# Base Load Power Hub (BLPH)

## DAVIT CRANE

## WELDING PROCEDURE SPECIFICATION (WPS) AND QUALIFICATIONS RECORDS (PQR), WELDING OPERATORS LIST and WELDER QUALIFICATIONS RECORDS (WPQ), WELDING MAP

Document Number: 1724001010-WEL-PRO-00005

Document Class: 2

| Rev. | Date | Description | Prepared | Reviewed | Approved |
|---|---|---|---|---|---|
| 05 | 19/12/2024 | Accepted for construction (AFC) | CZB | MPU | ATR |
| 04 | 12/11/2024 | Accepted for construction (AFC) | CZB | MPU | ATR |
| 03 | 30/10/2024 | Accepted for construction (AFC) | CZB | MPU | ATR |
| 02 | 09/10/2024 | Issue for Review (IFR) | CZB | MPU | ATR |
| 01 | 06/09/2024 | Issue for Review (IFR) | CZB | MPU | ATR |
| 00 | 26/07/2024 | Issue for Review (IFR) | CZB | MPU | ATR |

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## Revision / Change Log

| Rev. | Description |
|---|---|
| 00 | Issue for Review (IFR) |
| 01 | Issue for Review (IFR) |
| 02 | Issue for Review (IFR) |
| 03 | Accepted for construction (AFC) |
| 04 | Accepted for construction (AFC) / Added section for Winch and Winch Carpentry |
| 05 | |
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## HOLDS LIST

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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.

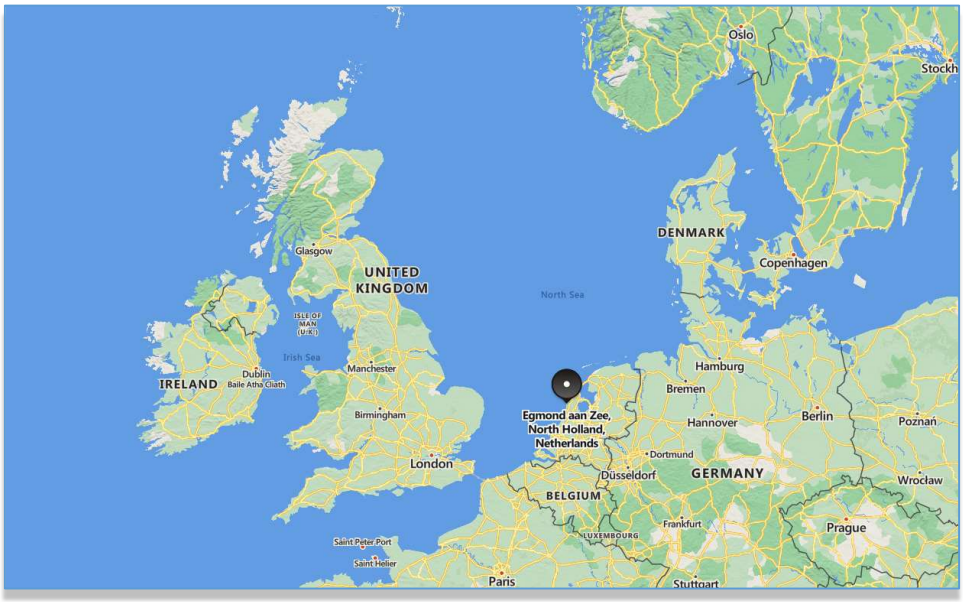


*Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map*




*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.

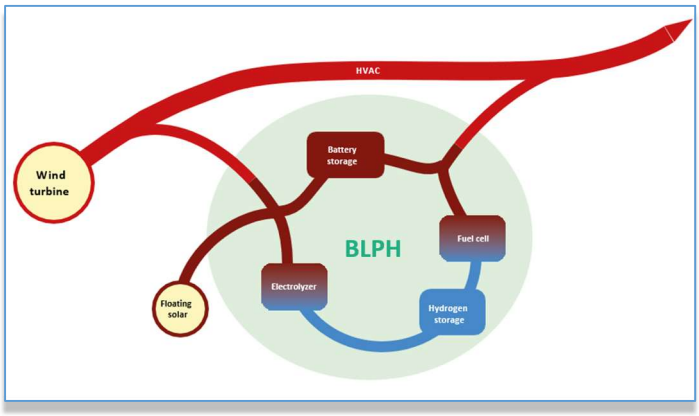



*Figure 3 – BLPH Concept*

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

WELDING PROCEDURE SPECIFICATION (WPS) AND QUALIFICATIONS RECORDS (PQR), WELDING OPERATORS LIST and WELDER QUALIFICATIONS RECORDS (WPQ), WELDING MAP

*Table 1 - Reference Documents*

## 2.1 DEFINITIONS AND ABBREVIATIONS

| | |
|---|---|
| COMPANY or Client (CPY): | Crosswind |
| CONTRACTOR (CTR): | ROSETTI MARINO S.p.A. |
| PROJECT: | HOLLANDSE KUST NOORD WIND PARK Project |

*Table 2 - Definitions and Abbreviations*

# 3 WELDING BOOK

# DAVIT CRANE

# WELDING PROCEDURE SPECIFICATION (WPS) & QUALIFICATION RECORDS (PQR), WELDING OPERATORS LIST & WELDER QUALIFICATION RECORDS (WPQ), WELDING MAP – REMAZEL

| Rev | Date | Revision Description | Prepared | Checked | Approved |
|---|---|---|---|---|---|
| 05 | 19/12/2024 | Accepted for constrution | CZB | MPU | ATR |
| 04 | 12/11/2024 | Accepted for constrution | CZB | MPU | ATR |
| 03 | 24/10/2024 | Accepted for constrution | CZB | MPU | ATR |
| 02 | 09/10/2024 | Issued For Review | CZB | MPU | ATR |
| 01 | 06/09/2024 | Issued For Review | CZB | MPU | ATR |
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## SUMMARY OF REVISION

| Rev. | Revised chapters | Revision description | Reason for revision |
|---|---|---|---|
| 00 | /// | /// | IFR |
| 01 | /// | /// | IFR |
| 02 | All | Add WPQR CCP09; Reviewed comment on WPQR CCP12 | IFR |
| 03 | / | Add welders history certificates Also Accepted for construction | AFC |
| 04 | / | Add section for Winch and Winch Carpentry | AFC |
| 05 | / | // | AFC |

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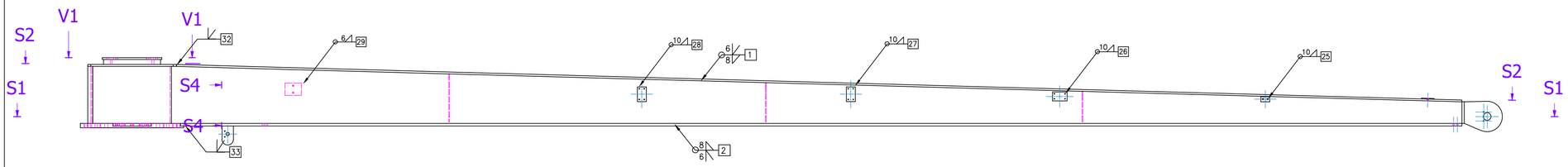
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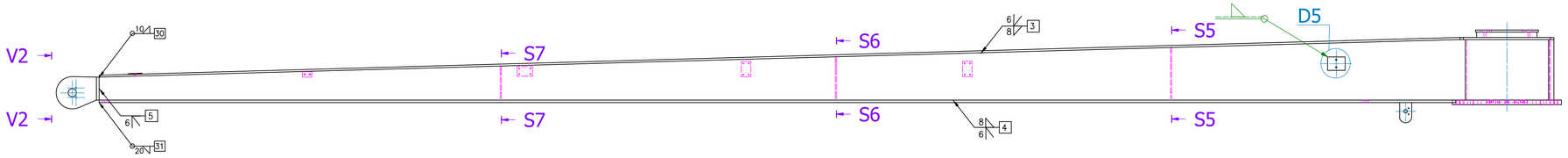

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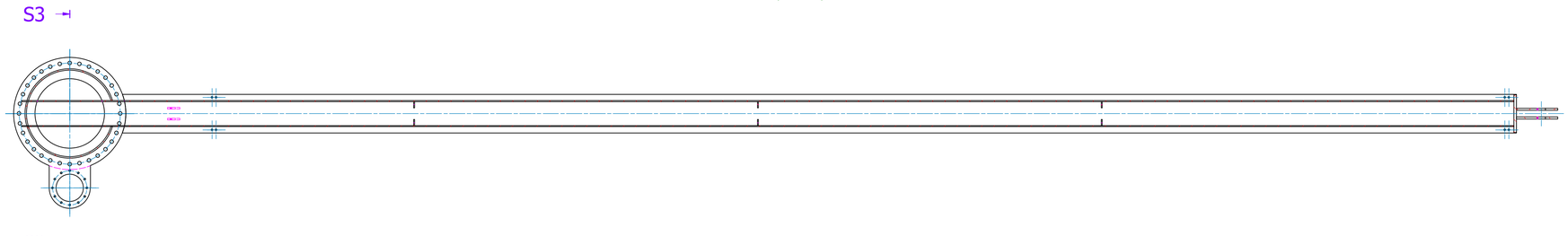
# 1. Weld Map

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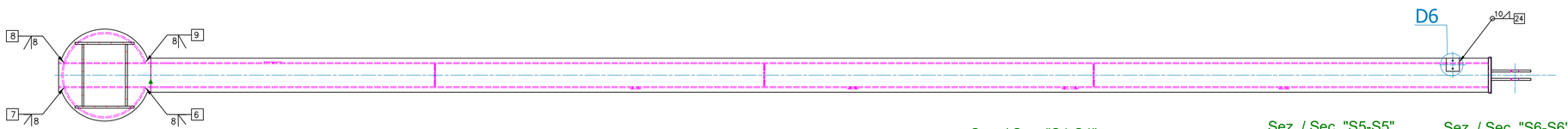


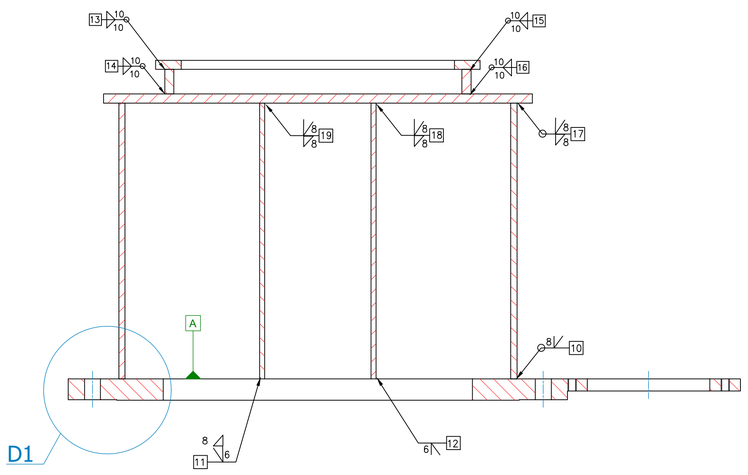

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( 1 : 20 )



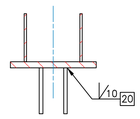

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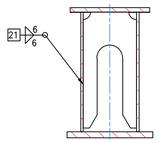

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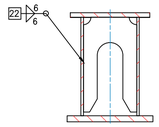

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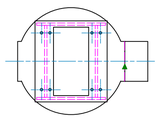

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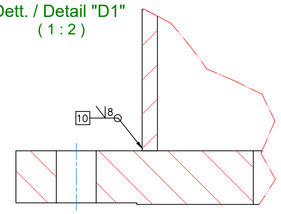

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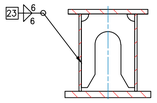

Vista da / View from "V1"
( 1 : 20 )



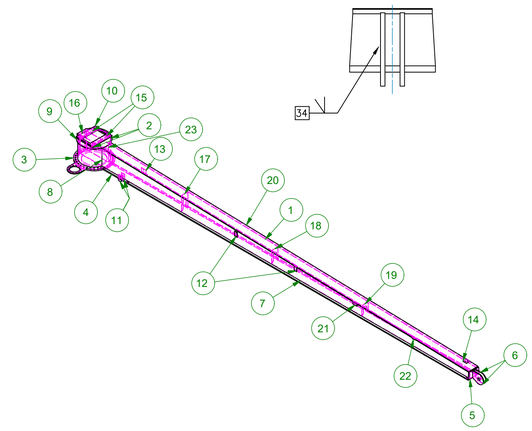
Dett. / Detail "D1"
( 1 : 2 )




Sez. / Sez. "S7-S7"
( 1 : 10 )




Vista da / View from "V2"
( 1 : 10 )




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|---|---|---|---|---|---|
| 23 | Sheet metal | Thk = 10 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | C3 | 28,73 kg |
| 22 | Sheet metal | Thk = 10 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | C3 | 0,21 kg |
| 21 | Sheet metal | Thk = 10 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | C3 | 0,62 kg |
| 20 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | C3 | 311,25 kg |
| 19 | Sheet metal | Thk = 8 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | C3 | 1,59 kg |
| 18 | Sheet metal | Thk = 8 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | C3 | 2,11 kg |
| 17 | Sheet metal | Thk = 8 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | C3 | 2,63 kg |
| 16 | Sheet metal | Thk = 10 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | C3 | 6,23 kg |
| 15 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 2 | C3 | 2,22 kg |
| 14 | Sheet metal | Thk = 9 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | C3 | 0,46 kg |
| 13 | Sheet metal | Thk = 6 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | C3 | 0,61 kg |
| 12 | Sheet metal | Thk = 10 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 2 | C3 | 0,62 kg |
| 11 | Sheet metal | Thk = 12 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 2 | C3 | 1,13 kg |
| 10 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | C3 | 17,09 kg |
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| 7 | Sheet metal | Thk = 8 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | C3 | 217,62 kg |
| 6 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 2 | C3 | 6,77 kg |
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| 3 | Sheet metal | Thk = 35 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | C3 | 89,54 kg |
| 2 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 2 | C3 | 2,12 kg |
| 1 | Sheet metal | Thk = 8 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | C3 | 217,65 kg |
| EL. | DESCRIPTION | DESCRIPTION ADDITIONAL | Q.TY | Q.C.L. | WEIGHT |

**Riferimenti documenti per Costruzione / Verniciatura / Controllo**
***Reference documents for Construction / Painting / Inspections***

| Numero Documento / Documents number | Descrizione / Description |
|---|---|
| | Piano di collaudo / Inspection Test Plan |
| | Specifica di Verniciatura / Painting Specification |
| | Specifica di Distensione / Stress Relieving Specification |
| | Specifica Trattamento Termico / Heat Treatment Specification |

**3.1 CERTIFICATE - EN10204**

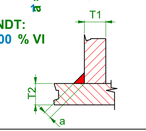
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*CONTINUOUS WELDING*

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NDT
100% VI
100% MT/PT
100% UT

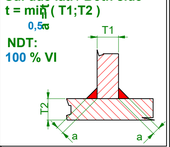
**SALDATURE NON QUOTATE**
***WELD WITHOUT DIMENSION***

**Su un lato / One side**
t = min ( T1;T2 )
NDT:
100 % VI




**SALDATURE NON QUOTATE**
***WELD WITHOUT DIMENSION***

**Sui due lati / Both side**
t = min ( T1;T2 )
NDT:
100 % VI




Eliminare spigoli vivi
*Remove all edges*

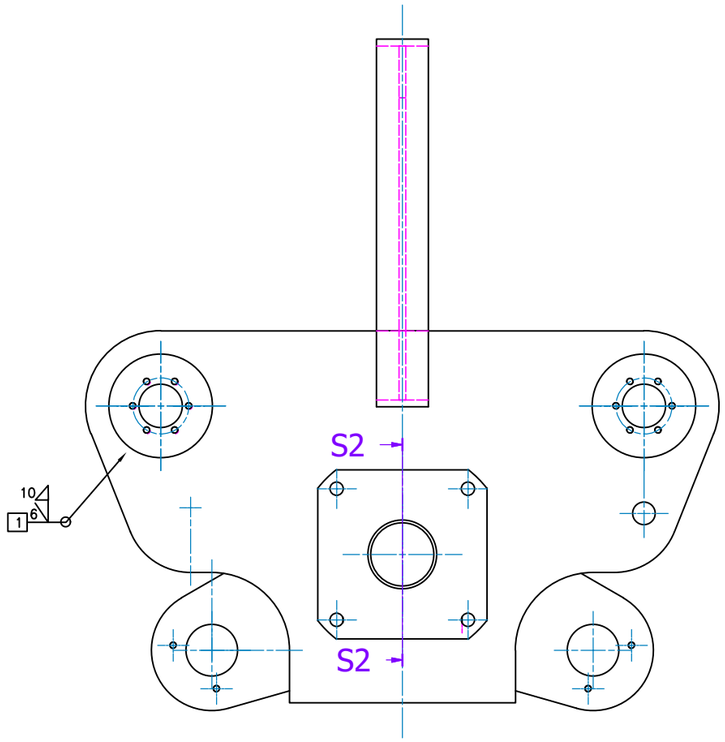
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**UNI EN ISO 2553**

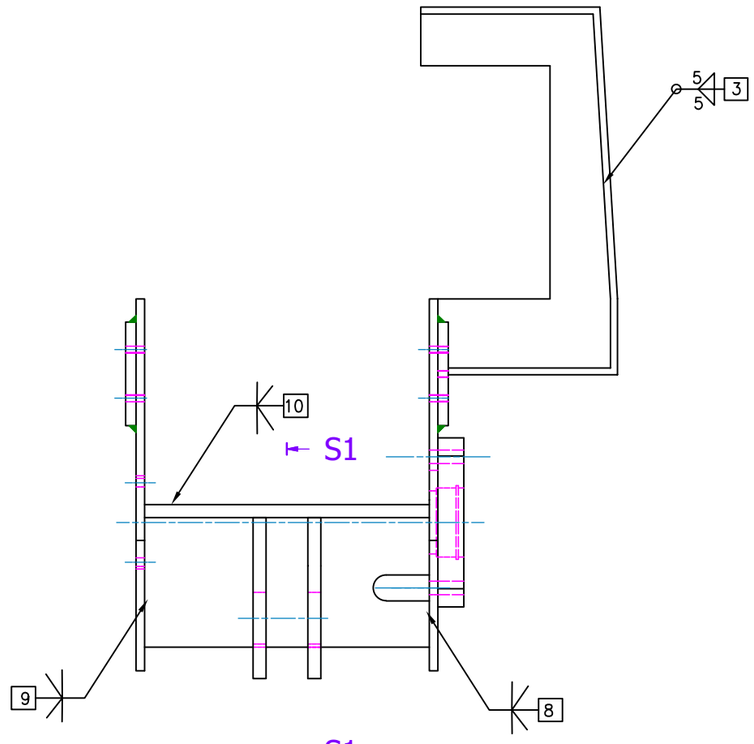
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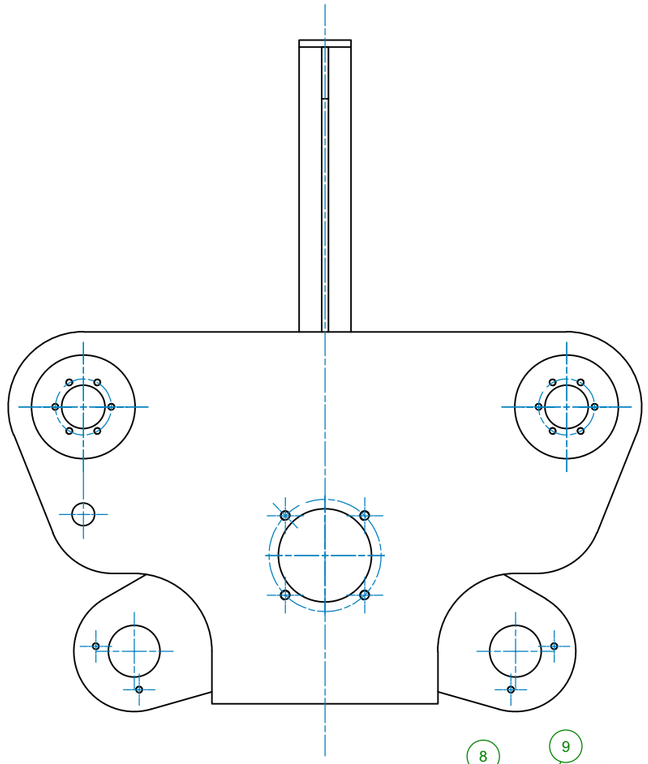

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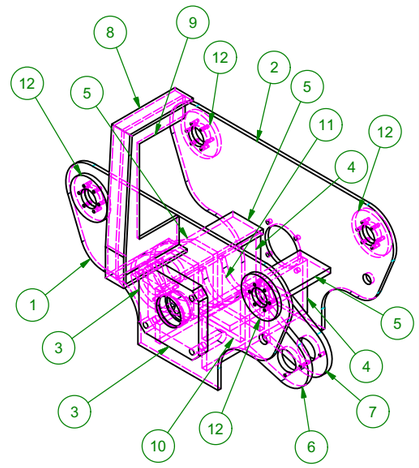

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Weight : N/A
Scale : 1 : 20
Sheet : 1 of 3
A1
Drawing State: **Work in Progress** / ***PRELIMINARY***
Q.C.L. : C3
Drawing N° : C09-0001-P0004
Revision : A


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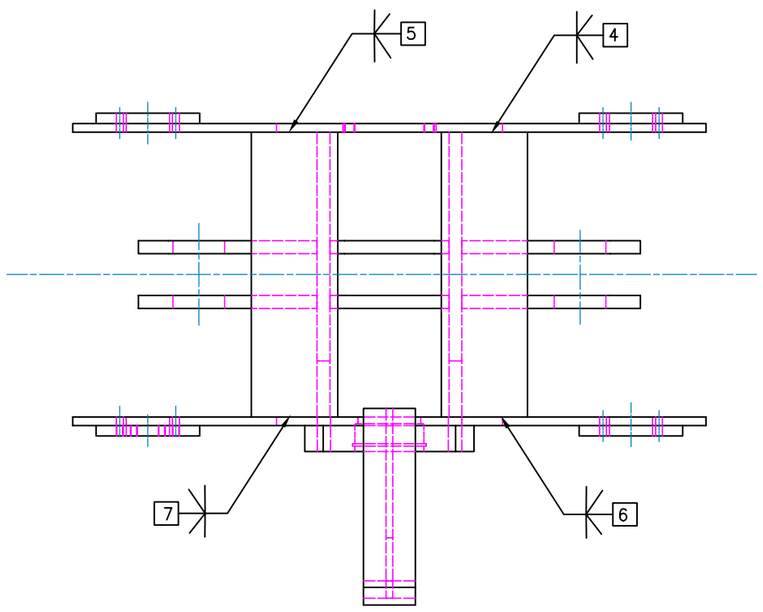


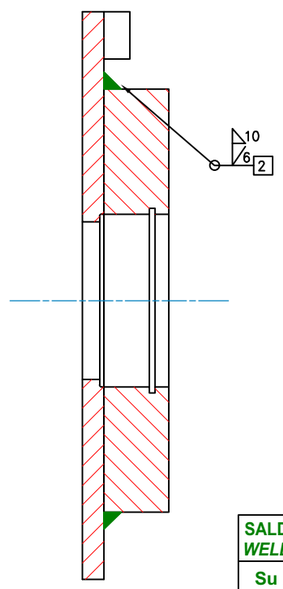



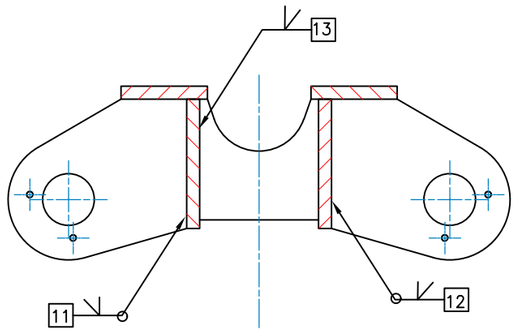



Sez. / Sec. **"S2-S2"**
( 1 : 2 )




Sez. / Sec. **"S1-S1"**
( 1 : 5 )




| | | | | | |
|---|---|---|---|---|---|
| 12 | Flange | Ø120 mm - S 355 J2+N UNI EN 10025_Cert 3.1 | C3 | 4 | 0,86 kg |
| 11 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert 3.1 | C3 | 1 | 1,64 kg |
| 10 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert 3.1 | C3 | 1 | 1,64 kg |
| 9 | Sheet metal | Thk = 8 mm - S 355 J2+N UNI EN 10025_Cert 3.1 | C3 | 1 | 2,82 kg |
| 8 | Metal Profile | Plate 60x8 - S 355 J2+N UNI EN 10025_Cert 3.1 | C3 | 1 | 3,12 kg |
| 7 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert 3.1 | C3 | 2 | 3,19 kg |
| 6 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert 3.1 | C3 | 2 | 3,19 kg |
| 5 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert 3.1 | C3 | 2 | 3,89 kg |
| 4 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert 3.1 | C3 | 2 | 5,62 kg |
| 3 | Sheet metal | Thk = 30 mm - S 355 J2+N UNI EN 10025_Cert 3.1 | C3 | 1 | 7,49 kg |
| 2 | Sheet metal | Thk = 10 mm - S 355 J2+N UNI EN 10025_Cert 3.1 | C3 | 1 | 17,1 kg |
| 1 | Sheet metal | Thk = 10 mm - S 355 J2+N UNI EN 10025_Cert 3.1 | C3 | 1 | 17,44 kg |
| EL. | DESCRIPTION | ADDITIONAL DESCRIPTION | Q.C.L. | Q.TY | WEIGHT |

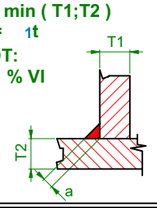
Eliminare spigoli vivi
*Remove all edges*

0.8 3.2 6.3

**SALDATURA CONTINUA**
*CONTINUOUS WELDING*

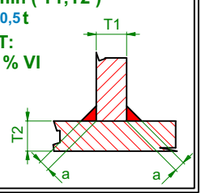
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***WELD WITHOUT DIMENSION***

**Su un lato / *One side***
**t = min ( T1;T2 )**
**a = 1t**
**NDT:**
**100 % VI**




**SALDATURE NON QUOTATE**
***WELD WITHOUT DIMENSION***

**Sui due lati / *Both side***
**t = min ( T1;T2 )**
**a = 0,5t**
**NDT:**
**100 % VI**




| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| A | 15/07/2024 | Prima emissione / First issued | riccardo.sobani | | - | |

REMAZEL ENGINEERING
Chiuduno (BG) - 24060 - ITALY
Phone : +39-035-68.44.14 - Fax : +39-035-68.78.23
e-mail : info@remazel.com / website : www.remazel.com

Project / Equipment :
**C09-0001**

Weight :
86,5 kg

Title :
Carrello Gancio
Traveling Trolley

Scale :
1 : 5

Sheet :
1 of 1

**A2**

Drawing State:
**Work in Progress**
***PRELIMINARY***

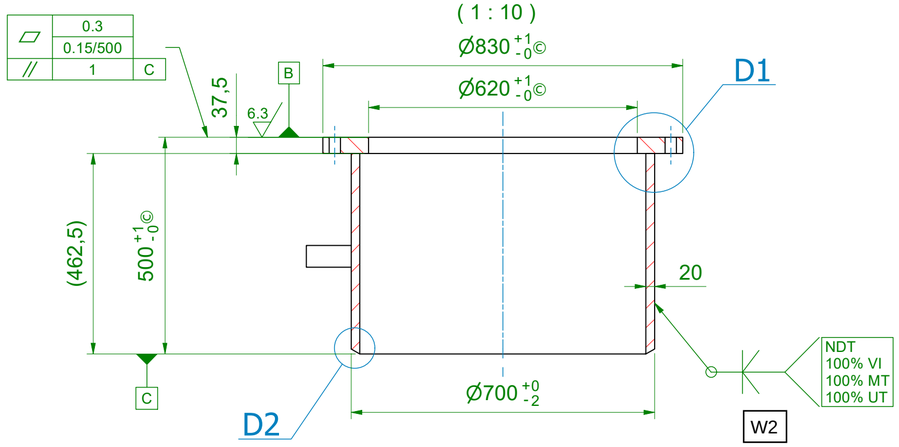
Q.C.L. :
C3

Drawing N° :
C09-0001-P0006

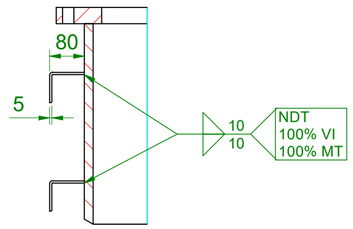
Revision :
A

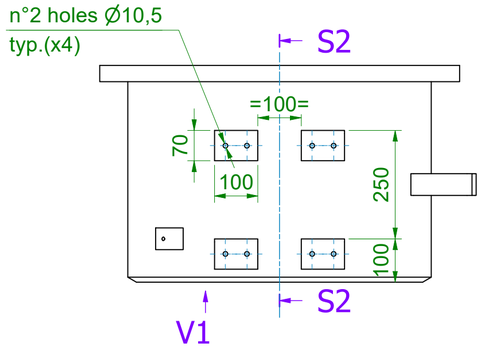
This drawing is property of REMAZEL ENGINEERING S.p.A. It is strictly forbidden to copy, reproduce, modify or distribute the drawing to third persons without owner's written permission.

## Sez. / Sec. **"S1-S1"**
( 1 : 10 )

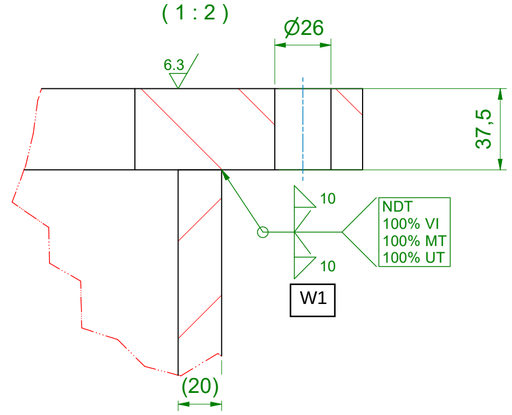



## Sez. / Sec. **"S2-S2"**
( 1 : 10 )

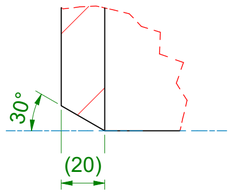


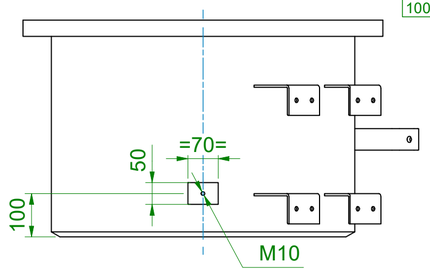

## Dett. / Detail **"D1"**
( 1 : 2 )



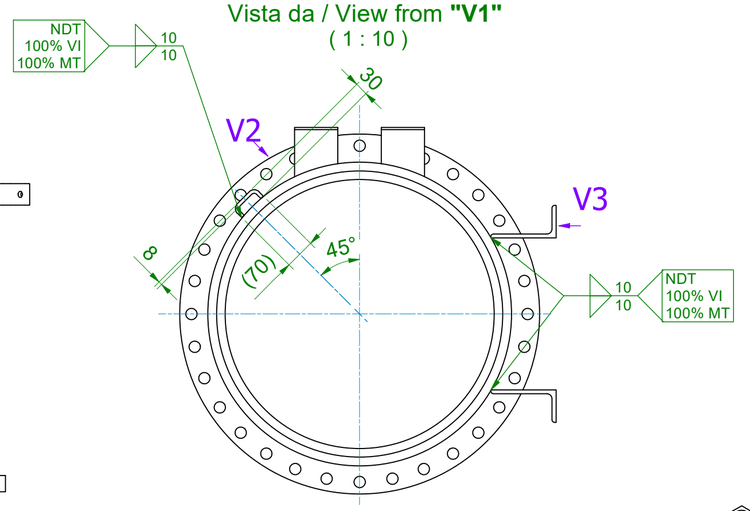

## Dett. / Detail **"D2"**
( 1 : 2 )

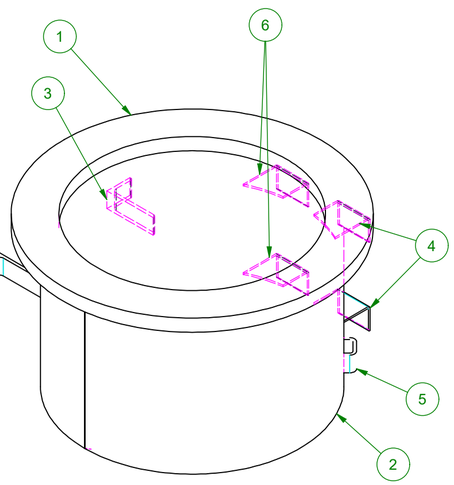


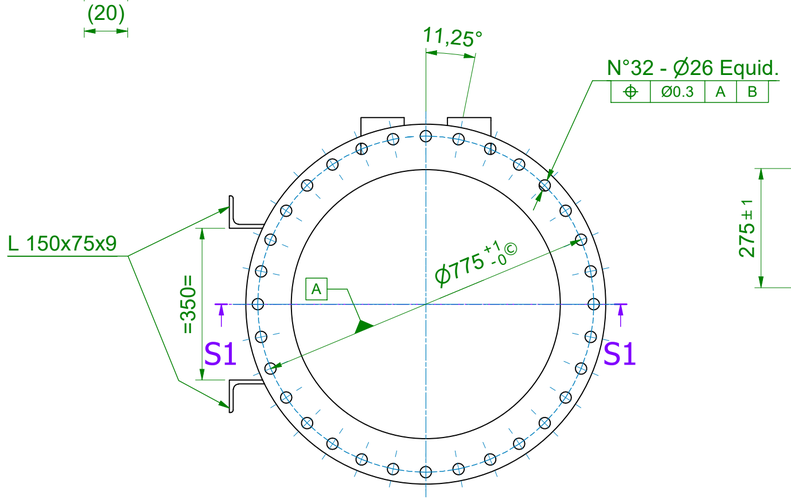

## Vista da / View from **"V2"**
( 1 : 10 )



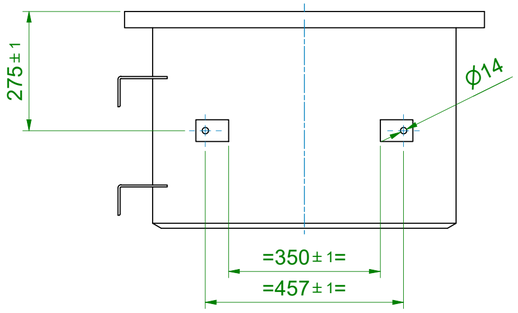

## Vista da / View from **"V1"**
( 1 : 10 )




## Vista da / View from **"V3"**
( 1 : 10 )




### Riferimenti documenti per Costruzione / Verniciatura / Controllo
### *Reference documents for Construction / Painting / Inspections*

| Numero Documento / *Documents number* | Descrizione / *Description* |
|---|---|
| 1724001010-QC-ITP-00002 | Piano di collaudo / *Inspection Test Plan* |
| 1724001010-MAT-PRO-00007 | Specifica di Verniciatura / *Painting Specification* |
| | Specifica di Distensione / *Stress Relieving Specification* |
| | Specifica Trattamento Termico / *Heat Treatment Specification* |

Simboli saldatura secondo
*Welding symbols according to*
**UNI EN ISO 2553**

Eliminare spigoli vivi
*Remove all edges*

| | | | | | | |
|---|---|---|---|---|---|---|
| 6 | Sheet metal | Thk = 5 mm - S 355 J2+N UNI EN 10025_Cert.3.1 | 2 | 0,62 kg |
| 5 | Sheet metal | Thk = 8 mm - S 355 J2+N UNI EN 10025_Cert.3.1 | 1 | 0,33 kg |
| 4 | Sheet metal | Thk = 5 mm - S 355 J2+N UNI EN 10025_Cert.3.1 | 2 | 0,62 kg |
| 3 | Sheet metal | L 150x75x9 - S 355 J2+N UNI EN 10025_Cert.3.1 | 2 | 0,77 kg |
| 2 | Sheet metal | Thk = 20 mm - S 355 J2+N UNI EN 10025_Cert.3.1 | 1 | 153,36 kg |
| 1 | Sheet metal | Thk = 40 mm - S 355 J2+N UNI EN 10025_Cert.3.1 | 1 | 78,77 kg |
| EL. | DESCRIPTION | ADDITIONAL DESCRIPTION | Q.TY | WEIGHT |

| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| D | 12/09/2024 | Modificato Item 4 / Update item 4 | riccardo.sobani | Sobani R. | De Fazio F. | – |
| C | 04/09/2024 | Aggiornamento Generale / General Update | riccardo.sobani | Sobani R. | De Fazio F. | – |
| B | 05/09/2024 | Rimozione verniciatura Aggiunte nuove carpenterie/ Delete painting color and Added new Carpentry | riccardo.sobani | Sobani R. | De Fazio F. | – |
| A | 31/07/2024 | Prima emissione / First issued | riccardo.sobani | | | |

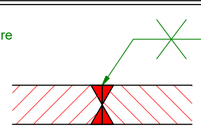
6.3

**PRIMER ONLY**

**SALDATURA CONTINUA**
*CONTINUOUS WELDING*

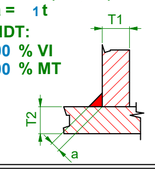
Tutte le saldature testa a testa non indicate a disegno devono essere a piena penetrazione

*All head to head weldings not indicated on drawing must be complete penetration joint*



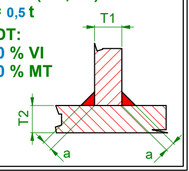

**SALDATURE NON QUOTATE**
***WELD WITHOUT DIMENSION***

**Su un lato / *One side***
**t = min ( T1;T2 )**
**a = 1 t**
**NDT:**
**100 % VI**
**100 % MT**




**SALDATURE NON QUOTATE**
***WELD WITHOUT DIMENSION***

**Sui due lati / *Both side***
**t = min ( T1;T2 )**
**a = 0,5 t**
**NDT:**
**100 % VI**
**100 % MT**




### UNI EN ISO 8501-3

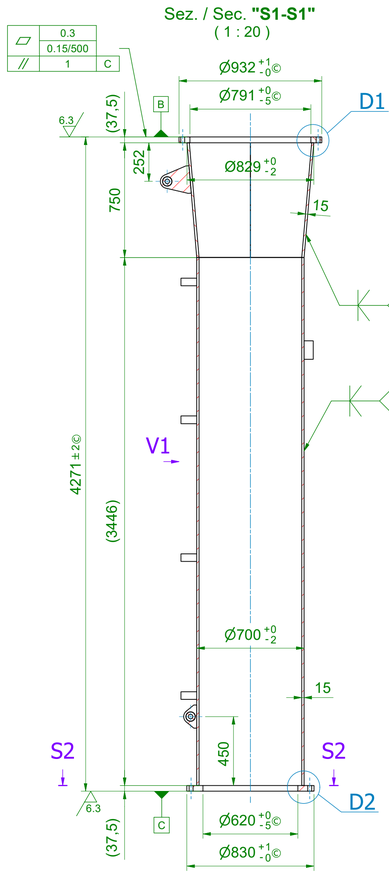
**Grado di preparazione saldature, bordi e altre aree con imperfezioni superficiali**
*Preparation grade of welds, edges and other areas with surface imperfections*

| Zona / *Areas* | Grado / *Grade* | R min / *Min radius* |
|---|---|---|
| Saldature / *Welds* | P3 | N.A. |
| Bordi / *Edges* | P3 | 2 mm |
| Aree con imperf. superf. / *Areas with surface imperf.* | P3 | N.A. |

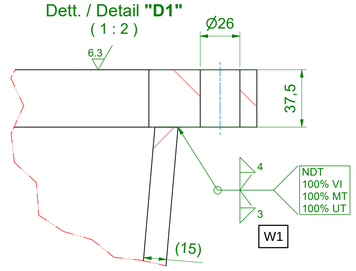
REMAZEL ENGINEERING
Chiuduno (BG) - 24060 - ITALY
Phone : +39-035-68.44.14 - Fax : +39-035-68.78.23
e-mail : info@remazel.com / website : www.remazel.com

