATO / As Welded
- [x] SPAZZOLATO / Brushed
- [ ] GREZZO / As Forged
- [ ] COME CALANDRATO / As Rolled
- [ ] MOLATO / Ground
- [ ] COME LAMINATO / As Rolled
- [ ] LAVORATO DI MAC. / Machined
- [ ] _____

- [ ] PUNTALI / Prods
- [x] GIOGO / Yoke
- [ ] BOBINA / Coil
- [ ] CONDUTTORE CENTRALE / Central Conductor

CORRENTE: _____ A.C. _____ / Current

INTENSITA': _____ / _____ / Intensity

DISTANZA: _____ **200 mm** _____ / Spacing

TIPO APPARECCHIO: _____ **CGM TWIST YOKE Matr. 6699** / Flow Detector

- [ ] SECCO / Dry
- [x] UMIDO / Wet
- [ ] FLUORESCENTE / Fluorescent

- [x] POLVERE / Powder
- [ ] GRIGIA / Grey
- [x] NERA / Black
- [ ] ROSSA / Red

MARCA: _____ **CGM** _____ / Trade

TIPO: _____ **LK 35** _____ / Type

NOTE - Remarks

TEST PERFORMED ON PQR 23B-10 AT 100%

TECNICO I LIVELLO / Level I Technician

RISULTATI - Results

- [x] CONFORME / According to Spec.
- [ ] NON CONFORME / Non conforming to Spec.

PROCEDURA DI CONTROLLO / Application Procedure

110A20-QC-PRO-005

TECNICO II° LIVELLO / Level II° Technician	C. QUALITA' / Q. Control	ISPETTORE CLIENTE / Company Repr.	ISPETTORE A.I. / Inspection Agency
M.COMANDINI II level MT-PT-UT	ROSETTI MARINO SpA Quality Control Dept.		RINA S. Sabatino

ROSETTI MARINO	UT N°: UT 23B/10	
RAPPORTO D'ESAME CON ULTRASUONI *Ultrasonic Examination Report*	DATA - Date 18/04/10	FOGLIO - Sheet 1 / 1

CLIENTE - Customer	ORDINE - Order	PROGETTO – Project	COMMESSA - Job
CONOCO PHILIPS	/	JASMINE JACKET	110A20
OGGETTO - Object	**DISEGNO - Dwg**	**P.F.C. / Q.C.P.**	**FASE - Step**
PQR 23B/10	/	/	/

MATERIAL Materiale	BS-7191 450EM	DIAMETER Diameter	PLATE	THICKNESS Spessore	80 mm
SURFACE CONDTION Stato Superficiale	AS WELDED	Couplant Liquido di accoppiamento	GLUE		
EQUIPMENT Apparecchio	PANAMETRICS	TYPE Tipo	EPOCH 4	CONTROL TECHNIQUE Tecnica di Controllo	CONTACT REFLECTION

TRASDUTTORE Search unit	TIPO Type	FREQ. Frequency (MHz)	SEZIONE Size (mm)	ANGOLO Angle	ONDE Waves
KRAUTKRAMER	MWB	2	14 X 14	45°-60°-70°	SHEAR

BLOCCO CAMPIONE: IIW-V1 TARATURA DELLA SCALA: ON DISTANCE
Reference Block Scale calibration

SENSIBILITA' DI TARATURA: DAC ON HOLES Φ 3 mm
Calibration sensitivity

NOTE - Remarks	TECNICO I LIVELLO Level I Technician
TEST PERFORMED ON PQR 23B/10 AT 100%	

RISULTATI - Results		PROCEDURA DI CONTROLLO Application Procedure
	[X] CONFORME According to Spec.	
	[ ] NON CONFORME Non conforming to Spec.	110A20-QC-PRO-004

TECNICO II° LIVELLO Level II° Technician	C. QUALITA' Q. Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
M.COMANDINI II level MT-PT-UT	ROSETTI M. S.p.A. controllo qualità quality control		RINA S. Sabatino

ATTESTATO DI CONTROLLO/ TEST REPORT

In accordo a/acc to EN 10204 - 2.2

Data/Date: 2010-04-09

Numero certificato/Cert no: EC21568159 rev. 0

Nostro ordine/Our order:
Nostro riferimento/Our ref:
Codice Cliente/Cust no: NA
Data ordine Cliente/Your date:

Vostro ordine/Your order:
Vostro riferimento/Your ref:
Vostro numero fax/Your fax:
Vostra e-mail/Your e-mail:

Indirizzo di fatturazione/Invoice address
ROSETTI MARINO SPA
VIA TRIESTE 230
48100 RAVENNA
RA

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
ROSETTI MARINO SPA
VIA TRIESTE 230
48100 RAVENNA
RA

CONSEGNA/DELIVERY Numero di lotto/Lot no: PN950036 Quantità/Quantity:

PRODOTTO/PRODUCT

Marchio/Brand: ESAB
Descrizione/Desc: OK Tubrod 15.17 1.2mm 16kg
Codice/Item no: 1517127730

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.29	E81T1-Ni1M
EN ISO 17632-A	T 46 3 1Ni P C 2 H5
EN ISO 17632-A	T 46 4 1Ni P M 2 H5

CARATTERISTICHE MECCANICHE/MECHANICAL PROPS

Norma/Standard: EN
Altro/Auxiliary: M21 (EN ISO 14175)
Condizione/Condition: As welded

TRAZIONE/TENSILE

ReL	Rm	A5
544 MPa	613 MPa	26 %

RESILIENZA/IMPACT

Temp	KV
-40 °C	124 J

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

All weld metal
Altro/Auxiliary: M21 (EN ISO 14175)

C	0.05%
Si	0.34%
Mn	1.15%
P	0.008%
S	0.008%
Cr	0.03%
Ni	0.96%
Mo	0.01%
Nb	0.02%
Cu	0.03%
Pb	0.002%
Ti	0.040%
V	0.02%
Al	0.01%
B	0.005%
As	< 0.005%
Sb	< 0.005%
N	0.0037%
Sn	< 0.005%

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura Spa Via E.Mattei 24, I-20010 Mesero (MI), +39 02 979 68.1

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione/Validation
Shaun Studholme Product Manager

OK

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02	ABNAHMEPRUEFZEUGNIS	3.1.B	DIN EN 10204 - EN 10204 - DIN 50049	A09 Advice of dispatch No./ Date of dispatch	A02/ Manufacturer's order/ A03 Certificate No. / Sheet
	CERTIFICAT DE RECEPTION	3.1.B	NF EN 10204		
	INSPECTION CERTIFICATE	3.1.B	BS EN 10204 - ISO 10474 MATERIAL TEST REPORT	184932-26.05.05	294969-003 1/...

A05 Established inspecting body	A06 Purchaser	KUERVERS E.,MEERBUSC	A07.1 No. 7350/20/BS BATCH 7	B01 Product
MODY TUVM	First receiver	ROSETTI MAR.,RAVENNA	A07.2 No. BPAC-ACGX-PNSM01B	HOT ROLLED PLATES

B02/ Steel grade TYPE-II-450EM
B03 Specifications BR-1GZZZZ-MT-SPE-0004:REV.C3
BR-1GZZZZ-MT-SPE-0073:REV.C2
BS-7191:89+AMD-5865

28. Juni 2005

REVIEWED
Technischer Überwachungs-Verein Saarland e.V.

TÜV SAARLAND e.V.
TEST no.: 8022 / 05 / 0325

B01-B99 Product description

B09 Item No.	B10 Quantity	B11 Thickness	B12 Width MM	B13 Length	B14 Mass theoretical KG	B04 Delivery condition	B08 Heat No.	B07 Rolled plate No./ Test No.	B15 Customer reference
02	1	80,00	x 3200	x 7000	14067	TM	68704	07898-01	SPL0280X7000X3200
02	1	80,00	x 3200	x 7000	14067	TM	68704	07900-01	SPL0280X7000X3200
02	1	80,00	x 3200	x 7000	14067	TM	68704	07900-02	SPL0280X7000X3200
**	3				42201				
***	3				42201				

Edmford inford

B06 Marking

ITEM NO.: 02
STEEL GRADE TYPE-II-450EM
HEAT NO. / TRADEMARK / ROLLED PLATE NO.-TEST NO. / INSPECTOR'S STAMP

C10-C29 Tensile test

B09 Item No.	B08 Heat No.	B07 Rolplate/ Test No.	B05 Reference condition	C01	C02/ C01	C03 Temp. GR.C	C10 C11 MPA RP02	C12 RM	C13 A % LO=5D	C14-C15 RP02/RM
02	68704	07898		K4	Q	RT	463	559	26,7	0,83
02	68704	07900		K4	Q	RT	458	548	25,2	0,84

C40-C49 Impact test

B09 Item No.	B08 Heat No.	B07 Rolplate/ Test No.	B05 Reference condition	C01	C02/ C01	C03 Temp. GR.C	C41 Specimen width	C40 Type of specimen	C44 Testing method	C46 Energy Joule	C45	C42 Individual values AV=J			C43 Average value
02	68704	07898		K4	Q3	-40		CEP-V		600	AV	337	316	313	322
				K4	QM	-40		CEP-V		600	AV	274	156	252	221
02	68704	07900		K4	Q3	-40		CEP-V		600	AV	324	309	299	310
				K4	QM	-40		CEP-V		600	AV	191	184	58	144

A04 Trademark

Z01/Z02 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

B. MUELLER
Der Werkssachverständige

Inspector's stamp

Date 28.06.05

A01
AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

EK 1

DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.biz certificate)

A02 ABNAHMEPRUEFZEUGNIS	3.1.B	DIN EN 10204 - EN 10204 - DIN 50049	A05 Advice of dispatch No./ Date of dispatch	A06/ Manufacturer's order/ A08 Certificate No.	Sheet
CERTIFICAT DE RECEPTION	3.1.B	NF EN 10204			
INSPECTION CERTIFICATE	3.1.B	BS EN 10204 - ISO 10474 MATERIAL TEST REPORT	184932-28.06.05	294969-003	2/...

A05 Established inspecting body: MODY TUVM

A06 Purchaser: KUERVERS E.,MEERBUSC A07.1 No. 7250/20/BS BATCH 7

Final receiver: ROSETTI MAR.,RAVENNA A07.2 No. BPAC-ACGX-PNSM01B

B01 Product: HOT ROLLED PLATES

B02/ Steel grade: TYPE-II-450EM

B03 Specifications: BR-1GZZZZ-MT-SPE-0004:REV.C3; BR-1GZZZZ-MT-SPE-0073:REV.C2; BS-7191:89+AMD-6885

28. Juni 2005

Prüfstelle: Technische Überwachungs-Verein Saarland e.V. Abteilung Anlagentechnik

C66-C68 Supplementary tests on test samples

ITEM NO.: 02
DEEP ETCH TESTING AS PER DE-STANDARD <=2B: SATISFACTORY.

C70-C99 Chemical composition % - Heat analysis

B08 Heat	C70	C99	C	SI	MN	P	S	N	AL	CU	MO	NI	CR	V	NB	AS
68704	Y	S	0,058	0,300	1,59	0,012	0,0005	0,0030	0,035	0,269	0,011	0,448	0,037	0,002	0,020	0,004

B08 Heat	C70	C99	SN	TI	PB	B	SB	CA	BI	AL-T
68704	Y	S	0,000	0,003	0,000	0,0000	0,0003	0,0032	0,0001	0,036

C94 Heat analysis Carbon equivalent / Alloying restrictions

B08 Heat								
68704	FO-02=	0,38	FO-51=	0,02	FO-52=	0,03	FO-55=	0,77	FO-58=	11,67

C95 Further information about ladle treatment

ITEM NO.: 02
FULLY KILLED AND FINE GRAIN TREATED.

C70-C99 Chemical composition % - Product analysis

B08 Heat	B07 Test No.	C01	C	SI	MN	P	S	N	AL	CU	MO	NI	CR	V	NB	TI
68704	07898	K4	0,061	0,320	1,56	0,012	0,0006	0,0031	0,036	0,270	0,010	0,443	0,035	0,000	0,020	0,003
68704	07900	K4	0,058	0,288	1,58	0,010	0,0004	0,0031	0,036	0,268	0,016	0,445	0,042	0,000	0,020	0,002

B08 Heat	B07 Test No.	C01	B	AL-T
68704	07898	K4	0,0001	0,037
68704	07900	K4	0,0002	0,037

A04 D H Trademark

Z01/Z02 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

B. MUELLER
Der Werkssachverständige

AHB Inspector's stamp

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Date 28.06.05 EK 1

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations/www.dillinger.de/certificate

DILLINGER HÜTTE

A02				A03 Advice of dispatch No./ Date of dispatch	A03/ Manufacturer's order/ A03 Certificate No.	Sheet
ABNAHMEPRÜFZEUGNIS	3.1.B	DIN EN 10204 - EN 10204 - DIN 50049				
CERTIFICAT DE RECEPTION	3.1.B	NF EN 10204				
INSPECTION CERTIFICATE	3.1.B	BS EN 10204 - ISO 10474	MATERIAL TEST REPORT	184932-28.06.05	294969-003	3

A05 Established inspecting body	A06 Purchaser		A07.1 No.	B01 Product
MODY TUVM	Final receiver	KUERVERS E.,MEERBUSC	7250/20/BS BATCH 7	HOT ROLLED PLATES
		ROSETTI MAR.,RAVENNA	A07.2 No. BPAC-ACGX-PNSM01B	

B02/ Steel grade: TYPE-II-450EM

B03 Specifications: BR-1G2ZZZ-MT-SPE-0004:REV.C3
BR-1G2ZZZ-MT-SPE-0073:REV.C2
BS-7191:89+AMD-6885

28. Juni 2005

APPROVED
Technischer Überwachungs-Verein
Saarland e.V.
Abteilung Anlagentechnik

C94 Product analysis Carbon equivalent / Alloying restrictions

B08 Heat	B07 Test No.	C01									
58704	07898	K4	FO-02=	0,38	FO-51=	0,02	FO-52=	0,02	FO-55=	0,76	FO-58= 11,61
58704	07900	K4	FO-02=	0,38	FO-51=	0,02	FO-52=	0,02	FO-55=	0,77	FO-58= 11,61

C94 Carbon equivalent formula / Alloying restrictions

FO-02 = C+(MN/6)+(CR+MO+V)/5+(NI+CU)/15
FO-51 = V +NB
FO-52 = V +NB+TI
FO-55 = CU+MO+NI+CR
FO-58 = AL/N

D01 Checking of marking, surface, shape and dimensions

ITEM NO.: 02
RESULT OF MARKING, SURFACE, SHAPE AND DIMENSIONS: NO REMARKS
SURFACE AS PER BS-7191:89
THICKNESS AS PER BS-EN10029-A:91
LENGTH AND WIDTH AS PER BS-EN10029:91
FLATNESS AS PER BS-EN10029-T4H:91

D02 Ultrasonic testing

ITEM NO.: 02
UT-SPECIFICATION : BS-5996:93 LEVEL B3 AND B1
SCANNING PLAN BODY : TRANSVERSAL SCAN LINES SPACING 60 MM
EDGES : 1,5 X PLATE THICKNESS, MINIMUM 50 MM
PERSONNEL QUALIFICATION : LEVEL 2 IN ACC. TO EN 473 AND SNT-TC-1A
THE TEST RESULTS MEET THE REQUIREMENTS OF THE ORDER.

A04 D H Trademark

Z01/Z02 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

B. MUELLER
Der Werkssachverständige

AHB Inspector's stamp

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Date 28.06.05 EK 1

ROSETTI MARINO	Welding Procedure Qualification Record (WPQR) Verbale di Qualifica di Procedura di Saldatura	No. 02/19	Sheet/Foglio 1/2

Manufacturer's Welding Procedure. Ref. no.	02/19 REV. 0					
Manufacturer	ROSETTI MARINO S.p.A.					
Address	VIA TRIESTE 230 - 48121 RAVENNA					
Code, Testing Standard	EN ISO 15613:2005					
	Location of test specimen according to EN ISO 15614-2:2017 Par. 7.2. Essential variables according to EN ISO 15613:2005 Section 8 & EN ISO 15614-1:2017, Section 8					
Date of welding	Start: February 1st , 2019 Complete: February 1st , 2019					
Examiner of examining body	Rina Services S.p.A.					
RANGE OF QUALIFICATION						
Welding process	136 - FCAW					
Type(s)	Semiautomatic					
Welding Equipment Type	HF inverter type					
Actual parent Material side A	Pipe: API 5L X65 PSL1 (Heat: 28559)					
Actual parent Material side B	Pipe: API 5L X65 PSL1 (Heat: 28559)					
Parent Material grade	Carbon steel with maximum strength of 530 MPa					
Supply condition	Hot rolled					
Carbon equivalent/Pcm/C	Heat Values: 0,32/0,180/ 0,10					
Groove design/configuration	Partial Penetration Pipe to Pipe Joint in Single Pass and Multipass (Half Vee), See Page 3 of 6					
Parent material thickness (mm)	7,14 mm (Minimum deposit required: 3 mm)					
Weld metal thickness (mm)	136 - FCAW (Minimum deposit required: 3 mm)					
Single or Multi-pass	136 - FCAW SINGLE AND MULTIPLE					
Outside diameter	≥30,15 mm (60,3 mm Test Coupon)					
Filler material Designation	**136 FCAW** EN ISO 17632-A: T 46 4 1Ni P M 21 2 H5 (AWS 5.36: E81T1-M21A4-Ni1)					
Filler material Maker	136 - Esab OK Tubrod 15.17					
Filler material Size	136 - FCAW ∅ 1,2 mm					
Shielding gas/Flux	ISO 14175 :2008 M21 (80% Ar + 20% CO_2)					
Shielding gas flow rate	20 l/min.					
Backing gas (purging)	None					
Type of welding current & polarity	DC - RP	Heat input / Apporto termico (kJ/mm) ± 25%		Diameter mm	2G (PC)	5G (PH)
			Pass			
			Root	∅ 1,2	0,51 to 0,88	0,48 to 1,05
			Fill/Cap	∅ 1,2	0,44 to 0,73	0,64 to 1,06
Welding position	All, vertical down progression excluded (Test Coupon performed in PC and PH positions)					
Preheat (°C)	20	Interpass temperature / Temp. di interpass (°C)	250			
Post-Weld Heat Treatment and/or ageing	NONE					
Weld bead width	Max. 10 mm for PC position ; Max. 12 mm for PH position					
Welder's detail	Crispino Antonio NC272					
Time lapse between root and hot pass	N.A.					
Other information / Altre informazioni	- Preheat performed by propane torch -Accelerate weld cooling not permitted; -Base material origin: Seamless pipe					

Manufacturer's Welding Procedure. Ref. no.	02/19 REV. 0		
Test result (WPQR) N°	02/19	Date/Data	12/02/2019
Manufacturer's WPS No.	pWPS 02/19 REV. 0	Date/Data	04/02/2019

TESTS CARRIED OUT ON SAMPLES 02/19 WELDED IN 2G POSITION (PC, single and multipass) & IN 5G POSITION (PH, single and multipass)

NON DESTRUCTIVE EXAMINATIONS

	Judgement	Report No.
Visual examinations	Acceptable	VDR 02/19
Penetrant test	N.A.	/
Magnetic particle test	Acceptable	14-18205
Radiographic test	N.A.	/
Ultrasonic test	N.A.	/

TENSILE TEST

Specimen type and No.	$R_{P0,2\%}$ [N/mm2]	$R_{t0,5\%}$ [N/mm2]	Rm [N/mm2]	A [%]	Z [%]	Fracture Location	Remarks
/	/	/	/	/	/	/	/

BEND TEST

Type & N.	Bend angle	Remarks	Results
/	/	/	/

IMPACT TEST

Specimen Dimens. Dim. Provette (mm)	Notch Locations / Direction	Notch Type	Test Temp. (°C)	Absorbed energy [J]			Avarage value [J]	Remarks
/	/	/	/	/	/	/	/	/

OTHER TESTS

Type of test / Tipo di prova	Results / Risultati
2 Macro examination+Hardness test (HV10) (PH, multipass)	Satisfactory-See Inspecta certificate No. 0029-00210-19, max. Hardness: 223HV10 Welding Deposit: 5,53 mm (1st Macro-examination) ; 4,41 mm (2nd Macro-examination)
2 Macro examination+Hardness test (HV10) (PC, multipass)	Satisfactory-See Inspecta certificate No. 0029-00210-19, max. Hardness: 218HV10 Welding Deposit: 5,56 mm (1st Macro-examination) ; 5,39 mm (2nd Macro-examination)
2 Macro examination+Hardness test (HV10) (PH, single pass)	Satisfactory-See Inspecta certificate No. 0029-00210-19, max. Hardness: 221HV10 Welding Deposit: 3,36 mm (1st Macro-examination) ; 4,31 mm (2nd Macro-examination)
2 Macro examination+Hardness test (HV10) (PC, single pass)	Satisfactory-See Inspecta certificate No. 0029-00210-19, max. Hardness: 233HV10 Welding Deposit: 4,35 mm (1st Macro-examination) ; 4,30 mm (2nd Macro-examination)
Welding test conducted by	Rosetti Marino S.p.A. - Ravenna
Mechanical test conducted by	Inspecta S.r.l. - Ravenna (RA)
Laboratory report reference N.	Report No. 0029-00210-19 dated FEBRUARY 12th 2019
Test carried out in the presence of:	RINA Services S.p.A.

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of EN ISO 15613:2005 Standard

Date/Data
12-02-2019

ROSETTI MARINO SpA
Welding Dept.
D. Cenacchi

ROSETTI MARINO S.p.A.

Examiner or Examination Body
RINA Services S.p.A.

RINA
F. Lago
RINA Services S.p.A.

Name and signature / Nome e firma

ROSETTI MARINO

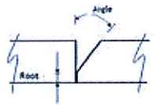
PQR - AS- RUN PARAMETER SHEET

pWPS 02/19	
PQR 02/19	
Coupon Nr. 02/19 PC SI	
Date: 04/02/2019	Page: 1_ of _1

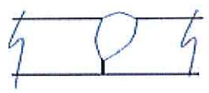
REFERENCE CODE AND PROJECT SPECIFICATIONS: **EN ISO 15613:2005**

Welder Name(s):	CRISPINO ANTONIO	Welder Id No(s):	NC272		
Welding Process(es):	136-FCAW	Type(s):	SEMIAUTOMATIC		
Welding Position:	PC (2G)	Progression:	N.A.		
Base Materials:	API 5L Gr. X65 PSL1	Wall Thickness:	7,14 (Pipe)	Diameter:	60,3 mm (2")
Heat No(s):	28559	Joint Type:	PARTIAL PENETRATION BUTT JOINT, HALF VEE		

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNS24006	ESAB OK TUBROD 15.17
Hot Pass	/		
Filling Runs	/		
Filling Runs	/		
Cap	/		

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar+ 20%CO2
Flow:	20 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/8"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:	No of Passes:	Mulliple or Single Electrodes:
10 mm	String	Single	Single

	Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required		Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
20°C	PROPANE TORCH	N.A.	CONTACT DIGITAL THERMOMETHER	NA		NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
NA	1	FCAW	1	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	165	175	170,0	24	26	25,0	-	-	30	0,68	0,80	20	Welding unit: HELVI SE.0236
																				Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:			SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	RINA Services SpA No. Bo. 0474	Date 04/07/2019	Name:
Signature: ROSETTI MARINO SpA Welding Dept. D. Cenacchi	Signature:	Signature:	Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	File Signature Cinotti Davide	Signature:
Date:	Date:	Date:			Date:

ROSETTI MARINO

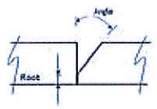
PQR - AS- RUN PARAMETER SHEET

pWPS 02/19	
PQR 02/19	
Coupon Nr. 02/19 PC MI	
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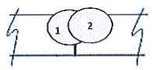
REFERENCE CODE AND PROJECT SPECIFICATIONS: **EN ISO 15613:2005**

Welder Name(s):	CRISPINO ANTONIO	Welder Id No(s):	NC272
Welding Process(es):	136-FCAW	Type(s):	SEMIAUTOMATIC
Welding Position:	PC (2G)	Progression:	N.A.
Base Materials:	API 5L Gr. X65 PSL1	Wall Thickness:	7,14 — Diameter: 60,3 mm (2")
Heat No(s):	28559	Joint Type:	PARTIAL PENETRATION BUTT JOINT, HALF VEE

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNS24006	ESAB OK TUBROD 15.17
Fill/Cap	1,2	PNS24006	ESAB OK TUBROD 15.17

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar+ 20%CO2
Flow:	20 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/8"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
10 mm	String	Multiple	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
20°C	PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL AWS Spec.	FILLER METAL Dia. mm	Electrode Polarity	Current Amperage Range Min	Current Amperage Range Max	Current Amperage Range Av.	Voltage Range Min	Voltage Range Max	Voltage Range Av.	Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
NA	1	FCAW	1	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	170	180	175,0	24	26	25,0	-	-	30	0,70	0,80	20	Welding unit: HELVI SE.0236
NA	2	FCAW	2	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	175	185	180,0	24	26	25,0	-	-	37	0,58	0,80	250	Digital thermometer: Della Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:		SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	RINA Services SpA No. Bo. 0474	Name:
Signature: ROSETTI MARINO SpA Welding Dept. D. Cenacchi	Signature:	Signature:	Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	Signature:
Date:	Date:	Date:	Date 04/02/2019 File Signature Cimatti Davide	Date:

ROSETTI MARINO

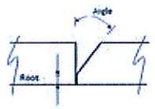
PQR - AS- RUN PARAMETER SHEET

pWPS 02/19	
PQR 02/19	
Coupon Nr. 02/19 PH SI	
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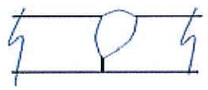
REFERENCE CODE AND PROJECT SPECIFICATIONS: **EN ISO 15613:2005**

Welder Name(s):	CRISPINO ANTONIO	Welder Id No(s):	NC272		
Welding Process(es):	136-FCAW	Type(s):	SEMIAUTOMATIC		
Welding Position:	PC (2G)	Progression:	N.A.		
Base Materials:	API 5L Gr. X65 PSL1	Wall Thickness:	7,14 (Pipe)	Diameter:	60,3 mm (2")
Heat No(s):	28559	Joint Type:	PARTIAL PENETRATION BUTT JOINT, HALF VEE		

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNS24006	ESAB OK TUBROD 15.17
Hot Pass	/		
Filling Runs	/		
Filling Runs	/		
Cap	/		

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar+ 20%CO2
Flow:	20 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/8"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:	No of Passes:	Mulliple or Single Electrodes:
12 mm	String	Single	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature °C	Holding Time °c	Heating Rate °C	Cooling Rate °C
20°C	PROPANE TORCH	N.A.	CONTACT DIGITAL THERMOMETHER	NA	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
NA	1	FCAW	1	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	155	165	160,0	23	25	24,0	-	-	22	0,84	0,80	20	Welding unit: HELVI SE.0236
																				Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:		SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	RINA Services SpA	Name:
Signature: ROSETTI MARINO S.p.A. Welding Dept. D. Cerracchi	Signature:	Signature:	Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐	Signature:
Date:	Date:	Date:	Date 04/02/2019 File Signature Cimatti Davide	Date:

ROSETTI MARINO

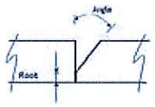
PQR - AS- RUN PARAMETER SHEET

pWPS 02/19	
PQR 02/19	
Coupon Nr. 02/19 PH MI	
Date: 04/02/2019	Page: 1_ of _1

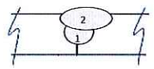
REFERENCE CODE AND PROJECT SPECIFICATIONS: **EN ISO 15613:2005**

Welder Name(s):	CRISPINO ANTONIO	Welder Id No(s):	NC272
Welding Process(es):	136-FCAW	Type(s):	SEMIAUTOMATIC
Welding Position:	PH (5G)	Progression:	UPHILL
Base Materials:	API 5L Gr. X65 PSL1	Wall Thickness:	7,14 — Diameter: 60,3 mm (2")
Heat No(s):	28559	Joint Type:	PARTIAL PENETRATION BUTT JOINT, HALF VEE

WELD PREPARATION:



WELDING SEQUENCE / PASS LOCATION:



WELDING CONSUMABLES:

LAYER:	DIA:	BATCH NO:	SUPPLIER & TYPE:
Root	1,2	PNS24006	ESAB OK TUBROD 15.17
Fill/Cap	1,2	PNS24006	ESAB OK TUBROD 15.17

GAS:

Shielding Gas:	Mixture
Composition:	80%Ar+ 20%CO2
Flow:	20 l/min
Gas Backing:	None
Flow:	N.A.
Gas Size Nozzle:	3/8"
Tungsten Type:	NA
O2 Content of Back Purge:	NA

Max Weld Bead Width:	String or Weave:	No of Passes:	Multiple or Single Electrodes:
12 mm	String	Multiple	Single

Preheat Method:	Max Interpass Temperature:	Check / Control Method:	Heat Treatment Required	Holding Temperature °c	Holding Time °c	Heating Rate °C	Cooling Rate °C
20°C	PROPANE TORCH	250°C	CONTACT DIGITAL THERMOMETHER	NA	NA	NA	NA

WELDING PARAMETERS

Side No. (For 2 Welders)	Layer No.	Welding Process	Pass	Layer Thk. Mm	FILLER METAL		Electrode Polarity	Current Amperage Range			Voltage Range			Bead Length (mm)	Arc Time (Seconds)	Welding Speed Range (Cm/Min)	Heat Input Range (kJ/mm) Average	Arc Thermal Efficieny Factor As per EN 1011-1 (kJ/mm)	Interpass Temperature °C	REMARKS
					AWS Spec.	Dia. mm		Min	Max	Av.	Min	Max	Av.							
NA	1	FCAW	1	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	145	155	150,0	22	24	23,0	-	-	26	0,64	0,80	20	Welding unit: HELVI SE.0236
NA	2	FCAW	2	-	E81T1-M21A4-Ni1 T46 4 1Ni P M21 2 H5	1,2	DC EP	150	160	155,0	23	25	24,0	-	-	21	0,85	0,80	250	Digital thermometer: Delta Ohm Mod. HD2328 TP 745 Matr. 12014533; 12017635

SIGNED BY REPRESENTATIVE:	SIGNED BY CLIENT REPRESENTATIVE:	SIGNED BY THIRD PARTY REPRESENTATIVE:		SIGNED BY CLIENT THIRD PARTY REPRESENTATIVE:
Name:	Name:	Name:	RINA Services SpA No. SO. 0474 — Date 04/02/2019	Name:
Signature: ROSETTI MARINO SpA Welding Dept. D. Conacchi	Signature:	Signature:	Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ — File — Signature: Cimatti Davide	Signature:
Date:	Date:	Date:		Date:

ROSETTI MARINO

PQR 02/19

PQR attachments index:

Base material certificate (Pipe API 5L X65 PSL1)

Consumables certificate

preliminary WPS

NDE certificate

Mechanical test report

ROSETTI MARINO

PQR 02/19

Base material certificate
(Pipe API 5L X65 PSL1)

Siderca
Tenaris Group

Av. Jorge A. Simini 250
(B2804MHA) Campana
Buenos Aires, Argentina

(54) 3489 433100 tel
(54) 3489 433405 fa

INSPECTION CERTIFICATE

(EN 10204 3.1B - ISO 10474 3.1B)

Cliente / Customer	Expediente/ Manufacturing Order	Número / Number	Fecha / Date	Pág./Page
ROSETTI MARINO SPA - ROSETTI MARINO S.P.A	5/1137.01	174711	11/09/2003	1 / 6

Producto / Product	Orden de Compra/ Purchase Order	Item	Referencia del Cliente / Customer Reference
SEAMLESS STEEL LINE PIPE	OH 2003496 - 102C55	00001	ITEM 1-221967

Norma / Standard	Grado / Grade	Extremos / Ends
API 5L +SPEC E-23-S-P-5001-00 REV. P1 + SPEC E-23-S-P-5003-00 REV. P2	X65 PSL1	BEVELLED AT 30 DEG. API 5L

Dimensiones / Dimensions	Schedule	Peso Nominal / Nominal Weight	Longitud / Length	Superficie Externa / External Surface	Cantidades / Quantities
60.30 x 7.14 mm 2 3/8 x 0.281 inches		6.29 LB/FT 9.36 KG/MT	5.5/ 5.9 m	EXTERNAL OILED	53 Pz 310.33 m 2852 Kg 53 Pcs 1018.14 Ft 6288 Lb

ENSAYOS DE TRACCION / TENSILE TEST

Colada	N° de Ensayo	Condición de la probeta						Temp de Ens	Dimensiones	Sección	Fluencia / Yield Strength					Rotura/U.T.S			Relación F/R		Alargamiento Elongation			Red. de area		Dureza / Hardness Tipo / type:				
											Offset Method		EUL Method																
Heat	Test N°	Specimen condition						Test Temp	Size	Area	Req. Min 0.2%	V. obt.	EUL	Req. Min	V. obt.	Req. Max	Req. Min	V. obt.	Req. Max	YS/UTS Ratio		Lo 2"	Req. Min	V. obt	Area Red.		Req. Min	V. Obt.		Req. Max
		Zona Zone	Estado	Ext.	N° P/T	Tipo Type	Ori	°C	mm	mm2	N/mm2		%	N/mm2			N/mm2			Req. Max	Obt	mm	%		Req. Min	%				
28559	393942	C/B	PRO	O	26	ST	L	TA/RT	18,42 X 7,37	138,72			0.5	450	528.4	600	535	603.4	758			50.8	18.0	34.3						
28559	393943	C/B	PRO	E	5	ST	L	TA/RT	18,75 X 7,06	135,34			0.5	450	543.8	600	535	615.5	758			50.8	18.0	34.6						

TEST TECNOLOGICO / TECHNOLOGICAL TEST

Aplastamiento Flattening Test	Curvado Bend test	Abocardado Flaring Test	Pestañado Flange Test	Ens. De anillo expandido Ring expanding Test	Ens. De Tracción de anillo Ring tensile Test
N.A	N.A	N.A	N.A	N.A	N.A

NOTA / NOTE:

Pro = Proceso/ Process
N = Normalizada/ Normalized
DIST = Distensionada / Stress Relief
Q & T = Templado y Revenido/ Quenched & Tempered
TA/RT = Temp. Ambiente/ Room Temperature

RE = Rectangular
CI = Cilíndrica/ Cylindrical
ST = Segmento Tubular / Tubular segmen
TU = Transversal

C/B = Cuerpo / Body
R/U = Recalque / Upset
P / A = Promedio / Average
Min = Mínimo / minimum
Max = Máximo / Maximum

L = Longitudinal
T = Transversal
P/T = Tubo/ Pipe
EXT = Extremo/ End
M = Medio/ Middle

V.Obt. = Valor Obtenido / Obtained value
E = Comienzo de marcación/ Stenciling starting
O = Extremo opuesto al E/ Opposite extreme to E

CALI 175/04

Siderca
Tenaris Group

INSPECTION CERTIFICATE

(EN 10204 3.1B - ISO 10474 3.1B)

Dr. Jorge A. Simini 250
(B2804MHA) Campana
Buenos Aires, Argentina

(54) 3489 433100 tel
(54) 3489 433405 fa

Cliente / Customer	Expediente/ Manufacturing Order	Número / Number	Fecha / Date	Pág./Page
ROSETTI MARINO SPA - ROSETTI MARINO S.P.A	5/1137.01	174711	11/09/2003	2 / 6

Producto / Product	Orden de Compra/ Purchase Order	Item	Referencia del Cliente / Customer Reference
SEAMLESS STEEL LINE PIPE	OH 2003496 - 102C55	00001	ITEM 1-221967

Norma / Standard	Grado / Grade	Extremos / Ends
API 5L +SPEC E-23-S-P-5001-00 REV. P1 + SPEC E-23-S-P-5003-00 REV. P2	X65 PSL1	BEVELLED AT 30 DEG. API 5L

Dimensiones / Dimensions	Schedule	Peso Nominal / Nominal Weight	Longitud / Length	Superficie Externa / External Surface	Cantidades / Quantities
60.30 x 7.14 mm 2 3/8 x 0.281 inches		6.29 LB/FT 9.36 KG/MT	5.5/ 5.9 m	EXTERNAL OILED	53 Pz 310.33 m 2852 Kg 53 Pcs 1018.14 Ft 6288 Lb

ENSAYOS QUIMICOS / CHEMICAL ANALYSES

			% C	% Si	% Mn	% Cr	% Mo	% W	% Cd	% P	% S	% Ni	% V	% Al	% Sn	% Cu	% As	% Nb	% Ti	% Pb	% Sb	% Co	% Zr	% Bi	% Ca	% B	% N	% O	% Mg	% H	% C.e 1	% C.e 2	% Pcm	% Sum 1	% Sum 2	% Sum 3	R 1	R 2	R 3
			x 100							x 1000													x 10000							*	x 100			x 1000					
Colada Heat	Heat	Max	14		140					15	3																				40			150					
		Min																																					
Ensayo Test	Prod	Max	14		140					15	3																				40			150					
		Min																																					
28559	Heat		10	26	106	4	10	0		10	1	26	53	27	11	71	4	1	13	1	1	6	10	13	27	1	41		1		32			67					
(393942)	Prod		10	27	107	4	10	0		10	1	25	53	28	11	69	2	1	12	1	1	4	10	12	29	1	43		5		32			66					
(393943)	Prod		11	26	106	4	10	0		9	1	25	53	27	11	67	2	1	12	1	2	4	10	12	25	1	41		5		33			66					

NOTAS / NOTES: H = Análisis de colada / Heat Analysis. P = Análisis de producto / Product Analysis C.e = Carbono Equivalente/Equivalent Carbon R = Ratio * = PPM / Part per million

CEQ 1 = C+(MN/6)+(CR+MO+V)/5+(NI+CU)/15

CEQ 2 =

PCM =

Sum 1 = NB+V+TI

SUM 2 =

SUM 3 =

R 1 =

R 2 =

R 3 =

CALI 175/04

Siderca
Tenaris Group

Dr. Jorge A. Simini 250
(B2804MHA) Campana
Buenos Aires, Argentina

(54) 3489 433100 tel
(54) 3489 433405 fa

INSPECTION CERTIFICATE

(EN 10204 3.1B - ISO 10474 3.1B)