Project / Equipment : **C09-0001**
Weight : 223,2 kg
Title : Carpenteria Pedestal / Pedestal Carpentry
Scale : 1 : 10
Sheet : 1 of 3 **A2**
Drawing State: **Work in Progress** / ***FOR CONSTRUCTION***
Q.C.L. : C1
Drawing N° : C09-0001-P0001
Revision : D

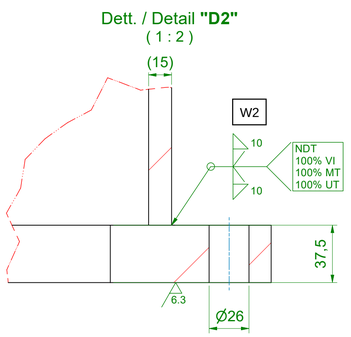
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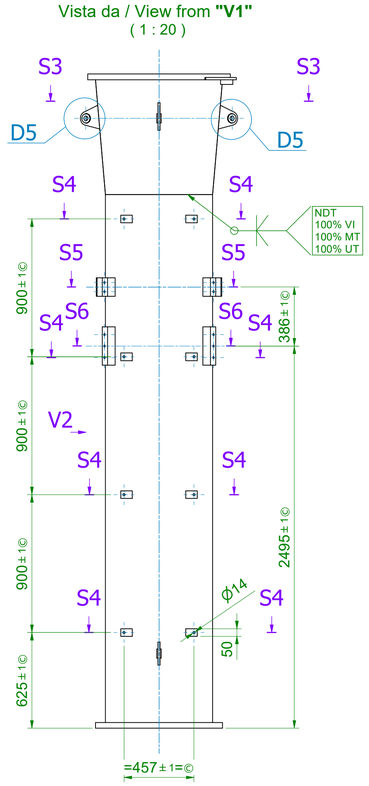

Sez. / Sec. **"S1-S1"**
( 1 : 20 )



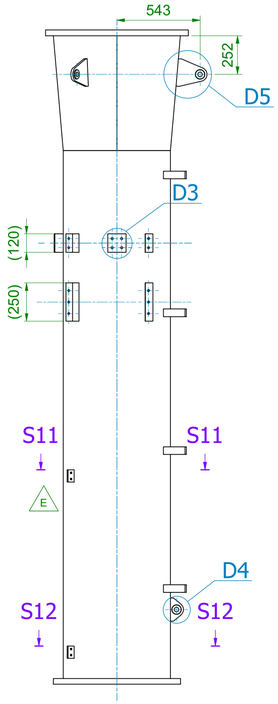

Dett. / Detail **"D1"**
( 1 : 2 )



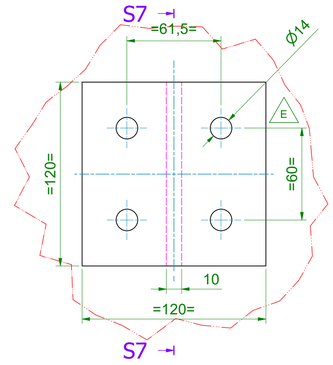

Dett. / Detail **"D2"**
( 1 : 2 )



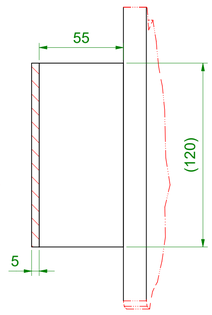

Vista da / View from **"V1"**
( 1 : 20 )



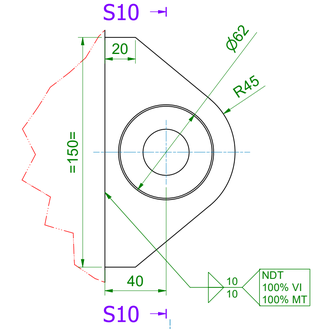

Vista da / View from **"V2"**
( 1 : 20 )



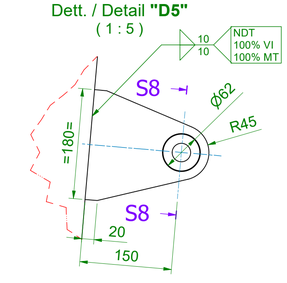

Dett. / Detail **"D3"**
( 1 : 2 )



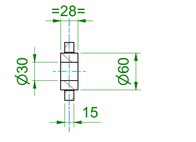

Sez. / Sec. **"S7-S7"**
( 1 : 2 )



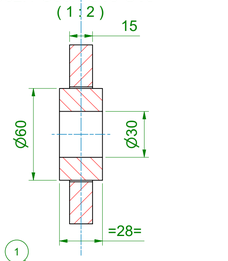

Dett. / Detail **"D4"**
( 1 : 2 )



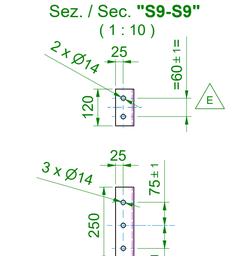

Dett. / Detail **"D5"**
( 1 : 5 )



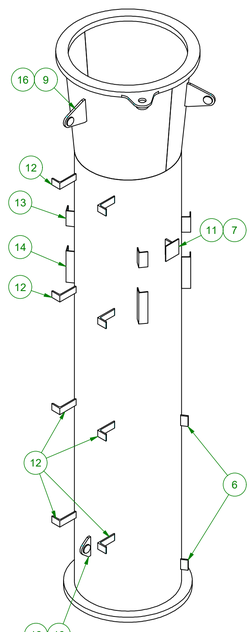

Sez. / Sec. **"S8-S8"**
( 1 : 5 )

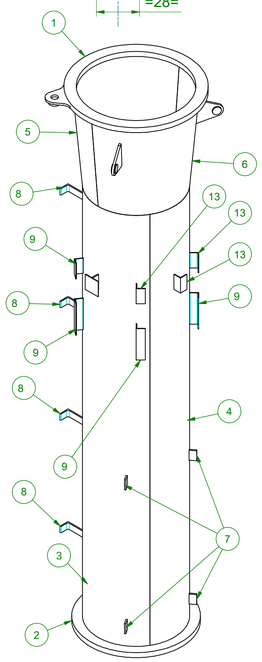


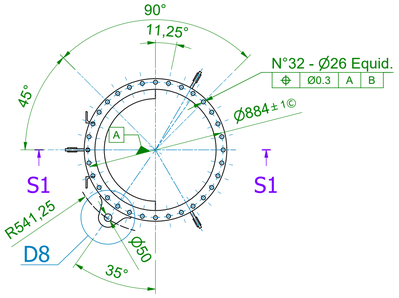

Sez. / Sec. **"S10-S10"**
( 1 : 2 )



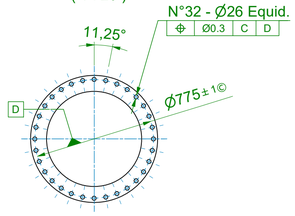

Sez. / Sec. **"S9-S9"**
( 1 : 10 )



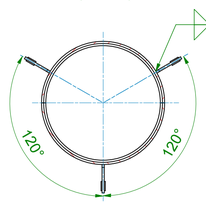



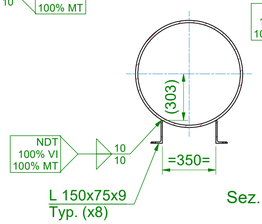

Sez. / Sec. **"S2-S2"**
( 1 : 20 )



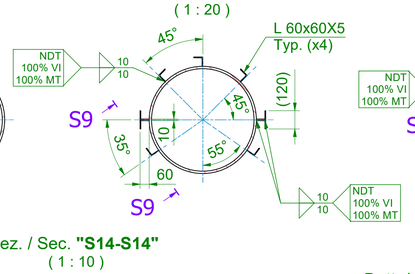

Sez. / Sec. **"S3-S3"**
( 1 : 20 )



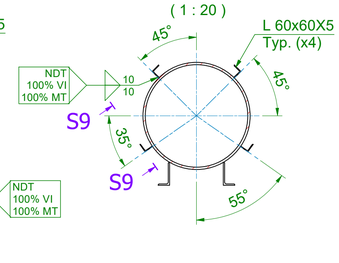

Sez. / Sec. **"S4-S4"**
( 1 : 20 )



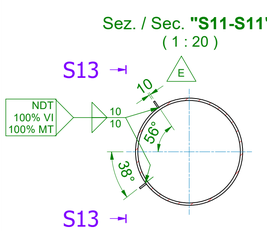

Sez. / Sec. **"S5-S5"**
( 1 : 20 )



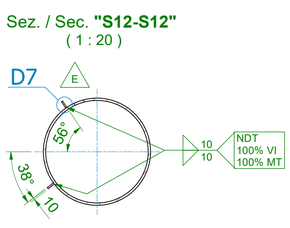

Sez. / Sec. **"S6-S6"**
( 1 : 20 )



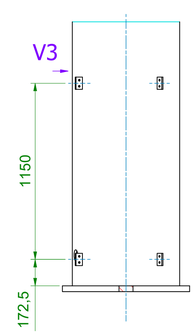

Sez. / Sec, **"S13-S13"**
( 1 : 20 )

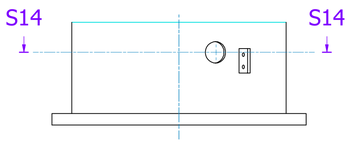


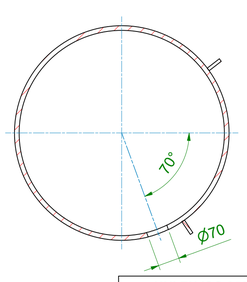

Sez. / Sec. **"S11-S11"**
( 1 : 20 )



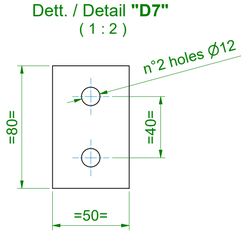

Sez. / Sec. **"S12-S12"**
( 1 : 20 )




Sez. / Sec. **"S14-S14"**
( 1 : 10 )




Dett. / Detail **"D7"**
( 1 : 2 )

6,3

| | | | | |
|---|---|---|---|---|
| 16 | Metal profile | Rod Bar Ø60 - S 355 J2+N UNI EN 10025_Cert.3.1 | 4 | 0,62 kg |
| 15 | Metal profile | Rod Bar Ø60 - S 355 J2+N UNI EN 10025_Cert.3.1 | 1 | 1,19 kg |
| 14 | Metal profile | L 60x60x5 - S 355 J2+N UNI EN 10025_Cert.3.1 | 4 | 1,14 kg |
| 13 | Metal profile | L 60x60x5 - S 355 J2+N UNI EN 10025_Cert.3.1 | 5 | 0,55 kg |
| 12 | Metal profile | L 150x75x9 - S 355 J2+N UNI EN 10025_Cert.3.1 | 8 | 0,77 kg |
| 11 | Sheet metal | Thk = 5 mm - S 355 J2+N UNI EN 10025_Cert.3.1 | 2 | 0,56 kg |
| 10 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert.3.1 | 1 | 0,72 kg |
| 9 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert.3.1 | 3 | 2,55 kg |
| 8 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert.3.1 | 1 | 2,07 kg |
| 7 | Sheet metal | Thk = 10 mm - S 355 J2+N UNI EN 10025_Cert.3.1 | 2 | 0,52 kg |
| 6 | Sheet metal | Thk = 10 mm - S 355 J2+N UNI EN 10025_Cert.3.1 | 4 | 0,31 kg |
| 5 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert.3.1 | 1 | 104,4 kg |
| 4 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert.3.1 | 1 | 104,4 kg |
| 3 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert.3.1 | 1 | 874,32 kg |
| 2 | Sheet metal | Thk = 40 mm - S 355 J2+N UNI EN 10025_Cert.3.1 | 1 | 82,35 kg |
| 1 | Sheet metal | Thk = 40 mm - S 355 J2+N UNI EN 10025_Cert.3.1 | 1 | 68,5 kg |
| EL. | DESCRIPTION | ADDITIONAL DESCRIPTION | Q.TY | WEIGHT |

| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| E | 07/10/2024 | Aggiornamento distanza fori Item 11 Item 13 / Update holes space Item 11 Item 13 | riccardo.sobani | Sobani R. | De Fazio F. | – |
| D | 11/09/2024 | Aggiornamento Item 6 Item 3 / Update Item 6 Item 3 | riccardo.sobani | Sobani R. | De Fazio F. | – |
| C | 04/09/2024 | Aggiornamento Generale / General Update | riccardo.sobani | Sobani R. | De Fazio F. | – |
| B | 03/09/2024 | Aggiornamento Generale / General Update | riccardo.sobani | Sobani R. | De Fazio F. | – |
| A | 31/07/2024 | Prima emissione / First issued | riccardo.sobani | Sobani R. | – | – |

**SALDATURA CONTINUA**
*CONTINUOUS WELDING*

Tutte le saldature testa a testa non indicate a disegno devono essere a piena penetrazione

*All head to head weldings not indicated on drawing must be complete penetration joint*

NDT
100% VI
100% MT/PT
100% UT

**Riferimenti documenti per Costruzione / Verniciatura / Controllo**
***Reference documents for Construction / Painting / Inspections***

| Numero Documento / *Documents number* | Descrizione / *Description* |
|---|---|
| 1724001010-QC-ITP-00002 | Piano di collaudo / *Inspection Test Plan* |
| 1724001010-MAT-PRO-00007 | Specifica di Verniciatura / *Painting Specification* |
| | Specifica di Distensione / *Stress Relieving Specification* |
| | Specifica Trattamento Termico / *Heat Treatment Specification* |

Eliminare spigoli vivi
*Remove all edges*

Simboli saldatura secondo
*Welding symbols according to*
**UNI EN ISO 2553**

**UNI EN ISO 8501-3**
**Grado di preparazione saldature, bordi e altre aree con imperfezioni superficiali**
*Preparation grade of welds, edges and other areas with surface imperfections*

| Zona / *Areas* | Grado / *Grade* | R min / *Min radius* |
|---|---|---|
| Saldature / *Welds* | P3 | N.A. |
| Bordi / *Edges* | P3 | 2 mm |
| Aree con imperf. superf. / *Areas with surface imperf.* | P3 | N.A. |

**SALDATURE NON QUOTATE**
***WELD WITHOUT DIMENSION***
**Sui due lati / *Both side***
**t = min ( T1;T2 )**
**a = 0.5 t**
**NDT:**
**100 % VI**
**100 % MT**

**SALDATURE NON QUOTATE**
***WELD WITHOUT DIMENSION***
**Su un lato / *One side***
**t = min ( T1;T2 )**
**a = 1 t**
**NDT:**
**100 % VI**
**100 % MT**

REMAZEL ENGINEERING
Chiuduno (BG) - 24060 - ITALY
Phone : +39-035-68.44.14 - Fax : +39-035-68.78.23
e-mail : info@remazel.com / website : www.remazel.com

Project / Equipment :
**C09-0001**

Weight : 1228,9 kg

Title :
Carpenteria Colonna Fissa
Fixed Column Carpentry

Scale : 1 : 20

Sheet : 1 of 3 **A1**

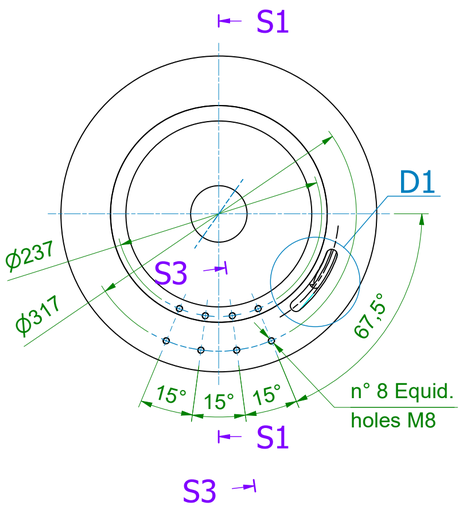
Drawing State: **Work in Progress** / **FOR CONSTRUCTION**

Q.C.L. : C1

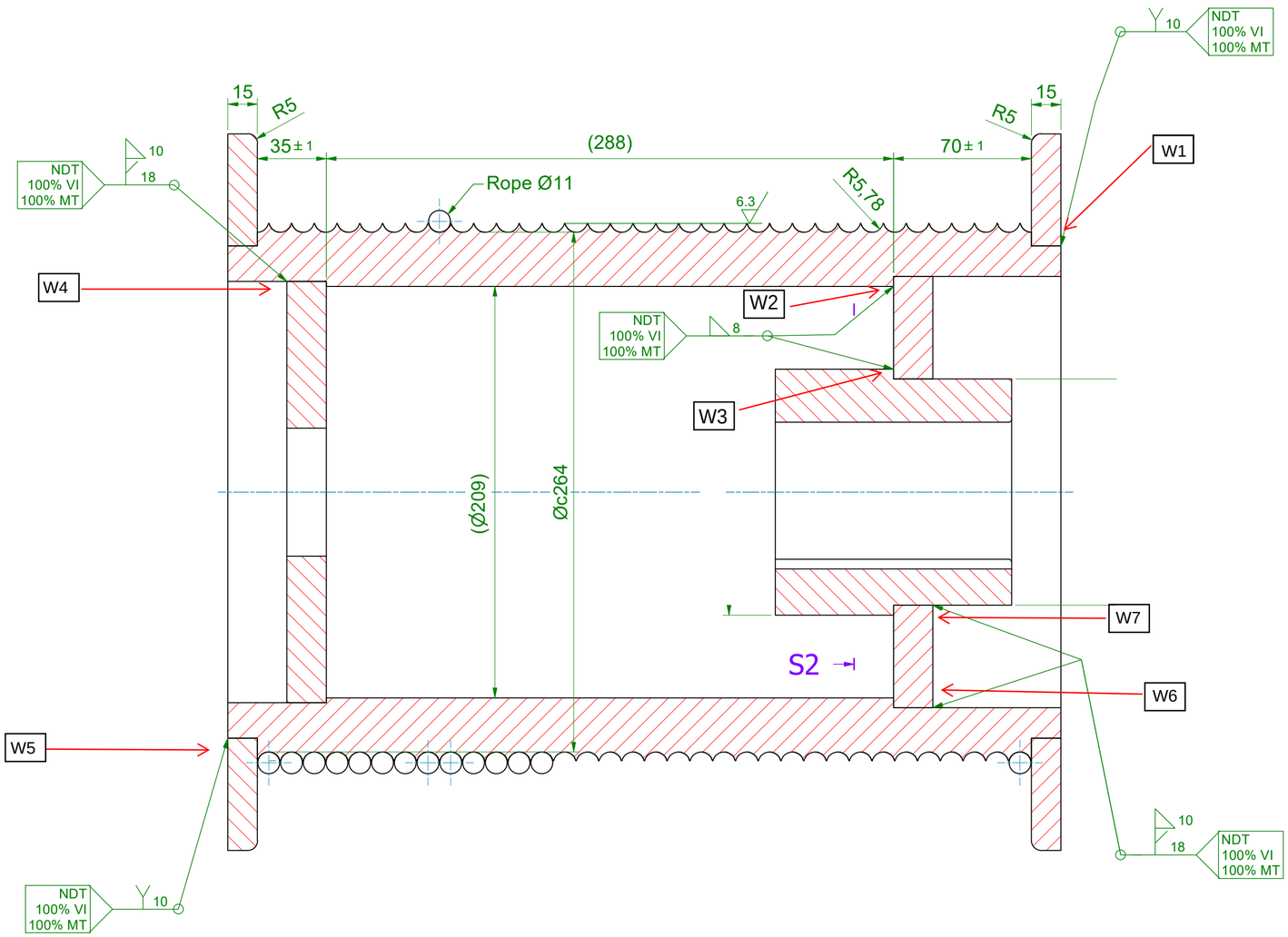
Drawing N° : C09-0001-P0002

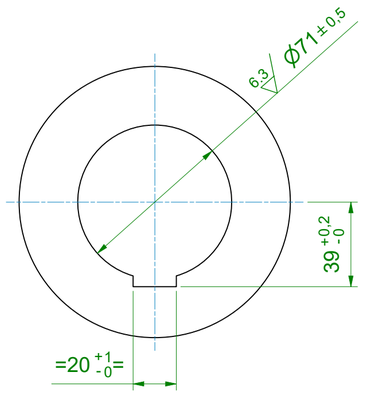
Revision : E

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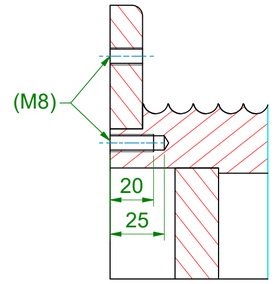


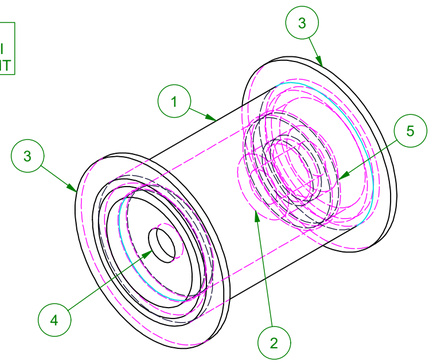

NOTA:
Fori filettati da eseguire dopo assemblaggio
Threaded holes to be drilled after assembly




Sez. / Sec. **"S3-S3"**
( 1 : 2 )




| EL. | DESCRIPTION | ADDITIONAL DESCRIPTION | Q.TY | WEIGHT |
|---|---|---|---|---|
| 5 | Sheet metal | Thk = 20 mm - S 355 J2 UNI EN 10025_Cert. 3.1 | 1 | 4,43 kg |
| 4 | Sheet metal | Thk = 20 mm - S 355 J2 UNI EN 10025_Cert. 3.1 | 1 | 5,13 kg |
| 3 | Sheet metal | Thk = 15 mm - S 355 J2 UNI EN 10025_Cert. 3.1 | 2 | 6,48 kg |
| 2 | Metal profile | Rod Bar Ø 125 - S 355 J2 UNI EN 10025_Cert. 3.1 | 1 | 8,35 kg |
| 1 | Metal profile | Thk = 21 mm - S 355 J2 UNI EN 10025_Cert. 3.1 | 1 | 89,2 kg |

Eliminare spigoli vivi
*Remove all edges*

Simboli saldatura secondo
*Welding symbols according to*
**UNI EN ISO 2553**

**SALDATURA CONTINUA**
*CONTINUOUS WELDING*

**Riferimenti documenti per Costruzione / Verniciatura / Controllo**
***Reference documents for Construction / Painting / Inspections***

| Numero Documento / *Documents number* | Descrizione / *Description* |
|---|---|
| 1724001010-QC-ITP-00002 | Piano di collaudo / *Inspection Test Plan* |
| 1724001010-MAT-PRO-00007 | Specifica di Verniciatura / *Painting Specification* |
| | Specifica di Distensione / *Stress Relieving Specification* |
| | Specifica Trattamento Termico / *Heat Treatment Specification* |

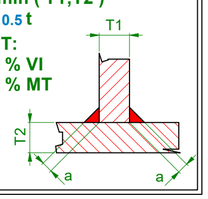
**UNI EN ISO 8501-3**

**Grado di preparazione saldature, bordi e altre aree con imperfezioni superficiali**
*Preparation grade of welds, edges and other areas with surface imperfections*

| Zona / *Areas* | Grado / *Grade* | R min / *Min radius* |
|---|---|---|
| Saldature / *Welds* | P2 | N.A. |
| Bordi / *Edges* | P3 | 2 mm |
| Aree con imperf. superf. / *Areas with surface imperf.* | P3 | N.A. |

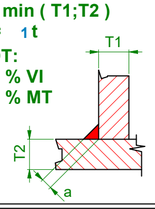
**SALDATURE NON QUOTATE**
***WELD WITHOUT DIMENSION***

**Sui due lati / *Both side***
**t = min ( T1;T2 )**
**a = 0.5 t**
**NDT:**
**100 % VI**
**100 % MT**




**SALDATURE NON QUOTATE**
***WELD WITHOUT DIMENSION***

**Su un lato / *One side***
**t = min ( T1;T2 )**
**a = 1 t**
**NDT:**
**100 % VI**
**100 % MT**




3.2 6.3

| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| A | 22/10/2024 | Prima emissione / First issued | riccardo.sobani | Sobani R. | De Fazio F. | – |


LAVORAZIONI RECANTI I SIMBOLI SEGUENTI SONO ESEGUITE CON MACCHINE A CONTROLLO NUMERICO
Taglio Laser / Laser Cutting
Piegatura / Bending
Punzonatura / Punching
Saldatura / Welding
Lavorazioni Meccaniche / Machining



REMAZEL ENGINEERING
Chiuduno (BG) - 24060 - ITALY
Phone : +39-035-68.44.14 - Fax : +39-035-68.78.23
e-mail : info@remazel.com / website : www.remazel.com


Project / Equipment :
**C09-0001**

Weight :
120,1 kg

Title :
Cassa Winch
Winch Box

Scale :
1 : 7.5

Sheet :
1 of 3

**A2**

Drawing State:
**Released**
***FOR CONSTRUCTION***

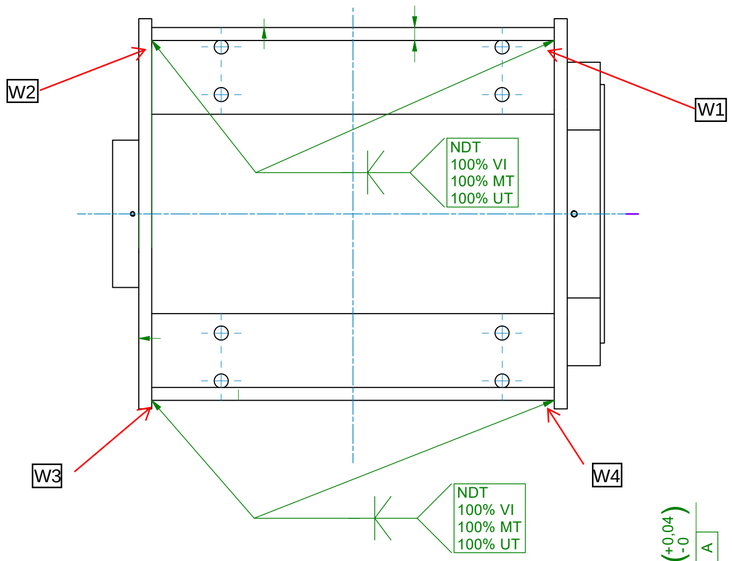
Q.C.L. :
C1

Drawing N° :
C09-0001-P0085

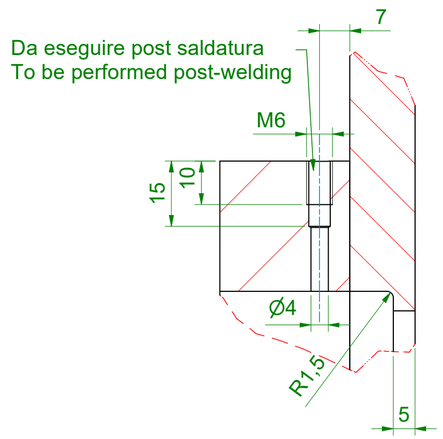
Revision :
A


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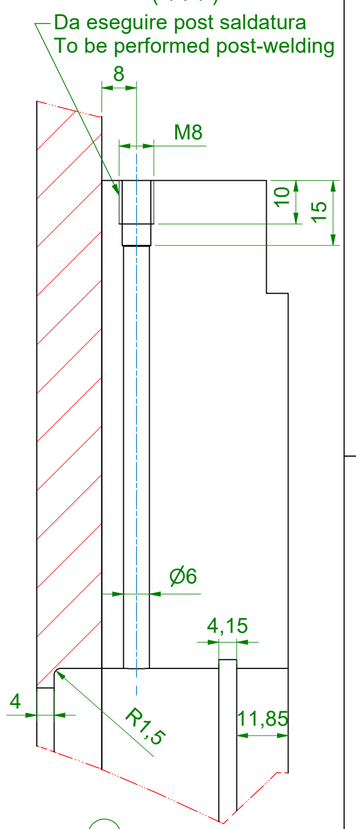
Sez. / Sez. **"S5-S5"**
( 1 : 5 )



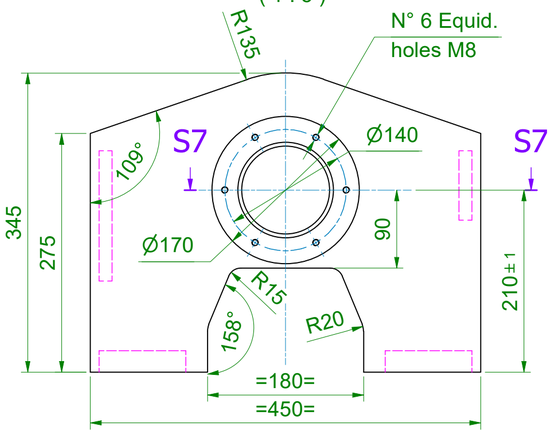

Dett. / Detail **"D1"**
( 1 : 1 )



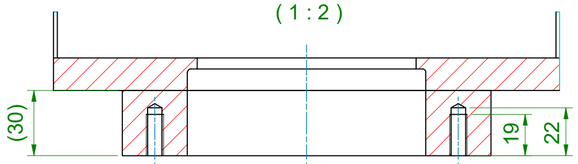

Dett. / Detail **"D2"**
( 1 : 1 )

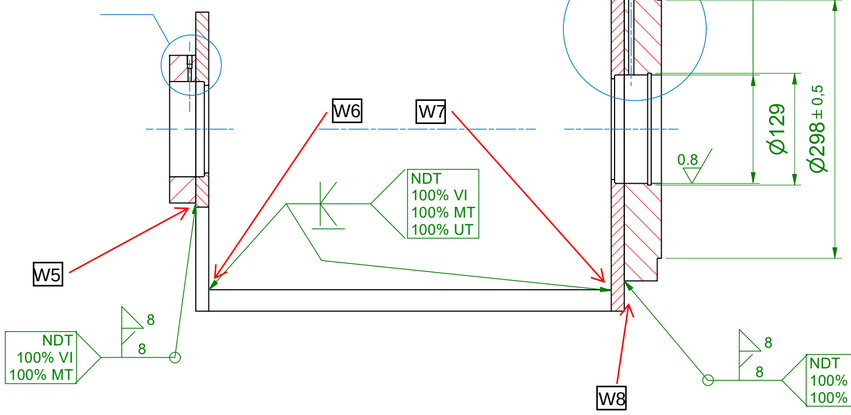



Sez. / Sez. **"S3-S3"**
( 1 : 5 )

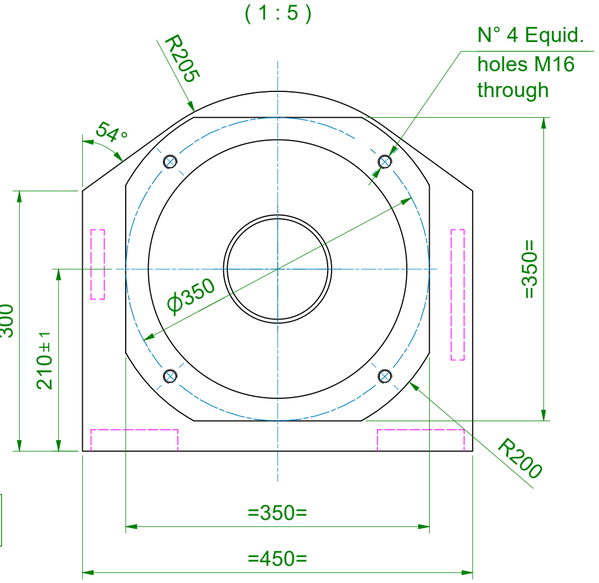


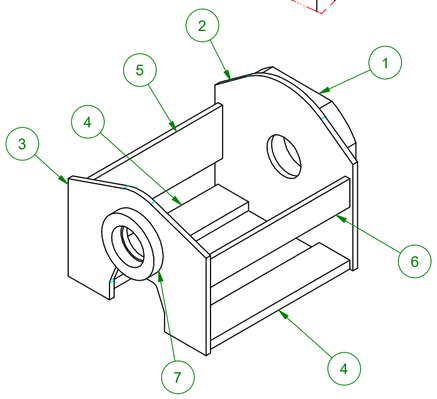

Sez. / Sez. **"S7-S7"**
( 1 : 2 )

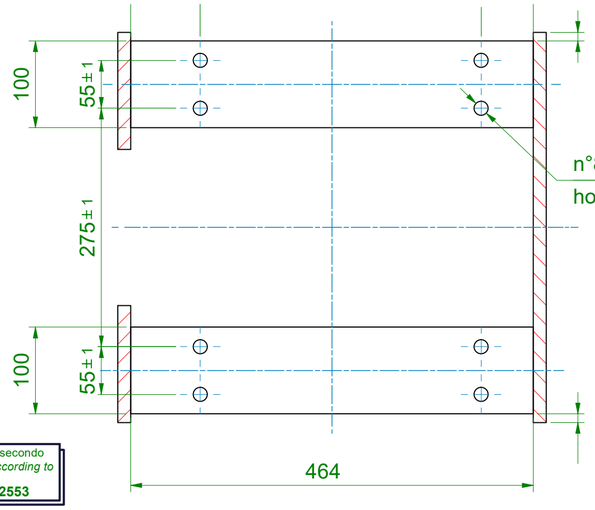



Sez. / Sez. **"S2-S2"**
( 1 : 5 )



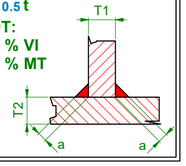




| | | | | |
|---|---|---|---|---|
| 7 | Sheet metal | Thk = 30 mm - S 355 J2 UNI EN 10025_Cert. 3.1 | 1 | 3,31 kg |
| 6 | Sheet metal | Thk = 15 mm - S 355 J2 UNI EN 10025_Cert. 3.1 | 1 | 4,38 kg |
| 5 | Sheet metal | Thk = 15 mm - S 355 J2 UNI EN 10025_Cert. 3.1 | 1 | 8,21 kg |
| 4 | Sheet metal | Thk = 25 mm - S 355 J2 UNI EN 10025_Cert. 3.1 | 2 | 9,12 kg |
| 3 | Sheet metal | Thk = 15 mm - S 355 J2 UNI EN 10025_Cert. 3.1 | 1 | 13,47 kg |
| 2 | Sheet metal | Thk = 15 mm - S 355 J2 UNI EN 10025_Cert. 3.1 | 1 | 18,64 kg |
| 1 | Sheet metal | Thk = 45 mm - S 355 J2 UNI EN 10025_Cert. 3.1 | 1 | 35,82 kg |
| EL. | DESCRIPTION | ADDITIONAL DESCRIPTION | Q.TY | WEIGHT |

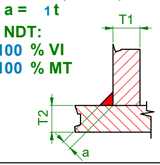
**SALDATURE NON QUOTATE**
***WELD WITHOUT DIMENSION***

**Sui due lati / *Both side***
**t = min ( T1;T2 )**
**a = 0.5 t**
**NDT:**
**100 % VI**
**100 % MT**




**SALDATURE NON QUOTATE**
***WELD WITHOUT DIMENSION***

**Su un lato / *One side***
**t = min ( T1;T2 )**
**a = 1 t**
**NDT:**
**100 % VI**
**100 % MT**




**Riferimenti documenti per Costruzione / Verniciatura / Controllo**
***Reference documents for Construction / Painting / Inspections***

| Numero Documento / *Documents number* | Descrizione / *Description* |
|---|---|
| 1724001010-QC-ITP-00002 | Piano di collaudo / *Inspection Test Plan* |
| 1724001010-MAT-PRO-00007 | Specifica di Verniciatura / *Painting Specification* |
| | Specifica di Distensione / *Stress Relieving Specification* |
| | Specifica Trattamento Termico / *Heat Treatment Specification* |

Simboli saldatura secondo
*Welding symbols according to*
**UNI EN ISO 2553**

Eliminare spigoli vivi
*Remove all edges*

**SALDATURA CONTINUA**
***CONTINUOUS WELDING***

0.8 / 6.3

**UNI EN ISO 8501-3**

**Grado di preparazione saldature, bordi e altre aree con imperfezioni superficiali**
*Preparation grade of welds, edges and other areas with surface imperfections*

| Zona *Areas* | Grado *Grade* | R min *Min radius* |
|---|---|---|
| **Saldature** *Welds* | **P2** | **N.A.** |
| **Bordi** *Edges* | **P3** | **2 mm** |
| **Aree con imperf. superf.** *Areas with surface imperf.* | **P3** | **N.A.** |

| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| A | 22/10/2024 | Prima emissione / First issued | riccardo.sobani | Sobani R. | De Fazio F. | – |


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e-mail : info@remazel.com / website : www.remazel.com


Project / Equipment : **C09-0001**
Weight : N/A
Title : Carpenteria Telaio Winch / Chassis Winch Carpentry
Scale : 1 : 5
Sheet : 1 of 2 **A2**
Drawing State: **Released** **FOR CONSTRUCTION**
Q.C.L. : C1
Drawing N° : C09-0001-P0005
Revision : A


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# WELDING MATRIX - BOOM CARPENTRY

REV. 0

Drawing No. C09-0001-P0004

| Typical Weld N° | Item number | | Type of Material | | Plate Thickness Mat "A" | Plate Thickness Mat "B" | Deposited thickness | | | Back gouging | WPQR number | WPS number | Welding Position | Filler brand name | Process | VT examination | MT examination | UT examination | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | "A" | "B" | "A" | "B" | (mm) | (mm) | (mm) | | | | | | | | | | | | |
| W1 | 1 | 7 | S355J2+N | S355J2+N | 8 | 8 | 6+8 | PJP+FW | 1/2V | NO | CCP12 | CCP12-2 | PA +PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W2 | 4 | 7 | S355J2+N | S355J2+N | 20 | 8 | 6+8 | PJP+FW | 1/2V | NO | CCP12 | CCP12-2 | PA +PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W3 | 7 | 7 | S355J2+N | S355J2+N | 8 | 8 | 6+8 | PJP+FW | 1/2V | NO | CCP12 | CCP12-2 | PA +PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W4 | 4 | 7 | S355J2+N | S355J2+N | 20 | 8 | 6+8 | PJP+FW | 1/2V | NO | CCP12 | CCP12-2 | PA +PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W5 | 5 | 7 | S355J2+N | S355J2+N | 20 | 8 | 6 | PJP | 1/2V | NO | CCP12 | CCP12-2 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | TYPICAL WELD VALID ON BOTH SIDES OF THE BOOM |
| W6 | 8 | 7 | S355J2+N | S355J2+N | 10 | 8 | 8 | PJP | 1/2V | NO | CCP12 | CCP12-2 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W7 | 8 | 7 | S355J2+N | S355J2+N | 10 | 8 | 8 | PJP | 1/2V | NO | CCP12 | CCP12-2 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W8 | 8 | 7 | S355J2+N | S355J2+N | 10 | 8 | 8 | PJP | 1/2V | NO | CCP12 | CCP12-2 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W9 | 8 | 7 | S355J2+N | S355J2+N | 10 | 8 | 8 | PJP | 1/2V | NO | CCP12 | CCP12-2 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W10 | 8 | 3 | S355J2+N | S355J2+N | 10 | 35 | 8 | PJP | 1/2V | NO | CCP12 | CCP12-2 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W11 | 3 | 7 | S355J2+N | S355J2+N | 35 | 8 | 6+8 | PJP | 1/2V | NO | CCP12 | CCP12-2 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W12 | 3 | 7 | S355J2+N | S355J2+N | 35 | 8 | 6 | PJP | 1/2V | NO | CCP12 | CCP12-2 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W13 | 10 | 2 | S355J2+N | S355J2+N | 15 | 15 | 10 | FW | NA | NA | CCP13 | CCP13-01 | PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W14 | 15 | 2 | S355J2+N | S355J2+N | 15 | 15 | 10 | FW | NA | NA | CCP13 | CCP13-01 | PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W15 | 10 | 2 | S355J2+N | S355J2+N | 15 | 15 | 10 | FW | NA | NA | CCP13 | CCP13-01 | PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W16 | 9 | 2 | S355J2+N | S355J2+N | 15 | 15 | 10 | FW | NA | NA | CCP13 | CCP13-01 | PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W17 | 8 | 9 | S355J2+N | S355J2+N | 10 | 15 | 8+8 | PJP+FW | 1/2V | NO | CCP12 | CCP12-2 | PA +PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W18 | 7 | 9 | S355J2+N | S355J2+N | 8 | 15 | 8+8 | PJP+FW | 1/2V | NO | CCP12 | CCP12-2 | PA +PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W19 | 7 | 9 | S355J2+N | S355J2+N | 8 | 15 | 6+8 | PJP+FW | 1/2V | NO | CCP12 | CCP12-2 | PA +PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W20 | 11 | 4 | S355J2+N | S355J2+N | 12 | 20 | 10 | PJP | 1/2V | NO | CCP12 | CCP12-2 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W21 | 17 | 7 & 1 | S355J2+N | S355J2+N | 8 | 8 | 6 | FW | NA | NA | CCP14 | CCP14-01 | PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W22 | 18 | 7 & 1 | S355J2+N | S355J2+N | 8 | 8 | 6 | FW | NA | NA | CCP14 | CCP14-01 | PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W23 | 19 | 7 & 1 | S355J2+N | S355J2+N | 8 | 8 | 6 | FW | NA | NA | CCP14 | CCP14-01 | PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W24 | 14 | 7 | S355J2+N | S355J2+N | 9 | 8 | 10 | FW | NA | NA | CCP13 | CCP13-01 | PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W25 | 22 | 7 | S355J2+N | S355J2+N | 10 | 8 | 10 | FW | NA | NA | CCP13 | CCP13-01 | PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W26 | 21 | 7 | S355J2+N | S355J2+N | 10 | 8 | 10 | FW | NA | NA | CCP13 | CCP13-01 | PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W27 | 12 | 7 | S355J2+N | S355J2+N | 10 | 8 | 10 | FW | NA | NA | CCP13 | CCP13-01 | PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W28 | 12 | 7 | S355J2+N | S355J2+N | 10 | 8 | 10 | FW | NA | NA | CCP13 | CCP13-01 | PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W29 | 13 | 7 | S355J2+N | S355J2+N | 10 | 8 | 10 | FW | NA | NA | CCP13 | CCP13-01 | PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W30 | 5 | 1 | S355J2+N | S355J2+N | 20 | 8 | 10 | FW | NA | NA | CCP13 | CCP13-01 | PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W31 | 5 | 4 | S355J2+N | S355J2+N | 20 | 20 | 20 | FW | NA | NA | CCP13 | CCP13-01 | PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W32 | 1 | 9 | S355J2+N | S355J2+N | 8 | 15 | 8 | CJP | 1/2V | NO | CCP12 | CCP12-01 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W33 | 4 | 3 | S355J2+N | S355J2+N | 20 | 35 | 20 | CJP | 1/2V | NO | CCP12 | CCP12-01 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W34 | 6 | 5 | S355J2+N | S355J2+N | 15 | 20 | 15 | CJP | 1/2V | NO | CCP12 | CCP12-01 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | TYPICAL WELD VALID FOR BOTH ITEMS 6 |

# WELDING MATRIX - TRAVELING TROLLEY

REV. 0

Drawing No. C09-0001-P0006

| Typical Weld N° | Item number | | Type of Material | | Plate Thickness Mat "A" | Plate Thickness Mat "B" | Deposited thickness | | | Back gouging | WPQR number | WPS number | Welding Position | Filler brand name | Process | VT examination | MT examination | UT examination | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | "A" | "B" | "A" | "B" | (mm) | (mm) | (mm) | | | | | | | | | | | | |
| W1 | 1 | 12 | S355J2+N | S355J2+N | 10 | 12 | 6+10 | PJP+FW | 1/2V | NO | CCP12 | CCP12-2 | PC +PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | TYPICA L WELD FOR ALL ITEMS 12 |
| W2 | 1 | 3 | S355J2+N | S355J2+N | 10 | 30 | 6+10 | PJP+FW | 1/2V | NO | CCP12 | CCP12-2 | PC +PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W3 | 8 | 9 | S355J2+N | S355J2+N | 8 | 8 | 5 | FW | NA | NA | CCP14 | CCP14-01 | PB | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W4 | 5 | 2 | S355J2+N | S355J2+N | 15 | 10 | 15 | CJP | K | YES | CCP12 | CCP12-3 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W5 | 5 | 2 | S355J2+N | S355J2+N | 15 | 10 | 15 | CJP | K | YES | CCP12 | CCP12-3 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | TYPICAL WELD VALID ON BOTH SIDES OF THE BOOM |
| W6 | 5 | 1 | S355J2+N | S355J2+N | 15 | 10 | 15 | CJP | K | YES | CCP12 | CCP12-3 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W7 | 5 | 1 | S355J2+N | S355J2+N | 15 | 10 | 15 | CJP | K | YES | CCP12 | CCP12-3 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W8 | 4 | 1 | S355J2+N | S355J2+N | 15 | 10 | 15 | CJP | K | YES | CCP12 | CCP12-3 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | TYPICAL WELD VALID FOR BOTH ITEMS 4 |
| W9 | 4 | 2 | S355J2+N | S355J2+N | 15 | 10 | 15 | CJP | K | YES | CCP12 | CCP12-3 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | TYPICAL WELD VALID FOR BOTH ITEMS 4 |
| W10 | 4 | 5 | S355J2+N | S355J2+N | 15 | 15 | 15 | CJP | K | YES | CCP12 | CCP12-3 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | TYPICAL WELD VALID FOR BOTH ITEMS 4 |
| W11 | 6 | 4 | S355J2+N | S355J2+N | 15 | 15 | 15 | CJP | 1/2V | YES | CCP12 | CCP12-3 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W12 | 7 | 4 | S355J2+N | S355J2+N | 15 | 15 | 15 | CJP | 1/2V | YES | CCP12 | CCP12-3 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |
| W13 | 11 | 5 | S355J2+N | S355J2+N | 15 | 15 | 15 | CJP | 1/2V | YES | CCP12 | CCP12-3 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 0% | |

# WELDING MATRIX - PEDESTAL CARPENTRY

REV. 0

Drawing No. C09-0001-P0001

| Typical Weld N° | Item number | | Type of Material | | Plate Thickness Mat "A" | Plate Thickness Mat "B" | Deposited thickness | | | Back gouging | WPQR number | WPS number | Welding Position | Filler brand name | Process | VT examination | MT examination | UT examination | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | "A" | "B" | "A" | "B" | (mm) | (mm) | (mm) | | | | | | | | | | | | |
| W1 | 1 | 2 | S355J2+N | S355J2+N | 20 | 42 | 20 | CJP | K | YES | CCP09 | CCP09-01 | PC | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 100% | ADDITIONAL FILLET WELD LEG 10 mm |
| W2 | 2 | 2 | S355J2+N | S355J2+N | 20 | 20 | 20 | CJP | K | YES | CCP10 | CCP10-2 | PA | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 100% | |

# WELDING MATRIX - SLEWING COLUMN

REV. 0

Drawing No. C09-0001-P0002

| Typical Weld N° | Item number | | Type of Material | | Plate Thickness Mat "A" | Plate Thickness Mat "B" | Deposited thickness | | | Back gouging | WPQR number | WPS number | Welding Position | Filler brand name | Process | VT examination | MT examination | UT examination | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | "A" | "B" | "A" | "B" | (mm) | (mm) | (mm) | | | | | | | | | | | | |
| W1 | 5&6 | 1 | S355J2+N | S355J2+N | 15 | 42 | 15 | CJP | K | YES | CCP09 | CCP09-01 | PC | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 100% | ADDITIONAL FILLET WELD LEG 10 mm |
| W2 | 3&4 | 2 | S355J2+N | S355J2+N | 15 | 42 | 15 | CJP | K | YES | CCP09 | CCP09-01 | PC | ESAB OK ARISTOROD 12.50 | 135 | 100% | 100% | 100% | ADDITIONAL FILLET WELD LEG 10 mm |
| | | | | | | | | | | | | | | | | | | | |
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REMAZEL

**WELDING MATRIX**

**Revisione/** *Revision:* 0

| job | Reference Drawing |
|---|---|
| 24-27012 | C09-0001-P0085 |

| Joint ID | Combination | | | Thk Item "A" | Thk Item "B" | Material item "A" | Material item "B" | Deposit thickness | WPQR | WPS | Process | VT | MT | UT | note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W | A | \ | B | mm | mm | | | mm | | | | % | | | |
| W1 | 1 | \ | 3 | 15,5 | 15 | S355J2+N | S355J2+N | 10 | CCP-12 | CCP12-2 | 135 | 100 | 100 | \ | |
| W2 | 1 | \ | 5 | 27,5 | 20 | S355J2+N | S355J2+N | 8 | CCP-13 | CCP13-01 | 135 | 100 | 100 | \ | |
| W3 | 2 | \ | 5 | 27 | 20 | S355J2+N | S355J2+N | 8 | CCP-13 | CCP13-01 | 135 | 100 | 100 | \ | |
| W4 | 1 | \ | 4 | 25 | 20 | S355J2+N | S355J2+N | 10+18 | CCP-13 | CCP13-01 | 135 | 100 | 100 | \ | |
| W5 | 1 | \ | 3 | 25 | 15 | S355J2+N | S355J2+N | 10 | CCP-12 | CCP12-2 | 135 | 100 | 100 | \ | |
| W6 | 1 | \ | 5 | 15,5 | 20 | S355J2+N | S355J2+N | 10+18 | CCP-13 | CCP13-01 | 135 | 100 | 100 | \ | |
| W7 | 2 | \ | 5 | 22 | 20 | S355J2+N | S355J2+N | 10+18 | CCP-13 | CCP13-01 | 135 | 100 | 100 | \ | |
| | | | | | | | | | | | | | | | |
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REMAZEL

**WELDING MATRIX**

**Revisione/** *Revision:* 0

| job | Reference Drawing |
|---|---|
| 24-27012 | C09-0001-P0005 |

| Joint ID | Combination | | | Thk Item "A" | Thk Item "B" | Material item "A" | Material item "B" | Deposit thickness | WPQR | WPS | Process | VT | MT | UT | note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W | A | \ | B | mm | mm | | | mm | | | | % | | | |
| W1 | 2 | | 5 | 15 | 15 | S355J2+N | S355J2+N | 15 | CCP10 | CCP10-2 | 135 | 100 | 100 | 100 | |
| W2 | 3 | | 5 | 15 | 15 | S355J2+N | S355J2+N | 15 | CCP10 | CCP10-2 | 135 | 100 | 100 | 100 | |
| W3 | 3 | | 6 | 15 | 15 | S355J2+N | S355J2+N | 15 | CCP10 | CCP10-2 | 135 | 100 | 100 | 100 | |
| W4 | 2 | | 6 | 15 | 15 | S355J2+N | S355J2+N | 15 | CCP10 | CCP10-2 | 135 | 100 | 100 | 100 | |
| W5 | 3 | | 7 | 15 | 30 | S355J2+N | S355J2+N | 8+8 | CCP13 | CCP13-01 | 135 | 100 | 100 | \ | |
| W6 | 3 | | 4 | 15 | 25 | S355J2+N | S355J2+N | 15 | CCP10 | CCP10-2 | 135 | 100 | 100 | 100 | |
| W7 | 2 | | 4 | 15 | 25 | S355J2+N | S355J2+N | 15 | CCP10 | CCP10-2 | 135 | 100 | 100 | 100 | |
| W8 | 1 | | 2 | 45 | 15 | S355J2+N | S355J2+N | 15 | CCP13 | CCP13-01 | 135 | 100 | 100 | \ | |
| | | | | | | | | | | | | | | | |
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# 2. WPS

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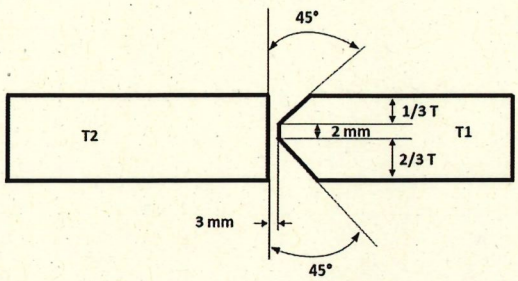
| CONCRANE A REMAZEL Group Company | WELDING PROCEDURE SPECIFICATION (WPS) | WPS n°: CCP09-1<br>WPQR: CCP09<br>Rev. 01 – 18/07/2024 | Pag. 1 / 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| *Reference code* | **EN ISO 15614-1;** | *Welding position* | **H (PC) – HORIZONTAL POSITION** |
| *Welding process* | **GMAW (135)** | *Type* | **SEMI AUTOMATIC** |
| *Mode of metal transfer* | **SHORT AND SPRAY ARC** | *Preparation method* | **FLAME CUTTING AND MACHINING** |

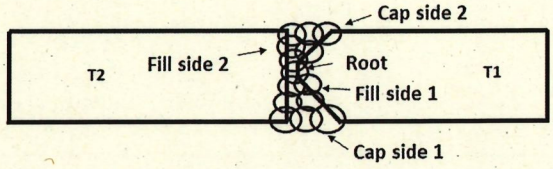
**JOINT DESIGN**

| | | | |
|---|---|---|---|
| *Joint type* | **BW – BUTT WELD (CJP)** | *Structural class* | **N.A.** |
| *Groove type* | **Double bevel groove weld** | *Root opening* | **3 mm** |
| *Groove angle* | **45° ± 5°** | *Root face* | **1-2 mm** |
| *Backing* | **none** | *Leg Size* | **n.a.** |
| *Back gouging procedure* | **Grind to sound metal** | *Deposition Range* | **12 mm – 48 mm** |

*Bevel design*




*Welding sequence*




**BASE MATERIAL**

| *Part identification* | *Part $t_1$* | *Part $t_2$* |
|---|---|---|
| *Pipe or plate* | **PLATE** | **PLATE** |
| *Material group ISO 15608* | **1.2** | **1.2** |
| *Material type* | **S355J2+N** | **S355J2+N** |
| *Thickness range* | **12 – 48 mm** | **12 – 48 mm** |
| *Diameter* | **>150 mm** | **>150 mm** |

**FILLER MATERIALS**

| | |
|---|---|
| *Welding process* | **GMAW (135)** |
| *Specification* | **EN ISO 14341-A** |
| *Classification* | **G42 4 M21 3Si** |
| *Trade marker* | **ESAB OK AristoRod 12.50** |
| *Size* | **Ø 1.2 mm** |

**SHIELD GAS**

| | |
|---|---|
| *Welding process* | **GMAW (135)** |
| *Specification* | **EN ISO 14175** |
| *Class* | **M21** |
| *Trade marker* | **82% Ar + 18% CO2** |
| *Flow rate* | **18-24 l/min** |
| *Nozzle diameter* | **Ø16 mm** |

**PREHEAT**

| | |
|---|---|
| *Preheat temperature* | **T= 20°C** |
| *Preheat maintenance temperature* | **N.A.** |
| *Interpass temperature* | **MAX 250°** |

*Other remarks for preheat and interpass temeprature*
**Monitor interpass temperature with tempilstik or laser thermometer.**

**PWHT**

| | |
|---|---|
| *Time and temperature* | **N.A.** |
| *PWHT method* | **N.A.** |
| *Heating and cooling rates* | **N.A.** |

*Other remarks for PWHT:*
**N.A.**

**TECNIQUE**

| | | | |
|---|---|---|---|
| *String or wave* | **STRING** | *Stick out* | **15÷20 mm** |
| *Multiple or single pass* | **MULTIPLE** | *C - CEV (IIW) & Pcm* | **Cev max= 0.44 ; Pcm max= 0.27** |
| *Initial/Interpass cleaning* | **BRUSHING AND/OR GRINDING** | *Torch travel angle* | **15÷20° (Push)** |

**WELDING DETAILS**

| *No.* | *Process* | *Position* | *Filler Ø (mm)* | *Current* | *Amperage range [A]* | | *Voltage range (V)* | | *Travel speed range (mm/min)* | | *Transfer Mode* | *Heat input [kJ/mm]* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | *Min* | *Max* | *Min* | *Max* | *Min* | *Max* | | *Min* | *Max* |
| Root | 135 | F (PC) | 1.2 | DCEP | 160 | 180 | 20.5 | 22.5 | 120 | 160 | Short Arc | 0.98 | 1.62 |
| Fill Side 1 | 135 | F (PC) | 1.2 | DCEP | 240 | 280 | 25 | 27 | 250 | 330 | Spray Arc | 0.91 | 1.45 |
| Cap Side1 | 135 | F (PC) | 1.2 | DCEP | 240 | 280 | 25 | 27 | 250 | 320 | Spray Arc | 0.91 | 1.45 |
| Fill Side 2 | 135 | F (PC) | 1.2 | DCEP | 240 | 280 | 25 | 27 | 250 | 330 | Spray Arc | 0.91 | 1.45 |
| Cap Side2 | 135 | F (PC) | 1.2 | DCEP | 240 | 280 | 25 | 27 | 250 | 320 | Spray Arc | 0.91 | 1.45 |

*Other remarks:*
Tack welding will be done according to first pass parameters.

**REVISION AND SIGANTURE**

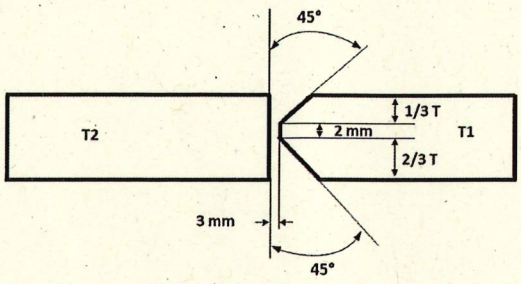
| *REV* | *Date* | *Description* | *Prepared* | *Approved* |
|---|---|---|---|---|
| | | | | |
| 00 | 18/07/2024 | First issue | | |

| *Prepared by* | *Approved by* | *Society approved by* | *Customer approved by:* |
|---|---|---|---|
| REMAZEL ENGINEERING S.p.A. | | | |

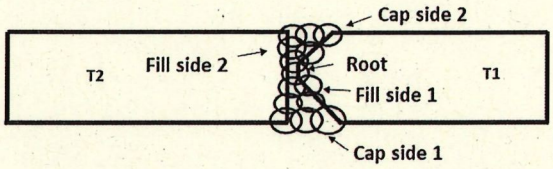
| REMAZEL ENGINEERING | WELDING PROCEDURE SPECIFICATION (WPS) | WPS n°: CCP10-2<br>WPQR: CCP10<br>Rev. 01 – 18/07/2024 \| Pag. 1 / 1 |
|---|---|---|

| | | | |
|---|---|---|---|
| *Reference code* | **EN ISO 15614-1;** | *Welding position* | **F (PA) – FLAT POSITION** |
| *Welding process* | **GMAW (135)** | *Type* | **SEMI AUTOMATIC** |
| *Mode of metal transfer* | **SHORT AND SPRAY ARC** | *Preparation method* | **FLAME CUTTING AND MACHINING** |
| **JOINT DESIGN** | | | |
| *Joint type* | **BW – BUTT WELD (CJP)** | *Structural class* | **n.a.** |
| *Groove type* | **Double bevel groove weld** | *Root opening* | **3 mm** |
| *Groove angle* | **45° ± 5°** | *Root face* | **1-2 mm** |
| *Backing* | **none** | *Leg Size* | **n.a.** |
| *Back gouging procedure* | **Grind to sound metal** | *Deposition Range* | **7.5 mm – 30 mm** |

*Bevel design*




*Welding sequence*




| **BASE MATERIAL** | | |
|---|---|---|
| *Part identification* | *Part $t_1$* | *Part $t_2$* |
| *Pipe or plate* | **PLATE** | **PLATE** |
| *Material group ISO 15608* | **1.2** | **1.2** |
| *Material type* | **S355J2+N** | **S355J2+N** |
| *Thickness range* | **7.5 - 30 mm** | **7.5 - 30 mm** |
| *Diameter* | **>150 mm** | **>150 mm** |

| **FILLER MATERIALS** | |
|---|---|
| *Welding process* | **GMAW (135)** |
| *Specification* | **EN ISO 14341-A** |
| *Classification* | **G42 4 M21 3Si** |
| *Trade marker* | **ESAB OK AristoRod 12.50** |
| *Size* | **Ø 1.2 mm** |

| **SHIELD GAS** | |
|---|---|
| *Welding process* | **GMAW (135)** |
| *Specification* | **EN ISO 14175** |
| *Class* | **M21** |
| *Trade marker* | **82% Ar + 18% CO2** |
| *Flow rate* | **18-24 l/min** |
| *Nozzle diameter* | **Ø16 mm** |

| **PREHEAT** | |
|---|---|
| *Preheat temperature* | **T= 20°C** |
| *Preheat maintenance temperature* | **N.A.** |
| *Interpass temperature* | **MAX 250°** |

*Other remarks for preheat and interpass temeprature*
**Monitor interpass temperature with tempilstik or laser thermometer.**

| **PWHT** | |
|---|---|
| *Time and temperature* | **N.A.** |
| *PWHT method* | **N.A.** |
| *Heating and cooling rates* | **N.A.** |

*Other remarks for PWHT:*
**N.A.**

| **TECNIQUE** | | | |
|---|---|---|---|
| *String or wave* | **STRING** | *Stick out* | **15÷20 mm** |
| *Multiple or single pass* | **MULTIPLE** | *C - CEV (IIW) & Pcm* | **Cev max= 0.44 ; Pcm max= 0.27** |
| *Initial/Interpass cleaning* | **BRUSHING AND/OR GRINDING** | *Torch travel angle* | **15÷20° (Push)** |

**WELDING DETAILS**

| *No.* | *Process* | *Position* | *Filler Ø (mm)* | *Current* | *Amperage range [A]* | | *Voltage range (V)* | | *Travel speed range (mm/min)* | | *Transfer Mode* | *Heat input [kJ/mm]* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | *Min* | *Max* | *Min* | *Max* | *Min* | *Max* | | *Min* | *Max* |
| Root | 135 | F (PA) | 1.2 | DCEP | 160 | 180 | 20.5 | 22.5 | 120 | 160 | Short Arc | 0.98 | 1.62 |
| Fill Side 1 | 135 | F (PA) | 1.2 | DCEP | 240 | 280 | 25 | 27 | 250 | 330 | Spray Arc | 0.91 | 1.45 |
| Cap Side1 | 135 | F (PA) | 1.2 | DCEP | 240 | 280 | 25 | 27 | 250 | 320 | Spray Arc | 0.91 | 1.45 |
| Fill Side 2 | 135 | F (PA) | 1.2 | DCEP | 240 | 280 | 25 | 27 | 250 | 330 | Spray Arc | 0.91 | 1.45 |
| Cap Side2 | 135 | F (PA) | 1.2 | DCEP | 240 | 280 | 25 | 27 | 250 | 320 | Spray Arc | 0.91 | 1.45 |

*Other remarks:*
Tack welding will be done according to first pass parameters.

**REVISION AND SIGANTURE**

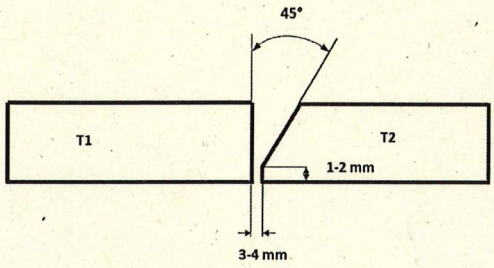
| *REV* | *Date* | *Description* | *Prepared* | *Approved* |
|---|---|---|---|---|
| | | | | |
| 00 | 18/07/2024 | First issue | | |

| *Prepared by* | *Approved by* | *Society approved by* | *Customer approved by:* |
|---|---|---|---|
| REMAZEL ENGINEERING S.p.A. | | | |

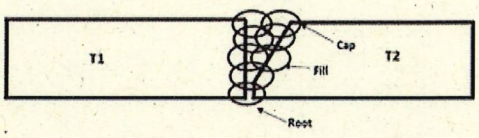
| CONGRANE A REMAZEL Group Company | WELDING PROCEDURE SPECIFICATION (WPS) | WPS n°: CCP12-1<br>WPQR: CCP12<br>Rev. 01 – 08/10/2024 | Pag. 1 / 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| *Reference code* | EN ISO 15614-1; | *Welding position* | F (PA)– FLAT POSITION |
| *Welding process* | GMAW (135) | *Type* | SEMI AUTOMATIC |
| *Mode of metal transfer* | SHORT AND SPRAY ARC | *Preparation method* | FLAME CUTTING AND MACHINING |
| **JOINT DESIGN** | | | |
| *Joint type* | BW – BUTT WELD (CJP) | *Structural class* | N.A. |
| *Groove type* | Single bevel groove weld | *Root opening* | 3-4 mm |
| *Groove angle* | 45° ± 5° | *Root face* | 1-2 mm |
| *Backing* | none | *Leg Size* | n.a. |
| *Back gouging procedure* | n.a. | *Deposition Range* | 7.5 mm – 30 mm |

*Bevel design*




*Welding sequence*




| BASE MATERIAL | | | PREHEAT | |
|---|---|---|---|---|
| *Part identification* | *Part $t_1$* | *Part $t_2$* | *Preheat temperature* | T= 20°C |
| *Pipe or plate* | PLATE | PLATE | | |
| *Material group ISO 15608* | 1.2 | 1.2 | *Preheat maintenance temperature* | N.A. |
| *Material type* | S355J2+N | S355J2+N | | |
| *Thickness range* | 7.5 - 30 mm | 7.5 - 30 mm | *Interpass temperature* | MAX 250° |
| *Diameter* | >150 mm | >150 mm | | |

| FILLER MATERIALS | |
|---|---|
| *Welding process* | GMAW (135) |
| *Specification* | EN ISO 14341-A |
| *Classification* | G42 4 M21 3Si1 |
| *Trade marker* | ESAB OK AristoRod 12.50 |
| *Size* | Ø 1.2 mm |

| SHIELD GAS | |
|---|---|
| *Welding process* | GMAW (135) |
| *Specification* | EN ISO 14175 |
| *Class* | M21 |
| *Trade marker* | 82% Ar + 18% CO2 |
| *Flow rate* | 18-24 l/min |
| *Nozzle diameter* | Ø16 mm |

*Other remarks for preheat and interpass temeprature*
**Monitor interpass temperature with tempilstik or laser thermometer.**

| PWHT | |
|---|---|
| *Time and temperature* | N.A. |
| *PWHT method* | N.A. |
| *Heating and cooling rates* | N.A. |

*Other remarks for PWHT:*
N.A.

| TECHNIQUE | | | |
|---|---|---|---|
| *String or wave* | STRING | *Stick out* | 15÷20 mm |
| *Multiple or single pass* | MULTIPLE | *C - CEV (IIW) & Pcm* | Cev max= 0.44 ; Pcm max= 0.27 |
| *Initial/Interpass cleaning* | BRUSHING AND/OR GRINDING | *Torch travel angle* | 15÷20° (Push) |

**WELDING DETAILS**

| *No.* | *Process* | *Position* | *Filler Ø (mm)* | *Current* | *Amperage range [A]* | | *Voltage range (V)* | | *Travel speed range (mm/min)* | | *Transfer Mode* | *Heat input [kJ/mm]* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | *Min* | *Max* | *Min* | *Max* | *Min* | *Max* | | *Min* | *Max* |
| Root | 135 | F(PA) | 1.2 | DCEP | 110 | 130 | 17 | 19 | 120 | 170 | Short Arc | 0.57 | 0.95 |
| Fill | 135 | F(PA) | 1.2 | DCEP | 260 | 280 | 29 | 31 | 290 | 330 | Spray Arc | 1.01 | 1.44 |
| Cap | 135 | F(PA) | 1.2 | DCEP | 260 | 280 | 29 | 31 | 290 | 330 | Spray Arc | 1.01 | 1.44 |

*Other remarks:*
Tack welding will be done according to first pass parameters.

**REVISION AND SIGANTURE**

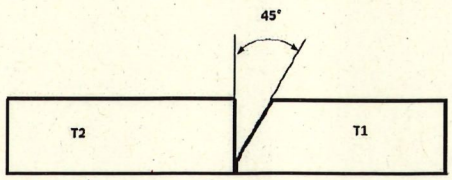
| *REV* | *Date* | *Description* | *Prepared* | *Approved* |
|---|---|---|---|---|
| 01 | 08/10/2024 | Revised heat input | | |
| 00 | 22/07/2024 | | | |

| *Prepared by* | *Approved by* | *Society approved by* | *Customer approved by:* |
|---|---|---|---|
| REMAZEL ENGINEERING S.p.A. | | | |

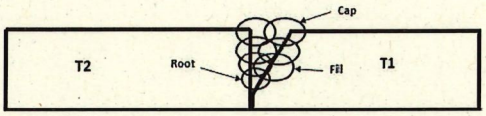
| CONCRANE A REMAZEL Group Company | WELDING PROCEDURE SPECIFICATION (WPS) | WPS n°: CCP12-2<br>WPQR: CCP12<br>Rev. 01 – 08/10/2024 | Pag. 1 / 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| *Reference code* | EN ISO 15614-1; | *Welding position* | F (PA)– FLAT POSITION |
| *Welding process* | GMAW (135) | *Type* | SEMI AUTOMATIC |
| *Mode of metal transfer* | SHORT AND SPRAY ARC | *Preparation method* | FLAME CUTTING AND MACHINING |
| **JOINT DESIGN** | | | |
| *Joint type* | BW – BUTT WELD (CJP) | *Structural class* | N.A. |
| *Groove type* | Single bevel groove weld | *Root opening* | 0 mm |
| *Groove angle* | 45° ± 5° | *Root face* | According to dwg |
| *Backing* | none | *Leg Size* | n.a. |
| *Back gouging procedure* | n.a. | *Deposition Range* | |

*Bevel design*




*Welding sequence*




| **BASE MATERIAL** | | |
|---|---|---|
| *Part identification* | *Part $t_1$* | *Part $t_2$* |
| *Pipe or plate* | PLATE | PLATE |
| *Material group ISO 15608* | 1.2 | 1.2 |
| *Material type* | S355J2+N | S355J2+N |
| *Thickness range* | 7.5 - 30 mm | 7.5 - 30 mm |
| *Diameter* | >150 mm | >150 mm |

| **FILLER MATERIALS** | |
|---|---|
| *Welding process* | GMAW (135) |
| *Specification* | EN ISO 14341-A |
| *Classification* | G42 4 M21 3Si1 |
| *Trade marker* | ESAB OK AristoRod 12.50 |
| *Size* | Ø 1.2 mm |

| **SHIELD GAS** | |
|---|---|
| *Welding process* | GMAW (135) |
| *Specification* | EN ISO 14175 |
| *Class* | M21 |
| *Trade marker* | 82% Ar + 18% CO2 |
| *Flow rate* | 18-24 l/min |
| *Nozzle diameter* | Ø16 mm |

| **PREHEAT** | |
|---|---|
| *Preheat temperature* | T= 20°C |
| *Preheat maintenance temperature* | N.A. |
| *Interpass temperature* | MAX 250° |

*Other remarks for preheat and interpass temeprature*
**Monitor interpass temperature with tempilstik or laser thermometer.**

| **PWHT** | |
|---|---|
| *Time and temperature* | N.A. |
| *PWHT method* | N.A. |
| *Heating and cooling rates* | N.A. |

*Other remarks for PWHT:*
N.A.

| **TECHNIQUE** | | | |
|---|---|---|---|
| *String or wave* | STRING | *Stick out* | 15÷20 mm |
| *Multiple or single pass* | MULTIPLE | *C - CEV (IIW) & Pcm* | Cev max= 0.44 ; Pcm max= 0.27 |
| *Initial/Interpass cleaning* | BRUSHING AND/OR GRINDING | *Torch travel angle* | 15÷20° (Push) |

**WELDING DETAILS**

| *No.* | *Process* | *Position* | *Filler Ø (mm)* | *Current* | *Amperage range [A]* | | *Voltage range (V)* | | *Travel speed range (mm/min)* | | *Transfer Mode* | *Heat input [kJ/mm]* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | *Min* | *Max* | *Min* | *Max* | *Min* | *Max* | | *Min* | *Max* |
| Root | 135 | F(PA) | 1.2 | DCEP | 160 | 180 | 20.5 | 22.5 | 120 | 160 | Short Arc | 0.98 | 1.62 |
| Fill | 135 | F(PA) | 1.2 | DCEP | 240 | 280 | 25 | 27 | 250 | 320 | Spray Arc | 0.91 | 1.45 |
| Cap | 135 | F(PA) | 1.2 | DCEP | 240 | 280 | 25 | 27 | 250 | 320 | Spray Arc | 0.91 | 1.45 |

*Other remarks:*
Tack welding will be done according to first pass parameters.

**REVISION AND SIGANTURE**

| *REV* | *Date* | *Description* | *Prepared* | *Approved* |
|---|---|---|---|---|
| 01 | 08/10/2024 | Revised heat input | | |
| 00 | 22/07/2024 | | | |

| *Prepared by* | *Approved by* | *Society approved by* | *Customer approved by:* |
|---|---|---|---|
| REMAZEL ENGINEERING S.p.A. | | | |

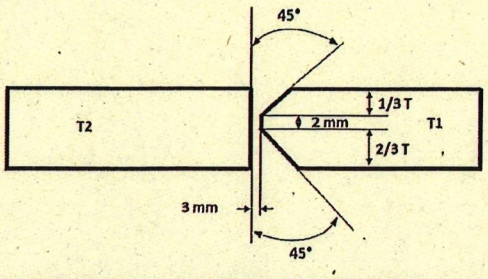
| REMAZEL ENGINEERING | WELDING PROCEDURE SPECIFICATION (WPS) | WPS n°: CCP12-3<br>WPQR: CCP12<br>Rev. 00 – 22/07/2024 | Pag. 1 / 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| *Reference code* | EN ISO 15614-1; | *Welding position* | F (PA)– FLAT POSITION |
| *Welding process* | GMAW (135) | *Type* | SEMI AUTOMATIC |
| *Mode of metal transfer* | SHORT AND SPRAY ARC | *Preparation method* | FLAME CUTTING AND MACHINING |

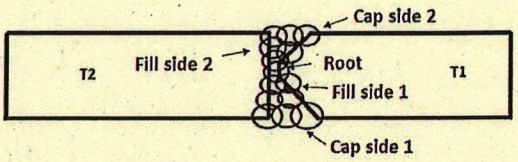
**JOINT DESIGN**

| | | | |
|---|---|---|---|
| *Joint type* | BW – BUTT WELD (CJP) | *Structural class* | N.A. |
| *Groove type* | K bevel groove weld | *Root opening* | 2-3 mm |
| *Groove angle* | 45° ± 5° | *Root face* | 1-2 mm |
| *Backing* | none | *Leg Size* | n.a. |
| *Back gouging procedure* | n.a. | *Deposition Range* | |

*Bevel design*




*Welding sequence*




**BASE MATERIAL**

| *Part identification* | *Part $t_1$* | *Part $t_2$* |
|---|---|---|
| *Pipe or plate* | PLATE | PLATE |
| *Material group ISO 15608* | 1.2 | 1.2 |
| *Material type* | S355J2+N | S355J2+N |
| *Thickness range* | 7.5 - 30 mm | 7.5 - 30 mm |
| *Diameter* | >150 mm | >150 mm |

**FILLER MATERIALS**

| | |
|---|---|
| *Welding process* | GMAW (135) |
| *Specification* | EN ISO 14341-A |
| *Classification* | G42 4 M21 3Si1 |
| *Trade marker* | ESAB OK AristoRod 12.50 |
| *Size* | Ø 1.2 mm |

**SHIELD GAS**

| | |
|---|---|
| *Welding process* | GMAW (135) |
| *Specification* | EN ISO 14175 |
| *Class* | M21 |
| *Trade marker* | 82% Ar + 18% CO2 |
| *Flow rate* | 18-24 l/min |
| *Nozzle diameter* | Ø16 mm |

**PREHEAT**

| | |
|---|---|
| *Preheat temperature* | T= 20°C |
| *Preheat maintenance temperature* | N.A. |
| *Interpass temperature* | MAX 250° |

*Other remarks for preheat and interpass temeprature*
Monitor interpass temperature with tempilstik or laser thermometer.

**PWHT**

| | |
|---|---|
| *Time and temperature* | N.A. |
| *PWHT method* | N.A. |
| *Heating and cooling rates* | N.A. |

*Other remarks for PWHT:*
N.A.

**TECHNIQUE**

| | | | |
|---|---|---|---|
| *String or wave* | STRING | *Stick out* | 15÷20 mm |
| *Multiple or single pass* | MULTIPLE | *C - CEV (IIW) & Pcm* | Cev max= 0.44 ; Pcm max= 0.27 |
| *Initial/Interpass cleaning* | BRUSHING AND/OR GRINDING | *Torch travel angle* | 15÷20° (Push) |

**WELDING DETAILS**

| *No.* | *Process* | *Position* | *Filler Ø (mm)* | *Current* | *Amperage range [A]* | | *Voltage range (V)* | | *Travel speed range (mm/min)* | | *Transfer Mode* | *Heat Input (kJ/mm)* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | *Min* | *Max* | *Min* | *Max* | *Min* | *Max* | | *Min* | *Max* |
| Root | 135 | F (PA) | 1.2 | DCEP | 160 | 180 | 20.5 | 22.5 | 120 | 160 | Short Arc | 0.98 | 1.62 |
| Fill Side 1 | 135 | F (PA) | 1.2 | DCEP | 240 | 280 | 25 | 27 | 250 | 330 | Spray Arc | 0.91 | 1.45 |
| Cap Side1 | 135 | F (PA) | 1.2 | DCEP | 240 | 280 | 25 | 27 | 250 | 320 | Spray Arc | 0.91 | 1.45 |
| Fill Side 2 | 135 | F (PA) | 1.2 | DCEP | 240 | 280 | 25 | 27 | 250 | 330 | Spray Arc | 0.91 | 1.45 |
| Cap Side2 | 135 | F (PA) | 1.2 | DCEP | 240 | 280 | 25 | 27 | 250 | 320 | Spray Arc | 0.91 | 1.45 |

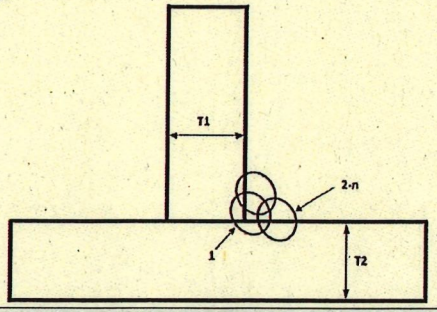
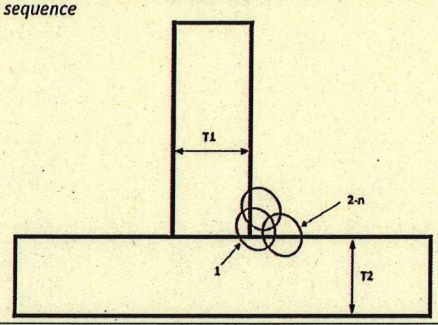
*Other remarks:*
Tack welding will be done according to first pass parameters.

**REVISION AND SIGANTURE**

| *REV* | *Date* | *Description* | *Prepared* | *Approved* |
|---|---|---|---|---|
| | | | | |
| 00 | 22/07/2024 | | | |

| *Prepared by* | *Approved by* | *Society approved by* | *Customer approved by:* |
|---|---|---|---|
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| REMAZEL ENGINEERING | WELDING PROCEDURE SPECIFICATION (WPS) | WPS n°: CCP13-01<br>WPQR: CCP13<br>Rev. 00 – 18/07/2024 | Pag. 1 / 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Reference code | EN ISO 15614-1; | Welding position | F (PB) – FLAT POSITION |
| Welding process | GMAW (135) | Type | SEMI AUTOMATIC |
| Mode of metal transfer | SHORT AND SPRAY ARC | Preparation method | FLAME CUTTING AND MACHINING |
| **JOINT DESIGN** | | | |
| Joint type | FW – FILLET WELD (T-JOINT) | Structural class | N.A. |
| Groove type | n.a | Root opening | 0-2 mm |
| Groove angle | n.a | Root face | n.a. |
| Backing | n.a. | Leg Size range | 7 mm – 26 mm |
| Back gouging procedure | n.a. | Deposition Range | 3 mm - 48 mm |
| Bevel design |  | Welding sequence |  |

| BASE MATERIAL | | | PREHEAT | |
|---|---|---|---|---|
| Part identification | Part $t_1$ | Part $t_2$ | Preheat temperature | T= 20°C |
| Pipe or plate | PLATE | PLATE | | |
| Material group ISO 15608 | 1.2 | 1.2 | Preheat maintenance temperature | N.A. |
| Material type | S355J2+N | S355J2+N | | |
| Thickness range | 3-48 mm | 3-48 mm | Interpass temperature | MAX 250° |
| Diameter | >150 mm | >150 mm | | |

| FILLER MATERIALS | | FILLER MATERIALS |
|---|---|---|
| Welding process | GMAW (135) | Monitor interpass temperature with tempilstik or laser thermometer. |
| Specification | EN ISO 14341-A | |
| Classification | G42 4 M21 3Si1 | |
| Trade marker | ESAB OK ArlstoRod 12.50 | |
| Size | Ø 1.2 mm | |

| PWHT | |
|---|---|
| Time and temperature | N.A. |
| SHIELD GAS | |
| Heating and cooling rates | N.A. |
| Other remarks for PWHT: N.A. | |

| SHIELD GAS | |
|---|---|
| Welding process | GMAW (135) |
| Specification | EN ISO 14175 |
| Class | M21 |
| Trade marker | 82% Ar + 18% CO2 |
| Flow rate | 18-24 l/min |
| Nozzle diameter | Ø16 mm |

| TECNIQUE | | | |
|---|---|---|---|
| String or wave | STRING | Stick out | 15÷20 mm |
| Multiple or single pass | MULTIPLE | C - CEV (IIW) & Pcm | Cev max= 0.45; |
| Initial/Interpass cleaning | BRUSHING AND/OR GRINDING | Torch travel angle | 15÷20° (Push) |

**WELDING DETAILS**

| No. | Process | Position | Filler Ø (mm) | Current | Amperage range [A] | | Voltage range (V) | | Travel speed range (mm/min) | | Transfer Mode | Heat input (kJ/mm) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Min | Max | Min | Max | Min | Max | | Min | Max |
| 1 | 135 | F (PB) | 1.2 | DCEP | 240 | 280 | 28 | 31 | 250 | 330 | Spray Arc | 1.0 | 1.7 |
| 2-n | 135 | F (PB) | 1.2 | DCEP | 240 | 280 | 28 | 31 | 250 | 330 | Spray Arc | 1.0 | 1.7 |

*Other remarks:*
Tack welding will be done according to first pass parameters.