Cliente / Customer ROSETTI MARINO SPA - ROSETTI MARINO S.P.A			*Expediente/ Manufacturing Order* 5/1137.01	*Número / Number* 174711	*Fecha / Date* 11/09/2003	*Pág./Page* 3 / 6
Producto / Product SEAMLESS STEEL LINE PIPE			*Orden de Compra/ Purchase Order* OH 2003496 - 102C55	*Item* 00001	*Referencia del Cliente / Customer Reference* ITEM 1-221967	
Norma / Standard API 5L +SPEC E-23-S-P-5001-00 REV. P1 + SPEC E-23-S-P-5003-00 REV. P2			*Grado / Grade* X65 PSL1		*Extremos / Ends* BEVELLED AT 30 DEG. API 5L	
Dimensiones / Dimensions 60.30 x 7.14 mm 2 3/8 x 0.281 inches	*Schedule*	*Peso Nominal / Nominal Weight* 6.29 LB/FT 9.36 KG/MT	*Longitud / Length* 5.5/ 5.9 m	*Superficie Externa / External Surface* EXTERNAL OILED	*Cantidades / Quantities* 53 Pz 310.33 m 2852 Kg 53 Pcs 1018.14 Ft 6288 Lb	

ENSAYOS DE IMPACTO / IMPACT TEST

Colada Heat	Ensayo Test	Condición de la probeta / Specimen condition					Energía Absorbida / Absorbed Energy.									Area ductil / Shear Area (%)						Expansión Lateral/Lateral Exp. (MM)					
		Zona Zone	Metodo Method	Entalla Notch	Dimensiones Size mm	Orient. Orient.	Temper. °C Req.	Temper. °C T/E	Unidad Unit	Req. Min	Req. P/A	V.Obt/Obtained Values Sample N° 1	2	3	Min	P/A	Req. Min	Req. P/A	V.Obt/Obtained Values Sample N° 1	2	3	Min	P/A	Req. Min	Req. P/A	V.Obt./Obtained Values Sample N° 1	2	3	Min	P/A
28559	393942	C/B	CHARPY	V	10,00 x 5,00	L	-40	-40	Joules	22,00	28,00	113.0	113.0	126.0	113.0	117.3	60.0	75.0	100.0	100.0	100.0	100.0	100.0							
28559	393943	C/B	CHARPY	V	10,00 x 5,00	L	-40	-40	Joules	22,00	28,00	112.0	111.0	111.0	111.0	111.3	60.0	75.0	100.0	100.0	100.0	100.0	100.0							

NOTE: **Req =** Requisitos / Requirements **C/B =** Cuerpo / Body **R/U =** Recalque / Upset **Orient =** Orientación / Orientation **V =** Valor / Value **P/A =** Promedio / Average **Min =** Mínimo / Minimum **T/E =** Temp. Ens. / Test Temp.

CALI 17/5/04

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INSPECTION CERTIFICATE

(EN 10204 3.1B - ISO 10474 3.1B)

Cliente / Customer	Expediente/ Manufacturing Order	Número / Number	Fecha / Date	Pág./Page
ROSETTI MARINO SPA - ROSETTI MARINO S.P.A	5/1137.01	174711	11/09/2003	4 / 6

Producto / Product	Orden de Compra/ Purchase Order	Item	Referencia del Cliente / Customer Reference
SEAMLESS STEEL LINE PIPE	OH 2003496 - 102C55	00001	ITEM 1-221967

Norma / Standard	Grado / Grade	Extremos / Ends
API 5L +SPEC E-23-S-P-5001-00 REV. P1 + SPEC E-23-S-P-5003-00 REV. P2	X65 PSL1	BEVELLED AT 30 DEG. API 5L

Dimensiones / Dimensions	Schedule	Peso Nominal / Nominal Weight	Longitud / Length	Superficie Externa / External Surface	Cantidades / Quantities
60.30 x 7.14 mm 2 3/8 x 0.281 Inches		6.29 LB/FT 9.36 KG/MT	5.5/ 5.9 m	EXTERNAL OILED	53 Pz 310.33 m 2852 Kg 53 Pcs 1018.14 Ft 6288 Lb

EVALUACION METALOGRAFICA / METALLOGRAPHIC EVALUATION

	NIVEL DE INCLUSIONES NO METALICAS / LEVEL NON METALIC INCLUSIONS								TAMAÑO DE GRANO / GRAIN SIZE				DECARBURIZACION / DECARBURIZATION					ENSAYO DE COLAPSO / COLLAPSE TEST	
	Norma/ Standard :								Norma/ Standard : ASTM E112				Norma/ Standard :					Norma / Standard :	
	Método/ Method :								Método/ Method : LINEAL INTERCEPT PROCEDURE				Método/ Method :					Método/ Method :	
Colada / Heat	Muestra / Sample	Tipo/Type A Sulfuros / Sulfides *	Tipo/Type A Sulfuros / Sulfides **	Tipo/ Type B Aluminatos / Aluminates *	Tipo/ Type B Aluminatos / Aluminates **	Tipo/ Type C Silicatos / Silicates *	Tipo/ Type C Silicatos / Silicates **	Tipo/ Type D Oxidos / Oxides *	Tipo/ Type D Oxidos / Oxides **	Muestra / Sample	Tipo de Grano / Grain Type	Unit.: N Min	Unit.: N Max	Unidad/ Unity :					Unidad/ Unity :	
															Int.		Ext.		Presión requerida / Pressure Required :	
												1.00	1.00	Muestra / Sample	Req. Max	V. Obt	Req. Max	V. Obt	Muestra / Sample	Presión garantizada / Guaranteed pressure
28559										1	AUSTENITIC	9.00								

Req = Requisitos / Requirements
* = Max. requerido Fino / Specified Thin
Magnif. = Magnificación / Magnification.
N = Número / Number
** = Max. requerido grueso / Specified Heavy
U = Unidad / Unity

CAL! 175/04

Siderca
Tenaris Group

INSPECTION CERTIFICATE

(EN 10204 3.1B - ISO 10474 3.1B)

Dr. Jorge A. Simini 250
(B2804MHA) Campana
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(54) 3489 433405 fa

Cliente / Customer	Expediente/ Manufacturing Order	Número / Number	Fecha / Date	Pág./Page
ROSETTI MARINO SPA - ROSETTI MARINO S.P.A	5/1137.01	174711	11/09/2003	5 / 6

Producto / Product	Orden de Compra/ Purchase Order	Item	Referencia del Cliente / Customer Reference
SEAMLESS STEEL LINE PIPE	OH 2003496 - 102C55	00001	ITEM 1-221967

Norma / Standard	Grado / Grade	Extremo / Ends
API 5L +SPEC E-23-S-P-5001-00 REV. P1 + SPEC E-23-S-P-5003-00 REV. P2	X65 PSL1	BEVELLED AT 30 DEG. API 5L

Dimensiones / Dimensions	Schedule	Peso Nominal / Nominal Weight	Longitud / Length	Superficie Externa / External Surface	Cantidades / Quantities
60.30 x 7.14 mm 2 3/8 x 0.281 inches		6.29 LB/FT 9.36 KG/MT	5.5/ 5.9 m	EXTERNAL OILED	53 Pz 310.33 m 2852 Kg 53 Pcs 1018.14 Ft 6288 Lb

Marcas / Marking

& = Monograma / Monogram SIDERCA **NNNNN** = Número de tubo / Nbr of pipe **LLL** = Longitud / length **PPP** = Peso / Weight **@** = Monograma / Monogram API
MM.YY = Mes / Año Month / Year **Y/T** = Año / Trimestre Year / Quarter **HNXXXXX** = Colada / Heat

Estarcido (Tubo) / Stencilling (Pipe)

MADE IN ARGENTINA NNNNN LLLL & 5L0098 @ MM.YY API5L 60,3 7,14 X65 PSL1 HQ S SR4 SIDERCA BAHR ESSALAM SUBSEA PRODUCTION SYSTEM PO OH 2003496-102C55 HNXXXXX

Tarjeta / Card :

SIDERCA MADE IN ARGENTINA
P.O.: OF: 5/1137-01
PIECES: LENGTH:
WEIGHT(KG): LIFT:
SIZE: 60,30 X 7,14 GDO:X65 PSL1
SPEC: API 5L HEAT:
ROSETTI MARINO SPA FOR BAHR
ESSALAM PROJECT

FABRICADO POR SIDERCA	*MANUFACTURED BY SIDERCA*
PROCESO DE ACERACIÓN	*ACIERAGE PROCESS*
-FABRICACIÓN DE ACERO: FUNDICIÓN POR ARCO ELECTRICO Y COLADO CONTINUO - ACERO CALMADO AL ALUMINIO.	-STEEL MAKING PROCESS: E.A.F./L.F. AND CONTINUOUS CASTING - FULL ALUMINIUM KILLED AND FINE GRAIN PRACTICE.
-LA PRÁCTICA DE AFINO EN EL HORNO - CUCHARA INCLUYE UNA INYECCIÓN FINAL DE UNA VARILLA DE SILICIURO DE CALCIO PARA OBTENER UNA FORMA GLOBULAR DE EVENTUALES MICROINCLUSIONES.	-THE LF PRACTICE INCLUDES A FINAL INJECTION OF CALCIUM SILICIDE WIRE FOR MICROINCLUSION SHAPE CONTROL.
-MATERIAL LIBRE DE CONTAMINACIÓN DE MERCURIO.	-MATERIAL FREE FROM MERCURY CONTAMINATION.
PROCESO DE LAMINACIÓN	*ROLLING PROCESS*
-FABRICACIÓN DE TUBO: LAMINADO EN CALIENTE Y SIN COSTURA.	-MANUFACTURING PROCESS : SEAMLESS HOT ROLLED.
CONTROLES	*CONTROLS*
-CONTROL VISUAL Y DIMENSIONAL: SATISFACTORIO.	-VISUAL AND DIMENSIONAL INSPECTION : SATISFACTORY.
CONDICIONES DEL MATERIAL	*MATERIAL CONDITIONS*

CALI 175/04

Siderca
Tenaris Group

Dr. Jorge A. Simini 250
(B2804MHA) Campana
Buenos Aires, Argentina

(54) 3489 433100 tel
(54) 3489 433495 fa

INSPECTION CERTIFICATE

(EN 10204 3.1B - ISO 10474 3.1B)

Cliente / Customer	Expediente/ Manufacturing Order	Número / Number	Fecha / Date	Pág./Page
ROSETTI MARINO SPA - ROSETTI MARINO S.P.A	5/1137.01	174711	11/09/2003	6 / 6

Producto / Product	Orden de Compra/ Purchase Order	Item	Referencia del Cliente / Customer Reference
SEAMLESS STEEL LINE PIPE	OH 2003496 - 102C55	00001	ITEM 1-221967

Norma / Standard	Grado / Grade	Extremo / Ends
API 5L +SPEC E-23-S-P-5001-00 REV. P1 + SPEC E-23-S-P-5003-00 REV. P2	X65 PSL1	BEVELLED AT 30 DEG. API 5L

Dimensiones / Dimensions	Schedule	Peso Nominal / Nominal Weight	Longitud / Length	Superficie Externa / External Surface	Cantidades / Quantities
60.30 x 7.14 mm 2 3/8 x 0.281 inches		6.29 LB/FT 9.36 KG/MT	5.5/ 5.9 m	EXTERNAL OILED	53 Pz 310.33 m 2852 Kg 53 Pcs 1018.14 Ft 6288 Lb

-NO REPARADO POR SOLDADURA.	-NO REPAIR BY WELDING.
-LA DUREZA CUMPLE CON LA NORMA NACE MR 01-75 ULTIMA EDICION.	-HARDNESS ACCORDING TO NACE MR-01-75 LATEST EDITION.
NORMAS	*STANDARDS*
-CERTIFICADO DE ACUERDO CON: (UNI) EN 10204 3.1.B/95 - ISO 10474 3.1.B/92.	-CERTIFICATE ACCORDING TO : (UNI) EN 10204 3.1.B/95 - ISO 10474 3.1.B/92.
-EDICION DE LA NORMA : API 5L, 42° Edition 2000.	-EDITION OF REGULATION: API 5L, 42° Edition 2000.

Observaciones / Remarks

HYDROSTATIC TEST PRESSURE: 432 BAR (15 SEC.) 100% OF PIPES: SATISFACTORY

NDT: (SR4) SATISFACTORY

INSPECTION METHODS: U.T. LONG. (EXT./INT.) NOTCH 5% + U.T. TRANSV. (EXT./INT.) NOTCH 10 % FULL LENGTH + MPI LONG. (EXT./INT) + W.M.P.I. ON BEVELS.

ENDS PROTECTORS: PLASTIC CLOSED END NON LIFTABLE.

SEE ATTACHED HARDNESS TEST REPORT.

INSPECTED BY LLOYD´S REGISTER.

Por la presente certificamos que el material aqui descripto ha sido fabricado de acuerdo con las normas y especificaciones solicitadas en vuestra orden y satisfacen los correspondientes requerimientos.	We hereby certify that material herein described has been manufactured in accordance with the standards and specifications required in your order and satisfies the corresponding requirements.
Este certificado se emite mediante un sistema computarizado y es valido con firma electrónica.El certificado original presenta el logo Tenaris (verde claro), impreso en la parte inferior de la hoja. En caso que el poseedor del certificado entregue una copia del mismo, deberá garantizar la conformidad con el original, haciéndose responsable por cualquier uso ilegal o indebido.	This certificate is issued by a computerized system and it is valid with electronic signature. On the original certficate the trade-mark Tenaris light-green coloured at the bottom of the page is stamped. In case the owner of the certificate would release a copy of it, he must attest its conformity to the original one taking upon himself the responsibility for any unlawful or not allowed use.
Cualquier alteración y / o falsificación estará sujeta a la ley. Si necesita asegurar la autenticidad de este certificado, contactarse con Siderca SAIC, e-mail: aye@siderca.com	Any alteration and / or falsification will be subject to the law. If you need to assure the authenticity of this certificate, please do not hesitate to contact Siderca SAIC through this e-address:aye@siderca.com



QUALITY CERTIFICATION DEPT.
DTO CERTIFICACION DE CALIDAD
EDUARDO A. AYERBE

CALI 175/04

Consumables certificate

CERTIFICATO DI COLLAUDO (3.1) - Analisi Chimica
ATTESTATO DI CONTROLLO (2.2) - Caratteristiche Meccaniche/
INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Data/Date: 2018-07-27

Numero certificato/Cert no: EC25251151 rev. 0

Nostro ordine/Our order:	2013780	Vostro ordine/Your order:	1718000897
Nostro riferimento/Our ref:	Web user - Movex CMP020 ITB	Vostro riferimento/Your ref:	
Codice Cliente/Cust no:	ITB00060	Vostro numero fax/Your fax	
Data ordine Cliente/Your date:	20180727	Vostra e-mail/Your e-mail:	

Indirizzo di fatturazione/Invoice address

ESAB SALDATURA S.P.A. (6155)
STRADA PROVINCIALE 34, N. 7
IT-20010 OSSONA MI
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address

ROSETTI MARINO SPA
.
VIA TRIESTE 230
48100 RAVENNA RA
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PNS24006 Quantità/Quantity: 20 CT

PRODOTTO/PRODUCT

Marchio/Brand:	ESAB
Descrizione/Desc:	OK Tubrod 15.17 1.2mm 16kg
Codice/Item no:	**1517127730**

CLASSIFICAZIONE/CLASSIFICATIONS

SFA/AWS A5.36: E81T1-M21A4-Ni1
EN ISO 17632-A: T 46 3 1Ni P C1 2 H5
EN ISO 17632-A: T 46 4 1Ni P M21 2 H5

COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

Valori reali/Actual results: in accordo a/acc to EN 10204 - 3.1

All weld metal

Altro/Auxiliary:	M21 (EN ISO 14175)
C	0.05%
Si	0.39%
Mn	1.15%
P	0.01%
S	0.02%
Cr	0.03%
Ni	1.0%
Mo	0.03%
Nb	0.02%
Cu	0.06%
V	0.02%

CARATTERISTICHE MECCANICHE/MECH PROPS

Valori tipici/Typical data: in accordo a/acc to EN 10204 - 2.2

Norma/Standard:	EN
Altro/Auxiliary:	M21 (EN ISO 14175)
Condizione/Condition:	As welded

TRAZIONE/TENSILE

ReL	Rm	A5
544 MPa	613 MPa	26 %

RESILIENZA/IMPACT

Temp	-40 °C
KV	124 J

COMMENTI/COMMENTS

Materiale fornito in accordo al Sistema Qualità conforme alla norma EN ISO 9001.
Questo certificato è stampato elettronicamente ed è valido senza firma.
Per ogni chiarimento, rivolgersi a:

ESAB Saldatura Spa, Via Rosa Luxemburg 49, I-20085 Locate Triulzi (MI), +39 02 97968.1

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to: (see above)

Validazione - analisi chimica/Validation - Chemical Analysis

Piotr Grela Quality Assurance Manager

Validazione - altro/Validation - Others

Neil Farrow Product Manager

ROSETTI MARINO

PQR 02/19

preliminary WPS

PQR ref.:	TBQ	WPS (ISO 15614-1 Ed.2017)	02/19	REV.:	0	Data /date	04/02/2019

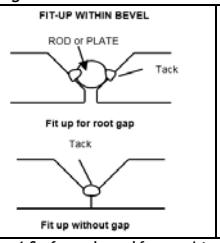
Procedimento di saldatura / Welding process: **136-FCAW** — Tipo / Type: **SEMIAUTOMATIC**

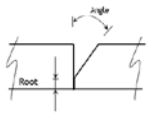
GIUNTO - JOINT

Tipo di giunto / Joint Design: **Partial** — Supporto / Backing: ☒ Si / Yes ☐ No

Materiale di supporto (tipo) / Backing material (type): ☒ Metallico / Metal ☐ Non metallico / No metal. ☐ Metallo non fondente / Non Fusing metal ☐ Altro / Other

Dettagli / Details:





Angle: 45°
Gap: 0 mm
Root: 3 mm



Note: **1.Surfaces cleaned from moisture, oil, grease, paint before welding (by grinding)**/ *Pulire le superfici da liquidi, oli, grasso e vernici con molatura prima di saldare*.
2.Minimum tack weld lengths shall be 4 times the thk or 50 mm, whichever is less/ I tacchetti devono essere lunghi almeno 50 mm o 4 volte lo spessore (il più piccolo dei due);
4.Preheat shall be performed by electrical resistance, induction equioment or with gas burners. Cutting torches shall not be permitted. ***Il preriscaldo può essere eseguito con resitenze, induzione o torcia. Non può essere utilizzato l'ossitaglio.***

MATERIALE BASE - BASE MATERIAL

Da / from P-N°: /	Group N°	A / to P-N°: /	Group N°

DA Tipo e grado / From type and grade: **API 5L Gr.X65 diam 2" x 7,14mm**

A Tipo e grado / To type and grade: **API 5L Gr.X65 diam 2" x 7,14mm**

Gamma spessori / Thickness range: ► Materiale base / Base material: Piena penetrazione / Groove **7,14 mm**

► Gamma diametri / Pipe dia. Range: Piena penetrazione / Groove **Ø 2" (60,3 mm)**

METALLO D'APPORTO - FILLER METAL

	GS FCAW	
Spec. N° (SFA)	5.29/5.36	
AWS N° (CLASS)	E81T1-1/E81T1-Ni1	
F-N°	6	
A-N°	1	
Diametro mat. D'apporto / Size of filler metal	1,2	
Gamma spessori /Thick. Range (mm)	Up to filling	
Accoppiamento filo-flusso / Electrode-flux (CLASS)	NA	
Denom. Comm. Flusso / FLUX trade name	NA	
Inserto consumabile / Consumable insert	NA	
Altro / other	OK Tubrod 15.17	

POSIZIONI - POSITION

giunto / Joint: **Cianfrino / groove** — Posizione / position **PC-PH** — Progressione / weld progression: **Ascendente / UP hill**

PRERISCALDO - PRE-HEAT

Temp.preriscaldo minima / Min. pre-heat temp: **20 °C** — Max temp. Di interpass / Max interpass temp.: **250 °C** — Mantenimento interpass / Interpass maintenance: **N.A.** — Tempo di mantenimento prerisc. / Maintenance timing: **N.A.**

TRATTAMENTO TERMICO DOPO SALDATURA - POST WELD HEAT TREATMENT

Riscaldamento / Heating rate (°C/Hrs): **N.A.** — Temperatura di stasi / Holding temperature °C: **N.A.** — Tempo di stasi / Holding time (min.): **N.A.** — Velocità di raffreddamento / Cooling rate (°C/Hrs): **N.A.**

GAS DI PROTEZIONE - GAS

	GAS	Miscela / Mixture	Port. / Flow rate
Protezione / Shielding:	Ar+CO2	80%+20%	16-24 lt/min
Protezione al seguito / Trailing:	N.A.	N.A.	N.A.
Prot. Al rovescio / Backing:	N.A.	N.A.	N.A.

CARATTERISTICHE ELETTRICHE / ELECTRICAL CHARACTERISTICS

Corrente / Current: **DC** — Polarità / Polarity **RP**

Dia e tipo elettr. Tungsteno / Tungsten elctr. Size & type: **N.A.**

Metodo di trasferimento per GMAW / GMAW metal tranfer mode: **N.A.**

Velocità alimentazione filo / Electr. Wire feed speed range: **Self regulated**

TECNICA - TECHNIQUE

Passata / Bead: **Tirata/String** — Dimensione bocchello gas / Orifice of gas cup size: **N.A.** — Pulizia iniziale e fra le passate / Initial and interpass cleaning: **Spazzolatura/Brushing**

Metodo di solcatura a rovescio / Method of back gouging: **N.A.** — Oscillazione / Oscillation: **N.A.** — Distanza zona di contatto e pezzo / Contact zone to work distance: **N.A.**

N°Passate / Passes nr.: **Multipla/Multiple** — Elettrodo multiplo o singolo / Multiple or single electrodes: **Singolo/Single** — Martellatura / Peening: **N.A.**

Altro / Other: **All arc/air gouged surface shall be dressed to bright clean metal by grinding at an additional depth of minimum 2 mm/** *Molare per una profondità minima di 2 mm dopo scriccatura.* ***Preheat shall be 100 °C for material with thickness ≥ 40 mm/** *il preriscaldo deve essere incrementato a 100 °C per gli spessori ≥ 40 mm*

N° Passate / Weld layers nr.	Processo / Process	Materiale d'apporto / Filler metal		Corrente / Current		Voltaggio / Volt range		Vel. Avanzamento / Travel speed range (mm/min)		Apporto termico / Heat input (KJ/mm)	
		Classe / Class	Dia. (mm.)	Polarità / Polarity	Amp. Range						
For multi pass											
Tack-1	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	190 270	23	28	355	415	0,63	1,27
2-N	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	190 270	23	28	355	415	0,63	1,27
For single pass											
Tack-1	FCAW	E81T1-1/E81T1-Ni1	1,2	RP	250 290	23	30	195	375	0,92	2,68

Preparato da / prepared by:	Client/Third part signature:	Client/Third part signature:
D.Cenacchi	***TOTAL***	***DNV***

NDE certificate

ROSETTI MARINO	**VERBALE DI CONTROLLO VISIVO/DIMENSIONALE** **visual/dimensional inspection report**	VDR N° **02-19** data: **01-02-2019**

progetto project	**TOLMOUNT REDEVELOPMENT PROJECT**	cliente **PREMIER OIL** client	ordine **/** PO	commessa **118A50** job

disegno dwg	**/**	ITP N° **AB-TO-ROS-PM-QA-PL-0002 REV.C01**	fase step	**8.1**

SI CERTIFICA CHE :

gli item di seguito indicati sono stati sottoposti a controllo dimensionale ed accettati in accordo alla procedura / specifica sotto indicata ed ai criteri di accettabilità in essa definiti.

WE CERTIFY THAT:

items below indicated have undergone a dimensional inspection and have been accepted according to the specific / procedure mentioned hereunder and to acceptance criteria defined in it.

oggetto – item

COUPON	STAMP	POS	DIAM	THK	LENGHT	WPS	Date of examination
01/19 PC SL	NC272	PB	60,3 mm	7,14 mm	190 mm	pWPS 01/19	01/02/2019
01/19 PC ML	NC272	PB	60,3 mm	7,14 mm	190 mm	pWPS 01/19	01/02/2019
01/19 PH SL	NC272	PD	60,3 mm	7,14 mm	190 mm	pWPS 01/19	01/02/2019
01/19 PH ML	NC272	PD	60,3 mm	7,14 mm	190 mm	pWPS 01/19	01/02/2019

RINA Services SpA No. Bo. 0474	Date 01/02/2019
Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐	File Signature Cimatti Davide

note - remarks

Acceptance criteria: EEMUA 158 TABLE 14

and EN ISO 5817:2014, Lev. B

risultato - result ☒ conforme - conforming ☐ non conforme - not conforming

procedure / specifiche applicabili - applicable procedures / specifications

AB-TO-ROS-PM-QA-PR-0006 Rev.01

Operatore - Operator	Controllo Qualita' - Quality Control	Cliente - Client
CSWIP D.CENACCHI 305250 WI3.1		

QUALITY TEST srl	Controlli non distruttivi Via F. Crispi n. 1 - Zona Bassette Sud 48123 Ravenna Tel 0544 468472 info@qualitytestsrl.com	DATA – Date 04/02/2018	FOGLIO – Sheet 1
RAPPORTO D'ESAME MAGNETOSCOPICO ***MAGNETIC PARTICLE TEST***		MT N° : 14	Ns. Rif./Our Ref. 18205

CLIENTE – Client	ORDINE – Order	PROGETTO – Project	COMMESSA – Job	
ROSETTI MARINO	/	TYRA FUTURE	118A10	
CLIENTE FINALE - Customer	OGGETTO - Object	DISEGNO – Drawing	P.F.C. – Q.C.P.	Fase - Step
MAERSK OIL	PQR	/	/	/

CODICE / code	PROCEDURA/Procedure	ACCETTABILITA - Acceptance level	
/	DK-TEHY-MET-PRO-000-10006	Quality Level ISO 5817 ☑ B ☐ C ☐ D Acceptance level ISO 23278 ☑ 2x ☐ 2x ☐ 3x	
MATERIALE Material	TEMPERATURA DELLE SUPERFICI Surface temperature	INTENSITA' LUMINOSA / Light intensity	
		LUCE BIANCA	LUCE NERA
API 5L Gr. X65 PSL1	RANGE 5÷52°C	☑ > 500 LUX	☐ 500 µW/cm².