**REVISION AND SIGANTURE**

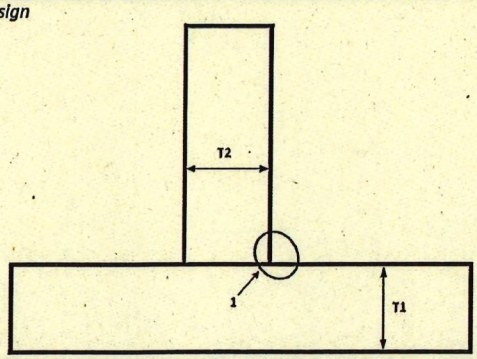
| REV | Date | Description | Prepared | Approved |
|---|---|---|---|---|
| 00 | 18/07/2024 | First issue | | |

| Prepared by | Approved by | Society approved by | Customer approved by: |
|---|---|---|---|
| | REMAZEL ENGINEERING S.p.A. | | |

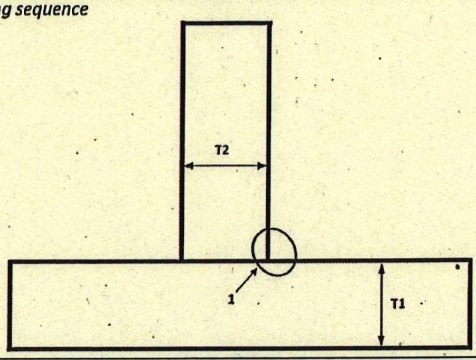
| REMAZEL ENGINEERING | WELDING PROCEDURE SPECIFICATION (WPS) | WPS n°: CCP14-1<br>WPQR: CCP14<br>Rev. 00 – 18/07/2024 | Pag. 1 / 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| *Reference code* | EN ISO 15614-1; | *Welding position* | F/H (PB)– FLAT POSITION |
| *Welding process* | GMAW (135) | *Type* | SEMI AUTOMATIC |
| *Mode of metal transfer* | SHORT AND SPRAY ARC | *Preparation method* | FLAME CUTTING AND MACHINING |
| **JOINT DESIGN** | | | |
| *Joint type* | FW – FILLET WELD (T-JOINT) | *Structural class* | N.A. |
| *Groove type* | n.a | *Root opening* | 0-2 mm |
| *Groove angle* | n.a | *Root face* | n.a. |
| *Backing* | n.a. | *Leg Size range* | 3.5 mm – 7 mm |
| *Back gouging procedure* | n.a. | *Thickness Range* | 3 mm – 30 mm |

*Bevel design*




*Welding sequence*




| **BASE MATERIAL** | | |
|---|---|---|
| *Part identification* | *Part $t_1$* | *Part $t_2$* |
| *Pipe or plate* | PLATE | PLATE |
| *Material group ISO 15608* | 1.2 | 1.2 |
| *Material type* | S355J2+N | S355J2+N |
| *Thickness* | 7.5 mm – 30 mm | 7.5 mm – 30 mm |
| *Diameter* | N.A. | N.A. |

| **FILLER MATERIALS** | |
|---|---|
| *Welding process* | GMAW (135) |
| *Specification* | EN ISO 14341-A |
| *Classification* | G42 4 M21 3Si1 |
| *Trade marker* | ESAB OK AristoRod 12.50 |
| *Size* | Ø 1.2 mm |

| **SHIELD GAS** | |
|---|---|
| *Welding process* | GMAW (135) |
| *Specification* | EN ISO 14175 |
| *Class* | M21 |
| *Trade marker* | 82% Ar + 18% CO2 |
| *Flow rate* | 18-24 l/min |
| *Nozzle diameter* | Ø16 mm |

| **PREHEAT** | |
|---|---|
| *Preheat temperature* | -<br>T= 20°C |
| *Preheat maintenance temperature* | N.A. |
| *Interpass temperature* | MAX 250° |

*Other remarks for preheat and interpass temeprature*
Monitor interpass temperature with tempilstik or laser thermometer.

| **PWHT** | |
|---|---|
| *Time and temperature* | N.A. |
| *PWHT method* | N.A. |
| *Heating and cooling rates* | N.A. |

*Other remarks for PWHT:*
N.A.

| **TECNIQUE** | | | |
|---|---|---|---|
| *String or wave* | STRING | *Stick out* | 15÷20 mm |
| *Multiple or single pass* | SINGLE | *C - CEV (IIW) & Pcm* | Cev max= 0.44 ; Pcm max= 0.27 |
| *Initial/Interpass cleaning* | BRUSHING AND/OR GRINDING | *Torch travel angle* | 15÷20° (Push) |

**WELDING DETAILS**

| *No.* | *Process* | *Position* | *Filler Ø (mm)* | *Current* | *Amperage range [A]* | | *Voltage range (V)* | | *Travel speed range (mm/min)* | | *Transfer Mode* | *Heat input [kJ/mm]* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | *Min* | *Max* | *Min* | *Max* | *Min* | *Max* | | *Min* | *Max* |
| 1 | 135 | PB | 1.2 | DCEP | 240 | 280 | 25 | 27 | 250 | 330 | Spray Arc | 0.91 | 1.45 |

*Other remarks:*
Tack welding will be done according to first pass parameters.

**REVISION AND SIGANTURE**

| *REV* | *Date* | *Description* | *Prepared* | *Approved* |
|---|---|---|---|---|
| | | | | |
| 00 | 18/07/2024 | First issue | | |

| *Prepared by* | *Approved by* | *Society approved by* | *Customer approved by:* |
|---|---|---|---|
| | REMAZEL ENGINEERING S.p.A | | |

# 3. WPQR

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PRD N° 002 B

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*Signatory of EA, IAF and ILAC Mutual Recognition Agreements*

# WELDING PROCEDURE QUALIFICATION RECORD (WPQR)

## LEVEL 2

N. 21TO00308PW\5A

Manufacturer **CONCRANE S.r.l. - TRIESTE (TS)**

WPQR No. **CCP12 Rev.01 dated 15/07/2021** Dated **21/06/2021**

Manufacturer's welding procedure (WPS) No. **p-CCP12** Dated **17/05/2021**

**RANGE OF QUALIFICATION**

Welding process **135** Type **Partly mechanized**

Joint type **Plates and Pipes and build-up BW ssnb-ssmb-bs/FW**

Single/Multiple pass **Multiple** (**Impact and Hardness properties apply**)

Parent material group(s) **1-1** ISO/TR 15608; ISO/TR20172; ISO/TR 20173; ISO/TR20174 with a specified minimum yield strength 275 < ReH ≤ 360 Mpa **DH36; AH36; DH32; AH32; D; B; A** according to Pt D, Ch 2, Sec 1 of RINA Rules

Parent material thickness (mm) Butt Joint = **7,5 to 30** Fillet Joint $t_1$ **= 3 to 30** $t_2$ **= 3 to 30**

Throat thickness (mm) **No restriction ***

Weld deposit thickness (mm) **Max 30 mm**

Outside pipe diameter (mm) **Over 150 (PA, PB, PC rotated positions); Over 500 (Other qualified positions) ****

Filler metal make **N.A.** Nr. of wires for process 12: **None**

Flux make **N.A.** Flux Designation: **N.A.**

Filler metal designation **Solid wire EN ISO 14341-A G42 4M21 3Si1**

Shielding gas (ISO 14175) **M21 with $CO_2$% min.14,4 max.21,6** Backing gas (ISO 14175) **None**

Type of welding current **DCEP** Kj/cm **min 5,7 ; max 16,4**

Welding position **PA** Transfer Mode **First pass: Short Arc; Other Passes: Spray, Pulse and Globular transfer**

Preheat min. (°C) +20 (if ISO/TR 17671-2 requirements are fulfilled) Interpass temp. Max. (°C) -

Interpass temp. Max. (°C) +250 Postheat min. (°C) - Time (minutes) -

Post weld heat treatment / Ageing **None** Time (minutes) -

Other information **(*) Multi-run; as for butt welds with multi-run (i.e. a=t); (**) Over 500 mm, when RINA Rules apply**

Welder's/Operator's name **Radasanu Georgetin Ionut** Stamp No. **RG**

Welding test conducted by **CONCRANE S.r.l. - Trieste (TS)**

Mechanical test conducted by **Metal Services Srl - R. d. Legionari (GO)** Laboratory test No. **21.0368 Rev.1**

At presence of RINA Surveyor **F. Sedran**

We confirm that statements in this record are correct and that the test welds were prepared, welded and tested and have fulfilled the requirements in accordance with **UNI EN ISO 15614-1: 2019** Standard and **RINA Rules for the Classification of Ships** requirements**.**

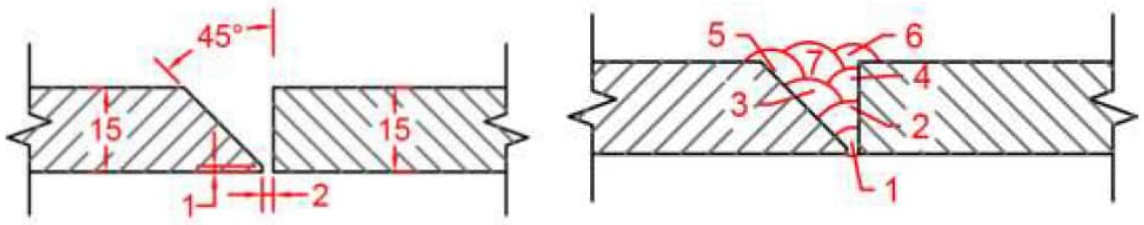
Issued at: Genova on 15 July 2021

RINA Services S.p.A.
PED No. Bo. 0474

**Certificate No. 21TO00308PW\5A**

**RECORD OF WELD TEST**

| JOINT DETAILS AND WELDING SEQUENCES<br>PLATE TO PLATE BUTT JOINT FULL PENETRATION- SINGLE BEVEL with root face and root gap – ss nb ml | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Pass No. | Process | Filler metal diam. (mm) | Amps | Volt | Type of Current/ Polarity | Travel speed (cm/min) | Heat input (kJ/cm) | Metal Transfer mode | Other |
| 1 | **135** | 1,2 | 125 | 18,2 | **DCEP** | 14,3 | 7,6 | **Short Arc** | - |
| 2 | **135** | 1,2 | 239 | 28,8 | **DCEP** | 31,0 | 10,7 | **Spray Arc** | - |
| 3 | **135** | 1,2 | 242 | 28,2 | **DCEP** | 29,8 | 11,0 | **Spray Arc** | - |
| 4 | **135** | 1,2 | 268 | 28,5 | **DCEP** | 30,5 | 12,0 | **Spray Arc** | - |
| 5 | **135** | 1,2 | 269 | 28,2 | **DCEP** | 27,7 | 13,1 | **Spray Arc** | - |
| 6 | **135** | 1,2 | 252 | 28,2 | **DCEP** | 31,6 | 10.8 | **Spray Arc** | - |
| 7 | **135** | 1,2 | 256 | 28,3 | **DCEP** | 30,5 | 11,4 | **Spray Arc** | - |




**PARENT MATERIAL**

| | | | |
|---|---|---|---|
| Material specification | **EN 10028-3 (Pt D, Ch 2, Sec 1 of RINA Rules)** | | |
| Type or grade | **P355NH (DH36)** | | |
| Group(s)/Subgroup(s) No. (ISO/TR 15608; ISO/TR20172; ISO/TR 20173; ISO/TR20174) | | | **1.2** |
| Thickness (mm) | **15 to 15** | Throat thickness (mm) | **N.A.** |
| Diameter (mm) | **N.A.** | | |
| Branch connection angle | **N.A.** | | |
| Other | - | | |

**WELDING CONSUMABLES**

| | | |
|---|---|---|
| Process | **135D** | **135S** |
| Trade name(s) | **ESAB OK AristoRod 12.50** | **ESAB OK AristoRod 12.50** |
| Specification | **EN ISO 14341-A** | **EN ISO 14341-A** |
| Classification / designation | **G42 4 M21 3Si1** | **G42 4 M21 3Si1** |
| Size (mm) | **1,2** | **1,2** |
| Deposited metal thickness | | |
| Groove | **3 mm** | **12 mm** |
| Throat | **N.A.** | **N.A.** |
| Flux trade name | **N.A.** | **N.A.** |
| Consumable insert | **N.A.** | **N.A.** |
| Other | - | - |

**GAS**

| | Gas | Mixture | Flow rate (l/min.) |
|---|---|---|---|
| Shielding | | **Ar 82% + $CO_2$ 18%** | **18** |
| Trailing | | | |
| Backing | | | |

**POSITION**

Welding position **PA**

Other **-**

**PREHEAT**

Preheat temperature **+20°C**

Interpass temperature **+250°C**

Postheat temperature **None** Time **-**

**POSTWELD HEAT TREATMENT**

Temperature **None** Time -

Method **-**

Other **-**

**ELECTRICAL CHARACTERISTICS**

Current **DCEP**

Ampere (range) **See table** Volts (Range) **See table**

Mode of metal transfer **D (Short Transfer) First pass; S (Spray Transfer) Other passes**

Tungsten electrode size and type **N.A.**

Pulse welding details **N.A.**

Plasmawelding details **N.A.**

Waveform controlled welding machine - Waveform control mode **-**

Power source - Welding mode Pulse □ Non pulse ☑

Other **-**

**TECHNIQUE**

Travel speed (range) **See table**

String or weave bead **String** Maximum width of run **None**

Oscillation (*) **None** (Amplitude/Frequency/Dwell time)

Method of groove/edge preparation **Flame cutting and Machining**

Interpass cleaning **Grinding/Brushing**

Method of back gouging **N.A.**

Orifice or gas cup size **16**

Distance contact tube/worpiece (*) **15-20 mm**

Multiple or single pass **Multiple**

Multiple or single electrodes **Single**

Torch angle (*) **N.A.**

Other (*) for fully mechanized/robotic only

**Certificate No. 21TO00308PW\5A**

| TRANSVERSE TENSILE TEST | | | | | | |
|---|---|---|---|---|---|---|
| Spec. (No.) | Width (mm) | Thickness (mm) | Area ($mm^2$) | Total load (N) | $R_m$. ($N/mm^2$) | Fracture location |
| **1238** | **25,02** | **13,44** | **336,27** | **179058** | **532** | **Base material - ductile** |
| **1238** | **25,01** | **13,24** | **331,13** | **175425** | **530** | **Base material - ductile** |

| ALL-WELD METAL TENSILE TEST | | | | | | | |
|---|---|---|---|---|---|---|---|
| Spec. (No.) | Diameter (mm) | Area (mm) | $L_0$ (mm) | Yield strength ($N/mm^2$) | Tensile strength ($N/mm^2$) | A (%) | Z (%) |
| **1238** | **6,06** | **-** | **30** | **408** | **520** | **33.0** | **74** |

| BEND TEST | | | |
|---|---|---|---|
| Type | No. | Bend Angle | Result |
| **SIDE TRANSVERSE** | **4 OFF** | **180°** | **Acceptable** |

**IMPACT TEST**

**Full-Size 10x10x55**

| Spec No. | Notch location | Notch type | Test Temp. (°C) | Impact values (J) | Average (J) |
|---|---|---|---|---|---|
| **VWT** $_{0/1}$ | **WELD** | **ISO-V** | **-20** | **149 - 156 - 149** | **151** |
| **VHT** $_{0/1}$ | **FUSION LINE** | **ISO-V** | **-20** | **144 - 202 - 184** | **177** |
| **VHT** $_{2/1}$ | **FUSION LINE + 2** | **ISO-V** | **-20** | **260 - 257 - 258** | **258** |
| **VHT** $_{5/1}$ | **FUSION LINE + 5** | **ISO-V** | **-20** | **241 - 242 - 244** | **242** |

| HARDNESS TEST | | |
|---|---|---|
| Location | Type/load | Maximum value |
| Parent metal(s) | **HV10** | **158** |
| H.A.Z.(s) | **HV10** | **220** |
| Weld metal | **HV10** | **186** |

**OTHER TEST**

MACROGRAPHIC EXAMINATION **Acceptable**

MICROGRAPHIC EXAMINATION **Not required**

**NON DESTRUCTIVE EXAMINATION**

VISUAL EXAMINATION **Acceptable**

RADIOGRAPHIC EXAMINATION **Not required**

PENETRANT TEST **Not required**

MAGNETIC PARTICLE **Acceptable**

ULTRASONIC TEST **Acceptable**

Issued at: Genova on 15 July 2021

RINA Services S.p.A.
PED No. Bo. 0474

METAL SERVICES
MATERIALS TESTING

# TEST REPORT No. 21.0368 Rev.1

**ISSUED ON 21/06/2021**

**This document replace the test report no. 21.0368 Rev.0**

Customer

**CONCRANE S.r.l.**

Via Caboto, 26

34147 Trieste (TS)

## INFORMATION

The present test report cannot be modified and cannot be reproduced in a partial way without the formal written approval of Metal Services Materials Testing Srl.
Test results are only related to the supplied tested samples; the remains of them will be stored and available for not more than 30 days after the test report issuing date, unless differently agreed on the purchase order.
Equipment used are to be intended under metrological validity.
The uncertainty of measurement is expressed as expanded uncertainty obtained by multiplying the combined uncertainty for the coverage factor of k = 2, corresponding to a confidence interval of about 95%.
(+) Supervised test by 3rd part inspector.

## MATERIAL RECEPTION

| Date | Delivery note no. | Offer no. | Order no. |
|---|---|---|---|
| 28/05/2021 | 21050 | - | - |

**Sampling data**

Sampling and identification executed by the Customer

## MATERIAL DESCRIPTION

| Sample no. | Identification mark |
|---|---|
| 1238 | Sample identified as "pWPS CCP12 – BW plate thk. 15 mm – material DNV-GL EH36/RINA DH36 – welding process GMAW – position 1G – welding consumable ESAB OK AristoRod 12.50 Ø 1.2 mm – AWS A5.18 ER 70S-6 – shielding gas EN ISO 14175 M21 82%Ar + 18% CO2 18/24 l/min" |

## TEST INDEX


| Section no. | Test | Page |
|---|---|---|
| 1 | Visual examination (UNI EN ISO 17637:2017) | 2 |
| 2 | Magnetoscopic examination (UNI EN ISO 17638:2016 – ASTM E709 – API 2X) | 2 |
| 3 | Ultrasonic examination (UNI EN ISO 17640:2018 – API RP 2X) | 3 |
| 4 | Transverse tensile test on welds (UNI EN ISO 4136:2012) | 4 |
| 5 | Longitudinal tensile test on welds (UNI EN ISO 5178:2011) | 4 |
| 6 | Bend test on welds (UNI EN ISO 5173:2012) | 4 |
| 7 | Impact test on welds (UNI EN ISO 9016:2012) | 4 |
| 8 | Macrographic examination (UNI EN ISO 17639:2013) | 5 |
| 9 | Hardness test on welded joints (UNI EN ISO 9015-1:2011) | 6 |
| - | Other reference documents (08833.ENG.MME.SDS Rev.07) | - |


## NOTE

This document replaces the test report no. 21.0368 Rev.0 and it has been issued in order to integrate data of the fields "Material description" and of the section 5 "Longitudinal tensile test on welds"

//

## RESERVED FOR DIGITAL SIGNATURE

Firmato digitalmente da:
PELLEGRIN LORENZO
Firmato il 21/06/2021 11:14
Seriale Certificato: 21401746878628221003275909547213633194
Valido dal 01/10/2020 al 01/10/2023
ArubaPEC S.p.A. NG CA 3

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# TEST REPORT No. 21.0368 Rev.1

**ISSUED ON 21/06/2021**

**This document replace the test report no. 21.0368 Rev.0**

## 1. VISUAL EXAMINATION

### TEST CONDITIONS

| Equipment | Visual conditions | Surface conditions | Working step |
|---|---|---|---|
| Weld Gauge, Lamp | Min. 1000 lux on tested surface | As welded | Welds completed |
| **Test method** | **Acceptance criteria** | **Procedure of examination** | **Reference drawing** |
| UNI EN ISO 17638:2016 – ASTM E709 – API 2X | UNI EN ISO 5817:2014 - 08833.ENG.MME.SDS Rev.07 | - | pWPS CCP12 |
| **Heat Treatment** | **Extention of the examination** | **-** | **-** |
| - | 100% | - | - |

### RESULTS

| Sample no. | Data | Position | Result of inspection |
|---|---|---|---|
| 1238 | 31/05/2021 | - | *Imperfections exceeding the acceptance criteria and their location*: No recordable indications. |

**Record of indications detected**

| *Weld Id.* | *Indication no.* | *Start from* | *Probe*[1] | *Length* | *Depth*[1] | *Probable type of defect* |
|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - |

Glossary: //

Note 1: Only for UT examination

## 2 MAGNETIC PARTICLES TESTING

### TEST CONDITIONS

| Equipment | Visual conditions | Surface conditions | Working step |
|---|---|---|---|
| Deltaflux DF Y/A S/N 140514 | Min. 500 lux on tested surface | Welded | As finished |
| **Contrast paint** | **Type of magnetic particles** | **Magnetic particles** | **Type of current** |
| ProNdt 183 | Wet - visible | ProNdt 181 | AC |
| **Test method** | **Acceptance criteria** | **Procedure of examination** | **Reference drawing** |
| UNI EN ISO 17640:2018 – API RP 2X | UNI EN ISO 23278:2015 Lev.1 - 08833.ENG.MME.SDS Rev.07 | - | pWPS CCP12 |
| **Heat Treatment** | **Extension of the examination** | **Demagnetization** | **Lifting power** |
| Not declared | 100% | Not required | 5 Kg |

### RESULTS

| Sample no. | Data | Position | Result of inspection |
|---|---|---|---|
| 1238 | 31/05/2021 | - | *Imperfections exceeding the acceptance criteria and their location*: No recordable indications. |

**Record of indications detected**

| *Weld Id.* | *Indication no.* | *Start from* | *Probe*[1] | *Length* | *Depth*[1] | *Probable type of defect* |
|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - |

Glossary: //

Note 1: Only for UT examination

### NOTE

//

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# TEST REPORT No. 21.0368 Rev.1
## ISSUED ON 21/06/2021
**This document replace the test report no. 21.0368 Rev.0**

## 3. ULTRASONIC EXAMINATION

**TEST CONDITIONS**

| Material | Thickness | Heat Treatment | Testing plan |
|---|---|---|---|
| EH36 | 15 mm | - | 100 % |
| **Instrument** | **Probe** | **Couplant** | **Note** |
| Sonatest D20+ s/n.:I009835 | Olympus AMR 8x9 70 | Gel | - |
| **Test method** | | **Acceptance criteria** | |
| UNI EN ISO 17640:2018 – API RP 2X | | UNI EN ISO 11666:2018 - 08833.ENG.MME.SDS Rev.07 | |

**RESULTS**

| Sample no. | Data | Position | Result of inspection |
|---|---|---|---|
| 1238 | 31/05/2021 | - | *Imperfections exceeding the acceptance criteria and their location*: No recordable indications. |

**Record of indications detected**

| *Weld Id.* | *Indication no.* | *Start from* | *Probe*[1] | *Length* | *Depth*[1] | *Probable type of defect* |
|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - |

Glossary: //

Note 1: Only for UT examination

**NOTE**

//

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# TEST REPORT No. 21.0368 Rev.1

**ISSUED ON 21/06/2021**

**This document replace the test report no. 21.0368 Rev.0**

## 4. TRANSVERSE TENSILE TEST ON WELDS

| Sample no. | Date | Position | T °C | a mm | b mm | So $mm^2$ | Fm N | Rm MPa | Fracture Position |
|---|---|---|---|---|---|---|---|---|---|
| 1238 | 07/06/2021 | T to Weld | 22 | 13.44 | 25.02 | 336.27 | 179058 | 532 | Base material - ductile |
| 1238 | 07/06/2021 | T to Weld | 22 | 13.24 | 25.01 | 331.13 | 175425 | 530 | Base material - ductile |

Instruments: Galdabini Quasar 1200 (Serial no. V9GV)
Glossary: T = transversal; L = longitudinal
Note: //

## 5. LONGITUDINAL TENSILE TEST ON WELDS

| Sample no. | Date | Position | T °C | Ø mm | $Rp_{0.02}$ MPa | $Rp_{0.2}$ MPa | $Rp_{1.0}$ MPa | Rm MPa | $L_0$ mm | A % | Z % | Rs/Rm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1238 | 07/06/2021 | All weld | 22 | 6.06 | - | 408 | - | 520 | 30 | 33.0 | 74 | - |

Instruments: Galdabini Quasar 250 (Serial no.V901)
Glossary: //
Note: //

## 6. BEND TEST ON WELDS

| Sample no. | Date | Type of test | T °C | $t_s$ mm | l mm | d mm | Bend angle ° | Test Result |
|---|---|---|---|---|---|---|---|---|
| 1238 | 07/06/2021 | SBB | 22 | 10 | 65 | 40 | 180 | No recordable indication |
| 1238 | 07/06/2021 | SBB | 22 | 10 | 65 | 40 | 180 | No recordable indication |
| 1238 | 07/06/2021 | SBB | 22 | 10 | 65 | 40 | 180 | No recordable indication |
| 1238 | 07/06/2021 | SBB | 22 | 10 | 65 | 40 | 180 | No recordable indication |

Instruments: Caliper Sama 18148032 (766)
Glossary: $t_s$= specimen thickness; l= minimum clearance between the shoulders; d= ram diameter; SBB = Side bend on butt weld.
Note: //

## 7. IMPACT TEST ON WELDS

| Sample no. | Date | Position | w mm | T °C | $KV_2$ J | | | $KV_2$ AVG J |
|---|---|---|---|---|---|---|---|---|
| 1238 | 07/06/2021 | VHT 5/1 | 10 | -20 | 241 | 242 | 244 | 242 |
| 1238 | 07/06/2021 | VHT 2/1 | 10 | -20 | 260 | 257 | 258 | 258 |
| 1238 | 07/06/2021 | VHT 0/1 | 10 | -20 | 144 | 202 | 184 | 177 |
| 1238 | 07/06/2021 | VWT 0/1 | 10 | -20 | 149 | 156 | 149 | 151 |

Instruments: Galdabini Impact 300 (Serial no.V88G)
Glossary: T = transversal; L = longitudinal
Note: When absorbed energy is < 8 J or >= 240 J the values are approximate.

## NOTE

//

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# TEST REPORT No. 21.0368 Rev.1

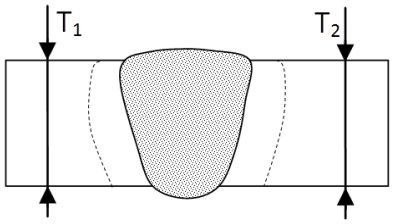
**ISSUED ON 21/06/2021**

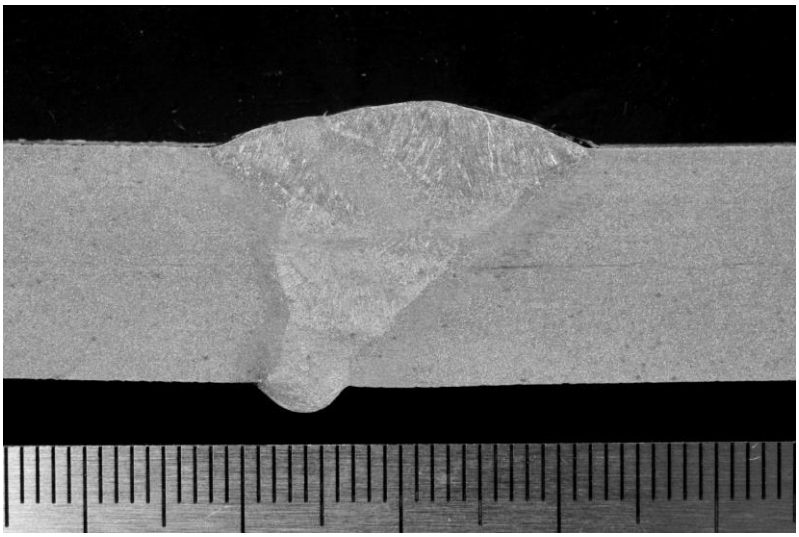
**This document replace the test report no. 21.0368 Rev.0**

## 8. MACROGRAPHIC EXAMINATION

| | |
|---|---|
| **Sample no** | 1238 Macro #1 |
| **Date** | 03/06/2021 |
| **Position** | T to weld |
| **Etching** | HNO3 10% |
| **$T_1$** | 15 mm |
| **$T_2$** | 15 mm |
| **$Z_1$** | n.a. |
| **$Z_2$** | n.a. |
| **Throat Thickness** | n.a. |

**Sketch**



| **Imperfection** |
|---|
| No recordable indications |

Instruments: Wild stereomicroscope (serial no.386471309)

Glossary: //

Note: //

**NOTE**

//

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# TEST REPORT No. 21.0368 Rev.1

**ISSUED ON 21/06/2021**

**This document replace the test report no. 21.0368 Rev.0**

## 9. HARDNESS TEST ON ARC WELDED JOINTS

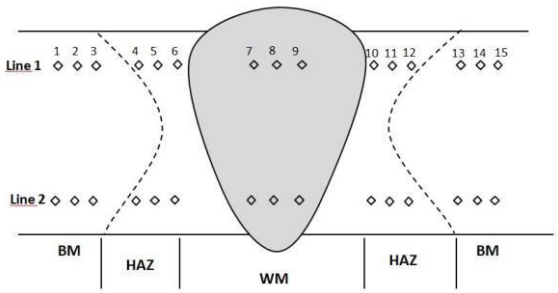
| Sample no. | Date | Type of test | Indentation | Position | Line 1 (HV) | Line 2 (HV) | Line 3 (HV) |
|---|---|---|---|---|---|---|---|
| 1238 Macro #1 | 03/06/2021 | HV10 | 1 | BM | 150 | 154 | - |
| | | | 2 | BM | 151 | 152 | - |
| | | | 3 | BM | 158 | 156 | - |
| | | | 4 | HAZ | 177 | 169 | - |
| | | | 5 | HAZ | 198 | 177 | - |
| | | | 6 | HAZ | 206 | 178 | - |
| | | | 7 | WM | 179 | 181 | - |
| | | | 8 | WM | 167 | 156 | - |
| | | | 9 | WM | 171 | 186 | - |
| | | | 10 | HAZ | 211 | 204 | - |
| | | | 11 | HAZ | 214 | 220 | - |
| | | | 12 | HAZ | 193 | 186 | - |
| | | | 13 | BM | 156 | 154 | - |
| | | | 14 | BM | 150 | 151 | - |
| | | | 15 | BM | 148 | 155 | - |

Instruments: QNESS Q150+ (serial no. Q1294/02/18)

Glossary: //

Note: //

### INDENTATION POSITION




### NOTE

//

### INSPECTOR NOTES(+)

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# CERTIFICATO DI CONTROLLO 3.2 / INSPECTION CERTIFICATE 3.2 - EN 10204:2004


**METINVEST**
METINVEST TRAMETAL SPA

Società per azioni con socio unico soggetta a direzione e coordinamento di Metinvest B.V
Registered office: Via XII Ottobre, 3 - 16121 Genova, Italy
Phone +39 010 5762911 - Fax +39 010 5762990
Works: Via E. Fermi, 44 - 33058 San Giorgio di Nogaro UD, Italy
Phone +39 0431 629989 - Fax +39 0431 629985
Cap. Soc. Euro 300.120.000,00 i.v.
C.F., P.IVA e Iscr. Reg. Imp. GE 05956630965 - REA 437720/GE
http://trametal.metinvestholding.com


(A) PROCESSO DI ELABORAZIONE / STEELMAKING PROCESS: E = ELECTRIC ; BO = BASIC OXYGEN
(B) STATO DI FORNITURA / DELIVERY CONDITION: AR = GREZZO DI LAMINAZIONE / AS ROLLED ;
N* = LAMINAZIONE A TEMPERATURA CONTROLLATA / NORMALIZING ROLLING ;
N = NORMALIZZATO / NORMALIZED at 910°C, 1,5 min/mm ; ARIA CALMA / STILL AIR;
R = RICOTTO / ANNEALED;
N+R = NORMALIZZATO + RINVENUTO / NORMALIZED + TEMPERED
(C) TRATTAMENTO TERMICO DEL CAMPIONE / HEAT TREATMENT OF SAMPLE:
N = 910°C, 1,5 min/mm ; ARIA CALMA / STILL AIR
R = 650°C, 1,5 min/mm ; ARIA CALMA / STILL AIR
(D) Ceq_1 = C + Mn/6 ; Ceq_2 = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15 ;
Pcm = C + Si/30 + (Mn + Cu + Cr)/20 + Nl/60 + Mo/15 + V/10 + B*5
(1) POSIZIONE / LOCATION: 1 = TESTA / TOP ; 2 = PIEDE / BOTTOM
(2) POSIZIONE / LOCATION: C = CUORE / 1/2 THICKNESS ; P = PELLE / SURFACE ; D = 1/4 SPESSORE / THICKNESS
(3) DIREZIONE / DIRECTION: L = LONGITUDINALE / LONGITUDINAL ; T = TRASVERSALE / TRANSVERSE
(4) FORMA DEL PROVINO / SHAPE OF TEST PIECE: P = PRISMATICO / PRISMATIC ; C = CILINDRICO / CYLINDRICAL
(5) ESITO PROVA DI PIEGA / RESULT: OK = COMPLYING ; NO = NOT COMPLYING

A06 Cliente / Customer

**TONELLO S.P.A.**
**VIA D'ORMENT N. 6**
**33042 BUTTRIO 33042 IT**
**UD ITALIA**

| A03 N° Certificato / Certificate no. | Z02 Data / Date |
|---|---|
| 47645 | 12/12/2019 |
| A08 N° Ordine Trametal / Works order | A07 N° Ordine cliente / Customer's order |
| 31904901 | B9001117 |
| DDT | del / date |
| Pratica / File no. | N141X66X |
| del / date | 09/12/2019 |

B06 Marcatura di prodotto / Marking of the product
LAMIERA/ORDINE/N° INFORNAMENTO/DIMENSIONI/QUALITÀ/MARCHIO DEL PRODUTTORE
PLATE/ORDER/INTERNAL N°/DIMENSIONS/STEEL GRADE/MANUFACTURER'S MARK

B01/B02/B03

| | |
|---|---|
| Prodotto / Product | Lamiere / Hot rolled plates |
| Qualità / Steel grade | VL E36 |
| Normativa / Specification | IACS-DNVGL |

| B07 ITEM | B07 LAMIERA PLATE | B07 N° INFORN. INTERNAL NUMBER | B09/B11 DIMENSIONI [mm] DIMENSIONS | B12 MASSA TEORICA [t] THEORICAL WEIGHT | B07 LOTTO BATCH NO. | C70 PROCESSO ELAB. (A) STEELMAKING PROCESS | B04 STATO FORNITURA LAMIERA (B) DELIVERY CONDITION | C00 CAMPIONE SAMPLE | B05 TRATT. CAMPIONE (C) HEAT TREATMENT | C00 CAMPIONE PWHT SAMPLE | B05 PWHT BEGINNING TEMPERATURA INIZIO °C | VELOCITA' RISCALDO C/h | TEMPERATURE TREATMENT TEMPERATURA TRATTAMENTO °C | HOLDING TIME PERMANENZA Min | COOLING RATE VELOCITA' RAFFREDDAMENTO °C/h | END TEMPERATURA FINE °C | N° CICLI / CYCLES | C00 CAMPIONE Q+T SAMPLE | B05 Q+T TEMPERATURE TEMPERATURA (Q) °C | HOLDING TIME PERMANENZA (Q) Min | COOLING RAFFREDDAMENTO | TEMPERATURE TEMPERATURA (T) °C | HOLDING TIME PERMANENZA (T) Min | COOLING RAFFREDDAMENTO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1TAN850407A | 1590166 | 15.00X2450X12000 | 3,46 | 632914 | BO | N | W7849 | | 19T829 | | | | | | | | | | | | | | |
| ~~2~~ | ~~1NAM330204A~~ | ~~1590652~~ | ~~30.00X2450X6300~~ | ~~3,63~~ | ~~632911~~ | ~~BO~~ | ~~N~~ | ~~W7846~~ | | | | | | | | | | | | | | | | |
| ~~3~~ | ~~1NAM960403A~~ | ~~1590606~~ | ~~35.00X2450X7200~~ | ~~4,85~~ | ~~632912~~ | ~~BO~~ | ~~N~~ | ~~W7847~~ | | | | | | | | | | | | | | | | |
| ~~4~~ | ~~1NAM960503A~~ | ~~1590550~~ | ~~50.00X2450X6300~~ | ~~6,06~~ | ~~632913~~ | ~~BO~~ | ~~N~~ | ~~W7848~~ | | | | | | | | | | | | | | | | |
| | Total | 4 | | 18,00 | | | | | | | | | | | | | | | | | | | | |

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## C71/C92 COMPOSIZIONE CHIMICA DI COLATA / HEAT CHEMICAL ANALYSIS

| B07 COLATA HEAT | C71 C % | C72 Mn % | C73 Si % | C74 P % | C75 S % | C76 Cu % | C77 Ni % | C78 Cr % | C79 Mo % | C80 Al % | C81 V % | C82 Nb % | C83 Ti % | C84 Sn % | C85 Ca % | C86 N % | C87 B % | C88 H % | C89 Ceq1 % (D) | C90 Ceq2 % (D) | C91 Pcm % (D) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VL E36 Min 0.00 - 100.00 | | 0,90 | | | | | | | | 0,020 | 0,050 | 0,020 | 0,007 | | | | | | | | |
| VL E36 Max 0.00 - 100.00 | 0,18 | 1,60 | 0,50 | 0,035 | 0,035 | 0,350 | 0,400 | 0,200 | 0,080 | | 0,100 | 0,050 | 0,020 | | | | | | | | |
| 1NAM33 | 0,16 | 1,50 | 0,20 | 0,012 | 0,003 | 0,060 | 0,040 | 0,030 | <0.005 | 0,035 | <0.005 | 0,021 | <0.005 | <0.005 | 0,0000 | 0,0080 | 0,0005 | 0,0002 | 0,41 | 0,42 | 0,25 |
| 1NAM96 | 0,16 | 1,49 | 0,20 | 0,012 | 0,002 | 0,040 | 0,030 | 0,020 | <0.005 | 0,035 | <0.005 | 0,020 | <0.005 | <0.005 | 0,0000 | 0,0070 | <0.0005 | 0,0002 | 0,41 | 0,42 | 0,24 |
| 1TAN85 | 0,16 | 1,51 | 0,22 | 0,008 | 0,002 | 0,030 | 0,020 | 0,030 | <0.005 | 0,037 | <0.005 | <0.010 | <0.005 | <0.005 | 0,0000 | 0,0070 | <0.0005 | 0,0004 | 0,41 | 0,42 | 0,25 |

| | PROVA DI TRAZIONE TENSILE TEST | | | | | | | | | PROVA DI RESILIENZA IMPACT TEST - CHARPY V-NOTCH TEST | | | | | | PROVA DI PIEGA BEND TEST | | | | PROVA DI DUREZZA HARDNESS TEST | | | | PROVA DI STRIZIONE Z% TEST | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C00 | | C01 | C01 | C02 | C03 | C11 | C12 | | C13 | C14 | C10 | C41 | C02 | C03 | C01 | C42 | C43 | C02 | C51 | C52 | C50 | C01 | C30 | C31 | C32 | C53 | C54 |
| CAMPIONE SAMPLE | SPESSORE LAMIERA PLATE THICKNESS | POSIZIONE (1) LOCATION | POSIZIONE (2) LOCATION | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | ReH [Mpa] YIELD STRENGTH | Rm [Mpa] TENSILE STRENGTH | ReH/Rm | A% ELONGATION | Rp 0,2 [Mpa] PROOF/YIELD STRENGTH | FORMA PROVINO (4) SHAPE OF TEST PIECE | LARGHEZZA [mm] WIDTH | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | POSIZIONE (2) LOCATION | SINGOLI VALORI [J] INDIVIDUAL VALUES | MEDIA [J] MEAN VALUE | DIREZIONE (3) ORIENTATION | MANDRINO [mm] MANDREL | ANGOLO [°] ANGLE | ESITO (5) RESULT | POSIZIONE (2) LOCATION | METODO TEST METHOD | SINGOLI VALORI INDIVIDUAL VALUES | MEDIA MEAN VALUE | Z% VALORE MEDIO Z% MEAN VALUE | Z% SINGOLI VALORI Z% INDIVIDUAL VALUES |
| VL E36 Min 0.00 - 100.00 | | | | | 20 | 355 | 490 | | 21,0 | | | | | | | | | | | | | | | | | | |

| | | | PROVA DI TRAZIONE TENSILE TEST | | | | | | | | PROVA DI RESILIENZA IMPACT TEST - CHARPY V-NOTCH TEST | | | | | | PROVA DI PIEGA BEND TEST | | | | PROVA DI DUREZZA HARDNESS TEST | | | | PROVA DI STRIZIONE Z% TEST | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C00 | | C01 | C01 | C02 | C03 | C11 | C12 | | C13 | C14 | C10 | C41 | C02 | C03 | C01 | C42 | C43 | C02 | C51 | C52 | C50 | C01 | C30 | C31 | C32 | C53 | C54 |
| CAMPIONE SAMPLE | SPESSORE LAMIERA PLATE THICKNESS | POSIZIONE (1) LOCATION | POSIZIONE (2) LOCATION | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | ReH [Mpa] YIELD STRENGTH | Rm [Mpa] TENSILE STRENGTH | ReH/Rm | A% ELONGATION | Rp 0.2 [Mpa] PROOF/YIELD STRENGTH | FORMA PROVINO (4) SHAPE OF TEST PIECE | LARGHEZZA [mm] WIDTH | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | POSIZIONE (2) LOCATION | SINGOLI VALORI [J] INDIVIDUAL VALUES | MEDIA [J] MEAN VALUE | DIREZIONE (3) ORIENTATION | MANDRINO [mm] MANDREL | ANGOLO [°] ANGLE | ESITO (5) RESULT | POSIZIONE (2) LOCATION | METODO TEST METHOD | SINGOLI VALORI INDIVIDUAL VALUES | MEDIA MEAN VALUE | Z% SINGOLI VALORI Z% INDIVIDUAL VALUES | Z% VALORE MEDIO Z% MEAN VALUE |
| VL E36 Max 0.00 - 100.00 | | | | | 20 | | 630 | | | | | | | | | | | | | | | | | | | | |
| VL E36 Min 6.00 - 50.00 | | | | | | | | | | | | | L | -40 | | | 34 | | | | | | | | | | |
| ~~W7846~~ | ~~30,00~~ | ~~2~~ | ~~P~~ | ~~T~~ | ~~20~~ | ~~401~~ | ~~522~~ | ~~0,77~~ | ~~32,7~~ | | ~~P~~ | ~~10,00~~ | ~~L~~ | ~~-40~~ | ~~P~~ | ~~233 250 254~~ | ~~246~~ | | | | | | | | | | |
| ~~W7847~~ | ~~35,00~~ | ~~2~~ | ~~P~~ | ~~T~~ | ~~20~~ | ~~380~~ | ~~511~~ | ~~0,74~~ | ~~32,3~~ | | ~~P~~ | ~~10,00~~ | ~~L~~ | ~~-40~~ | ~~P~~ | ~~284 291 276~~ | ~~284~~ | | | | | | | | | | |
| ~~W7848~~ | ~~50,00~~ | ~~2~~ | ~~P~~ | ~~T~~ | ~~20~~ | ~~378~~ | ~~528~~ | ~~0,72~~ | ~~30,0~~ | | ~~P~~ | ~~10,00~~ | ~~L~~ | ~~-40~~ | ~~P~~ | ~~206 185 187~~ | ~~193~~ | | | | | | | | | | |
| W7849 | 15,00 | 2 | P | T | 20 | 413 | 513 | 0,81 | 31,8 | | P | 10,00 | L | -40 | P | 271 243 263 | 259 | | | | | | | | | | |

C10

UNI EN ISO 6892-1:2016 / UNI EN ISO 148-1:2016

Z01

| ITEM | | TOLLERANZA DI SPESSORE TOLERANCE ON THICKNESS | TOLLERANZE DI LARGHEZZA TOLERANCE ON WIDTH | TOLLERANZE DI LUNGHEZZA TOLERANCE ON LENGTH | CONDIZIONI SUPERFICIALI SURFACE FINISH | PLANARITÀ FLATNESS |
|---|---|---|---|---|---|---|
| 1 | | EN 10029 CL.B | -0+100 MM | -0+200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |
| 2 | | EN 10029 CL.B | -0+100 MM | -0+200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |
| 3 | | EN 10029 CL.B | -0+100 MM | -0+200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |
| 4 | | EN 10029 CL.B | -0+100 MM | -0+200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |

CERTIFICHIAMO che le lamiere elencate sono conformi alla prescrizione dell'ordine, che i controlli della marcatura, dell'aspetto superficiale e dimensionale hanno dato esito positivo.
WE CERTIFY that the above mentioned plates are consistent with the order prescriptions: marking, inspection and measurement without objection.
DICHIARIAMO CHE LE LAMIERE SONO STATE CONTROLLATE IN ACCORDO ALLA NORMATIVA VIGENTE E CHE LE RADIAZIONI IONIZZANTI NON ECCEDONO IL VALORE DEL FONDO NATURALE.
WE DECLARE THAT THE PLATES WERE CONTROLLED ACCORDING TO STANDARD AND RADIATION DO NOT EXCEED THE NATURAL RADIATION.

Z06

Z07

Z03 ENTE COLLAUDO / INSPECTION BODY

TIMBRO DELL'ISPETTORE
STAMP OF THE INSPECTION REPRESENTATIVE

X Witnessed ☐

And found to comply with:

DNV GL Rules

Date: 2019-12-12

Sign: Marco Berni
DNV GL Venice

This document has been digitally signed and will therefore not have handwritten signatures.

Z02

METINVEST TRAMETAL S.p.A.
F. Andrian
CQ Manager

Certificazione valida per materiale fornitoVi con ns. DDT nr. C1000590 del 20/04/2021 relativo a:

PZ. 2 PART. SAGOMATO A DISEGNO: P01 SP. 15mm
PZ. 2 PART. SAGOMATO A DISEGNO: P02 SP. 15mm
PZ. 6 PART. SAGOMATO A DISEGNO: P05 SP. 15mm
RIF. VS. ORD. EMAIL DEL 13/04/2021
RIF. VS. COMM. URGENTE

TONELLO S.p.A.
CONTROLLO QUALITA'
PER
COPIA CONFORME
CENTRO LAVORAZIONE LAMIERE

# 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: 2021-02-19

Numero certificato/Cert no: EC26329874 rev. 0

| | | | |
|---|---|---|---|
| Nostro ordine/Our order: | 0100206249 | Vostro ordine/Your order: | 263/2021 |
| Nostro riferimento/Our ref: | HYBRIS PRD account | Vostro riferimento/Your ref: | |
| Codice Cliente/Cust no: | ITB01537 | Vostro numero fax/Your fax | |
| Data ordine Cliente/Your date: | 20210217 | Vostra e-mail/Your e-mail: | |

Indirizzo di fatturazione/Invoice address
ALLOYS ITALIA SRL
.
VIA DEGLI SCHIAVETTI 9 - ZONA IND.
34074 MONFALCONE
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
ALLOYS ITALIA SRL
VIA DEGLI SCHIAVETTI 9 - ZONA IND.
34074 MONFALCONE GO
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PVV01022033B Quantità/Quantity: 1098 KGM

## PRODOTTO/PRODUCT

Marchio/Brand: ESAB
Descrizione/Desc: OK AristoRod 12.50 1.2mm 18kg
Codice/Item no: **1A50126910**

## CLASSIFICAZIONE/CLASSIFICATIONS

EN ISO 14341-A: G 3Si1
EN ISO 14341-A: G 38 3 C1 3Si1
EN ISO 14341-A: G 42 4 M20 3Si1
EN ISO 14341-A: G 42 4 M21 3Si1
SFA/AWS A5.18: ER70S-6
CSA W48: B-G 49A 3 C1 S6
JIS Z 3312: YGW 12 (C1)

## COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

**Valori reali/Actual results: in accordo a/acc to E 3.1**

Wire/strip

Altro/Auxiliary:

| | | |
|---|---|---|
| C | | 0.08% |
| Si | | 0.83% |
| Mn | | 1.47% |
| P | | 0.007% |
| S | | 0.012% |
| Cr | | 0.02% |
| Ni | | 0.01% |
| Mo | < | 0.01% |
| Cu | | 0.05% |
| V | < | 0.01% |
| Al | | 0.007% |
| Ti+Zr | | 0.01% |

## CARATTERISTICHE MECCANICHE/MECH PROPS

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

Norma/Standard: EN
Altro/Auxiliary: M21
Condizione/Condition:

TRAZIONE/TENSILE

| ReL | Rm | A4-A5 |
|---|---|---|
| 470 MPa | 560 MPa | 26 % |

RESILIENZA/IMPACT

| Temp | -30 °C | -40 °C | -50 °C |
|---|---|---|---|
| KV | 100 J | 90 J | 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 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,

# WELDING PROCEDURE QUALIFICATION RECORD (WPQR)

## LEVEL 2

N. 21TO00308PW\6A

Manufacturer **CONCRANE S.r.l. - TRIESTE (TS)**

WPQR No. **CCP13 Rev.01 dated 15/07/2021** Dated **21/06/2021**

Manufacturer's welding procedure (WPS) No. **p-CCP13** Dated **17/05/2021**

**RANGE OF QUALIFICATION**

| | | | |
|---|---|---|---|
| Welding process | **135** | Type | **Partly mechanized** |
| Joint type | **Plates and Pipes and build-up FW** | | |
| Single/Multiple pass | **Multiple** | (**Hardness properties apply**) | |
| Parent material group(s) | **1-1** | ISO/TR 15608; ISO/TR20172; ISO/TR 20173; ISO/TR20174 with a specified minimum yield strength 275 < ReH ≤ 360 Mpa | |
| Parent material thickness (mm) | Butt Joint = **N.A.** | Fillet Joint $t_1$ = **3 to 48** | $t_2$ = **3 to 48** |
| Throat thickness (mm) | **No restriction** | | |
| Weld deposit thickness (mm) | **N.A.** | | |
| Outside pipe diameter (mm) | **Over 150 (PA, PB, PC rotated positions); Over 500 (Other qualified positions)** | | |
| Filler metal make | **N.A.** | Nr. of wires for process 12: **None** | |
| Flux make | **N.A.** | Flux Designation: **N.A.** | |
| Filler metal designation | **Solid wire EN ISO 14341-A G42 4M21 3Si1** | | |
| Shielding gas (ISO 14175) | **M21 with $CO_2$% min.14,4 max.21,6** | Backing gas (ISO 14175) | **None** |
| Type of welding current | **DCEP** | Kj/cm **Min 8,7** | |
| Welding position | **PB** | Transfer Mode **Spray, Pulse and Globular transfer** | |
| Preheat min. (°C) | +20 (if ISO/TR 17671-2 requirements are fulfilled) | Interpass temp. Max. (°C) | - |
| Interpass temp. Max. (°C) | +250 | Postheat min. (°C) - | Time (minutes) - |
| Post weld heat treatment / Ageing | **None** | Time (minutes) - | |
| Other information | **None** | | |

| | | | |
|---|---|---|---|
| Welder's/Operator's name | **Radasanu Georgetin Ionut** | Stamp No. | **RG** |
| Welding test conducted by | **CONCRANE S.r.l. - Trieste (TS)** | | |
| Mechanical test conducted by | **Metal Services Srl - R. d. Legionari (GO)** | Laboratory test No. | **21.0384 Rev.1** |
| At presence of RINA Surveyor | **F. Sedran** | | |

We confirm that statements in this record are correct and that the test welds were prepared, welded and tested and have fulfilled the requirements in accordance with **UNI EN ISO 15614-1: 2019** Standard.

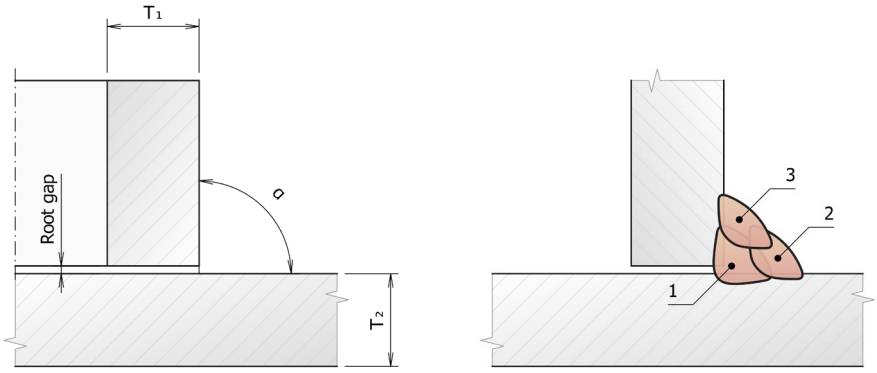
Issued at: Genova on 15 July 2021

RINA Services S.p.A.
PED No. Bo. 0474

**Certificate No. 21TO00308PW\6A**

**RECORD OF WELD TEST**

| JOINT DETAILS AND WELDING SEQUENCES<br>PLATE TO PLATE T FILLET WELD FROM ONE SIDE CLOSE SQUARE - ml | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Pass No. | Process | Filler metal diam. (mm) | Amps | Volt | Type of Current/ Polarity | Travel speed (cm/min) | Heat input (kJ/cm) | Metal Transfer mode | Other |
| 1 | **135** | 1,2 | 275 | 28,1 | **DCEP** | 26,3 | 14,1 | **Spray Arc** | - |
| 2 | **135** | 1,2 | 276 | 28,1 | **DCEP** | 32,1 | 11,6 | **Spray Arc** | - |
| 3 | **135** | 1,2 | 271 | 28,3 | **DCEP** | 28,8 | 12,8 | **Spray Arc** | - |




**PARENT MATERIAL**

| | | | |
|---|---|---|---|
| Material specification | **EN 10028-3** | | |
| Type or grade | **P355NH** | | |
| Group(s)/Subgroup(s) No. (ISO/TR 15608; ISO/TR20172; ISO/TR 20173; ISO/TR20174) | | | **1.2** |
| Thickness (mm) | **24 to 24** | Throat thickness (mm) | **9,5** |
| Diameter (mm) | **N.A.** | | |
| Branch connection angle | **N.A.** | | |
| Other | **-** | | |

**WELDING CONSUMABLES**

| | |
|---|---|
| Process | **135S** |
| Trade name(s) | **ESAB OK AristoRod 12.50** |
| Specification | **EN ISO 14341-A** |
| Classification / designation | **G42 4 M21 3Si1** |
| Size (mm) | **1,2** |
| Deposited metal thickness | **N.A.** |
| Groove | **N.A.** |
| Throat | **9,5 mm** |
| Flux trade name | **N.A.** |
| Consumable insert | **N.A.** |
| Other | **-** |

**GAS**

| | Gas | Mixture | Flow rate (l/min.) |
|---|---|---|---|
| Shielding | | **Ar 82% + $CO_2$ 18%** | **18** |
| Trailing | | | |
| Backing | | | |

**POSITION**

Welding position **PB**

Other **-**

**PREHEAT**

Preheat temperature **+20°C**

Interpass temperature **+250°C**

Postheat temperature **None** Time **-**

**POSTWELD HEAT TREATMENT**

Temperature **None** Time -

Method **-**

Other **-**

**ELECTRICAL CHARACTERISTICS**

Current **DCEP**

Ampere (range) **See table** Volts (Range) **See table**

Mode of metal transfer **S (Spray Transfer)**

Tungsten electrode size and type **N.A.**

Pulse welding details **N.A.**

Plasmawelding details **N.A.**

Waveform controlled welding machine - Waveform control mode **-**

Power source - Welding mode Pulse □ Non pulse ☑

Other **-**

**TECHNIQUE**

Travel speed (range) **See table**

String or weave bead **String** Maximum width of run **None**

Oscillation (*) **None** (Amplitude/Frequency/Dwell time)

Method of groove/edge preparation **Flame cutting and Machining**

Interpass cleaning **Grinding/Brushing**

Method of back gouging **N.A.**

Orifice or gas cup size **16**

Distance contact tube/worpiece (*) **15-20 mm**

Multiple or single pass **Multiple**

Multiple or single electrodes **Single**

Torch angle (*) **N.A.**

Other (*) for fully mechanized/robotic only

| HARDNESS TEST | | |
|---|---|---|
| Location | Type/load | Maximum value |
| Parent metal(s) | **HV10** | **167** |
| H.A.Z.(s) | **HV10** | **376** |
| Weld metal | **HV10** | **228** |

**OTHER TEST**

| | |
|---|---|
| MACROGRAPHIC EXAMINATION | **Acceptable** |
| MICROGRAPHIC EXAMINATION | **Not required** |

**NON DESTRUCTIVE EXAMINATION**

| | |
|---|---|
| VISUAL EXAMINATION | **Acceptable** |
| RADIOGRAPHIC EXAMINATION | **Not required** |
| PENETRANT TEST | **Not required** |
| MAGNETIC PARTICLE | **Acceptable** |
| ULTRASONIC TEST | **Not required** |

Issued at: Genova on 15 July 2021

RINA Services S.p.A.
PED No. Bo. 0474

METAL SERVICES
MATERIALS TESTING

# TEST REPORT No. 21.0384 Rev.1

**ISSUED ON 21/06/2021**

**This document replace the test report no. 21.0384 Rev.0**

Customer

**CONCRANE S.r.l.**

Via Caboto, 26

34147 Trieste (TS)

## INFORMATION

The present test report cannot be modified and cannot be reproduced in a partial way without the formal written approval of Metal Services Materials Testing Srl.
Test results are only related to the supplied tested samples; the remains of them will be stored and available for not more than 30 days after the test report issuing date, unless differently agreed on the purchase order.
Equipment used are to be intended under metrological validity.
The uncertainty of measurement is expressed as expanded uncertainty obtained by multiplying the combined uncertainty for the coverage factor of k = 2, corresponding to a confidence interval of about 95%.
(+) Supervised test by 3rd part inspector.

## MATERIAL RECEPTION

| Date | Delivery note no. | Offer no. | Order no. |
|---|---|---|---|
| 28/05/2021 | 21050 | | - |

**Sampling data**

Sampling and identification executed by the Customer

## MATERIAL DESCRIPTION

| Sample no. | Identification mark |
|---|---|
| 1239 | Sample identified as "pWPS CCP13 – FW plate thk. 24 mm – material DNV-GL EH36/RINA DH36 – welding process GMAW – position 2F – welding consumable ESAB OK AristoRod 12.50 Ø 1.2 mm – AWS A5.18 ER 70S-6 – shielding gas EN ISO 14175 M21 82%Ar + 18% CO2 18/24 l/min" |

## TEST INDEX


| Section no. | Test | Page |
|---|---|---|
| 1 | Visual examination (UNI EN ISO 17637:2017) | 2 |
| 2 | Magnetoscopic examination (UNI EN ISO 17638:2016 – ASTM E709 – API 2X) | 2 |
| 3 | Fracture test (UNI EN ISO 9017:2018) | 3 |
| 4 | Macrographic examination (UNI EN ISO 17639:2013) | 3 |
| 5 | Hardness test on welded joints (UNI EN ISO 9015-1:2011) | 4 |
| - | Other reference documents (08833.ENG.MME.SDS Rev.07) | - |


## NOTE

This document replaces the test report no. 21.0384 Rev.0 and it has been issued in order to integrate data of the field "Material description".
//

## RESERVED FOR DIGITAL SIGNATURE

Firmato digitalmente da:
PELLEGRIN LORENZO
Firmato il 21/06/2021 11:14
Seriale Certificato: 21401746878628221003275909547213633194
Valido dal 01/10/2020 al 01/10/2023
ArubaPEC S.p.A. NG CA 3

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# TEST REPORT No. 21.0384 Rev.1

**ISSUED ON 21/06/2021**

**This document replace the test report no. 21.0384 Rev.0**

## 1. VISUAL EXAMINATION

### TEST CONDITIONS

| Equipment | Visual conditions | Surface conditions | Working step |
|---|---|---|---|
| Weld Gauge, Lamp | Min. 1000 lux on tested surface | As welded | Welds completed |
| **Test method** | **Acceptance criteria** | **Procedure of examination** | **Reference drawing** |
| UNI EN ISO 17638:2016 – ASTM E709 – API 2X | UNI EN ISO 5817:2014 - 08833.ENG.MME.SDS Rev.07 | - | CCP13 |
| **Heat Treatment** | **Extention of the examination** | **-** | **-** |
| - | 100% | - | - |

### RESULTS

| Sample no. | Data | Position | Result of inspection |
|---|---|---|---|
| 1239 | 31/05/2021 | - | *Imperfections exceeding the acceptance criteria and their location*: No recordable indications. |

**Record of indications detected**

| *Weld Id.* | *Indication no.* | *Start from* | *Probe*[1] | *Length* | *Depth*[1] | *Probable type of defect* |
|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - |

Glossary: //

Note 1: Only for UT examination

## 2. MAGNETIC PARTICLES TESTING

### TEST CONDITIONS

| Equipment | Visual conditions | Surface conditions | Working step |
|---|---|---|---|
| Deltaflux DF Y/A S/N 140514 | Min. 500 lux on tested surface | Welded | As finished |
| **Contrast paint** | **Type of magnetic particles** | **Magnetic particles** | **Type of current** |
| ProNdt 183 | Wet - visible | ProNdt 181 | AC |
| **Test method** | **Acceptance criteria** | **Procedure of examination** | **Reference drawing** |
| UNI EN ISO 17640:2018 – API RP 2X | UNI EN ISO 23278:2015 Lev.1 - 08833.ENG.MME.SDS Rev.07 | - | CCP13 |
| **Heat Treatment** | **Extension of the examination** | **Demagnetization** | **Lifting power** |
| Not declared | 100% | Not required | 5 Kg |

### RESULTS

| Sample no. | Data | Position | Result of inspection |
|---|---|---|---|
| 1239 | 31/05/2021 | - | *Imperfections exceeding the acceptance criteria and their location*: No recordable indications. |

**Record of indications detected**

| *Weld Id.* | *Indication no.* | *Start from* | *Probe*[1] | *Length* | *Depth*[1] | *Probable type of defect* |
|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - |

Glossary: //

Note 1: Only for UT examination

## 3. FRACTURE TEST

| Sample no. | Date | Results |
|---|---|---|
| 1239 | 29/01/2021 | No recordable indications |

Instruments: Caliper Sama 18148032.

Glossary: N.R.I.; no recordable indications.

Note: //

### NOTE

//

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# TEST REPORT No. 21.0384 Rev.1

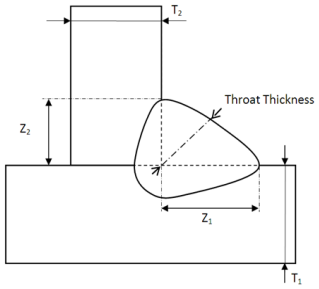
**ISSUED ON 21/06/2021**

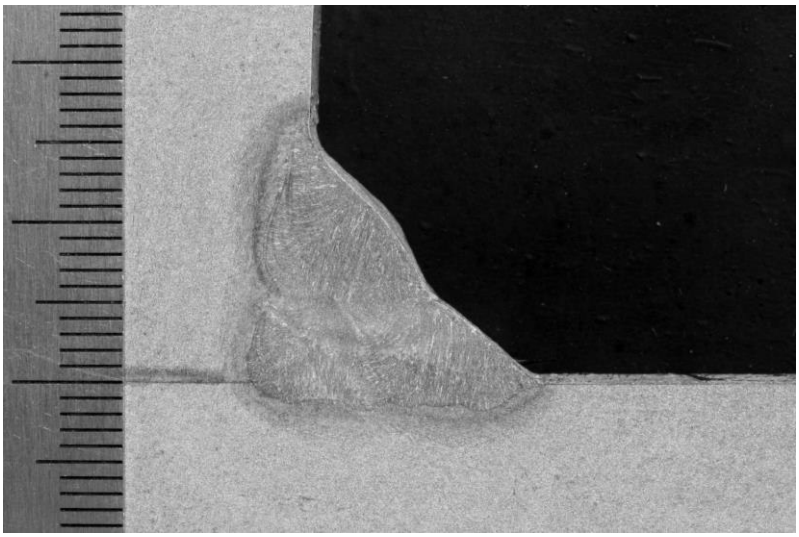
**This document replace the test report no. 21.0384 Rev.0**

## 4. MACROGRAPHIC EXAMINATION

| | |
|---|---|
| **Sample no** | 1239 Macro #1 |
| **Date** | 03/06/2021 |
| **Position** | T to weld |
| **Etching** | HNO3 10% |
| **$T_1$** | 24 mm |
| **$T_2$** | 24 mm |
| **$Z_1$** | 14.9 mm |
| **$Z_2$** | 16.6 mm |
| **Throat Thickness** | 9.5 mm |

**Sketch**



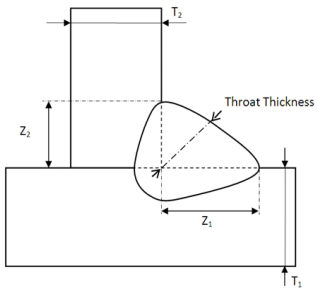
**Imperfection**

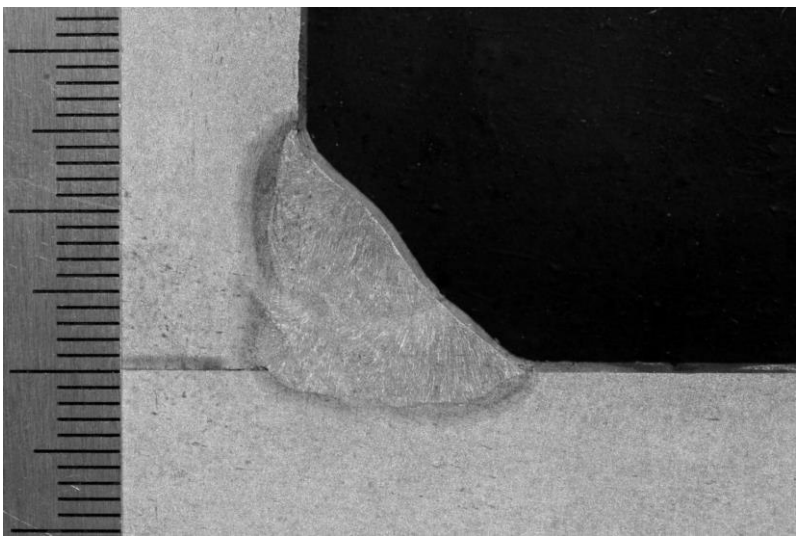
No recordable indications

Instruments: Wild stereomicroscope (serial no.386471309)
Glossary: //
Note: //

| | |
|---|---|
| **Sample no** | 1239 Macro #2 |
| **Date** | 03/06/2021 |
| **Position** | T to weld |
| **Etching** | HNO3 10% |
| **$T_1$** | 24 mm |
| **$T_2$** | 24 mm |
| **$Z_1$** | 14.9 mm |
| **$Z_2$** | 15.4 mm |
| **Throat Thickness** | 9.8 mm |

**Sketch**



**Imperfection**

No recordable indications

Instruments: Wild stereomicroscope (serial no.386471309)
Glossary: //
Note: //

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# TEST REPORT No. 21.0384 Rev.1

**ISSUED ON 21/06/2021**

**This document replace the test report no. 21.0384 Rev.0**

## 5. HARDNESS TEST ON ARC WELDED JOINTS

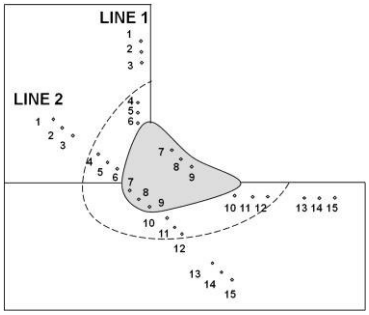
| Sample no. | Date | Type of test | Indentation | Position | Line 1 (HV) | Line 2 (HV) | Line 3 (HV) |
|---|---|---|---|---|---|---|---|
| 1239 Macro #1 | 03/06/2021 | HV10 | 1 | BM | 160 | 153 | - |
| | | | 2 | BM | 156 | 155 | - |
| | | | 3 | BM | 168 | 152 | - |
| | | | 4 | HAZ | 235 | 211 | - |
| | | | 5 | HAZ | 376 | 266 | - |
| | | | 6 | HAZ | 375 | 282 | - |
| | | | 7 | WM | 221 | 228 | - |
| | | | 8 | WM | 224 | 221 | - |
| | | | 9 | WM | 223 | 226 | - |
| | | | 10 | HAZ | 372 | 278 | - |
| | | | 11 | HAZ | 270 | 209 | - |
| | | | 12 | HAZ | 206 | 183 | - |
| | | | 13 | BM | 161 | 157 | - |
| | | | 14 | BM | 167 | 156 | - |
| | | | 15 | BM | 156 | 160 | - |

Instruments: QNESS Q150+ (serial no. Q1294/02/18)

Glossary: //

Note: //

**INDENTATION POSITION**




**NOTE**

//

**INSPECTOR NOTES(+)**

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

METAL SERVICES
MATERIALS TESTING

# TEST REPORT No. 21.0385 Rev.1

**ISSUED ON 21/06/2021**

**This document replace the test report no. 21.0385 Rev.0**

Customer

**CONCRANE S.r.l.**

Via Caboto, 26

34147 Trieste (TS)

## INFORMATION

The present test report cannot be modified and cannot be reproduced in a partial way without the formal written approval of Metal Services Materials Testing Srl.
Test results are only related to the supplied tested samples; the remains of them will be stored and available for not more than 30 days after the test report issuing date, unless differently agreed on the purchase order.
Equipment used are to be intended under metrological validity.
The uncertainty of measurement is expressed as expanded uncertainty obtained by multiplying the combined uncertainty for the coverage factor of k = 2, corresponding to a confidence interval of about 95%.
(+) Supervised test by 3rd part inspector.

## MATERIAL RECEPTION

| Date | Delivery note no. | Offer no. | Order no. |
|---|---|---|---|
| 28/05/2021 | 21050 | | - |

**Sampling data**

Sampling and identification executed by the Customer

## MATERIAL DESCRIPTION

| Sample no. | Identification mark |
|---|---|
| 1240 | Sample identified as "pWPS CCP14 – FW plate thk. 15 mm – material EH36 – welding process GMAW – position 2F – welding consumable ESAB OK AristoRod 12.50 Ø 1.2 mm – AWS A5.18 ER 70S-6 – shielding gas EN ISO 14175 M21 82%Ar + 18% CO2 18/24 l/min" |

## TEST INDEX


| Section no. | Test | Page |
|---|---|---|
| 1 | Visual examination (UNI EN ISO 17637:2017) | 2 |
| 2 | Magnetoscopic examination (UNI EN ISO 17638:2016 – ASTM E709 – API 2X) | 2 |
| 3 | Fracture test (UNI EN ISO 9017:2018) | 3 |
| 4 | Macrographic examination (UNI EN ISO 17639:2013) | 3 |
| 5 | Hardness test on welded joints (UNI EN ISO 9015-1:2011) | 4 |
| - | Other reference documents (08833.ENG.MME.SDS Rev.07) | - |


## NOTE

This document replaces the test report no. 21.0385 Rev.0 and it has been issued in order to integrate data of the field "Material description".
//

## RESERVED FOR DIGITAL SIGNATURE

Firmato digitalmente da:
PELLEGRIN LORENZO
Firmato il 21/06/2021 11:14
Seriale Certificato: 21401746878628221003275909547213633194
Valido dal 01/10/2020 al 01/10/2023
ArubaPEC S.p.A. NG CA 3

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

A02

# CERTIFICATO DI CONTROLLO 3.1 / INSPECTION CERTIFICATE 3.1 - EN 10204:2004

A04/A05

**METINVEST**
METINVEST TRAMETAL SPA

(A) PROCESSO DI ELABORAZIONE / STEELMAKING PROCESS: E = ELECTRIC ; BO = BASIC OXYGEN
(B) STATO DI FORNITURA / DELIVERY CONDITION: AR = GREZZO DI LAMINAZIONE / AS ROLLED ;
N* = LAMINAZIONE A TEMPERATURA CONTROLLATA / NORMALIZING ROLLING ;
N = NORMALIZZATO / NORMALIZED at 910°C, 1,5 min/mm ; ARIA CALMA / STILL AIR;
R = RICOTTO / ANNEALED;
N+R = NORMALIZZATO + RINVENUTO / NORMALIZED + ANNEALED
(C) TRATTAMENTO TERMICO DEL CAMPIONE / HEAT TREATMENT OF SAMPLE:
N = 910°C, 1,5 min/mm ; ARIA CALMA / STILL AIR
R = 650°C, 1,5 min/mm ; ARIA CALMA / STILL AIR
(D) Ceq_1 = C + Mn/6 ; Ceq_2 = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15 ;
Pcm = C + Si/30 + (Mn + Cu + Cr)/20 + NI/60 + Mo/15 + V/10 + B*5
(1) POSIZIONE / LOCATION: 1 = TESTA / TOP ; 2 = PIEDE / BOTTOM
(2) POSIZIONE / LOCATION: C = CUORE / 1/2 THICKNESS ; P = PELLE / SURFACE ; D = 1/4 SPESSORE / THICKNESS
(3) DIREZIONE / DIRECTION: L = LONGITUDINALE / LONGITUDINAL ; T = TRASVERSALE / TRANSVERSE
(4) FORMA DEL PROVINO / SHAPE OF TEST PIECE: P = PRISMATICO / PRISMATIC ; C = CILINDRICO / CYLINDRICAL
(5) ESITO PROVA DI PIEGA / RESULT: OK = COMPLYING ; NO = NOT COMPLYING

A01


Società per azioni con socio unico soggetta a direzione e coordinamento di Metinvest B.V
Registered office: Via XII Ottobre, 3 - 16121 Genova, Italy
Phone +39 010 5762911 - Fax +39 010 5762990
Works: Via E. Fermi, 44 - 33058 San Giorgio di Nogaro UD, Italy
Phone +39 0431 629989 - Fax +39 0431 629985
Cap. Soc. Euro 300.120.000,00 i.v.
C.F., P.IVA e Iscr. Reg. Imp. GE 05956630965 - REA 437720/GE
http://trametal.metinvestholding.com


A06 Cliente / Customer

**TONELLO S.P.A.**

**VIA D'ORMENT N. 6**
**33042 BUTTRIO**
**UD ITALY**

TONELLO S.p.A.
CONTROLLO QUALITA'
PER
COPIA CONFORME
CENTRO LAVORAZIONE LAMIERE

| A03 N° Certificato / Certificate no. | Z02 Data / Date |
|---|---|
| 377095 | 05/05/2016 |
| **A08 N° Ordine Trametal / Works order** | **A07 N° Ordine cliente / Customer's order** |
| 31601531 | B6000428 |
| DDT | del / date |
| BOL 31607710 | 04/05/2016 |
| Pratica / File no. | |
| del / date | |

B06 Marcatura di prodotto / Marking of the product

LAMIERA/ORDINE/N° INFORNAMENTO/DIMENSIONI/QUALITÀ/MARCHIO DEL PRODUTTORE
PLATE/ORDER/INTERNAL N°/DIMENSIONS/STEEL GRADE/MANUFACTURER'S MARK

B01/B02/B03

| | |
|---|---|
| Prodotto / Product | Lamiere / Hot rolled plates |
| Qualità / Steel grade | SA516GR70MT/LTV |
| Normativa / Specification | ASME |

| B07 ITEM | B07 LAMIERA PLATE | B07 N° INFORN. INTERNAL NUMBER | B09/B11 DIMENSIONI [mm] DIMENSIONS | B12 MASSA TEORICA [t] THEORICAL WEIGHT | B07 LOTTO BATCH NO. | C70 PROCESSO ELAB. (A) STEELMAKING PROCESS | B04 STATO FORNITURA LAMIERA (B) DELIVERY CONDITION | C00 CAMPIONE SAMPLE | B05 TRATT. CAMPIONE (C) HEAT TREATMENT | C00 CAMPIONE PWHT SAMPLE | B05 PWHT BEGINNING TEMPERATURE °C TEMPERATURA INIZIO | HEATING RATE °C/h VELOCITA' RISCALDO | TEMPERATURE TREATMENT °C TEMPERATURA TRATTAMENTO | HOLDING TIME PERMANENZA Min | COOLING RATE °C/h VELOCITA' RAFFREDDAMENTO | END TEMPERATURE °C TEMPERATURA FINE | N° CICLI / CYCLES | C00 CAMPIONE Q+T SAMPLE | B05 Q+T TEMPERATURE (Q) °C TEMPERATURA | HOLDING TIME PERMANENZA (Q) Min | COOLING RAFFREDDAMENTO | TEMPERATURE (T) °C TEMPERATURA | HOLDING TIME PERMANENZA (T) Min | COOLING RAFFREDDAMENTO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~2~~ | ~~1NV0820301A~~ | ~~1260851~~ | ~~60.00X2500X8500~~ | ~~10,01~~ | ~~477019~~ | ~~BO~~ | ~~N~~ | ~~GD930~~ | | | | | | | | | | | | | | | | | |
| 3 | 1NU9741803A | 1260333 | 25.00X2500X6000 | 2,94 | 477041 | BO | N | GD935 | | 16T319 | | | | | | | | | | | | | | | |