STATO DELLA SUPERFICIE – Surface condition		
☑ COME SALDATO As welded	☑ SPAZZOLATO – Brushed	☐ LAVORATO DI MACCHINA – Machined
☐ MOLATO – Ground	☐ LAMINATO – Rolled	☐ GREZZO – Forged

TECNICA DI MAGNETIZZAZIONE / Magnetizzazion tecnics			
☐ PUNTALI/Prods	☑ GIOGO/Yoke	☐ SOLENOIDE/Solenoid	☐ CONDUTTORE CENTRALE/Central conduttor

TIPO APPARECCHIO/Type of equipment	SILVER YOKE/S.No.03 230-16	DISTANZA PUNTALI/Pole spacing mm	180mm
TIPO DI CORRENTE/Type current	C.A	INTENSITÀ/Intesity (Amp)	4,5 kg

MEZZO DI ISPEZIONE / Examination medium		☑ UMIDO/Wet	☐ ASCIUTTO/Dry
PARTICELLE UTILIZZATE/Particle Type			
POLVERE NERA/Black powder	☑	FLUORESCENTE/Fluorescent	☐
MARCA TIPO/Mark Type	NDT BW2	MARCA TIPO/Mark Type	NDT FW1
LOTTO / Batck No.	7242s	LOTTO / Batck No.	
VERNICE DI CONTRASTO/Contrast Paint		☑ NDT WBL5	☐ CGM VECOPLAST
LOTTO / Batck No.		U171011c	

SALDATURE CONTROLLATE / Welds Verified

ITEM	POS.	STAMP	Ø	THK	PROCESS
PQR 02/19 SINGLE PASS	PC	NC272	60.3	7.14	FCAW
PQR 02/19 MULTI PASS	PC	NC272	60.3	7.14	FCAW
PQR 02/19 SINGLE PASS	PH	NC272	60.3	7.14	FCAW
PQR 02/19 MULTI PASS	PH	NC272	60.3	7.14	FCAW

RISULTATI Result	CONFORME ALLA SPECIFICA According to specification ☑	NON CONFORME ALLA SPECIFICA Non According to specification ☐

TECNICO II° LIVELLO Level II° Technician	CONTROLLO QUALITA' Quality Control	ISPETTORE CLIENTE Company Repr.	ISPETTORE A.I. Inspection Agency
Nico Tomasi II° Livello SNT - TC - 1A / ISO 9712	ROSETTI MARINO SpA Welding Dept. D. Cenacchi		RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☑ Witnessed ☐ Approved ☐ Date 12/02/2019 File Signature Cinotti Davide

È vietata la riproduzione parziale del certificato senza l'autorizzazione scritta – *Partial reproduction of this certificate must be written authorized*
I risultati delle prove si riferiscono unicamente ai particolari esaminati – *Test results relate only to the items examine*

ROSETTI MARINO

PQR 02/19

Mechanical test report

INSPECTA S.R.L.	**TEST REPORT** ***RAPPORTO DI PROVA*** **N° 0029-00210-19** **Rev.00** **Data: 12/02/2019**	ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO **LAB N°1607 L**

Object: *Oggetto:*	**MECHANICAL TEST ON WPQR 02/2019**		Pag. 1 di 17
Specimen: **see note** *Saggio:*	**Base Material:** *Materiale Base:*	**Pipe Ø 60,3 mm Thk. 7,14 mm with** **Pipe Ø 60,3 mm Thk. 7,14**	**API 5L GR.X65 PSL1with** **API 5L GR.X65 PSL1**
Customer: ROSETTI MARINO SPA *Committente:* **Address: Via Trieste, 230 - 48122 Ravenna (RA)** *Indirizzo:*		**Witnessed by:** *Presenziato da:*	**ROSETTI MARINO S.p.A.** **RINA SERVICE**
Final customer:. *Cliente finale:*	//		
Reference Yours bill of landing: **n°** *Vs. DDT di consegn* *n°* //	**Date:** *Data:* //	**MD52** **17/19** *MD 52*	**Date:** **04/02/2019** *Data:*
Start of activities:: *Inizio prove :*	**Date:** **12/02/2019** *Data:*	**End of activities:** *Fine prove:*	**Date:** **12/02/2019** *Data:*

PROVE RICHIESTE

☐ **TENSILE TEST**/*Trazione*	☐ Trasversal/*Trasversale*	☐ Longitudinal/*Longitudinale*	
☐ **BEND TEST**/*Piega*	☐ Trasversal/*Trasversale* ☐ Longitudinal/*Longitudinale*	☐ Face/Root /*Dritto/Rovescio* ☐ Side/ *Laterale*	
☐ **IMPACT TEST**/*Resilienza*	☐ Trasversal/ *Trasversale*	☐ Longitudinal/ *Longitudinale*	
☒ **MACROEXAMINATION TEST /** *Macrografia*			
☒ **HARDNESS TEST**/ *Durezza*	☐ HV 5	☒ HV 10	
☐ **FRACTURE TEST**/ *Frattura*	☐ Plate on Plate/ *Piastra su Piastra*	☐ Pipe on Plate/*Tubo su Piastra*	
☐ **CHEMICAL ANALYSIS**/*Analisi Chimica*			
☐ **MICROEXAMINATION TEST /** *Micrografia*			
☐ **OTHER (Specify)**/*Altro/(Specificare)*			

Allegati /Attachments: *NONE*

NOTE/ Remarks: ***REFERENCE CODE FROM CUSTOMER REQUEST:EN ISO 15613-1:2005***

Identific. saggio	Numero progress. interno	Pos. di saldatura
PQR 02/19	029/19	PH ml
PQR 02/19	030/19	PC ml
PQR 02/19	031/19	PH sl
PQR 02/19	032/19	PC sl

*** Prova non accreditata da ACCREDIA**

Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
INSPECTA srl Francesco Tassi Service Responsible 12/02/19	ROSETTI MARINO SpA Welding Dept D. Benacchi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 12/02/2019 File Signature Cimatti Davide

I risultati contenuti nel presente rapporto di prova si riferiscono unicamente al campione sottoposto a prova.. Il committente si impegna a riprodurre integralmente il rapporto di prova. E' vietata ogni forma di riproduzione parziale. L'accreditamento ACCREDIA non significa approvazione del prodotto da parte dell'organismo di accreditamento e del laboratorio. I campionamenti sono eseguiti dal cliente. Ove indicato l'incertezza di misura è da intendersi incertezza estesa, corrispondente ad un fattore di copertura Ku= 2 equivalente ad un livello di fiducia pari a 95%

The results in this test report refers only to the specimen that has been tested.The customer undertakes to print out /reproduce the test report. Any partial reproduction is prohibited.Accredia's accreditation does not imply the product approval neither by the accreditation body or the laboratory.Sampling shall be performed by the custode.Where indicated the measurement uncertainty is to be understood expanded uncertainty corresponding to a coverage factor Ku = 2 equivalent to a level of confidence of 95 % .

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing:12/02/2019
Data esecuzione prova:

Serial N. 43030614C

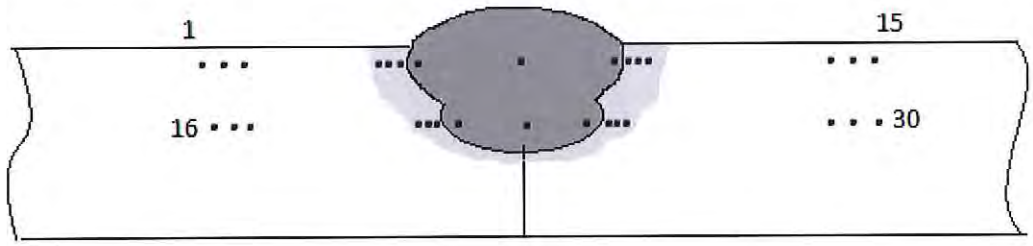
☒ *UNI EN ISO 6507-1: 2018* ☐ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

Internal procedure *Procedura interna*	PP10 rev.02	Sample Identification *Identificazione provino*	029/19 A	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	21,8°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: API 5L GR.X65 PSL1 — **Base Material Side B: API 5L GR.X65 PSL1**

	BM	HAZ	WM	HAZ	BM
ROW 01	1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
ROW 02	16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**162-162-163**	//	16 – 17 - 18	**156-155-162**	//	31 – 32 - 33	//	//
4 - 5 - 6	**165-172-176**	//	19 - 20 - 21	**166-169-180**	//	34 - 35 - 36	//	//
7 – 8 - 9	**200-223-223**	//	22 – 23 - 24	**207-203-195**	//	37 – 38 - 39	//	//
10 - 11 - 12	**182-175-163**	//	25 - 26 - 27	**165-174-172**	//	40 - 41 - 42	//	//
13 – 14 - 15	**158-159-164**	//	28 – 29 - 30	**154-159-147**	//	43 – 44 - 45	//	//

Remarks/ *Note:* **PH POSITION (ml)**

*** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third-part Inspector** *Ispettore Terza parte*
Sig. Matteo Galdieri	- INSPECTA srl - Francesco Tesei Service Responsible	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RINA Services S.p.A. No. Bo. 0474
12/02/19	12/02/19		Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐
			Date 12/02/2019 File _____ Signature Cimatti Davide

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing:12/02/2019
Data esecuzione prova:

☒ *UNI EN ISO 6507-1: 2018* ☐ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

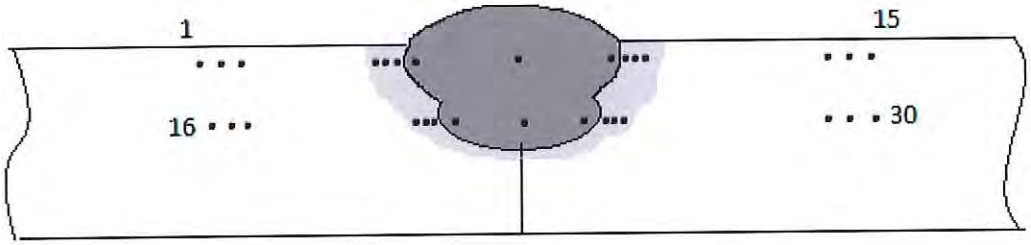
Serial N. 43030614C

Internal procedure *Procedura interna*	PP10 rev.02	Sample Identification *Identificazione provino*	029/19B	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	21,8°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: API 5L GR.X65 PSL1 **Base Material Side B: API 5L GR.X65 PSL1**

	BM	HAZ	WM	HAZ	BM
ROW 01	1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
ROW 02	16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**157-158-156**	//	16 – 17 – 18	**149-152-149**	//	31 – 32 - 33	//	//
4 - 5 - 6	**167-176-184**	//	19 - 20 - 21	**165-168-176**	//	34 - 35 - 36	//	//
7 – 8 - 9	**205-191-204**	//	22 – 23 – 24	**198-212-206**	//	37 – 38 - 39	//	//
10 - 11 - 12	**184-173-168**	//	25 - 26 - 27	**167-160-167**	//	40 - 41 - 42	//	//
13 – 14 - 15	**156-150-149**	//	28 – 29 – 30	**147-150-140**	//	43 – 44 - 45	//	//

Remarks/ *Note:* **PH POSITION (ml)**
*** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Sig. Matteo Galdieri	- INSPECTA srl - Francesca Tassi Service Responsible	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RINA Services SpA No. Bo. 0474
12/02/19	12/02/19		Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐
			Date 12/02/2019 File Signature Cimatti Davide

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing:12/02/2019
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

Internal procedure *PP12 rev.00* *Procedura internal*		**Test temperatura** *Temperature Test*	**21,8°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**029/19 A**	**Magnification:** *Ingrandimento:*	**Photo at 3.1X** **Examination at 3X**
Designation: *Designazione:*	**ISO 17639-A-E-1.2-1.2/1.2/1.2 NITAL**		



Remarks /
Note:

PH Position (ml)
WELDING DEPOSIT: 5,53 mm (MINIMUN REQUIRED: 3,00mm)
*** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio* *Sig. Matteo Galdieri*	Laboratory Responsible Responsabile Laboratorio	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
- INSPECTA srl - Laboratory Technician 12/02/19	- INSPECTA srl - Francesca Tassi Service Responsible 12/02/19	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ Date 12/02/2019 File _____ Signature Cimatti Davide

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing:12/02/2019
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

Internal procedure *PP12 rev.00* *Procedura internal*		**Test temperatura** *Temperature Test*	**21,8°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**029/19 B**	**Magnification:** *Ingrandimento:*	**Photo at 3.1X** **Examination at 3X**
Designation: *Designazione:*	**ISO 17639-A-E-1.2-1.2/1.2/1.2 NITAL**		



Remarks / *Note:*	**PH Position (ml)** **WELDING DEPOSIT: 4,41 mm (MINIMUN REQUIRED: 3,00mm)** *** Prova non accreditata da ACCREDIA**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio *Sig. Matteo Galdieri*	Responsabile Laboratorio	*Ispettore del cliente*	*Ispettore Terza parte*
- INSPECTA srl - Laboratory Technician 12/02/19	- INSPECTA srl - Francesca Tosei Service Responsible 12/02/19	ROSETTI MARINO SpA Welding Dept. D. Corlacchi	RINA Services SpA No. Bo. 0474 Date 12/02/2019 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File _____ Signature Cimatti Davide

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing:12/02/2019
Data esecuzione prova:

☒ *UNI EN ISO 6507-1: 2018* ☐ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

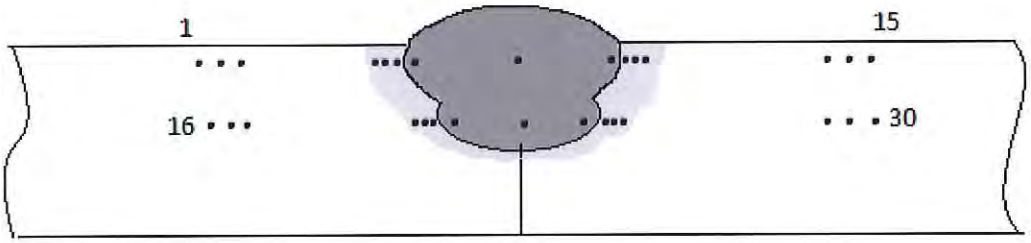
Serial N. 43030614C

Internal procedure *Procedura interna*	PP10 rev.02	Sample Identification *Identificazione provino*	030/19A	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	21,8°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: API 5L GR.X65 PSL1 **Base Material Side B: API 5L GR.X65 PSL1**

	BM	HAZ	WM	HAZ	BM
ROW 01	1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
ROW 02	16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**166-161-166**	//	16 – 17 - 18	**151-152-150**	//	31 – 32 - 33	//	//
4 - 5 - 6	**171-179-187**	//	19 - 20 - 21	**162-163-165**	//	34 - 35 - 36	//	//
7 – 8 - 9	**195-192-192**	//	22 – 23 - 24	**184-191-191**	//	37 – 38 - 39	//	//
10 - 11 - 12	**176-180-181**	//	25 - 26 - 27	**167-167-163**	//	40 - 41 - 42	//	//
13 – 14 - 15	**170-175-171**	//	28 – 29 - 30	**158-162-163**	//	43 – 44 - 45	//	//

Remarks/ *Note:* **PC POSITION (ml)**
*** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Sig. Matteo Galdieri 12/02/19	- INSPECTA srl - Francesco Tesei Service Responsible 12/02/19	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RINA Services S.p.A. No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 12/02/2019 File _____ Signature Cimatti Davide

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing:12/02/2019
Data esecuzione prova:

☒ *UNI EN ISO 6507-1: 2018* ☐ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

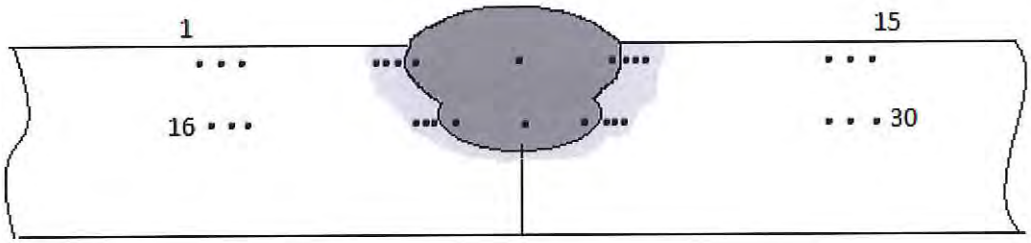
Serial N. 43030614C

Internal procedure *Procedura interna*	PP10 rev.02	Sample Identification *Identificazione provino*	030/19B	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	21,8°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: API 5L GR.X65 PSL1 **Base Material Side B: API 5L GR.X65 PSL1**

	BM	HAZ	WM	HAZ	BM
ROW 01	1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15
ROW 02	16 - 17 - 18	19 - 20 - 21	22 - 23 - 24	25 - 26 - 27	28 - 29 - 30



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**160-163-161**	//	16 – 17 - 18	**150-150-150**	//	31 – 32 - 33	//	//
4 - 5 - 6	**176-170-179**	//	19 - 20 - 21	**161-166-166**	//	34 - 35 - 36	//	//
7 – 8 - 9	**209-213-218**	//	22 – 23 - 24	**199-200-193**	//	37 – 38 - 39	//	//
10 - 11 - 12	**173-164-160**	//	25 - 26 - 27	**166-172-166**	//	40 - 41 - 42	//	//
13 – 14 - 15	**158-159-162**	//	28 – 29 - 30	**148-154-150**	//	43 – 44 - 45	//	//

Remarks/ *Note:* **PC POSITION (ml)**
*** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Sig. Matteo Galdieri 12/02/19	- INSPECTA srl - Francesca Tesei Service Responsible 12/02/19	BOSETTI MARINO SpA Welding Dept. D. Genaccbi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ Date 12/02/2019 File Signature Cimatti Davide

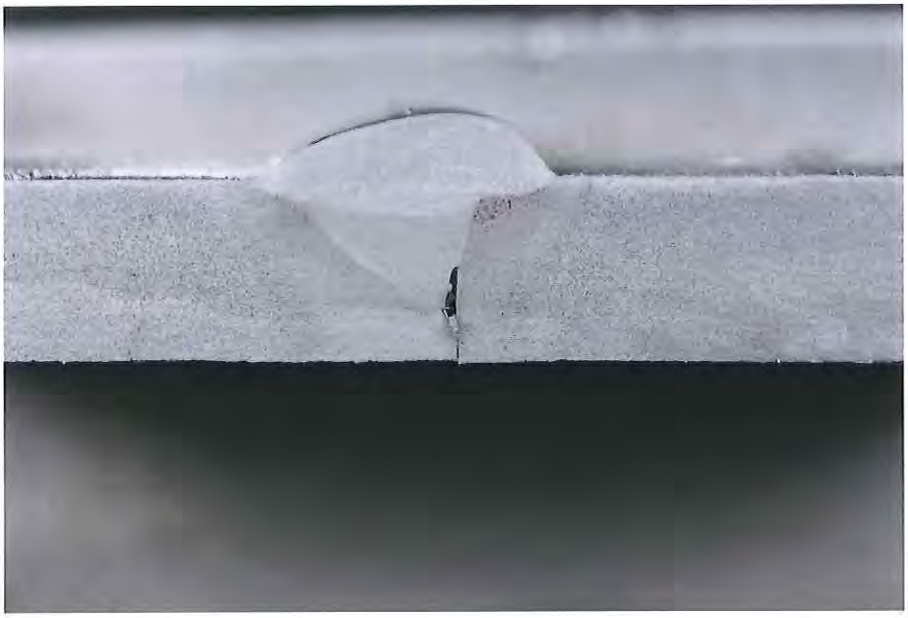
MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing:12/02/2019
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

Internal procedure *PP12 rev.00* *Procedura internal*		**Test temperatura** *Temperature Test*	**21,8°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**030/19A**	**Magnification:** *Ingrandimento:*	**Photo at 3.1X** **Examination at 3X**
Designation: *Designazione:*	**ISO 17639-A-E-1.2-1.2/1.2/1.2 NITAL**		



Remarks /
Note:

PC POSITION (ml)
WELDING DEPOSIT: 5,56 mm (MINIMUN REQUIRED: 3,00mm)
*** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio* *Sig. Matteo Galdieri*	Laboratory Responsible Responsabile Laboratorio	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
- INSPECTA srl - Laboratory Technician 12/02/19	- INSPECTA srl - Francesca Iesci Service Responsible 12/02/19	PROSETTI MARINO S.p.A. Welding Dept. D.Genacchi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ Date 12/02/2019 File Signature Cimatti Davide

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing:12/02/2019
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

Internal procedure *PP12 rev.00* *Procedura internal*		**Test temperatura** *Temperature Test*	**21,8°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**030/19B**	**Magnification:** *Ingrandimento:*	**Photo at 3.1X** **Examination at 3X**
Designation: *Designazione:*	**ISO 17639-A-E-1.2-1.2/1.2/1.2 NITAL**		



Remarks / *Note:*	**PC POSITION (ml)** **WELDING DEPOSIT: 5,39 mm (MINIMUN REQUIRED: 3,00mm)** *** Prova non accreditata da ACCREDIA**

Laboratory Technician	Laboratory Responsible	Customer Inspector	Third part Inspector
Tecnico di Laboratorio *Sig. Matteo Galdieri*	Responsabile Laboratorio	*Ispettore del cliente*	*Ispettore Terza parte*
- INSPECTA srl - Laboratory Technician 12/02/19	- INSPECTA srl - Francesca Tassi Service Responsible 12/02/19	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 12/02/2019 File Signature Cimatti Davide

VICKERS HARDNESS TEST METHOD

Prova di durezza Vickers

Date of Testing:12/02/2019
Data esecuzione prova:

☒ *UNI EN ISO 6507-1: 2018* ☐ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

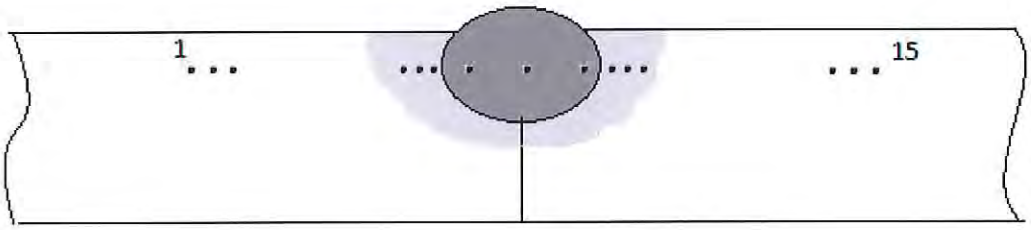
Serial N. 43030614C

Internal procedure *Procedura interna*	PP10 rev.02	**Sample Identification** *Identificazione provino*	031/19A	**Hardness test type** *Tipo di durezza*	HV10	**Test Temp.** *Temp.test*	21,8°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: API 5L GR.X65 PSL1 — **Base Material Side B: ISO API 5L GR.X65 PSL1**

	BM	HAZ	WM	HAZ	BM
ROW 01	1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15



Reference points *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U	**Reference points** *Punto di riferimento*	**Values measured** *Valori misurati*	U
1 – 2 - 3	**151-156-154**	//	16 – 17 - 18	//	//	31 – 32 - 33	//	//
4 - 5 - 6	**181-189-186**	//	19 - 20 - 21	//	//	34 - 35 - 36	//	//
7 – 8 - 9	**200-211-204**	//	22 – 23 - 24	//	//	37 – 38 - 39	//	//
10 - 11 - 12	**180-177-168**	//	25 - 26 - 27	//	//	40 - 41 - 42	//	//
13 – 14 - 15	**144-157-152**	//	28 – 29 - 30	//	//	43 – 44 - 45	//	//

Remarks/ *Note:* **PH POSITION (sl)**

*** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio*	**Laboratory Responsible** *Responsabile Laboratorio*	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
Sig. Matteo Galdieri	- INSPECTA srl - Francesco Tesei Service Responsible	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RINA Services SpA No. Bo. 0474 Date 12/02/2019
12/02/19	12/02/19		Noted ☐ File Reviewed ☐ Witnessed ☒ Signature Approved ☐ Cimatti Davide

VICKERS HARDNESS TEST METHOD
Prova di durezza Vickers

Date of Testing:12/02/2019
Data esecuzione prova:

Serial N. 43030614C

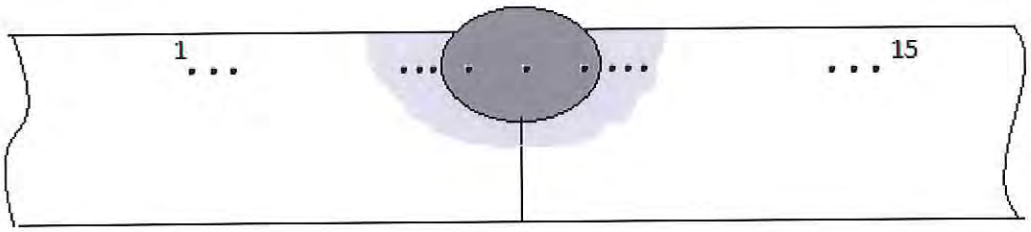
☒ *UNI EN ISO 6507-1: 2018* ☐ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