**C71/C92 COMPOSIZIONE CHIMICA DI COLATA / HEAT CHEMICAL ANALYSIS**

| B07 | C71 | C72 | C73 | C74 | C75 | C76 | C77 | C78 | C79 | C80 | C81 | C82 | C83 | C84 | C85 | C86 | C87 | C88 | C89 | C90 | C91 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COLATA HEAT | C % | Mn % | Si % | P % | S % | Cu % | Ni % | Cr % | Mo % | Al % | V % | Nb % | Ti % | Sn % | Ca % | N % | B % | H % | Ceq1 % (D) | Ceq2 % (D) | Pcm % (D) |
| Ordine Min 2 | | | | | | | | | | | | | | | | | | | | | |
| Ordine Max 2 | | | | | | | | | | | | 0,050 | | | | | | | | | |
| Ordine Min 3 | | | | | | | | | | | | | | | | | | | | | |
| Ordine Max 3 | | | | | | | | | | | | 0,050 | | | | | | | | | |
| SA51670LTV Min 12.60 - 50.00 | | 0,85 | 0,15 | | | | | | | | | | | | | | | | | | |
| SA51670LTV Max 12.60 - 50.00 | 0,28 | 1,20 | 0,40 | 0,035 | 0,035 | | | | | | | | | | | | | | | | |
| SA51670LTV Min 50.10 - 100.00 | | 0,85 | 0,15 | | | | | | | | | | | | | | | | | | |
| SA51670LTV Max 50.10 - 100.00 | 0,30 | 1,20 | 0,40 | 0,035 | 0,035 | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| 1NU974 | 0,16 | 1,49 | 0,26 | 0,013 | 0,003 | 0,030 | 0,020 | 0,020 | <0.005 | 0,030 | 0,004 | 0,023 | 0,004 | <0.005 | 0,0000 | 0,0080 | 0,0005 | 0,0002 | 0,41 | 0,42 | 0,25 |
| 1NV082 | 0,17 | 1,47 | 0,25 | 0,012 | 0,002 | 0,050 | 0,020 | 0,030 | <0.005 | 0,024 | <0.005 | 0,024 | <0.005 | <0.005 | 0,0000 | 0,0070 | <0.0005 | 0,0003 | 0,42 | 0,43 | 0,26 |

| | | | PROVA DI TRAZIONE TENSILE TEST | | | | | | | | | PROVA DI RESILIENZA IMPACT TEST - CHARPY V-NOTCH TEST | | | | | | PROVA DI PIEGA BEND TEST | | | | PROVA DI DUREZZA HARDNESS TEST | | | | PROVA DI STRIZIONE Z% TEST | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C00 | | C01 | C01 | C02 | C03 | C11 | C12 | | C13 | C14 | C10 | C41 | C02 | C03 | C01 | C42 | C43 | C02 | C51 | C52 | C50 | C01 | C30 | C31 | C32 | C53 | C54 |
| CAMPIONE SAMPLE | SPESSORE LAMIERA PLATE THICKNESS | POSIZIONE (1) LOCATION | POSIZIONE (2) LOCATION | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | ReH [Mpa] YIELD STRENGTH | Rm [Mpa] TENSILE STRENGTH | ReH/Rm | A2" ELONGATION | Rp 0.2 [Mpa] PROOF STRENGTH | FORMA PROVINO (4) SHAPE OF TEST PIECE | LARGHEZZA [mm] WIDTH | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | POSIZIONE (2) LOCATION | INDIVIDUAL VALUES [J] SINGOLI VALORI | MEDIA [J] MEAN VALUE | DIREZIONE (3) ORIENTATION | MANDRINO [mm] MANDREL | ANGOLO [°] ANGLE | ESITO (5) RESULT | POSIZIONE (2) LOCATION | METODO TEST METHOD | SINGOLI VALORI INDIVIDUAL VALUES | MEDIA MEAN VALUE | Z% INDIVIDUAL VALUES Z% SINGOLI VALORI | Z% VALORE MEDIO Z% MEAN VALUE |
| ORDINE Min 2 | | | | | | | | | | | | | | -42 | | 20 | 27 | | | | | | | | | | |
| ORDINE Min 3 | | | | | | | | | | | | | | -42 | | 20 | 27 | | | | | | | | | | |
| SA51670LTV Min 0.00 - 25.00 | | | | | | | | | | | | | L | -46 | | | 20 | | | | | | | | | | |
| SA51670LTV Min 20.10 - 120.00 | | | | | 20 | | 485 | | 17,0 | 260 | | | | | | | | | | | | | | | | | |
| SA51670LTV Max 20.10 - 120.00 | | | | | 20 | | 620 | | | | | | | | | | | | | | | | | | | | |
| SA51670LTV Min 50.10 - 75.00 | | | | | | | | | | | | | L | -35 | | | 20 | | | | | | | | | | |
| ~~GD930~~ | ~~60,00~~ | ~~2~~ | ~~D~~ | ~~T~~ | ~~20~~ | | ~~520~~ | | ~~37,7~~ | ~~379~~ | ~~C~~ | ~~10,00~~ | ~~L~~ | ~~-42~~ | ~~D~~ | ~~194 199 181~~ | ~~191~~ | | | | | | | | | | |
| GD935 | 25,00 | 2 | P | T | 20 | | 525 | | 34,0 | 385 | P | 10,00 | L | -42 | P | 187 183 189 | 186 | | | | | | | | | | |

C10

ASME SA-370 FIG. 3 AND FIG. 10 (FIG. 11 a 10x10mm) - SAMPLE TAKEN AFTER PLATE HEAT TREATMENT

TONELLO S.p.A. CONTROLLO QUALITA' PER COPIA CONFORME CENTRO LAVORAZIONE LAMIERE

**D02-D50 CONTROLLO ULTRASONORO / ULTRASONIC EXAMINATION**

| D02 | D03 | D04 | D05 | D06 | D07 |
|---|---|---|---|---|---|
| APPARECCHIATURA EQUIPMENT | N° SERIE SERIAL NO | CONDIZIONI SUPERFICIALI SURFACE CONDITIONS | ACCOPPIANTE COUPLANT | MODALITÀ OPERATIVE PROCEDURE | TARATURA CALIBRATION |
| GILARDONI RDG450 | RDG450-450-140156TC | GREZZO DI LAMINAZIONE AS ROLLED | ACQUA WATER | IN ACCORDO ALLA SPECIFICA ACCORDING TO SPECIFICATION | IN ACCORDO ALLA SPECIFICA ACCORDING TO SPECIFICATION |

| B07 LAMIERA PLATE | D08 SONDE PROBE | D09 DIAMETRO DIAMETER MM | D10 FREQUENZA FREQUENCE MHZ | D11 ANGOLO Angle ° | D12 NORMA DI RIFERIMENTO STANDARD SPECIFICATION | D13 CLASSE DI ACCETTABILITÀ ACCEPTANCE SPECIFICATIONS | D14 ESITO RESULT | D15 INDICAZIONI INDICATIONS | D16 RETICOLO RETICLE | D17 BORDI EDGES |
|---|---|---|---|---|---|---|---|---|---|---|
| 1NV0820301A | DP25/2 | mm 25 | 2 MHz | 0 | EN 10160 CL. S2 E3 | | OK | NO INDICATIONS FOUND | mm 100x100 | 75 |
| 1NU9741803A | BDD20/2 | mm 20 | 2 MHz | 0 | EN 10160 CL. S2 E3 | | OK | NO INDICATIONS FOUND | mm 100x100 | 50 |

| D18 NOTE REMARKS | D19 ENTE ISPETTIVO INSPECTOR | D20 FIRMA SIGNATURE |
|---|---|---|
| | | METINVEST TRAMETAL S.p.a. F. Andrian III Liv. EN ISO 9712 |

Z01

| ITEM | | TOLLERANZA DI SPESSORE TOLERANCE ON THICKNESS | TOLLERANZE DI LARGHEZZA TOLERANCE ON WIDTH | TOLLERANZE DI LUNGHEZZA TOLERANCE ON LENGTH | CONDIZIONI SUPERFICIALI SURFACE FINISH | PLANARITÀ FLATNESS |
|---|---|---|---|---|---|---|
| 2 | | EN 10029 CL.B | -0+100 MM | -0+200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |
| 3 | | EN 10029 CL.B | -0+100 MM | -0+200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |

CERTIFICHIAMO che le lamiere elencate sono conformi alla prescrizione dell'ordine, che i controlli della marcatura, dell'aspetto superficiale e dimensionale hanno dato esito positivo.
WE CERTIFY that the above mentioned plates are consistent with the order prescriptions: marking, inspection and measurement without objection.
DICHIARIAMO CHE LE LAMIERE SONO STATE CONTROLLATE IN ACCORDO ALLA NORMATIVA VIGENTE E CHE LE RADIAZIONI IONIZZANTI NON ECCEDONO IL VALORE DEL FONDO NATURALE.
WE DECLARE THAT THE PLATES WERE CONTROLLED ACCORDING TO STANDARD AND RADIATION DO NOT EXCEED THE NATURAL RADIATION.

Z06

| Z07 | Z03 ENTE COLLAUDO / INSPECTION BODY | Z02 |
|---|---|---|
| **PRODUCED FROM CONTINOUS CAST SLAB AND HAVE A MINIMUN REDUCTION RATIO OF 3 TO 1. ACCORDING TO ASME II PART A ED. 2013. FULLY KILLED, FINE GRAIN STEEL. Value of Mn maximun in derogation permitted up to 1.50% Plates acc. to PED 97/23/EC** | TIMBRO DELL'ISPETTORE STAMP OF THE INSPECTION REPRESENTATIVE | METINVEST TRAMETAL S.p.a. F. Andrian CQ Manager |

Certificazione valida per materiale fornitoVi con ns. DDT nr. C1000590 del 20/04/2021 relativo a:

PZ. 6 PART. SAGOMATO A DISEGNO: P06 SP. 25mm
PZ. 2 PART. SAGOMATO A DISEGNO: P03 SP. 25mm
PZ. 2 PART. SAGOMATO A DISEGNO: P04 SP. 25mm
RIF. VS. ORD. EMAIL DEL 13/04/2021
RIF. VS. COMM. URGENTE

# 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: 2021-02-19

Numero certificato/Cert no: EC26329874 rev. 0

| | | | |
|---|---|---|---|
| Nostro ordine/Our order: | 0100206249 | Vostro ordine/Your order: | 263/2021 |
| Nostro riferimento/Our ref: | HYBRIS PRD account | Vostro riferimento/Your ref: | |
| Codice Cliente/Cust no: | ITB01537 | Vostro numero fax/Your fax | |
| Data ordine Cliente/Your date: | 20210217 | Vostra e-mail/Your e-mail: | |

Indirizzo di fatturazione/Invoice address
ALLOYS ITALIA SRL
.
VIA DEGLI SCHIAVETTI 9 - ZONA IND.
34074 MONFALCONE
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
ALLOYS ITALIA SRL
VIA DEGLI SCHIAVETTI 9 - ZONA IND.
34074 MONFALCONE GO
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PVV01022033B Quantità/Quantity: 1098 KGM

## PRODOTTO/PRODUCT

Marchio/Brand: ESAB
Descrizione/Desc: OK AristoRod 12.50 1.2mm 18kg
Codice/Item no: **1A50126910**

## CLASSIFICAZIONE/CLASSIFICATIONS

EN ISO 14341-A: G 3Si1
EN ISO 14341-A: G 38 3 C1 3Si1
EN ISO 14341-A: G 42 4 M20 3Si1
EN ISO 14341-A: G 42 4 M21 3Si1
SFA/AWS A5.18: ER70S-6
CSA W48: B-G 49A 3 C1 S6
JIS Z 3312: YGW 12 (C1)

## COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

**Valori reali/Actual results: in accordo a/acc to I 3.1**

Wire/strip

Altro/Auxiliary:

| | | |
|---|---|---|
| C | | 0.08% |
| Si | | 0.83% |
| Mn | | 1.47% |
| P | | 0.007% |
| S | | 0.012% |
| Cr | | 0.02% |
| Ni | | 0.01% |
| Mo | < | 0.01% |
| Cu | | 0.05% |
| V | < | 0.01% |
| Al | | 0.007% |
| Ti+Zr | | 0.01% |

## CARATTERISTICHE MECCANICHE/MECH PROPS

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

Norma/Standard: EN
Altro/Auxiliary: M21
Condizione/Condition:

TRAZIONE/TENSILE

| ReL | Rm | A4-A5 |
|---|---|---|
| 470 MPa | 560 MPa | 26 % |

RESILIENZA/IMPACT

| Temp | -30 °C | -40 °C | -50 °C |
|---|---|---|---|
| KV | 100 J | 90 J | 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 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,

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO
PRD N° 002 B
Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
*Signatory of EA, IAF and ILAC Mutual Recognition Agreements*

# WELDING PROCEDURE QUALIFICATION RECORD (WPQR)

## LEVEL 2

N. 21TO00308PW\7A

Manufacturer **CONCRANE S.r.l. - TRIESTE (TS)**

WPQR No. **CCP14 Rev.01 dared 15/07/2021** Dated **21/06/2021**

Manufacturer's welding procedure (WPS) No. **p-CCP14** Dated **17/05/2021**

**RANGE OF QUALIFICATION**

Welding process **135** Type **Partly mechanized**

Joint type **Plates and Pipes and build-up FW**

Single/Multiple pass **Single** (**Hardness properties apply**)

Parent material group(s) **1-1** ISO/TR 15608; ISO/TR20172; ISO/TR 20173; ISO/TR20174 with a specified minimum yield strength 275 < ReH ≤ 360 Mpa **DH36; AH36; DH32; AH32; D; B; A** according to Pt D, Ch 2, Sec 1 of RINA Rules

Parent material thickness (mm) Butt Joint = **N.A.** Fillet Joint $t_1$ **= 3 to 30** $t_2$ **= 3 to 30**

Throat thickness (mm) **4,1 to 8,3**

Weld deposit thickness (mm) **N.A.**

Outside pipe diameter (mm) **Over 150 (PA, PB, PC rotated positions); Over 500 (Other qualified positions) ***

Filler metal make **N.A.** Nr. of wires for process 12: **None**

Flux make **N.A.** Flux Designation: **N.A.**

Filler metal designation **Solid wire EN ISO 14341-A G42 4M21 3Si1**

Shielding gas (ISO 14175) **M21 with $CO_2$% min.14,4 max.21,6** Backing gas (ISO 14175) **None**

Type of welding current **DCEP** Kj/cm **Min 10,9**

Welding position **PB** Transfer Mode **Spray, Pulse and Globular transfer**

Preheat min. (°C) +20 (if ISO/TR 17671-2 requirements are fulfilled) Interpass temp. Max. (°C) -

Interpass temp. Max. (°C) N.A. Postheat min. (°C) - Time (minutes) -

Post weld heat treatment / Ageing **None** Time (minutes) -

Other information **(*) Over 500 mm, when RINA Rules apply**

Welder's/Operator's name **Radasanu Georgetin Ionut** Stamp No. **RG**

Welding test conducted by **CONCRANE S.r.l. - Trieste (TS)**

Mechanical test conducted by **Metal Services Srl - R. d. Legionari (GO)** Laboratory test No. **21.0385 Rev.1**

At presence of RINA Surveyor **F. Sedran**

We confirm that statements in this record are correct and that the test welds were prepared, welded and tested and have fulfilled the requirements in accordance with **UNI EN ISO 15614-1: 2019** Standard and **RINA Rules for the Classification of Ships** requirements.

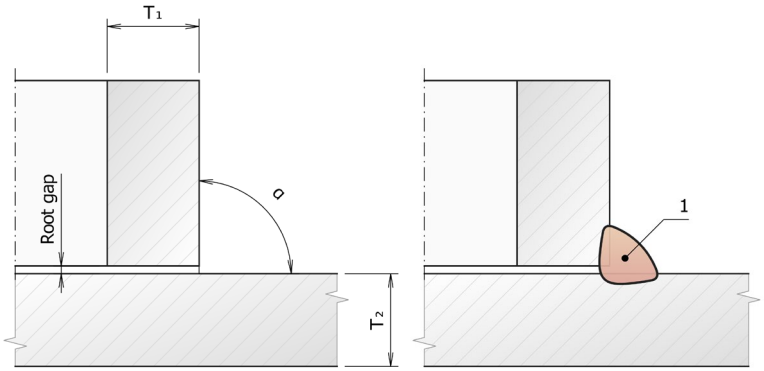
Issued at: Genova on 15 July 2021

RINA Services S.p.A.
PED No. Bo. 0474

**Certificate No. 21TO00308PW\7A**

**RECORD OF WELD TEST**

| JOINT DETAILS AND WELDING SEQUENCES<br>PLATE TO PLATE T FILLET WELD FROM ONE SIDE CLOSE SQUARE - sl | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Pass No. | Process | Filler metal diam. (mm) | Amps | Volt | Type of Current/ Polarity | Travel speed (cm/min) | Heat input (kJ/cm) | Metal Transfer mode | Other |
| 1 | **135** | 1,2 | 276 | 28,3 | **DCEP** | 25,5 | 14,5 | **Spray Arc** | - |




**PARENT MATERIAL**

| | | | |
|---|---|---|---|
| Material specification | **EN 10028-3 (Pt D, Ch 2, Sec 1 of RINA Rules)** | | |
| Type or grade | **P355NH (DH36)** | | |
| Group(s)/Subgroup(s) No. (ISO/TR 15608; ISO/TR20172; ISO/TR 20173; ISO/TR20174) | | | **1.2** |
| Thickness (mm) | **15 to 15** | Throat thickness (mm) | **5,5** |
| Diameter (mm) | **N.A.** | | |
| Branch connection angle | **N.A.** | | |
| Other | **-** | | |

**WELDING CONSUMABLES**

| | |
|---|---|
| Process | **135S** |
| Trade name(s) | **ESAB OK AristoRod 12.50** |
| Specification | **EN ISO 14341-A** |
| Classification / designation | **G42 4 M21 3Si1** |
| Size (mm) | **1,2** |
| Deposited metal thickness | **N.A.** |
| Groove | **N.A.** |
| Throat | **5,5 mm** |
| Flux trade name | **N.A.** |
| Consumable insert | **N.A.** |
| Other | **-** |

**GAS**

| | Gas | Mixture | Flow rate (l/min.) |
|---|---|---|---|
| Shielding | | **Ar 82% + $CO_2$ 18%** | **18** |
| Trailing | | | |
| Backing | | | |

**POSITION**

Welding position **PB**

Other **-**

**PREHEAT**

Preheat temperature **+20°C**

Interpass temperature **N.A.**

Postheat temperature **None** Time **-**

**POSTWELD HEAT TREATMENT**

Temperature **None** Time -

Method **-**

Other **-**

**ELECTRICAL CHARACTERISTICS**

Current **DCEP**

Ampere (range) **See table** Volts (Range) **See table**

Mode of metal transfer **S (Spray Transfer)**

Tungsten electrode size and type **N.A.**

Pulse welding details **N.A.**

Plasmawelding details **N.A.**

Waveform controlled welding machine - Waveform control mode **-**

Power source - Welding mode Pulse □ Non pulse ☑

Other **-**

**TECHNIQUE**

Travel speed (range) **See table**

String or weave bead **String** Maximum width of run **None**

Oscillation (*) **None** (Amplitude/Frequency/Dwell time)

Method of groove/edge preparation **Flame cutting and Machining**

Interpass cleaning **N.A.**

Method of back gouging **N.A.**

Orifice or gas cup size **16**

Distance contact tube/worpiece (*) **15-20 mm**

Multiple or single pass **Single**

Multiple or single electrodes **Single**

Torch angle (*) **N.A.**

Other (*) for fully mechanized/robotic only

| HARDNESS TEST | | |
|---|---|---|
| Location | Type/load | Maximum value |
| Parent metal(s) | **HV10** | **169** |
| H.A.Z.(s) | **HV10** | **259** |
| Weld metal | **HV10** | **222** |

**OTHER TEST**

| | |
|---|---|
| MACROGRAPHIC EXAMINATION | **Acceptable** |
| MICROGRAPHIC EXAMINATION | **Not required** |

**NON DESTRUCTIVE EXAMINATION**

| | |
|---|---|
| VISUAL EXAMINATION | **Acceptable** |
| RADIOGRAPHIC EXAMINATION | **Not required** |
| PENETRANT TEST | **Not required** |
| MAGNETIC PARTICLE | **Acceptable** |
| ULTRASONIC TEST | **Not required** |

Issued at: Genova on 15 July 2021

RINA Services S.p.A.
PED No. Bo. 0474

METAL SERVICES
MATERIALS TESTING

# TEST REPORT No. 21.0385 Rev.1

**ISSUED ON 21/06/2021**

**This document replace the test report no. 21.0385 Rev.0**

Customer

**CONCRANE S.r.l.**

Via Caboto, 26

34147 Trieste (TS)

## INFORMATION

The present test report cannot be modified and cannot be reproduced in a partial way without the formal written approval of Metal Services Materials Testing Srl.
Test results are only related to the supplied tested samples; the remains of them will be stored and available for not more than 30 days after the test report issuing date, unless differently agreed on the purchase order.
Equipment used are to be intended under metrological validity.
The uncertainty of measurement is expressed as expanded uncertainty obtained by multiplying the combined uncertainty for the coverage factor of k = 2, corresponding to a confidence interval of about 95%.
(+) Supervised test by 3rd part inspector.

## MATERIAL RECEPTION

| Date | Delivery note no. | Offer no. | Order no. |
|---|---|---|---|
| 28/05/2021 | 21050 | | - |

**Sampling data**

Sampling and identification executed by the Customer

## MATERIAL DESCRIPTION

| Sample no. | Identification mark |
|---|---|
| 1240 | Sample identified as "pWPS CCP14 – FW plate thk. 15 mm – material EH36 – welding process GMAW – position 2F – welding consumable ESAB OK AristoRod 12.50 Ø 1.2 mm – AWS A5.18 ER 70S-6 – shielding gas EN ISO 14175 M21 82%Ar + 18% CO2 18/24 l/min" |

## TEST INDEX


| Section no. | Test | Page |
|---|---|---|
| 1 | Visual examination (UNI EN ISO 17637:2017) | 2 |
| 2 | Magnetoscopic examination (UNI EN ISO 17638:2016 – ASTM E709 – API 2X) | 2 |
| 3 | Fracture test (UNI EN ISO 9017:2018) | 3 |
| 4 | Macrographic examination (UNI EN ISO 17639:2013) | 3 |
| 5 | Hardness test on welded joints (UNI EN ISO 9015-1:2011) | 4 |
| - | Other reference documents (08833.ENG.MME.SDS Rev.07) | - |


## NOTE

This document replaces the test report no. 21.0385 Rev.0 and it has been issued in order to integrate data of the field "Material description".
//

## RESERVED FOR DIGITAL SIGNATURE

Firmato digitalmente da:
PELLEGRIN LORENZO
Firmato il 21/06/2021 11:14
Seriale Certificato: 21401746878628221003275909547213633194
Valido dal 01/10/2020 al 01/10/2023
ArubaPEC S.p.A. NG CA 3

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# TEST REPORT No. 21.0385 Rev.1

**ISSUED ON 21/06/2021**

**This document replace the test report no. 21.0385 Rev.0**

## 1. VISUAL EXAMINATION

### TEST CONDITIONS

| Equipment | Visual conditions | Surface conditions | Working step |
|---|---|---|---|
| Weld Gauge, Lamp | Min. 1000 lux on tested surface | As welded | Welds completed |
| **Test method** | **Acceptance criteria** | **Procedure of examination** | **Reference drawing** |
| UNI EN ISO 17638:2016 – ASTM E709 – API 2X | UNI EN ISO 5817:2014 - 08833.ENG.MME.SDS Rev.07 | - | CCP14 |
| **Heat Treatment** | **Extention of the examination** | **-** | **-** |
| - | 100% | - | - |

### RESULTS

| Sample no. | Data | Position | Result of inspection |
|---|---|---|---|
| 1240 | 31/05/2021 | - | *Imperfections exceeding the acceptance criteria and their location*: No recordable indications. |

**Record of indications detected**

| *Weld Id.* | *Indication no.* | *Start from* | *Probe*[1] | *Length* | *Depth*[1] | *Probable type of defect* |
|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - |

Glossary: //

Note 1: Only for UT examination

## 2. MAGNETIC PARTICLES TESTING

### TEST CONDITIONS

| Equipment | Visual conditions | Surface conditions | Working step |
|---|---|---|---|
| Deltaflux DF Y/A S/N 140514 | Min. 500 lux on tested surface | Welded | As finished |
| **Contrast paint** | **Type of magnetic particles** | **Magnetic particles** | **Type of current** |
| ProNdt 183 | Wet - visible | ProNdt 181 | AC |
| **Test method** | **Acceptance criteria** | **Procedure of examination** | **Reference drawing** |
| UNI EN ISO 17640:2018 – API RP 2X | UNI EN ISO 23278:2015 Lev.1 - 08833.ENG.MME.SDS Rev.07 | - | CCP14 |
| **Heat Treatment** | **Extension of the examination** | **Demagnetization** | **Lifting power** |
| Not declared | 100% | Not required | 5 Kg |

### RESULTS

| Sample no. | Data | Position | Result of inspection |
|---|---|---|---|
| 1240 | 31/05/2021 | - | *Imperfections exceeding the acceptance criteria and their location*: No recordable indications. |

**Record of indications detected**

| *Weld Id.* | *Indication no.* | *Start from* | *Probe*[1] | *Length* | *Depth*[1] | *Probable type of defect* |
|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - |

Glossary: //

Note 1: Only for UT examination

## 3. FRACTURE TEST

| Sample no. | Date | Results |
|---|---|---|
| 1240 | 29/01/2021 | No recordable indications |

Instruments: Caliper Sama 18148032.

Glossary: N.R.I.; no recordable indications.

Note: //

### NOTE

//

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# TEST REPORT No. 21.0385 Rev.1

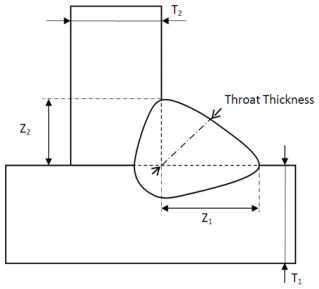
**ISSUED ON 21/06/2021**

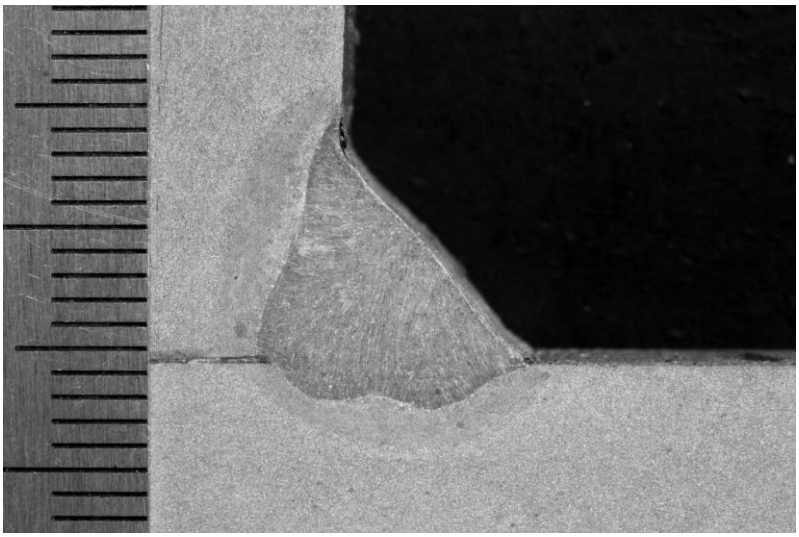
**This document replace the test report no. 21.0385 Rev.0**

## 4. MACROGRAPHIC EXAMINATION

| | |
|---|---|
| **Sample no** | 1240 Macro #1 |
| **Date** | 03/06/2021 |
| **Position** | T to weld |
| **Etching** | HNO3 10% |
| **$T_1$** | 15 mm |
| **$T_2$** | 15 mm |
| **$Z_1$** | 7.9 mm |
| **$Z_2$** | 10.5 mm |
| **Throat Thickness** | 5.5 mm |

**Sketch**



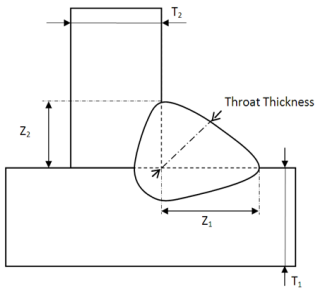
**Imperfection**

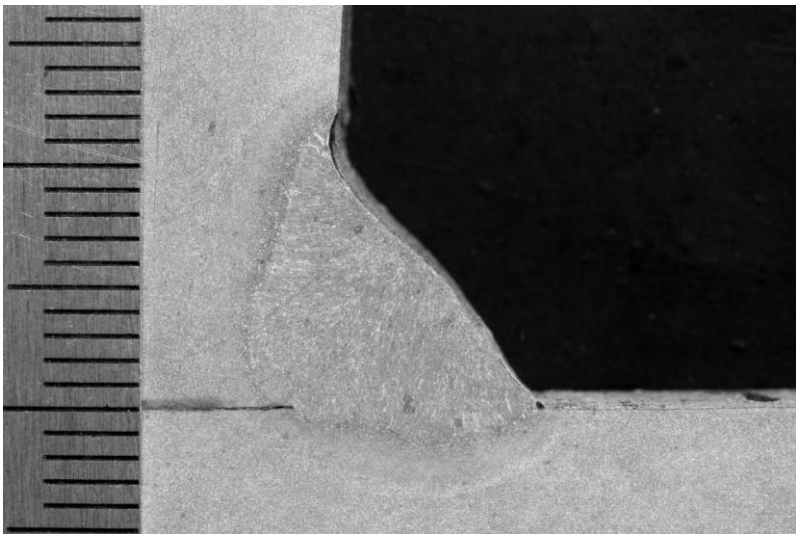
No recordable indications

Instruments: Wild stereomicroscope (serial no.386471309)
Glossary: //
Note: //

| | |
|---|---|
| **Sample no** | 1240 Macro #2 |
| **Date** | 03/06/2021 |
| **Position** | T to weld |
| **Etching** | HNO3 10% |
| **$T_1$** | 15 mm |
| **$T_2$** | 15 mm |
| **$Z_1$** | 8.9 mm |
| **$Z_2$** | 12.5 mm |
| **Throat Thickness** | 6.2 mm |

**Sketch**



**Imperfection**

No recordable indications

Instruments: Wild stereomicroscope (serial no.386471309)
Glossary: //
Note: //

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# TEST REPORT No. 21.0385 Rev.1

**ISSUED ON 21/06/2021**

**This document replace the test report no. 21.0385 Rev.0**

## 5. HARDNESS TEST ON ARC WELDED JOINTS

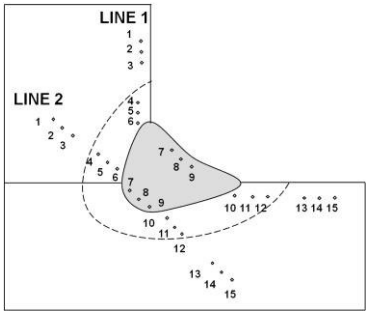
| Sample no. | Date | Type of test | Indentation | Position | Line 1 (HV) | Line 2 (HV) | Line 3 (HV) |
|---|---|---|---|---|---|---|---|
| 1240 Macro #1 | 03/06/2021 | HV10 | 1 | BM | 153 | 151 | - |
| | | | 2 | BM | 153 | 152 | - |
| | | | 3 | BM | 151 | 153 | - |
| | | | 4 | HAZ | 191 | 183 | - |
| | | | 5 | HAZ | 236 | 198 | - |
| | | | 6 | HAZ | 259 | 256 | - |
| | | | 7 | WM | 212 | 203 | - |
| | | | 8 | WM | 218 | 206 | - |
| | | | 9 | WM | 222 | 207 | - |
| | | | 10 | HAZ | 257 | 258 | - |
| | | | 11 | HAZ | 201 | 222 | - |
| | | | 12 | HAZ | 170 | 188 | - |
| | | | 13 | BM | 152 | 159 | - |
| | | | 14 | BM | 152 | 157 | - |
| | | | 15 | BM | 153 | 169 | - |

Instruments: QNESS Q150+ (serial no. Q1294/02/18)

Glossary: //

Note: //

### INDENTATION POSITION




### NOTE

//

### INSPECTOR NOTES(+)

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# CERTIFICATO DI CONTROLLO 3.2 / INSPECTION CERTIFICATE 3.2 - EN 10204:2004


**METINVEST**
METINVEST TRAMETAL SPA

Società per azioni con socio unico soggetta a direzione e coordinamento di Metinvest B.V
Registered office: Via XII Ottobre, 3 - 16121 Genova, Italy
Phone +39 010 5762911 - Fax +39 010 5762990
Works: Via E. Fermi, 44 - 33058 San Giorgio di Nogaro UD, Italy
Phone +39 0431 629989 - Fax +39 0431 629985
Cap. Soc. Euro 300.120.000,00 i.v.
C.F., P.IVA e Iscr. Reg. Imp. GE 05956630965 - REA 437720/GE
http://trametal.metinvestholding.com


(A) PROCESSO DI ELABORAZIONE / STEELMAKING PROCESS: E = ELECTRIC ; BO = BASIC OXYGEN
(B) STATO DI FORNITURA / DELIVERY CONDITION: AR = GREZZO DI LAMINAZIONE / AS ROLLED ;
N* = LAMINAZIONE A TEMPERATURA CONTROLLATA / NORMALIZING ROLLING ;
N = NORMALIZZATO / NORMALIZED at 910°C, 1,5 min/mm ; ARIA CALMA / STILL AIR;
R = RICOTTO / ANNEALED;
N+R = NORMALIZZATO + RINVENUTO / NORMALIZED + TEMPERED
(C) TRATTAMENTO TERMICO DEL CAMPIONE / HEAT TREATMENT OF SAMPLE:
N = 910°C, 1,5 min/mm ; ARIA CALMA / STILL AIR
R = 650°C, 1,5 min/mm ; ARIA CALMA / STILL AIR
(D) Ceq_1 = C + Mn/6 ; Ceq_2 = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15 ;
Pcm = C + Si/30 + (Mn + Cu + Cr)/20 + Nl/60 + Mo/15 + V/10 + B*5
(1) POSIZIONE / LOCATION: 1 = TESTA / TOP ; 2 = PIEDE / BOTTOM
(2) POSIZIONE / LOCATION: C = CUORE / 1/2 THICKNESS ; P = PELLE / SURFACE ; D = 1/4 SPESSORE / THICKNESS
(3) DIREZIONE / DIRECTION: L = LONGITUDINALE / LONGITUDINAL ; T = TRASVERSALE / TRANSVERSE
(4) FORMA DEL PROVINO / SHAPE OF TEST PIECE: P = PRISMATICO / PRISMATIC ; C = CILINDRICO / CYLINDRICAL
(5) ESITO PROVA DI PIEGA / RESULT: OK = COMPLYING ; NO = NOT COMPLYING

A06 Cliente / Customer

**TONELLO S.P.A.**
**VIA D'ORMENT N. 6**
**33042 BUTTRIO 33042 IT**
**UD ITALIA**

| A03 N° Certificato / Certificate no. | Z02 Data / Date |
|---|---|
| 47645 | 12/12/2019 |
| A08 N° Ordine Trametal / Works order | A07 N° Ordine cliente / Customer's order |
| 31904901 | B9001117 |
| DDT | del / date |
| Pratica / File no. | N141X66X |
| del / date | 09/12/2019 |

B06 Marcatura di prodotto / Marking of the product
LAMIERA/ORDINE/N° INFORNAMENTO/DIMENSIONI/QUALITÀ/MARCHIO DEL PRODUTTORE
PLATE/ORDER/INTERNAL N°/DIMENSIONS/STEEL GRADE/MANUFACTURER'S MARK

B01/B02/B03

| | |
|---|---|
| Prodotto / Product | Lamiere / Hot rolled plates |
| Qualità / Steel grade | VL E36 |
| Normativa / Specification | IACS-DNVGL |

| B07 ITEM | B07 LAMIERA PLATE | B07 N° INFORN. INTERNAL NUMBER | B09/B11 DIMENSIONI [mm] DIMENSIONS | B12 MASSA TEORICA [t] THEORICAL WEIGHT | B07 LOTTO BATCH NO. | C70 PROCESSO ELAB. (A) STEELMAKING PROCESS | B04 STATO FORNITURA LAMIERA (B) DELIVERY CONDITION | C00 CAMPIONE SAMPLE | B05 TRATT. CAMPIONE (C) HEAT TREATMENT | C00 CAMPIONE PWHT SAMPLE | B05 PWHT BEGINNING TEMPERATURA INIZIO °C | VELOCITA' RISCALDO C/h | TEMPERATURE TREATMENT TEMPERATURA TRATTAMENTO °C | HOLDING TIME PERMANENZA Min | COOLING RATE VELOCITA' RAFFREDDAMENTO °C/h | END TEMPERATURA FINE °C | N° CICLI / CYCLES | C00 CAMPIONE Q+T SAMPLE | B05 Q+T TEMPERATURE TEMPERATURA (Q) °C | HOLDING TIME PERMANENZA (Q) Min | COOLING RAFFREDDAMENTO | TEMPERATURE TEMPERATURA (T) °C | HOLDING TIME PERMANENZA (T) Min | COOLING RAFFREDDAMENTO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1TAN850407A | 1590166 | 15.00X2450X12000 | 3,46 | 632914 | BO | N | W7849 | | 19T829 | | | | | | | | | | | | | | |
| ~~2~~ | ~~1NAM330204A~~ | ~~1590652~~ | ~~30.00X2450X6300~~ | ~~3,63~~ | ~~632911~~ | ~~BO~~ | ~~N~~ | ~~W7846~~ | | | | | | | | | | | | | | | | |
| ~~3~~ | ~~1NAM960403A~~ | ~~1590606~~ | ~~35.00X2450X7200~~ | ~~4,85~~ | ~~632912~~ | ~~BO~~ | ~~N~~ | ~~W7847~~ | | | | | | | | | | | | | | | | |
| ~~4~~ | ~~1NAM960503A~~ | ~~1590550~~ | ~~50.00X2450X6300~~ | ~~6,06~~ | ~~632913~~ | ~~BO~~ | ~~N~~ | ~~W7848~~ | | | | | | | | | | | | | | | | |
| | Total | 4 | | 18,00 | | | | | | | | | | | | | | | | | | | | |

TONELLO S.p.A.
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CENTRO LAVORAZIONE LAMIERE

## C71/C92 COMPOSIZIONE CHIMICA DI COLATA / HEAT CHEMICAL ANALYSIS

| B07 COLATA HEAT | C71 C % | C72 Mn % | C73 Si % | C74 P % | C75 S % | C76 Cu % | C77 Ni % | C78 Cr % | C79 Mo % | C80 Al % | C81 V % | C82 Nb % | C83 Ti % | C84 Sn % | C85 Ca % | C86 N % | C87 B % | C88 H % | C89 Ceq1 % (D) | C90 Ceq2 % (D) | C91 Pcm % (D) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VL E36 Min 0.00 - 100.00 | | 0,90 | | | | | | | | 0,020 | 0,050 | 0,020 | 0,007 | | | | | | | | |
| VL E36 Max 0.00 - 100.00 | 0,18 | 1,60 | 0,50 | 0,035 | 0,035 | 0,350 | 0,400 | 0,200 | 0,080 | | 0,100 | 0,050 | 0,020 | | | | | | | | |
| 1NAM33 | 0,16 | 1,50 | 0,20 | 0,012 | 0,003 | 0,060 | 0,040 | 0,030 | <0.005 | 0,035 | <0.005 | 0,021 | <0.005 | <0.005 | 0,0000 | 0,0080 | 0,0005 | 0,0002 | 0,41 | 0,42 | 0,25 |
| 1NAM96 | 0,16 | 1,49 | 0,20 | 0,012 | 0,002 | 0,040 | 0,030 | 0,020 | <0.005 | 0,035 | <0.005 | 0,020 | <0.005 | <0.005 | 0,0000 | 0,0070 | <0.0005 | 0,0002 | 0,41 | 0,42 | 0,24 |
| 1TAN85 | 0,16 | 1,51 | 0,22 | 0,008 | 0,002 | 0,030 | 0,020 | 0,030 | <0.005 | 0,037 | <0.005 | <0.010 | <0.005 | <0.005 | 0,0000 | 0,0070 | <0.0005 | 0,0004 | 0,41 | 0,42 | 0,25 |

| | PROVA DI TRAZIONE TENSILE TEST | | | | | | | | | PROVA DI RESILIENZA IMPACT TEST - CHARPY V-NOTCH TEST | | | | | | PROVA DI PIEGA BEND TEST | | | | PROVA DI DUREZZA HARDNESS TEST | | | | PROVA DI STRIZIONE Z% TEST | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C00 | | C01 | C01 | C02 | C03 | C11 | C12 | | C13 | C14 | C10 | C41 | C02 | C03 | C01 | C42 | C43 | C02 | C51 | C52 | C50 | C01 | C30 | C31 | C32 | C53 | C54 |
| CAMPIONE SAMPLE | SPESSORE LAMIERA PLATE THICKNESS | POSIZIONE (1) LOCATION | POSIZIONE (2) LOCATION | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | ReH [Mpa] YIELD STRENGTH | Rm [Mpa] TENSILE STRENGTH | ReH/Rm | A% ELONGATION | Rp 0,2 [Mpa] PROOF/YIELD STRENGTH | FORMA PROVINO (4) SHAPE OF TEST PIECE | LARGHEZZA [mm] WIDTH | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | POSIZIONE (2) LOCATION | SINGOLI VALORI [J] INDIVIDUAL VALUES | MEDIA [J] MEAN VALUE | DIREZIONE (3) ORIENTATION | MANDRINO [mm] MANDREL | ANGOLO [°] ANGLE | ESITO (5) RESULT | POSIZIONE (2) LOCATION | METODO TEST METHOD | SINGOLI VALORI INDIVIDUAL VALUES | MEDIA MEAN VALUE | Z% VALORE MEDIO Z% MEAN VALUE | Z% SINGOLI VALORI Z% INDIVIDUAL VALUES |
| VL E36 Min 0.00 - 100.00 | | | | | 20 | 355 | 490 | | 21,0 | | | | | | | | | | | | | | | | | | |

| | | | PROVA DI TRAZIONE TENSILE TEST | | | | | | | | PROVA DI RESILIENZA IMPACT TEST - CHARPY V-NOTCH TEST | | | | | | PROVA DI PIEGA BEND TEST | | | | PROVA DI DUREZZA HARDNESS TEST | | | | PROVA DI STRIZIONE Z% TEST | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C00 | | C01 | C01 | C02 | C03 | C11 | C12 | | C13 | C14 | C10 | C41 | C02 | C03 | C01 | C42 | C43 | C02 | C51 | C52 | C50 | C01 | C30 | C31 | C32 | C53 | C54 |
| CAMPIONE SAMPLE | SPESSORE LAMIERA PLATE THICKNESS | POSIZIONE (1) LOCATION | POSIZIONE (2) LOCATION | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | ReH [Mpa] YIELD STRENGTH | Rm [Mpa] TENSILE STRENGTH | ReH/Rm | A% ELONGATION | Rp 0.2 [Mpa] PROOF/YIELD STRENGTH | FORMA PROVINO (4) SHAPE OF TEST PIECE | LARGHEZZA [mm] WIDTH | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | POSIZIONE (2) LOCATION | SINGOLI VALORI [J] INDIVIDUAL VALUES | MEDIA [J] MEAN VALUE | DIREZIONE (3) ORIENTATION | MANDRINO [mm] MANDREL | ANGOLO [°] ANGLE | ESITO (5) RESULT | POSIZIONE (2) LOCATION | METODO TEST METHOD | SINGOLI VALORI INDIVIDUAL VALUES | MEDIA MEAN VALUE | Z% SINGOLI VALORI Z% INDIVIDUAL VALUES | Z% VALORE MEDIO Z% MEAN VALUE |
| VL E36 Max 0.00 - 100.00 | | | | | 20 | | 630 | | | | | | | | | | | | | | | | | | | | |
| VL E36 Min 6.00 - 50.00 | | | | | | | | | | | | | L | -40 | | | 34 | | | | | | | | | | |
| ~~W7846~~ | ~~30,00~~ | ~~2~~ | ~~P~~ | ~~T~~ | ~~20~~ | ~~401~~ | ~~522~~ | ~~0,77~~ | ~~32,7~~ | | ~~P~~ | ~~10,00~~ | ~~L~~ | ~~-40~~ | ~~P~~ | ~~233 250 254~~ | ~~246~~ | | | | | | | | | | |
| ~~W7847~~ | ~~35,00~~ | ~~2~~ | ~~P~~ | ~~T~~ | ~~20~~ | ~~380~~ | ~~511~~ | ~~0,74~~ | ~~32,3~~ | | ~~P~~ | ~~10,00~~ | ~~L~~ | ~~-40~~ | ~~P~~ | ~~284 291 276~~ | ~~284~~ | | | | | | | | | | |
| ~~W7848~~ | ~~50,00~~ | ~~2~~ | ~~P~~ | ~~T~~ | ~~20~~ | ~~378~~ | ~~528~~ | ~~0,72~~ | ~~30,0~~ | | ~~P~~ | ~~10,00~~ | ~~L~~ | ~~-40~~ | ~~P~~ | ~~206 185 187~~ | ~~193~~ | | | | | | | | | | |
| W7849 | 15,00 | 2 | P | T | 20 | 413 | 513 | 0,81 | 31,8 | | P | 10,00 | L | -40 | P | 271 243 263 | 259 | | | | | | | | | | |

C10

UNI EN ISO 6892-1:2016 / UNI EN ISO 148-1:2016

Z01

| ITEM | | TOLLERANZA DI SPESSORE TOLERANCE ON THICKNESS | TOLLERANZE DI LARGHEZZA TOLERANCE ON WIDTH | TOLLERANZE DI LUNGHEZZA TOLERANCE ON LENGTH | CONDIZIONI SUPERFICIALI SURFACE FINISH | PLANARITÀ FLATNESS |
|---|---|---|---|---|---|---|
| 1 | | EN 10029 CL.B | -0+100 MM | -0+200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |
| 2 | | EN 10029 CL.B | -0+100 MM | -0+200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |
| 3 | | EN 10029 CL.B | -0+100 MM | -0+200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |
| 4 | | EN 10029 CL.B | -0+100 MM | -0+200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |

CERTIFICHIAMO che le lamiere elencate sono conformi alla prescrizione dell'ordine, che i controlli della marcatura, dell'aspetto superficiale e dimensionale hanno dato esito positivo.
WE CERTIFY that the above mentioned plates are consistent with the order prescriptions: marking, inspection and measurement without objection.
DICHIARIAMO CHE LE LAMIERE SONO STATE CONTROLLATE IN ACCORDO ALLA NORMATIVA VIGENTE E CHE LE RADIAZIONI IONIZZANTI NON ECCEDONO IL VALORE DEL FONDO NATURALE.
WE DECLARE THAT THE PLATES WERE CONTROLLED ACCORDING TO STANDARD AND RADIATION DO NOT EXCEED THE NATURAL RADIATION.

Z06

Z07

Z03 ENTE COLLAUDO / INSPECTION BODY

TIMBRO DELL'ISPETTORE
STAMP OF THE INSPECTION REPRESENTATIVE

X Witnessed ☐

And found to comply with:

DNV GL Rules

Date: 2019-12-12

Sign: Marco Berni
DNV GL Venice

This document has been digitally signed and will therefore not have handwritten signatures.

Z02

METINVEST TRAMETAL S.p.A.
F. Andrian
CQ Manager

Certificazione valida per materiale fornitoVi con ns. DDT nr. C1000590 del 20/04/2021 relativo a:

PZ. 2 PART. SAGOMATO A DISEGNO: P01 SP. 15mm
PZ. 2 PART. SAGOMATO A DISEGNO: P02 SP. 15mm
PZ. 6 PART. SAGOMATO A DISEGNO: P05 SP. 15mm
RIF. VS. ORD. EMAIL DEL 13/04/2021
RIF. VS. COMM. URGENTE

TONELLO S.p.A.
CONTROLLO QUALITA'
PER
COPIA CONFORME
CENTRO LAVORAZIONE LAMIERE

# 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: 2021-02-19

Numero certificato/Cert no: EC26329874 rev. 0

| | | | |
|---|---|---|---|
| Nostro ordine/Our order: | 0100206249 | Vostro ordine/Your order: | 263/2021 |
| Nostro riferimento/Our ref: | HYBRIS PRD account | Vostro riferimento/Your ref: | |
| Codice Cliente/Cust no: | ITB01537 | Vostro numero fax/Your fax | |
| Data ordine Cliente/Your date: | 20210217 | Vostra e-mail/Your e-mail: | |

Indirizzo di fatturazione/Invoice address
ALLOYS ITALIA SRL
.
VIA DEGLI SCHIAVETTI 9 - ZONA IND.
34074 MONFALCONE
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
ALLOYS ITALIA SRL
VIA DEGLI SCHIAVETTI 9 - ZONA IND.
34074 MONFALCONE GO
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PVV01022033B Quantità/Quantity: 1098 KGM

## PRODOTTO/PRODUCT

Marchio/Brand: ESAB
Descrizione/Desc: OK AristoRod 12.50 1.2mm 18kg
Codice/Item no: **1A50126910**

## CLASSIFICAZIONE/CLASSIFICATIONS

EN ISO 14341-A: G 3Si1
EN ISO 14341-A: G 38 3 C1 3Si1
EN ISO 14341-A: G 42 4 M20 3Si1
EN ISO 14341-A: G 42 4 M21 3Si1
SFA/AWS A5.18: ER70S-6
CSA W48: B-G 49A 3 C1 S6
JIS Z 3312: YGW 12 (C1)

## COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

**Valori reali/Actual results: in accordo a/acc to E 3.1**

Wire/strip

Altro/Auxiliary:

| | | |
|---|---|---|
| C | | 0.08% |
| Si | | 0.83% |
| Mn | | 1.47% |
| P | | 0.007% |
| S | | 0.012% |
| Cr | | 0.02% |
| Ni | | 0.01% |
| Mo | < | 0.01% |
| Cu | | 0.05% |
| V | < | 0.01% |
| Al | | 0.007% |
| Ti+Zr | | 0.01% |

## CARATTERISTICHE MECCANICHE/MECH PROPS

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

Norma/Standard: EN
Altro/Auxiliary: M21
Condizione/Condition:

TRAZIONE/TENSILE

| ReL | Rm | A4-A5 |
|---|---|---|
| 470 MPa | 560 MPa | 26 % |

RESILIENZA/IMPACT

| Temp | -30 °C | -40 °C | -50 °C |
|---|---|---|---|
| KV | 100 J | 90 J | 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 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,

# WELDING PROCEDURE QUALIFICATION RECORD (WPQR)

## LEVEL 2

N. 21TO00308PW\2A

Manufacturer **CONCRANE S.r.l. - TRIESTE (TS)**

WPQR No. **CCP09 Rev.01 dated 15/07/2021** Dated **21/06/2021**

Manufacturer's welding procedure (WPS) No. **p-CCP09** Dated **17/05/2021**

**RANGE OF QUALIFICATION**

| | | | |
|---|---|---|---|
| Welding process | **135** | Type | **Partly mechanized** |
| Joint type | **Plates and Pipes and build-up BW ssnb-ssmb-bs/FW** | | |
| Single/Multiple pass | **Multiple** | (**Impact and Hardness properties apply**) | |
| Parent material group(s) | **1-1** | ISO/TR 15608; ISO/TR20172; ISO/TR 20173; ISO/TR20174 with a specified minimum yield strength 275 < ReH ≤ 360 Mpa | |
| Parent material thickness (mm) | Butt Joint = **12 to 48** | Fillet Joint $t_1$ = **3 to 48** | $t_2$ = **3 to 48** |
| Throat thickness (mm) | **No restriction** | | |
| Weld deposit thickness (mm) | **Max 48 mm** | | |
| Outside pipe diameter (mm) | **Over 150 (PA, PB, PC rotated positions); Over 500 (Other qualified positions)** | | |
| Filler metal make | **N.A.** | Nr. of wires for process 12: **None** | |
| Flux make | **N.A.** | Flux Designation: **N.A.** | |
| Filler metal designation | **Solid wire EN ISO 14341-A G42 4M21 3Si1** | | |
| Shielding gas (ISO 14175) | **M21 with $CO_2$% min.14,4 max.21,6** | Backing gas (ISO 14175) | **None** |
| Type of welding current | **DCEP** | Kj/cm **min 7,2 ; max 15,5** | |
| Welding position | **PC** | Transfer Mode **First pass: Short Arc; Other Passes: Spray, Pulse and Globular transfer** | |
| Preheat min. (°C) | +20 (if ISO/TR 17671-2 requirements are fulfilled) | Interpass temp. Max. (°C) | - |
| Interpass temp. Max. (°C) | +250 | Postheat min. (°C) - | Time (minutes) - |
| Post weld heat treatment / Ageing | **None** | Time (minutes) - | |
| Other information | **None** | | |

| | | | |
|---|---|---|---|
| Welder's/Operator's name | **Radasanu Georgetin Ionut** | Stamp No. | **RG** |
| Welding test conducted by | **CONCRANE S.r.l. - Trieste (TS)** | | |
| Mechanical test conducted by | **Metal Services Srl - R. d. Legionari (GO)** | Laboratory test No. | **21.0365 Rev.1** |
| At presence of RINA Surveyor | **F. Sedran** | | |

We confirm that statements in this record are correct and that the test welds were prepared, welded and tested and have fulfilled the requirements in accordance with **UNI EN ISO 15614-1: 2019** Standard.

Issued at: Genova on 15 July 2021

RINA Services S.p.A.
PED No. Bo. 0474

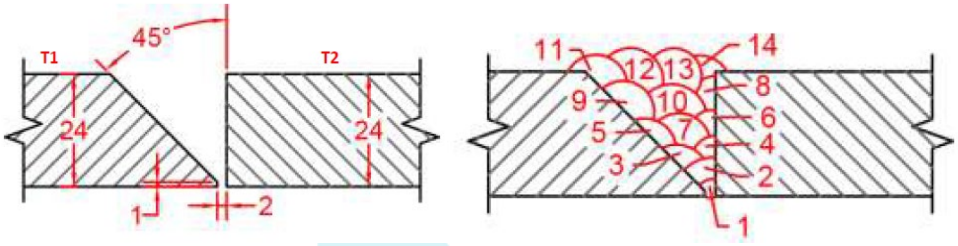
**Certificate No. 21TO00308PW\2A**

**RECORD OF WELD TEST**

**JOINT DETAILS AND WELDING SEQUENCES**

PLATE TO PLATE BUTT JOINT FULL PENETRATION- SINGLE BEVEL with root face and root gap – ss nb ml

| Pass No. | Process | Filler metal diam. (mm) | Amps | Volt | Type of Current/ Polarity | Travel speed (cm/min) | Heat input (kJ/cm) | Metal Transfer mode | Other |
|---|---|---|---|---|---|---|---|---|---|
| 1 | **135** | 1,2 | 132 | 19.2 | **DCEP** | 12,7 | 9,6 | **Short Arc** | - |
| 2 | **135** | 1,2 | 262 | 26.2 | **DCEP** | 29,5 | 11,2 | **Spray Arc** | - |
| 3 | **135** | 1,2 | 268 | 25.2 | **DCEP** | 27,7 | 11,7 | **Spray Arc** | - |
| 4 | **135** | 1,2 | 243 | 25.7 | **DCEP** | 30,0 | 10,0 | **Spray Arc** | - |
| 5 | **135** | 1,2 | 258 | 25.8 | **DCEP** | 25,7 | 12,4 | **Spray Arc** | - |
| 6 | **135** | 1,2 | 257 | 25.2 | **DCEP** | 26,5 | 11,7 | **Spray Arc** | - |
| 7 | **135** | 1,2 | 272 | 25.7 | **DCEP** | 29,0 | 11,6 | **Spray Arc** | - |
| 8 | **135** | 1,2 | 261 | 25.9 | **DCEP** | 28,1 | 11,5 | **Spray Arc** | - |
| 9 | **135** | 1,2 | 255 | 25.8 | **DCEP** | 30,0 | 10,5 | **Spray Arc** | - |
| 10 | **135** | 1,2 | 241 | 25.7 | **DCEP** | 29,5 | 10,1 | **Spray Arc** | - |
| 11 | **135** | 1,2 | 239 | 25.9 | **DCEP** | 28,1 | 10,6 | **Spray Arc** | - |
| 12 | **135** | 1,2 | 238 | 25.8 | **DCEP** | 26,5 | 11,1 | **Spray Arc** | - |
| 13 | **135** | 1,2 | 243 | 25.7 | **DCEP** | 29,5 | 10,2 | **Spray Arc** | - |
| 14 | **135** | 1,2 | 249 | 25.6 | **DCEP** | 28,1 | 10,9 | **Spray Arc** | - |




**PARENT MATERIAL**

| | | | |
|---|---|---|---|
| Material specification | **EN 10028-3** | | |
| Type or grade | **P355NH** | | |
| Group(s)/Subgroup(s) No. (ISO/TR 15608; ISO/TR20172; ISO/TR 20173; ISO/TR20174) | **1.2** | | |
| Thickness (mm) | **24 to 24** | Throat thickness (mm) | **N.A.** |
| Diameter (mm) | **N.A.** | | |
| Branch connection angle | **N.A.** | | |
| Other | **-** | | |

**WELDING CONSUMABLES**

| | | |
|---|---|---|
| Process | **135D** | **135S** |
| Trade name(s) | **ESAB OK AristoRod 12.50** | **ESAB OK AristoRod 12.50** |
| Specification | **EN ISO 14341-A** | **EN ISO 14341-A** |
| Classification / designation | **G42 4 M21 3Si1** | **G42 4 M21 3Si1** |
| Size (mm) | **1,2** | **1,2** |
| Deposited metal thickness | | |
| Groove | **3 mm** | **21 mm** |
| Throat | **N.A.** | **N.A.** |
| Flux trade name | **N.A.** | **N.A.** |
| Consumable insert | **N.A.** | **N.A.** |
| Other | **-** | **-** |

**GAS**

| | Gas | Mixture | Flow rate (l/min.) |
|---|---|---|---|
| Shielding | | **Ar 82% + $CO_2$ 18%** | **18** |
| Trailing | | | |
| Backing | | | |

**POSITION**

Welding position **PC**

Other **-**

**PREHEAT**

Preheat temperature **+20°C**

Interpass temperature **+250°C**

Postheat temperature **None** Time **-**

**POSTWELD HEAT TREATMENT**

Temperature **None** Time -

Method **-**

Other **-**

**ELECTRICAL CHARACTERISTICS**

Current **DCEP**

Ampere (range) **See table** Volts (Range) **See table**

Mode of metal transfer **D (Short Transfer) First pass; S (Spray Transfer) Other passes**

Tungsten electrode size and type **N.A.**

Pulse welding details **N.A.**

Plasmawelding details **N.A.**

Waveform controlled welding machine - Waveform control mode **-**

Power source - Welding mode Pulse □ Non pulse ☑

Other **-**

**TECHNIQUE**

Travel speed (range) **See table**

String or weave bead **String** Maximum width of run **None**

Oscillation (*) **None** (Amplitude/Frequency/Dwell time)

Method of groove/edge preparation **Flame cutting and Machining**

Interpass cleaning **Grinding/Brushing**

Method of back gouging **N.A.**

Orifice or gas cup size **16**

Distance contact tube/worpiece (*) **15-20 mm**

Multiple or single pass **Multiple**

Multiple or single electrodes **Single**

Torch angle (*) **N.A.**

Other (*) for fully mechanized/robotic only

| TRANSVERSE TENSILE TEST | | | | | | |
|---|---|---|---|---|---|---|
| Spec. (No.) | Width (mm) | Thickness (mm) | Area ($mm^2$) | Total load (N) | $R_m$. ($N/mm^2$) | Fracture location |
| **1235** | **25,07** | **18,56** | **465,30** | **254439** | **547** | **Base material - ductile** |
| **1235** | **25,09** | **18,50** | **464,17** | **253471** | **546** | **Base material - ductile** |

| ALL-WELD METAL TENSILE TEST | | | | | | | |
|---|---|---|---|---|---|---|---|
| Spec. (No.) | Diameter (mm) | Area (mm) | $L_0$ (mm) | Yield strength ($N/mm^2$) | Tensile strength ($N/mm^2$) | A (%) | Z (%) |
| **1235** | **10,06** | **-** | **50** | **529** | **609** | **25.0** | **67** |

| BEND TEST | | | |
|---|---|---|---|
| Type | No. | Bend Angle | Result |
| **SIDE TRANSVERSE** | **4 OFF** | **180°** | **Acceptable** |

**IMPACT TEST**

**Full-Size 10x10x55**

| Spec No. | Notch location | Notch type | Test Temp. (°C) | Impact values (J) | Average (J) |
|---|---|---|---|---|---|
| **VWT** $_{0/1}$ | **WELD** | **ISO-V** | **-20** | **143 - 131 - 79** | **118** |
| **VHT** $_{0/1}$ | **FUSION LINE** | **ISO-V** | **-20** | **196 - 84 - 119** | **133** |
| **VHT** $_{2/1}$ | **FUSION LINE + 2** | **ISO-V** | **-20** | **205 - 184 - 226** | **205** |
| **VHT** $_{5/1}$ | **FUSION LINE + 5** | **ISO-V** | **-20** | **220 - 169 - 207** | **199** |

| HARDNESS TEST | | |
|---|---|---|
| Location | Type/load | Maximum value |
| Parent metal(s) | **HV10** | **159** |
| H.A.Z.(s) | **HV10** | **378** |
| Weld metal | **HV10** | **205** |

**OTHER TEST**

| | |
|---|---|
| MACROGRAPHIC EXAMINATION | **Acceptable** |
| MICROGRAPHIC EXAMINATION | **Not required** |

**NON DESTRUCTIVE EXAMINATION**

| | |
|---|---|
| VISUAL EXAMINATION | **Acceptable** |
| RADIOGRAPHIC EXAMINATION | **Not required** |
| PENETRANT TEST | **Not required** |
| MAGNETIC PARTICLE | **Acceptable** |
| ULTRASONIC TEST | **Acceptable** |

Issued at: Genova on 15 July 2021

RINA Services S.p.A.
PED No. Bo. 0474

| CONCRANE A REMAZEL Group Company | **WELDING QUALIFICATION RECORD** | **pWPS n°:** CCP09<br>**Date** 14/05/2021<br>**Record n.** WR06/2021 | Pag. 1 / 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| *Reference code* | **EN ISO 15614-1; 08833.ENG.MME.SDS** | *Welding position* | **PC – 2G – HORIZONTAL POSITION** |
| *Welding process* | **135 – GNAW** | *Type* | **SEMI-AUTOMATIC** |
| **JOINT** | | | |
| *Joint type* | **BW- BUTT WELD** | *Preparation method* | **FLAME AND MACHINING** |
| *Weld preparation* | **SINGLE BEVEL GROOVE** | *Method* | **BRUSHING AND/OR GRIDING** |
| *Backing* | **NO** | *Root opening* | **2 mm** |
| *Backing material* | **N.A.** | *Groove angle* | **45°** |
| *Backing gouging* | **N.A.** | *Root face dimension* | **1 mm** |

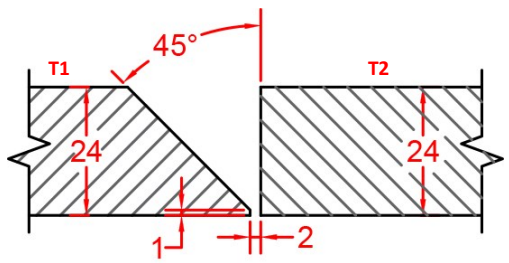
| **BASE MATERIAL** | | |
|---|---|---|
| *Part identification* | **A** | **B** |
| *Pipe or plate* | **PLATE** | **PLATE** |
| *Material group* | **1.2** | **1.2** |
| *Material type* | **EH36 (SA516GR70)** | **EH36 (SA516GR70)** |
| *Thickness* | **24mm** | **24 mm** |
| *Heat* | **477041** | **477041** |
| *C - CEV (IIW) & Pcm* | **0.42 – 0.43 – 0.26** | **0.42 – 0.43 – 0.26** |

| | | | |
|---|---|---|---|
| **FILLER MATERIALS AND GAS DETAIL DETAILS** | | | |
| *Trade marker filler* | **ESAB OK AristoRod 12.50** | *Specification* | **EN ISO 14175** |
| *Classification filler* | **G42 4 M21 3Si (EN ISO 14341-A)** | *Classification gas* | **M21 – 82% Ar + 18% $CO_2$** |
| *Batch nr. filler* | **PVV01022033B** | *Flow rate l/min* | **19 l/min** |
| **PREHEAT AND PWHT** | | | |
| *Preheat temperature* | **AMBIENT (>20 °C)** | *PHWT method* | **N.A.** |
| *Max interpass temperture* | **250 °C** | *Time and temperature* | **N.A.** |

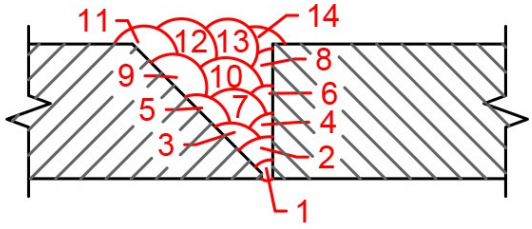
**PARAMETERS RECORD**

| Pass weld | Welding process | Filer metal classification | Filler diameter [mm] | Current type | Ampere [A] | Voltage [V] | Travel speed [mm/min] | Heat input [kJ/mm] | Interpass temperature [°C] |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 132 | 19.2 | 127 | 0.96 | N.A. |
| 2 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 262 | 26.2 | 295 | 1.12 | 82 °C |
| 3 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 268 | 25.2 | 277 | 1.17 | 91 °C |
| 4 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 243 | 25.7 | 300 | 1.00 | 106 °C |
| 5 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 258 | 25.8 | 257 | 1.24 | 111 °C |
| 6 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 257 | 25.2 | 265 | 1.17 | 125 °C |
| 7 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 272 | 25.7 | 290 | 1.16 | 141 °C |
| 8 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 261 | 25.9 | 281 | 1.15 | 153 °C |
| 9 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 255 | 25.8 | 300 | 1.05 | 174 °C |
| 10 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 241 | 25.7 | 295 | 1.01 | 178 °C |
| 11 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 239 | 25.9 | 281 | 1.06 | 185 °C |
| 12 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 238 | 25.8 | 265 | 1.11 | 191 °C |
| 13 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 243 | 25.7 | 295 | 1.02 | 202 °C |
| 14 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 249 | 25.6 | 281 | 1.09 | 205 °C |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

**Joint details**




**Bead sequence**




| *Registered by* | *Checked by* | *Society approved by* | *Customer approved by:* |
|---|---|---|---|
| **A. Feltrin** | | | |

METAL SERVICES
MATERIALS TESTING

# TEST REPORT No. 21.0365 Rev.1

**ISSUED ON 21/06/2021**

**This document replace the test report no. 21.0365 Rev.0**

Customer

**CONCRANE S.r.l.**

Via Caboto, 26

34147 Trieste (TS)

## INFORMATION

The present test report cannot be modified and cannot be reproduced in a partial way without the formal written approval of Metal Services Materials Testing Srl.
Test results are only related to the supplied tested samples; the remains of them will be stored and available for not more than 30 days after the test report issuing date, unless differently agreed on the purchase order.
Equipment used are to be intended under metrological validity.
The uncertainty of measurement is expressed as expanded uncertainty obtained by multiplying the combined uncertainty for the coverage factor of k = 2, corresponding to a confidence interval of about 95%.
(+) Supervised test by 3rd part inspector.

## MATERIAL RECEPTION

| Date | Delivery note no. | Offer no. | Order no. |
|---|---|---|---|
| 28/05/2021 | 21050 | - | - |

**Sampling data**

Sampling and identification executed by the Customer

## MATERIAL DESCRIPTION

| Sample no. | Identification mark |
|---|---|
| 1235 | Sample identified as “pWPS CCP09 – BW plate thk. 24 Mm – material DNV-GL EH36/RINA DH36 – welding process GMAW – position 2G – welding consumable ESAB OK AristoRod 12.50 Ø 1.2 mm – AWS A5.18 ER 70S-6 – shielding gas EN ISO 14175 M21 82%Ar + 18% CO2 18/24 l/min“ |

## TEST INDEX


| Section no. | Test | Page |
|---|---|---|
| 1 | Visual examination (UNI EN ISO 17637:2017) | 2 |
| 2 | Magnetoscopic examination (UNI EN ISO 17638:2016 – ASTM E709 – API 2X) | 2 |
| 3 | Ultrasonic examination (UNI EN ISO 17640:2018 – API RP 2X) | 3 |
| 4 | Transverse tensile test on welds (UNI EN ISO 4136:2012) | 4 |
| 5 | Longitudinal tensile test on welds (UNI EN ISO 5178:2011) | 4 |
| 6 | Bend test on welds (UNI EN ISO 5173:2012) | 4 |
| 7 | Impact test on welds (UNI EN ISO 9016:2012) | 4 |
| 8 | Macrographic examination (UNI EN ISO 17639:2013) | 5 |
| 9 | Hardness test on welded joints (UNI EN ISO 9015-1:2011) | 6 |
| - | Other reference documents (08833.ENG.MME.SDS Rev.07) | - |


## NOTE

This document replaces the test report no. 21.0365 Rev.0 and it has been issued in order to integrate data of the fields “Material description” and of the section 5 “Longitudinal tensile test on welds”

//

## RESERVED FOR DIGITAL SIGNATURE

Firmato digitalmente da:
PELLEGRIN LORENZO
Firmato il 21/06/2021 11:15
Seriale Certificato: 21401746878628221003275909547213633194
Valido dal 01/10/2020 al 01/10/2023
ArubaPEC S.p.A. NG CA 3

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# TEST REPORT No. 21.0365 Rev.1

**ISSUED ON 21/06/2021**

**This document replace the test report no. 21.0365 Rev.0**

## 1. VISUAL EXAMINATION

### TEST CONDITIONS

| Equipment | Visual conditions | Surface conditions | Working step |
|---|---|---|---|
| Weld Gauge, Lamp | Min. 1000 lux on tested surface | As welded | Welds completed |
| **Test method** | **Acceptance criteria** | **Procedure of examination** | **Reference drawing** |
| UNI EN ISO 17638:2016 – ASTM E709 – API 2X | UNI EN ISO 5817:2014 - 08833.ENG.MME.SDS Rev.07 | - | pWPS CCP09 |
| **Heat Treatment** | **Extention of the examination** | **-** | **-** |
| - | 100% | - | - |

### RESULTS

| Sample no. | Data | Position | Result of inspection |
|---|---|---|---|
| 1235 | 31/05/2021 | - | *Imperfections exceeding the acceptance criteria and their location*: No recordable indications. |

**Record of indications detected**

| *Weld Id.* | *Indication no.* | *Start from* | *Probe*[1] | *Length* | *Depth*[1] | *Probable type of defect* |
|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - |

Glossary: //

Note 1: Only for UT examination

## 2. MAGNETIC PARTICLES TESTING

### TEST CONDITIONS

| Equipment | Visual conditions | Surface conditions | Working step |
|---|---|---|---|
| Deltaflux DF Y/A S/N 140514 | Min. 500 lux on tested surface | Welded | As finished |
| **Contrast paint** | **Type of magnetic particles** | **Magnetic particles** | **Type of current** |
| ProNdt 183 | Wet - visible | ProNdt 181 | AC |
| **Test method** | **Acceptance criteria** | **Procedure of examination** | **Reference drawing** |
| UNI EN ISO 17640:2018 – API RP 2X | UNI EN ISO 23278:2015 Lev.1 - 08833.ENG.MME.SDS Rev.07 | - | pWPS CCP09 |
| **Heat Treatment** | **Extension of the examination** | **Demagnetization** | **Lifting power** |
| Not declared | 100% | Not required | 5 Kg |

### RESULTS

| Sample no. | Data | Position | Result of inspection |
|---|---|---|---|
| 1235 | 31/05/2021 | - | *Imperfections exceeding the acceptance criteria and their location*: No recordable indications. |

**Record of indications detected**

| *Weld Id.* | *Indication no.* | *Start from* | *Probe*[1] | *Length* | *Depth*[1] | *Probable type of defect* |
|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - |

Glossary: //

Note 1: Only for UT examination

### NOTE

//

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# TEST REPORT No. 21.0365 Rev.1
## ISSUED ON 21/06/2021
**This document replace the test report no. 21.0365 Rev.0**

## 3. ULTRASONIC EXAMINATION

**TEST CONDITIONS**

| Material | Thickness | Heat Treatment | Testing plan |
|---|---|---|---|
| EH36 | 24 mm | - | 100 % |
| **Instrument** | **Probe** | **Couplant** | **Note** |
| Sonatest D20+ s/n.:I009835 | Olympus AMR 8x9 70 | Gel | - |
| **Test method** | | **Acceptance criteria** | |
| UNI EN ISO 17640:2018 – API RP 2X | | UNI EN ISO 11666:2018 - 08833.ENG.MME.SDS Rev.07 | |

**RESULTS**

| Sample no. | Data | Position | Result of inspection |
|---|---|---|---|
| 1235 | 31/05/2021 | - | *Imperfections exceeding the acceptance criteria and their location*: No recordable indications. |

**Record of indications detected**

| *Weld Id.* | *Indication no.* | *Start from* | *Probe*[1] | *Length* | *Depth*[1] | *Probable type of defect* |
|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - |

Glossary: //

Note 1: Only for UT examination

**NOTE**

//

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | F. Sedran |

METAL SERVICES
MATERIALS TESTING

# TEST REPORT No. 21.0365 Rev.1

**ISSUED ON 21/06/2021**

**This document replace the test report no. 21.0365 Rev.0**

## 4. TRANSVERSE TENSILE TEST ON WELDS

| Sample no. | Date | Position | T °C | a mm | b mm | So $mm^2$ | Fm N | Rm MPa | Fracture Position |
|---|---|---|---|---|---|---|---|---|---|
| 1235 | 07/06/2021 | T to Weld | 22 | 18.56 | 25.07 | 465.30 | 254439 | 547 | Base material - ductile |
| 1235 | 07/06/2021 | T to Weld | 22 | 18.50 | 25.09 | 464.17 | 253471 | 546 | Base material - ductile |

Instruments: Galdabini Quasar 1200 (Serial no. V9GV)
Glossary: T = transversal; L = longitudinal
Note: //

## 5. LONGITUDINAL TENSILE TEST ON WELDS

| Sample no. | Date | Position | T °C | Ø mm | $Rp_{0.02}$ MPa | $Rp_{0.2}$ MPa | $Rp_{1.0}$ MPa | Rm MPa | $L_0$ mm | A % | Z % | Rs/Rm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1235 | 07/06/2021 | All weld | 22 | 10.06 | 529 | - | - | 609 | 50 | 25.0 | 67 | - |

Instruments: Galdabini Quasar 250 (Serial no.V901)
Glossary: //
Note: //

## 6. BEND TEST ON WELDS

| Sample no. | Date | Type of test | T °C | $t_s$ mm | l mm | d mm | Bend angle ° | Test Result |
|---|---|---|---|---|---|---|---|---|
| 1235 | 07/06/2021 | SBB | 22 | 10 | 65 | 40 | 180 | No recordable indication |
| 1235 | 07/06/2021 | SBB | 22 | 10 | 65 | 40 | 180 | No recordable indication |
| 1235 | 07/06/2021 | SBB | 22 | 10 | 65 | 40 | 180 | No recordable indication |
| 1235 | 07/06/2021 | SBB | 22 | 10 | 65 | 40 | 180 | No recordable indication |

Instruments: Caliper Sama 18148032 (766)
Glossary: $t_s$= specimen thickness; l= minimum clearance between the shoulders; d= ram diameter; SBB = Side bend on butt welds
Note: //

## 7. IMPACT TEST ON WELDS

| Sample no. | Date | Position | w mm | T °C | $KV_2$ J | | | $KV_2$ AVG J |
|---|---|---|---|---|---|---|---|---|
| 1235 | 07/06/2021 | VHT 5/1 | 10 | -20 | 220 | 169 | 207 | 199 |
| 1235 | 07/06/2021 | VHT 2/1 | 10 | -20 | 205 | 184 | 226 | 205 |
| 1235 | 07/06/2021 | VHT 0/1 | 10 | -20 | 196 | 84 | 119 | 133 |
| 1235 | 07/06/2021 | VWT 0/1 | 10 | -20 | 143 | 131 | 79 | 118 |

Instruments: Galdabini Impact 300 (Serial no.V88G)
Glossary: T = transversal; L = longitudinal
Note: When absorbed energy is < 8 J or >= 240 J the values are approximate.