Internal procedure *Procedura interna*	PP10 rev.02	Sample Identification *Identificazione provino*	031/19B	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	21,8°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: API 5L GR.X65 PSL1 — **Base Material Side B: API 5L GR.X65 PSL1**

	BM	HAZ	WM	HAZ	BM
ROW 01	1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**148-151-153**	//	16 – 17 - 18	//	//	31 – 32 - 33	//	//
4 - 5 - 6	**176-183-194**	//	19 - 20 - 21	//	//	34 - 35 - 36	//	//
7 – 8 - 9	**212-217-221**	//	22 – 23 - 24	//	//	37 – 38 - 39	//	//
10 - 11 - 12	**191-183-175**	//	25 - 26 - 27	//	//	40 - 41 - 42	//	//
13 – 14 - 15	**161-158-159**	//	28 – 29 - 30	//	//	43 – 44 - 45	//	//

Remarks/ *Note:* **PH POSITION (sl)**
*** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
Sig. Matteo Galdieri 12/02/19 Laboratory Technician	INSPECTA srl Francesca Tersi Service Responsible 12/02/19	ROSETTI MARINO SpA Welding Dept. B. Cenacchi	RINA Services SpA No. Bo. 0474 Date 12/02/2019 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Ciuffoli Davide

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing:12/02/2019
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

Internal procedure *PP12 rev.00* *Procedura internal*		**Test temperatura** *Temperature Test*	**21,8°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**031/19A**	**Magnification:** *Ingrandimento:*	**Photo at 3.1X** **Examination at 3X**
Designation: *Designazione:*	**ISO 17639-A-E-1.2-1.2/1.2/1.2 NITAL**		



Remarks /
Note:

PH POSITION (sl)
WELDING DEPOSIT: 3,36 mm (MINIMUN REQUIRED: 3,00mm)
*** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio* *Sig. Matteo Galdieri*	Laboratory Responsible Responsabile Laboratorio	Customer Inspector *Ispettore del cliente*	Third part Inspector *Ispettore Terza parte*
INSPECTA srl 12/02/19 Laboratory Technician	- INSPECTA srl - Francesca Jesi Service Responsible 12/02/19	BOSETTI MARINO SpA Welding Dept. D. Genacchi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ Date 12/02/2019 File Signature Cimatti Davide

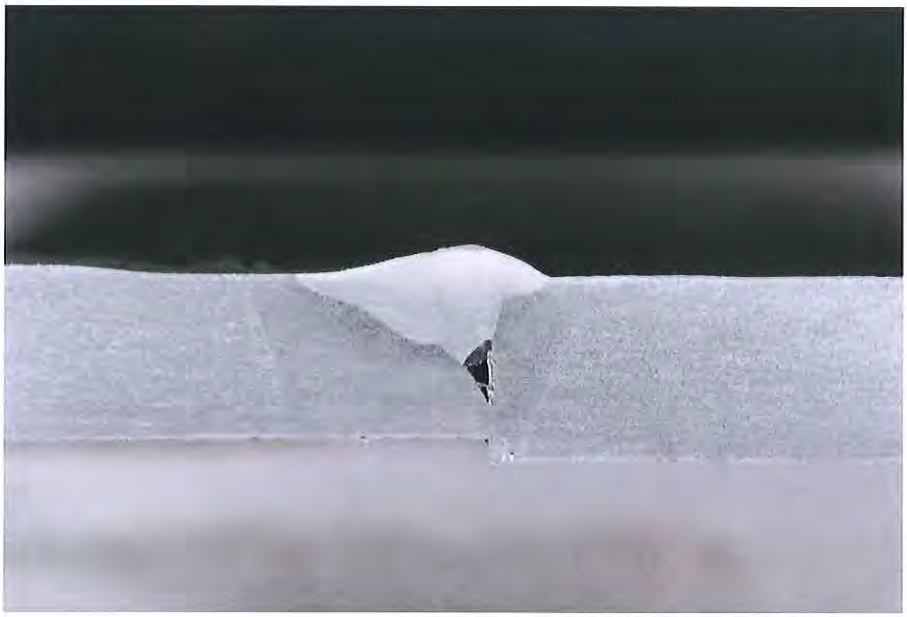
MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing:12/02/2019
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

Internal procedure *PP12 rev.00* *Procedura interna*		**Test temperatura** *Temperature Test*	**21,8°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**031/19B**	**Magnification:** *Ingrandimento:*	**Photo at 3.1X** **Examination at 3X**
Designation: *Designazione:*	**ISO 17639-A-E-1.2-1.2/1.2/1.2 NITAL**		



Remarks / *Note:*	**PH POSITION (sl)** **WELDING DEPOSIT: 4,31 mm (MINIMUN REQUIRED: 3,00mm)** *** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio* *Sig. Matteo Galdieri*	**Laboratory Responsible** Responsabile Laboratorio	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - 12/02/19 Laboratory Technician	- INSPECTA srl - Service Responsible 12/02/19	ROSETTI MARINO S.P.A. Welding Dept. B. Cenacchi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ Date 12/02/2019 File _____ Signature Cimatti Davide

VICKERS HARDNESS TEST METHOD

Prova di durezza Vickers

Date of Testing:12/02/2019
Data esecuzione prova:

☒ *UNI EN ISO 6507-1: 2018* ☐ *UNI EN ISO 9015-1: 2011* ☐ *ASTM E 92-17* ☐ _____

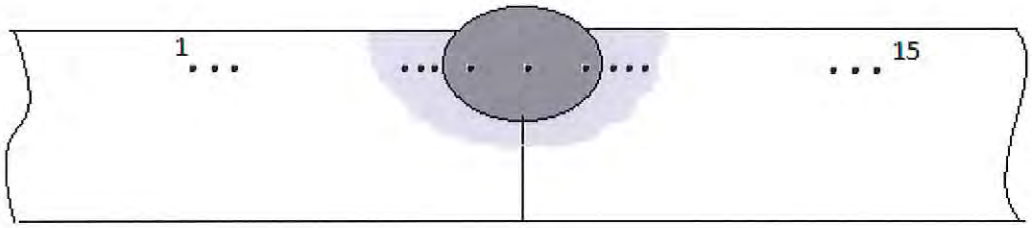
Serial N. 43030614C

Internal procedure *Procedura interna*	PP10 rev.02	Sample Identification *Identificazione provino*	032/19B	Hardness test type *Tipo di durezza*	HV10	Test Temp. *Temp.test*	21,8°C

Sketch for reference points
Schema punti di riferimento

Base Material Side A: API 5L GR.X65 PSL1 **Base Material Side B: API 5L GR.X65 PSL1**

	BM	HAZ	WM	HAZ	BM
ROW 01	1 - 2 - 3	4 - 5 - 6	7 - 8 - 9	10 - 11 - 12	13 - 14 - 15



Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U	Reference points *Punto di riferimento*	Values measured *Valori misurati*	U
1 – 2 - 3	**151-155-154**	//	16 – 17 - 18	//	//	31 – 32 - 33	//	//
4 - 5 - 6	**163-173-184**	//	19 - 20 - 21	//	//	34 - 35 - 36	//	//
7 – 8 - 9	**209-209-220**	//	22 – 23 - 24	//	//	37 – 38 - 39	//	//
10 - 11 - 12	**182-175-166**	//	25 - 26 - 27	//	//	40 - 41 - 42	//	//
13 – 14 - 15	**151-154-154**	//	28 – 29 - 30	//	//	43 – 44 - 45	//	//

Remarks/ *Note:* **PC POSITION (sl)**

*** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio*	Laboratory Responsible *Responsabile Laboratorio*	Customer Inspector *Ispettore del cliente*	Third-part Inspector *Ispettore Terza parte*
Sig. Matteo Galdieri 12/02/19	- INSPECTA srl - Francesca Tassi Service Responsible 12/02/19	ROSETTI MARINO S.p.A. Welding Dept. D. Cenacchi	RINA Services S.p.A. No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☒ Approved ☐ Date 12/02/2019 File _____ Signature Cimatti Davide

MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing:12/02/2019
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

Internal procedure *PP12 rev.00* *Procedura internal*		**Test temperatura** *Temperature Test*	**21,8°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**032/19A**	**Magnification:** *Ingrandimento:*	**Photo at 3.1X** **Examination at 3X**
Designation: *Designazione:*	**ISO 17639-A-E-1.2-1.2/1.2/1.2 NITAL**		



Remarks /
Note:

PC POSITION (sl)
WELDING DEPOSIT: 4,35 mm (MINIMUN REQUIRED: 3,00mm)
*** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio* *Sig. Matteo Galdieri*	**Laboratory Responsible** Responsabile Laboratorio	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
- INSPECTA srl - Laboratory Technician 12/02/19	- INSPECTA srl - Francesca Iosei Service Responsible 12/02/19	ROSETTI MARINO SAR Welding Dept. D. Genacchi	RINA Services SpA No. Bo. 0474 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ Date 12/02/2019 File _____ Signature Cimarti Davide

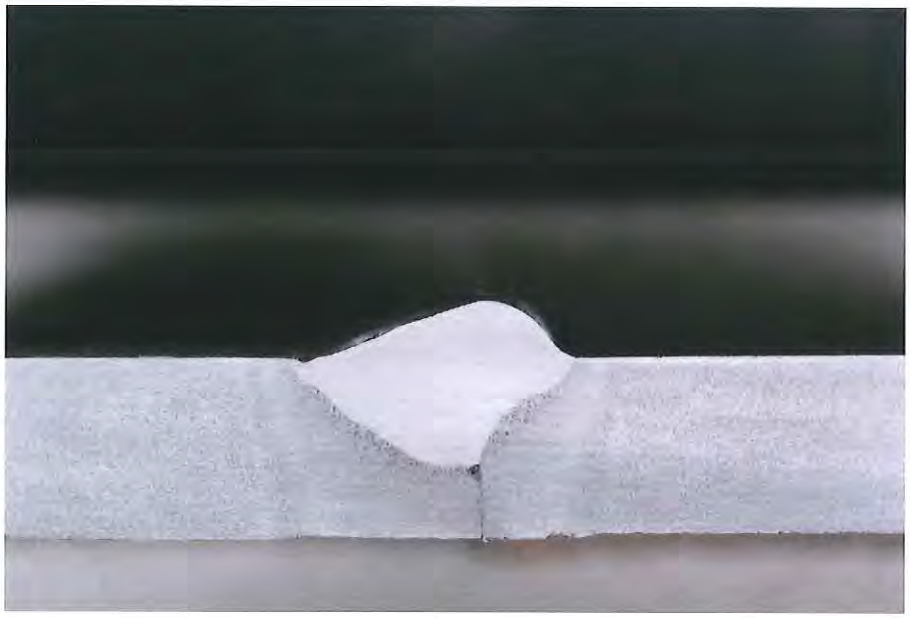
MACRO EXAMINATION TEST
Prova Macrografica

Date of Testing:12/02/2019
Data esecuzione prova:

☒ *UNI EN ISO 17639: 2013* ☐ *ASME IX QW-183: 2017* ☐ _____

Serial N.. EOS 650D/EFS

Internal procedure *PP12 rev.00* *Procedura internal*		**Test temperatura** *Temperature Test*	**21,8°C**
Surface finish: *Finitura superficiale:*	**POLISHED WITH SANDPAPER 1200gr.**	**Type and chemical composition:** *Tipo e composizione chimica:*	**NITAL 5%**
Etching methods: *Metodo di attacco:*	**IMMERSION**	**Etching time:** *Tempo di attacco:*	**10 sec.**
Sample Identification: *Identificazione provino:*	**032/19B**	**Magnification:** *Ingrandimento:*	**Photo at 3.1X** **Examination at 3X**
Designation: *Designazione:*	**ISO 17639-A-E-1.2-1.2/1.2/1.2 NITAL**		



Remarks /
Note:

PC POSITION (sl)
WELDING DEPOSIT: 4,30 mm (MINIMUN REQUIRED: 3,00mm)
*** Prova non accreditata da ACCREDIA**

Laboratory Technician *Tecnico di Laboratorio* *Sig. Matteo Galdieri*	**Laboratory Responsible** Responsabile Laboratorio	**Customer Inspector** *Ispettore del cliente*	**Third part Inspector** *Ispettore Terza parte*
12/02/19	- INSPECTA srl - Francesca Tesi Service Responsible 12/02/19	ROSETTI MARINO SpA Welding Dept. D. Cenacchi	RINA Services SpA No. Bo. 0474 Date 12/02/2019 Noted ☐ Reviewed ☐ Witnessed ☑ Approved ☐ File Signature Cimatti Davide