## NOTE

//

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# TEST REPORT No. 21.0365 Rev.1

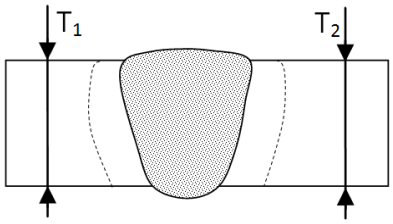
**ISSUED ON 21/06/2021**

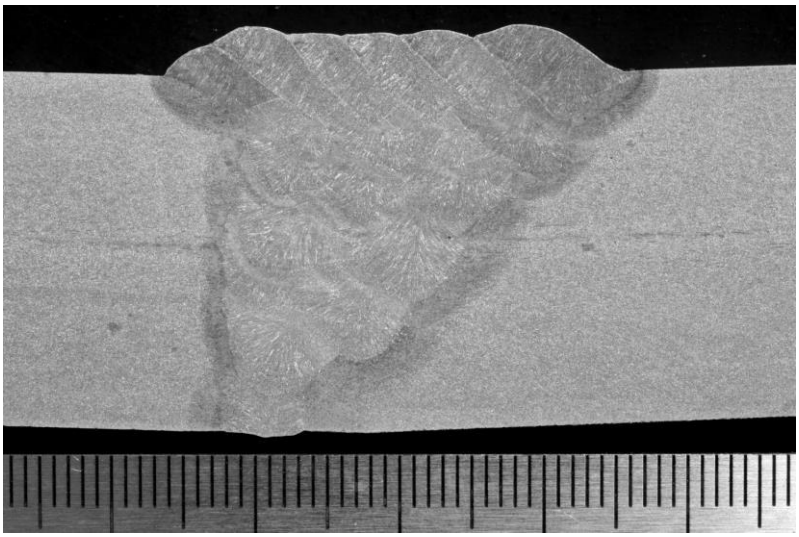
**This document replace the test report no. 21.0365 Rev.0**

## 8. MACROGRAPHIC EXAMINATION

| | |
|---|---|
| **Sample no** | 1235 Macro #1 |
| **Date** | 03/06/2021 |
| **Position** | T to weld |
| **Etching** | HNO3 10% |
| **$T_1$** | 24 mm |
| **$T_2$** | 24 mm |
| **$Z_1$** | n.a. |
| **$Z_2$** | n.a. |
| **Throat Thickness** | n.a. |

**Sketch**



| **Imperfection** |
|---|
| No recordable indications |

Instruments: Wild stereomicroscope (serial no.386471309)

Glossary: //

Note: //

**NOTE**

//

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# TEST REPORT No. 21.0365 Rev.1

**ISSUED ON 21/06/2021**

**This document replace the test report no. 21.0365 Rev.0**

## 9. HARDNESS TEST ON ARC WELDED JOINTS

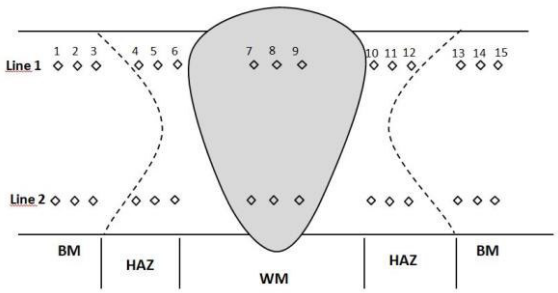
| Sample no. | Date | Type of test | Indentation | Position | Line 1 (HV) | Line 2 (HV) | Line 3 (HV) |
|---|---|---|---|---|---|---|---|
| 1235 Macro #1 | 03/06/2021 | HV10 | 1 | BM | 159 | 159 | - |
| | | | 2 | BM | 157 | 157 | - |
| | | | 3 | BM | 155 | 155 | - |
| | | | 4 | HAZ | 241 | 188 | - |
| | | | 5 | HAZ | 326 | 213 | - |
| | | | 6 | HAZ | 306 | 244 | - |
| | | | 7 | WM | 205 | 196 | - |
| | | | 8 | WM | 202 | 184 | - |
| | | | 9 | WM | 192 | 193 | - |
| | | | 10 | HAZ | 378 | 218 | - |
| | | | 11 | HAZ | 372 | 205 | - |
| | | | 12 | HAZ | 228 | 183 | - |
| | | | 13 | BM | 156 | 154 | - |
| | | | 14 | BM | 154 | 157 | - |
| | | | 15 | BM | 152 | 159 | - |

Instruments: QNESS Q150+ (serial no. Q1294/02/18)

Glossary: //

Note: //

**INDENTATION POSITION**




**NOTE**

//

**INSPECTOR NOTES(+)**

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

A02

# CERTIFICATO DI CONTROLLO 3.1 / INSPECTION CERTIFICATE 3.1 - EN 10204:2004

A04/A05

**METINVEST**
METINVEST TRAMETAL SPA

(A) PROCESSO DI ELABORAZIONE / STEELMAKING PROCESS: E = ELECTRIC ; BO = BASIC OXYGEN
(B) STATO DI FORNITURA / DELIVERY CONDITION: AR = GREZZO DI LAMINAZIONE / AS ROLLED ;
N* = LAMINAZIONE A TEMPERATURA CONTROLLATA / NORMALIZING ROLLING ;
N = NORMALIZZATO / NORMALIZED at 910°C, 1,5 min/mm ; ARIA CALMA / STILL AIR;
R = RICOTTO / ANNEALED;
N+R = NORMALIZZATO + RINVENUTO / NORMALIZED + ANNEALED
(C) TRATTAMENTO TERMICO DEL CAMPIONE / HEAT TREATMENT OF SAMPLE:
N = 910°C, 1,5 min/mm ; ARIA CALMA / STILL AIR
R = 650°C, 1,5 min/mm ; ARIA CALMA / STILL AIR
(D) Ceq_1 = C + Mn/6 ; Ceq_2 = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15 ;
Pcm = C + Si/30 + (Mn + Cu + Cr)/20 + NI/60 + Mo/15 + V/10 + B*5
(1) POSIZIONE / LOCATION: 1 = TESTA / TOP ; 2 = PIEDE / BOTTOM
(2) POSIZIONE / LOCATION: C = CUORE / 1/2 THICKNESS ; P = PELLE / SURFACE ; D = 1/4 SPESSORE / THICKNESS
(3) DIREZIONE / DIRECTION: L = LONGITUDINALE / LONGITUDINAL ; T = TRASVERSALE / TRANSVERSE
(4) FORMA DEL PROVINO / SHAPE OF TEST PIECE: P = PRISMATICO / PRISMATIC ; C = CILINDRICO / CYLINDRICAL
(5) ESITO PROVA DI PIEGA / RESULT: OK = COMPLYING ; NO = NOT COMPLYING

A01


Società per azioni con socio unico soggetta a direzione e coordinamento di Metinvest B.V
Registered office: Via XII Ottobre, 3 - 16121 Genova, Italy
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Works: Via E. Fermi, 44 - 33058 San Giorgio di Nogaro UD, Italy
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Cap. Soc. Euro 300.120.000,00 i.v.
C.F., P.IVA e Iscr. Reg. Imp. GE 05956630965 - REA 437720/GE
http://trametal.metinvestholding.com


A06 Cliente / Customer

**TONELLO S.P.A.**

**VIA D'ORMENT N. 6**
**33042 BUTTRIO**
**UD ITALY**

TONELLO S.p.A.
CONTROLLO QUALITA'
PER
COPIA CONFORME
CENTRO LAVORAZIONE LAMIERE

| A03 N° Certificato / Certificate no. | Z02 Data / Date |
|---|---|
| 377095 | 05/05/2016 |
| **A08 N° Ordine Trametal / Works order** | **A07 N° Ordine cliente / Customer's order** |
| 31601531 | B6000428 |
| DDT | del / date |
| BOL 31607710 | 04/05/2016 |
| Pratica / File no. | |
| del / date | |

B06 Marcatura di prodotto / Marking of the product

LAMIERA/ORDINE/N° INFORNAMENTO/DIMENSIONI/QUALITÀ/MARCHIO DEL PRODUTTORE
PLATE/ORDER/INTERNAL N°/DIMENSIONS/STEEL GRADE/MANUFACTURER'S MARK

B01/B02/B03

| | |
|---|---|
| Prodotto / Product | Lamiere / Hot rolled plates |
| Qualità / Steel grade | SA516GR70MT/LTV |
| Normativa / Specification | ASME |

| B07 ITEM | B07 LAMIERA PLATE | B07 N° INFORN. INTERNAL NUMBER | B09/B11 DIMENSIONI [mm] DIMENSIONS | B12 MASSA TEORICA [t] THEORICAL WEIGHT | B07 LOTTO BATCH NO. | C70 PROCESSO ELAB. (A) STEELMAKING PROCESS | B04 STATO FORNITURA LAMIERA (B) DELIVERY CONDITION | C00 CAMPIONE SAMPLE | B05 TRATT. CAMPIONE (C) HEAT TREATMENT | C00 CAMPIONE PWHT SAMPLE | B05 PWHT BEGINNING TEMPERATURE °C TEMPERATURA INIZIO | HEATING RATE °C/h VELOCITA' RISCALDO | TEMPERATURE TREATMENT °C TEMPERATURA TRATTAMENTO | HOLDING TIME PERMANENZA Min | COOLING RATE °C/h VELOCITA' RAFFREDDAMENTO | END TEMPERATURE °C TEMPERATURA FINE | N° CICLI / CYCLES | C00 CAMPIONE Q+T SAMPLE | B05 Q+T TEMPERATURE (Q) °C TEMPERATURA | HOLDING TIME PERMANENZA (Q) Min | COOLING RAFFREDDAMENTO | TEMPERATURE (T) °C TEMPERATURA | HOLDING TIME PERMANENZA (T) Min | COOLING RAFFREDDAMENTO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~2~~ | ~~1NV0820301A~~ | ~~1260851~~ | ~~60.00X2500X8500~~ | ~~10,01~~ | ~~477019~~ | ~~BO~~ | ~~N~~ | ~~GD930~~ | | | | | | | | | | | | | | | | | |
| 3 | 1NU9741803A | 1260333 | 25.00X2500X6000 | 2,94 | 477041 | BO | N | GD935 | | 16T319 | | | | | | | | | | | | | | | |

**C71/C92 COMPOSIZIONE CHIMICA DI COLATA / HEAT CHEMICAL ANALYSIS**

| B07 | C71 | C72 | C73 | C74 | C75 | C76 | C77 | C78 | C79 | C80 | C81 | C82 | C83 | C84 | C85 | C86 | C87 | C88 | C89 | C90 | C91 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COLATA HEAT | C % | Mn % | Si % | P % | S % | Cu % | Ni % | Cr % | Mo % | Al % | V % | Nb % | Ti % | Sn % | Ca % | N % | B % | H % | Ceq1 % (D) | Ceq2 % (D) | Pcm % (D) |
| Ordine Min 2 | | | | | | | | | | | | | | | | | | | | | |
| Ordine Max 2 | | | | | | | | | | | | 0,050 | | | | | | | | | |
| Ordine Min 3 | | | | | | | | | | | | | | | | | | | | | |
| Ordine Max 3 | | | | | | | | | | | | 0,050 | | | | | | | | | |
| SA51670LTV Min 12.60 - 50.00 | | 0,85 | 0,15 | | | | | | | | | | | | | | | | | | |
| SA51670LTV Max 12.60 - 50.00 | 0,28 | 1,20 | 0,40 | 0,035 | 0,035 | | | | | | | | | | | | | | | | |
| SA51670LTV Min 50.10 - 100.00 | | 0,85 | 0,15 | | | | | | | | | | | | | | | | | | |
| SA51670LTV Max 50.10 - 100.00 | 0,30 | 1,20 | 0,40 | 0,035 | 0,035 | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| 1NU974 | 0,16 | 1,49 | 0,26 | 0,013 | 0,003 | 0,030 | 0,020 | 0,020 | <0.005 | 0,030 | 0,004 | 0,023 | 0,004 | <0.005 | 0,0000 | 0,0080 | 0,0005 | 0,0002 | 0,41 | 0,42 | 0,25 |
| 1NV082 | 0,17 | 1,47 | 0,25 | 0,012 | 0,002 | 0,050 | 0,020 | 0,030 | <0.005 | 0,024 | <0.005 | 0,024 | <0.005 | <0.005 | 0,0000 | 0,0070 | <0.0005 | 0,0003 | 0,42 | 0,43 | 0,26 |

| | | | PROVA DI TRAZIONE TENSILE TEST | | | | | | | | | PROVA DI RESILIENZA IMPACT TEST - CHARPY V-NOTCH TEST | | | | | | PROVA DI PIEGA BEND TEST | | | | PROVA DI DUREZZA HARDNESS TEST | | | | PROVA DI STRIZIONE Z% TEST | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C00 | | C01 | C01 | C02 | C03 | C11 | C12 | | C13 | C14 | C10 | C41 | C02 | C03 | C01 | C42 | C43 | C02 | C51 | C52 | C50 | C01 | C30 | C31 | C32 | C53 | C54 |
| CAMPIONE SAMPLE | SPESSORE LAMIERA PLATE THICKNESS | POSIZIONE (1) LOCATION | POSIZIONE (2) LOCATION | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | ReH [Mpa] YIELD STRENGTH | Rm [Mpa] TENSILE STRENGTH | ReH/Rm | A2" ELONGATION | Rp 0.2 [Mpa] PROOF STRENGTH | FORMA PROVINO (4) SHAPE OF TEST PIECE | LARGHEZZA [mm] WIDTH | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | POSIZIONE (2) LOCATION | INDIVIDUAL VALUES [J] SINGOLI VALORI | MEDIA [J] MEAN VALUE | DIREZIONE (3) ORIENTATION | MANDRINO [mm] MANDREL | ANGOLO [°] ANGLE | ESITO (5) RESULT | POSIZIONE (2) LOCATION | METODO TEST METHOD | SINGOLI VALORI INDIVIDUAL VALUES | MEDIA MEAN VALUE | Z% INDIVIDUAL VALUES Z% SINGOLI VALORI | Z% VALORE MEDIO Z% MEAN VALUE |
| ORDINE Min 2 | | | | | | | | | | | | | | -42 | | 20 | 27 | | | | | | | | | | |
| ORDINE Min 3 | | | | | | | | | | | | | | -42 | | 20 | 27 | | | | | | | | | | |
| SA51670LTV Min 0.00 - 25.00 | | | | | | | | | | | | | L | -46 | | | 20 | | | | | | | | | | |
| SA51670LTV Min 20.10 - 120.00 | | | | | 20 | | 485 | | 17,0 | 260 | | | | | | | | | | | | | | | | | |
| SA51670LTV Max 20.10 - 120.00 | | | | | 20 | | 620 | | | | | | | | | | | | | | | | | | | | |
| SA51670LTV Min 50.10 - 75.00 | | | | | | | | | | | | | L | -35 | | | 20 | | | | | | | | | | |
| ~~GD930~~ | ~~60,00~~ | ~~2~~ | ~~D~~ | ~~T~~ | ~~20~~ | | ~~520~~ | | ~~37,7~~ | ~~379~~ | ~~C~~ | ~~10,00~~ | ~~L~~ | ~~-42~~ | ~~D~~ | ~~194 199 181~~ | ~~191~~ | | | | | | | | | | |
| GD935 | 25,00 | 2 | P | T | 20 | | 525 | | 34,0 | 385 | P | 10,00 | L | -42 | P | 187 183 189 | 186 | | | | | | | | | | |

C10

ASME SA-370 FIG. 3 AND FIG. 10 (FIG. 11 a 10x10mm) - SAMPLE TAKEN AFTER PLATE HEAT TREATMENT

TONELLO S.p.A. CONTROLLO QUALITA' PER COPIA CONFORME CENTRO LAVORAZIONE LAMIERE

**D02-D50 CONTROLLO ULTRASONORO / ULTRASONIC EXAMINATION**

| D02 | D03 | D04 | D05 | D06 | D07 |
|---|---|---|---|---|---|
| APPARECCHIATURA EQUIPMENT | N° SERIE SERIAL NO | CONDIZIONI SUPERFICIALI SURFACE CONDITIONS | ACCOPPIANTE COUPLANT | MODALITÀ OPERATIVE PROCEDURE | TARATURA CALIBRATION |
| GILARDONI RDG450 | RDG450-450-140156TC | GREZZO DI LAMINAZIONE AS ROLLED | ACQUA WATER | IN ACCORDO ALLA SPECIFICA ACCORDING TO SPECIFICATION | IN ACCORDO ALLA SPECIFICA ACCORDING TO SPECIFICATION |

| B07 LAMIERA PLATE | D08 SONDE PROBE | D09 DIAMETRO DIAMETER MM | D10 FREQUENZA FREQUENCE MHZ | D11 ANGOLO Angle ° | D12 NORMA DI RIFERIMENTO STANDARD SPECIFICATION | D13 CLASSE DI ACCETTABILITÀ ACCEPTANCE SPECIFICATIONS | D14 ESITO RESULT | D15 INDICAZIONI INDICATIONS | D16 RETICOLO RETICLE | D17 BORDI EDGES |
|---|---|---|---|---|---|---|---|---|---|---|
| 1NV0820301A | DP25/2 | mm 25 | 2 MHz | 0 | EN 10160 CL. S2 E3 | | OK | NO INDICATIONS FOUND | mm 100x100 | 75 |
| 1NU9741803A | BDD20/2 | mm 20 | 2 MHz | 0 | EN 10160 CL. S2 E3 | | OK | NO INDICATIONS FOUND | mm 100x100 | 50 |

| D18 NOTE REMARKS | D19 ENTE ISPETTIVO INSPECTOR | D20 FIRMA SIGNATURE |
|---|---|---|
| | | METINVEST TRAMETAL S.p.a. F. Andrian III Liv. EN ISO 9712 |

Z01

| ITEM | | TOLLERANZA DI SPESSORE TOLERANCE ON THICKNESS | TOLLERANZE DI LARGHEZZA TOLERANCE ON WIDTH | TOLLERANZE DI LUNGHEZZA TOLERANCE ON LENGTH | CONDIZIONI SUPERFICIALI SURFACE FINISH | PLANARITÀ FLATNESS |
|---|---|---|---|---|---|---|
| 2 | | EN 10029 CL.B | -0+100 MM | -0+200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |
| 3 | | EN 10029 CL.B | -0+100 MM | -0+200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |

CERTIFICHIAMO che le lamiere elencate sono conformi alla prescrizione dell'ordine, che i controlli della marcatura, dell'aspetto superficiale e dimensionale hanno dato esito positivo.
WE CERTIFY that the above mentioned plates are consistent with the order prescriptions: marking, inspection and measurement without objection.
DICHIARIAMO CHE LE LAMIERE SONO STATE CONTROLLATE IN ACCORDO ALLA NORMATIVA VIGENTE E CHE LE RADIAZIONI IONIZZANTI NON ECCEDONO IL VALORE DEL FONDO NATURALE.
WE DECLARE THAT THE PLATES WERE CONTROLLED ACCORDING TO STANDARD AND RADIATION DO NOT EXCEED THE NATURAL RADIATION.

Z06

| Z07 | Z03 ENTE COLLAUDO / INSPECTION BODY | Z02 |
|---|---|---|
| **PRODUCED FROM CONTINOUS CAST SLAB AND HAVE A MINIMUN REDUCTION RATIO OF 3 TO 1. ACCORDING TO ASME II PART A ED. 2013. FULLY KILLED, FINE GRAIN STEEL. Value of Mn maximun in derogation permitted up to 1.50% Plates acc. to PED 97/23/EC** | TIMBRO DELL'ISPETTORE STAMP OF THE INSPECTION REPRESENTATIVE | METINVEST TRAMETAL S.p.a. F. Andrian CQ Manager |

Certificazione valida per materiale fornitoVi con ns. DDT nr. C1000590 del 20/04/2021 relativo a:

PZ. 6 PART. SAGOMATO A DISEGNO: P06 SP. 25mm
PZ. 2 PART. SAGOMATO A DISEGNO: P03 SP. 25mm
PZ. 2 PART. SAGOMATO A DISEGNO: P04 SP. 25mm
RIF. VS. ORD. EMAIL DEL 13/04/2021
RIF. VS. COMM. URGENTE

# 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: 2021-02-19

Numero certificato/Cert no: EC26329874 rev. 0

| | | | |
|---|---|---|---|
| Nostro ordine/Our order: | 0100206249 | Vostro ordine/Your order: | 263/2021 |
| Nostro riferimento/Our ref: | HYBRIS PRD account | Vostro riferimento/Your ref: | |
| Codice Cliente/Cust no: | ITB01537 | Vostro numero fax/Your fax | |
| Data ordine Cliente/Your date: | 20210217 | Vostra e-mail/Your e-mail: | |

Indirizzo di fatturazione/Invoice address
ALLOYS ITALIA SRL
.
VIA DEGLI SCHIAVETTI 9 - ZONA IND.
34074 MONFALCONE
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
ALLOYS ITALIA SRL
VIA DEGLI SCHIAVETTI 9 - ZONA IND.
34074 MONFALCONE GO
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PVV01022033B Quantità/Quantity: 1098 KGM

## PRODOTTO/PRODUCT

Marchio/Brand: ESAB
Descrizione/Desc: OK AristoRod 12.50 1.2mm 18kg
Codice/Item no: **1A50126910**

## CLASSIFICAZIONE/CLASSIFICATIONS

EN ISO 14341-A: G 3Si1
EN ISO 14341-A: G 38 3 C1 3Si1
EN ISO 14341-A: G 42 4 M20 3Si1
EN ISO 14341-A: G 42 4 M21 3Si1
SFA/AWS A5.18: ER70S-6
CSA W48: B-G 49A 3 C1 S6
JIS Z 3312: YGW 12 (C1)

## COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

**Valori reali/Actual results: in accordo a/acc to I 3.1**

Wire/strip

Altro/Auxiliary:

| | | |
|---|---|---|
| C | | 0.08% |
| Si | | 0.83% |
| Mn | | 1.47% |
| P | | 0.007% |
| S | | 0.012% |
| Cr | | 0.02% |
| Ni | | 0.01% |
| Mo | < | 0.01% |
| Cu | | 0.05% |
| V | < | 0.01% |
| Al | | 0.007% |
| Ti+Zr | | 0.01% |

## CARATTERISTICHE MECCANICHE/MECH PROPS

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

Norma/Standard: EN
Altro/Auxiliary: M21
Condizione/Condition:

TRAZIONE/TENSILE

| ReL | Rm | A4-A5 |
|---|---|---|
| 470 MPa | 560 MPa | 26 % |

RESILIENZA/IMPACT

| Temp | -30 °C | -40 °C | -50 °C |
|---|---|---|---|
| KV | 100 J | 90 J | 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 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,

PRD N° 002 B

Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
*Signatory of EA, IAF and ILAC Mutual Recognition Agreements*

# WELDING PROCEDURE QUALIFICATION RECORD (WPQR)

## LEVEL 2

N. 21TO00308PW\3A

Manufacturer **CONCRANE S.r.l. - TRIESTE (TS)**

WPQR No. **CCP10 Rev.01 dated 15/07/2021** Dated **21/06/2021**

Manufacturer's welding procedure (WPS) No. **p-CCP10** Dated **17/05/2021**

**RANGE OF QUALIFICATION**

Welding process **135** Type **Partly mechanized**

Joint type **Plates and Pipes and build-up BW ssmb-bs/FW**

Single/Multiple pass **Multiple** (**Impact and Hardness properties apply**)

Parent material group(s) **1-1** ISO/TR 15608; ISO/TR20172; ISO/TR 20173; ISO/TR20174 with a specified minimum yield strength 275 < ReH ≤ 360 Mpa **DH36; AH36; DH32; AH32; D; B; A** according to Pt D, Ch 2, Sec 1 of RINA Rules

Parent material thickness (mm) Butt Joint = **7,5 to 30** Fillet Joint $t_1$ **= 3 to 30** $t_2$ **= 3 to 30**

Throat thickness (mm) **No restriction ***

Weld deposit thickness (mm) **Max 30 mm**

Outside pipe diameter (mm) **Over 150 (PA, PB, PC rotated positions); Over 500 (Other qualified positions) ****

Filler metal make **N.A.** Nr. of wires for process 12: **None**

Flux make **N.A.** Flux Designation: **N.A.**

Filler metal designation **Solid wire EN ISO 14341-A G42 4M21 3Si1**

Shielding gas (ISO 14175) **M21 with $CO_2$% min.14,4 max.21,6** Backing gas (ISO 14175) **None**

Type of welding current **DCEP** Kj/cm **min 7,1 ; max 15,3**

Welding position **PA** Transfer Mode **First pass: Short Arc; Other Passes: Spray, Pulse and Globular transfer**

Preheat min. (°C) +20 (if ISO/TR 17671-2 requirements are fulfilled) Interpass temp. Max. (°C) -

Interpass temp. Max. (°C) +250 Postheat min. (°C) - Time (minutes) -

Post weld heat treatment / Ageing **None** Time (minutes) -

Other information **(*) Multi-run; as for butt welds with multi-run (i.e. a=t), (**) Over 500 mm, when RINA Rules apply**

Welder's/Operator's name **Toma Alexandru** Stamp No. **TA**

Welding test conducted by **CONCRANE S.r.l. - Trieste (TS)**

Mechanical test conducted by **Metal Services Srl - R. d. Legionari (GO)** Laboratory test No. **21.0366 Rev.1**

At presence of RINA Surveyor **F. Sedran**

We confirm that statements in this record are correct and that the test welds were prepared, welded and tested and have fulfilled the requirements in accordance with **UNI EN ISO 15614-1: 2019** Standard and **RINA Rules for the Classification of Ships** requirements.

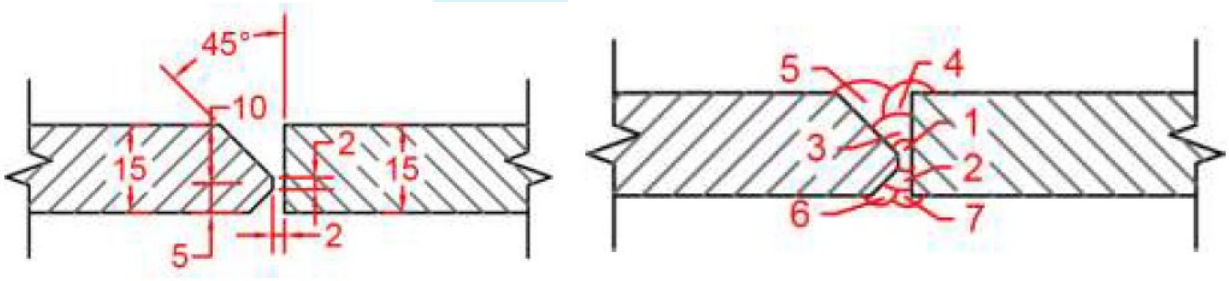
Issued at: Genova on 15 July 2021

RINA Services S.p.A.
PED No. Bo. 0474

**Certificate No. 21TO00308PW\3A**

**RECORD OF WELD TEST**

| JOINT DETAILS AND WELDING SEQUENCES<br>PLATE TO PLATE BUTT JOINT FULL PENETRATION- DOUBLE BEVEL with root face and root gap – bs ml | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Pass No. | Process | Filler metal diam. (mm) | Amps | Volt | Type of Current/ Polarity | Travel speed (cm/min) | Heat input (kJ/cm) | Metal Transfer mode | Other |
| 1 | **135** | 1,2 | 150 | 19.5 | **DCEP** | 14,9 | 9,4 | **Short Arc** | - |
| 3 | **135** | 1,2 | 253 | 27.5 | **DCEP** | 31,0 | 10,8 | **Spray Arc** | - |
| 4 | **135** | 1,2 | 252 | 27.9 | **DCEP** | 32,7 | 10,3 | **Spray Arc** | - |
| 5 | **135** | 1,2 | 245 | 27.7 | **DCEP** | 28,6 | 11,4 | **Spray Arc** | - |
| Grinding to sound metal | | | | | | | | | |
| 2 | **135** | 1,2 | 244 | 27.7 | **DCEP** | 29,5 | 11,0 | **Spray Arc** | - |
| 6 | **135** | 1,2 | 243 | 27.8 | **DCEP** | 26,5 | 12,2 | **Spray Arc** | - |
| 7 | **135** | 1,2 | 249 | 28.1 | **DCEP** | 29,5 | 11,4 | **Spray Arc** | - |




**PARENT MATERIAL**

| | | | |
|---|---|---|---|
| Material specification | **EN 10028-3 (Pt D, Ch 2, Sec 1 of RINA Rules)** | | |
| Type or grade | **P355NH (DH36)** | | |
| Group(s)/Subgroup(s) No. (ISO/TR 15608; ISO/TR20172; ISO/TR 20173; ISO/TR20174) | | | **1.2** |
| Thickness (mm) | **15 to 15** | Throat thickness (mm) | **N.A.** |
| Diameter (mm) | **N.A.** | | |
| Branch connection angle | **N.A.** | | |
| Other | **-** | | |

**WELDING CONSUMABLES**

| | | |
|---|---|---|
| Process | **135D** | **135S** |
| Trade name(s) | **ESAB OK AristoRod 12.50** | **ESAB OK AristoRod 12.50** |
| Specification | **EN ISO 14341-A** | **EN ISO 14341-A** |
| Classification / designation | **G42 4 M21 3Si1** | **G42 4 M21 3Si1** |
| Size (mm) | **1,2** | **1,2** |
| Deposited metal thickness | | |
| Groove | **3 mm** | **12 mm** |
| Throat | **N.A.** | **N.A.** |
| Flux trade name | **N.A.** | **N.A.** |
| Consumable insert | **N.A.** | **N.A.** |
| Other | **-** | **-** |

**GAS**

| | Gas | Mixture | Flow rate (l/min.) |
|---|---|---|---|
| Shielding | | **Ar 82% + $CO_2$ 18%** | **18** |
| Trailing | | | |
| Backing | | | |

**POSITION**

Welding position **PA**

Other **-**

| **PREHEAT** | | | | **POSTWELD HEAT TREATMENT** | | | |
|---|---|---|---|---|---|---|---|
| Preheat temperature | **+20°C** | | | Temperature | **None** | Time | - |
| Interpass temperature | **+250°C** | | | Method | **-** | | |
| Postheat temperature | **None** | Time | **-** | Other | **-** | | |

**ELECTRICAL CHARACTERISTICS**

Current **DCEP**

Ampere (range) **See table** Volts (Range) **See table**

Mode of metal transfer **D (Short Transfer) First pass; S (Spray Transfer) Other passes**

Tungsten electrode size and type **N.A.**

Pulse welding details **N.A.**

Plasmawelding details **N.A.**

Waveform controlled welding machine - Waveform control mode **-**

Power source - Welding mode Pulse □ Non pulse ☑

Other **-**

**TECHNIQUE**

Travel speed (range) **See table**

String or weave bead **String** Maximum width of run **None**

Oscillation (*) **None** (Amplitude/Frequency/Dwell time)

Method of groove/edge preparation **Flame cutting and Machining**

Interpass cleaning **Grinding/Brushing**

Method of back gouging **Grind to sound metal**

Orifice or gas cup size **16**

Distance contact tube/worpiece (*) **15-20 mm**

Multiple or single pass **Multiple**

Multiple or single electrodes **Single**

Torch angle (*) **N.A.**

Other (*) for fully mechanized/robotic only

| TRANSVERSE TENSILE TEST | | | | | | |
|---|---|---|---|---|---|---|
| Spec. (No.) | Width (mm) | Thickness (mm) | Area ($mm^2$) | Total load (N) | $R_m$. ($N/mm^2$) | Fracture location |
| **1236** | **25,03** | **13,00** | **325,39** | **173365** | **533** | **Base material - ductile** |
| **1236** | **25,00** | **12,99** | **324,75** | **172872** | **532** | **Base material - ductile** |

| ALL-WELD METAL TENSILE TEST | | | | | | | |
|---|---|---|---|---|---|---|---|
| Spec. (No.) | Diameter (mm) | Area (mm) | $L_0$ (mm) | Yield strength ($N/mm^2$) | Tensile strength ($N/mm^2$) | A (%) | Z (%) |
| **1236** | **6,02** | **-** | **30** | **470** | **584** | **28.0** | **60** |

| BEND TEST | | | |
|---|---|---|---|
| Type | No. | Bend Angle | Result |
| **SIDE TRANSVERSE** | **4 OFF** | **180°** | **Acceptable** |

**IMPACT TEST**

**Full-Size 10x10x55**

| Spec No. | Notch location | Notch type | Test Temp. (°C) | Impact values (J) | Average (J) |
|---|---|---|---|---|---|
| **VWT** $_{0/1}$ | **WELD** | **ISO-V** | **-20** | **142 - 187 - 201** | **177** |
| **VHT** $_{0/1}$ | **FUSION LINE** | **ISO-V** | **-20** | **237 - 125 - 187** | **183** |
| **VHT** $_{2/1}$ | **FUSION LINE + 2** | **ISO-V** | **-20** | **242 - 236 - 241** | **240** |
| **VHT** $_{5/1}$ | **FUSION LINE + 5** | **ISO-V** | **-20** | **236 - 239 - 234** | **236** |

| HARDNESS TEST | | |
|---|---|---|
| Location | Type/load | Maximum value |
| Parent metal(s) | **HV10** | **163** |
| H.A.Z.(s) | **HV10** | **276** |
| Weld metal | **HV10** | **214** |

**OTHER TEST**

| | |
|---|---|
| MACROGRAPHIC EXAMINATION | **Acceptable** |
| MICROGRAPHIC EXAMINATION | **Not required** |

**NON DESTRUCTIVE EXAMINATION**

| | |
|---|---|
| VISUAL EXAMINATION | **Acceptable** |
| RADIOGRAPHIC EXAMINATION | **Not required** |
| PENETRANT TEST | **Not required** |
| MAGNETIC PARTICLE | **Acceptable** |
| ULTRASONIC TEST | **Acceptable** |

Issued at: Genova on 15 July 2021

RINA Services S.p.A.
PED No. Bo. 0474

| CONCRANE A REMAZEL Group Company | **WELDING QUALIFICATION RECORD** | **pWPS n°:** | **CCP10** | |
|---|---|---|---|---|
| | | **Date** | **14/05/2021** | |
| | | **Record n.** | **WR07/2021** | Pag. 1 / 1 |

| | | | |
|---|---|---|---|
| *Reference code* | **EN ISO 15614-1; 08833.ENG.MME.SDS** | *Welding position* | **PA – 1G – FLAT POSITIONG** |
| *Welding process* | **135 – GNAW** | *Type* | **SEMI-AUTOMATIC** |
| **JOINT** | | | |
| *Joint type* | **BW- BUTT WELD** | *Preparation method* | **FLAME AND MACHINING** |
| *Weld preparation* | **DOUBLE BEVEL GROOVE** | *Method* | **BRUSHING AND/OR GRIDING** |
| *Backing* | **NO** | *Root opening* | **2 mm** |
| *Backing material* | **N.A.** | *Groove angle* | **45°** |
| *Backing gouging* | **N.A.** | *Root face dimension* | **2 mm** |

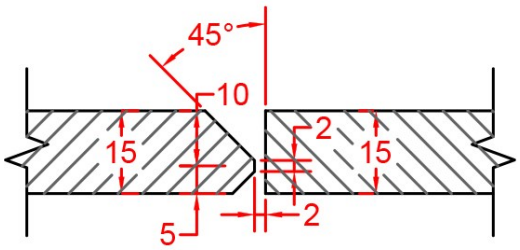
| **BASE MATERIAL** | | |
|---|---|---|
| *Part identification* | **A** | **B** |
| *Pipe or plate* | **PLATE** | **PLATE** |
| *Material group* | **1.2** | **1.2** |
| *Material type* | **EH36 (SA516GR70)** | **EH36 (SA516GR70)** |
| *Thickness* | **EH36** | **EH36** |
| *Heat* | **15 mm** | **15 mm** |
| *C - CEV (IIW) & Pcm* | **632914** | **632914** |

| **FILLER MATERIALS AND GAS DETAIL DETAILS** | | | |
|---|---|---|---|
| *Trade marker filler* | **ESAB OK AristoRod 12.50** | *Specification* | **EN ISO 14175** |
| *Classification filler* | **G42 4 M21 3Si (EN ISO 14341-A)** | *Classification gas* | **M21 – 82% Ar + 18% $CO_2$** |
| *Batch nr. filler* | **PVV01022033B** | *Flow rate l/min* | **19 l/min** |
| **PREHEAT AND PWHT** | | | |
| *Preheat temperature* | **AMBIENT (>20 °C)** | *PHWT method* | **N.A.** |
| *Max interpass temperture* | **250 °C** | *Time and temperature* | **N.A.** |

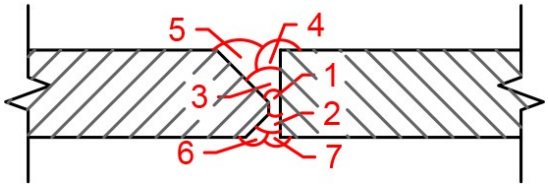
**PARAMETERS RECORD**

| Pass weld | Welding process | Filer metal classification | Filler diameter [mm] | Current type | Ampere [A] | Voltage [V] | Travel speed [mm/min] | Heat input [kJ/mm] | Interpass temperature [°C] |
|---|---|---|---|---|---|---|---|---|---|
| \1 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 150 | 19.5 | 149 | 0.94 | N.A. |
| 2 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 244 | 27.7 | 295 | 1.10 | 72 °C |
| 3 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 253 | 27.5 | 310 | 1.08 | 83 °C |
| 4 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 252 | 27.9 | 327 | 1.03 | 112 °C |
| 5 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 245 | 27.7 | 286 | 1.14 | 135 °C |
| \6 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 243 | 27.8 | 265 | 1.22 | 172 °C |
| 7 | 135 | G42 4 M21 3Si | Ø 1.2 | DCEP | 249 | 28.1 | 295 | 1.14 | 202 °C |
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**Joint details**




**Bead sequence**




| *Registered by* | *Checked by* | *Society approved by* | *Customer approved by:* |
|---|---|---|---|
| **A. Feltrin** | | | |

METAL SERVICES
MATERIALS TESTING

# TEST REPORT No. 21.0366 Rev.1

**ISSUED ON 21/06/2021**

**This document replace the test report no. 21.0366 Rev.0**

Customer

**CONCRANE S.r.l.**

Via Caboto, 26

34147 Trieste (TS)

## INFORMATION

The present test report cannot be modified and cannot be reproduced in a partial way without the formal written approval of Metal Services Materials Testing Srl.
Test results are only related to the supplied tested samples; the remains of them will be stored and available for not more than 30 days after the test report issuing date, unless differently agreed on the purchase order.
Equipment used are to be intended under metrological validity.
The uncertainty of measurement is expressed as expanded uncertainty obtained by multiplying the combined uncertainty for the coverage factor of k = 2, corresponding to a confidence interval of about 95%.
(+) Supervised test by 3rd part inspector.

## MATERIAL RECEPTION

| Date | Delivery note no. | Offer no. | Order no. |
|---|---|---|---|
| 28/05/2021 | 21050 | - | - |

**Sampling data**

Sampling and identification executed by the Customer

## MATERIAL DESCRIPTION

| Sample no. | Identification mark |
|---|---|
| 1236 | Sample identified as "pWPS CCP10 – BW plate thk. 15 mm – material DNV-GL EH36/RINA DH36 – welding process GMAW – position 1G – welding consumable ESAB OK AristoRod 12.50 Ø 1.2 mm – AWS A5.18 ER 70S-6 – shielding gas EN ISO 14175 M21 82%Ar + 18% CO2 18/24 l/min" |

## TEST INDEX


| Section no. | Test | Page |
|---|---|---|
| 1 | Visual examination (UNI EN ISO 17637:2017) | 2 |
| 2 | Magnetoscopic examination (UNI EN ISO 17638:2016 – ASTM E709 – API 2X) | 2 |
| 3 | Ultrasonic examination (UNI EN ISO 17640:2018 – API RP 2X) | 3 |
| 4 | Transverse tensile test on welds (UNI EN ISO 4136:2012) | 4 |
| 5 | Longitudinal tensile test on welds (UNI EN ISO 5178:2011) | 4 |
| 6 | Bend test on welds (UNI EN ISO 5173:2012) | 4 |
| 7 | Impact test on welds (UNI EN ISO 9016:2012) | 4 |
| 8 | Macrographic examination (UNI EN ISO 17639:2013) | 5 |
| 9 | Hardness test on welded joints (UNI EN ISO 9015-1:2011) | 6 |
| - | Other reference documents (08833.ENG.MME.SDS Rev.07) | - |


## NOTE

This document replaces the test report no. 21.0366 Rev.0 and it has been issued in order to integrate data of the fields "Material description" and of the section 5 "Longitudinal tensile test on welds"

//

## RESERVED FOR DIGITAL SIGNATURE

Firmato digitalmente da:
PELLEGRIN LORENZO
Firmato il 21/06/2021 11:19
Seriale Certificato: 21401746878628221003275909547213633194
Valido dal 01/10/2020 al 01/10/2023
ArubaPEC S.p.A. NG CA 3

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# TEST REPORT No. 21.0366 Rev.1

**ISSUED ON 21/06/2021**

**This document replace the test report no. 21.0366 Rev.0**

## 1. VISUAL EXAMINATION

### TEST CONDITIONS

| Equipment | Visual conditions | Surface conditions | Working step |
|---|---|---|---|
| Weld Gauge, Lamp | Min. 1000 lux on tested surface | As welded | Welds completed |
| **Test method** | **Acceptance criteria** | **Procedure of examination** | **Reference drawing** |
| UNI EN ISO 17638:2016 – ASTM E709 – API 2X | UNI EN ISO 5817:2014 - 08833.ENG.MME.SDS Rev.07 | - | pWPS CCP10 |
| **Heat Treatment** | **Extention of the examination** | **-** | **-** |
| - | 100% | - | - |

### RESULTS

| Sample no. | Data | Position | Result of inspection |
|---|---|---|---|
| 1236 | 31/05/2021 | - | *Imperfections exceeding the acceptance criteria and their location*: No recordable indications. |

**Record of indications detected**

| *Weld Id.* | *Indication no.* | *Start from* | *Probe[1]* | *Length* | *Depth[1]* | *Probable type of defect* |
|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - |

Glossary: //

Note 1: Only for UT examination

## 2. MAGNETIC PARTICLES TESTING

### TEST CONDITIONS

| Equipment | Visual conditions | Surface conditions | Working step |
|---|---|---|---|
| Deltaflux DF Y/A S/N 140514 | Min. 500 lux on tested surface | Welded | As finished |
| **Contrast paint** | **Type of magnetic particles** | **Magnetic particles** | **Type of current** |
| ProNdt 183 | Wet - visible | ProNdt 181 | AC |
| **Test method** | **Acceptance criteria** | **Procedure of examination** | **Reference drawing** |
| UNI EN ISO 17640:2018 – API RP 2X | UNI EN ISO 23278:2015 Lev.1 - 08833.ENG.MME.SDS Rev.07 | - | pWPS CCP10 |
| **Heat Treatment** | **Extension of the examination** | **Demagnetization** | **Lifting power** |
| Not declared | 100% | Not required | 5 Kg |

### RESULTS

| Sample no. | Data | Position | Result of inspection |
|---|---|---|---|
| 1236 | 31/05/2021 | - | *Imperfections exceeding the acceptance criteria and their location*: No recordable indications. |

**Record of indications detected**

| *Weld Id.* | *Indication no.* | *Start from* | *Probe[1]* | *Length* | *Depth[1]* | *Probable type of defect* |
|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - |

Glossary: //

Note 1: Only for UT examination

### NOTE

//

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# TEST REPORT No. 21.0366 Rev.1
## ISSUED ON 21/06/2021
**This document replace the test report no. 21.0366 Rev.0**

## 3. ULTRASONIC EXAMINATION

**TEST CONDITIONS**

| Material | Thickness | Heat Treatment | Testing plan |
|---|---|---|---|
| EH36 | 15 mm | - | 100 % |
| **Instrument** | **Probe** | **Couplant** | **Note** |
| Sonatest D20+ s/n.:I009835 | Olympus AMR 8x9 70 | Gel | - |
| **Test method** | | **Acceptance criteria** | |
| UNI EN ISO 17640:2018 – API RP 2X | | UNI EN ISO 11666:2018 - 08833.ENG.MME.SDS Rev.07 | |

**RESULTS**

| Sample no. | Data | Position | Result of inspection |
|---|---|---|---|
| 1236 | 31/05/2021 | - | *Imperfections exceeding the acceptance criteria and their location*: No recordable indications. |

**Record of indications detected**

| *Weld Id.* | *Indication no.* | *Start from* | *Probe*[1] | *Length* | *Depth*[1] | *Probable type of defect* |
|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - |

Glossary: //

Note 1: Only for UT examination

**NOTE**

//

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# TEST REPORT No. 21.0366 Rev.1

**ISSUED ON 21/06/2021**

**This document replace the test report no. 21.0366 Rev.0**

## 4. TRANSVERSE TENSILE TEST ON WELDS

| Sample no. | Date | Position | T °C | a mm | b mm | So $mm^2$ | Fm N | Rm MPa | Fracture Position |
|---|---|---|---|---|---|---|---|---|---|
| 1236 | 07/06/2021 | T to Weld | 22 | 13.00 | 25.03 | 325.39 | 173365 | 533 | Base material - ductile |
| 1236 | 07/06/2021 | T to Weld | 22 | 12.99 | 25.00 | 324.75 | 172872 | 532 | Base material - ductile |

Instruments: Galdabini Quasar 1200 (Serial no. V9GV)
Glossary: T = transversal; L = longitudinal
Note: //

## 5. LONGITUDINAL TENSILE TEST ON WELDS

| Sample no. | Date | Position | T °C | Ø mm | $Rp_{0.02}$ MPa | $Rp_{0.2}$ MPa | $Rp_{1.0}$ MPa | Rm MPa | $L_0$ mm | A % | Z % | Rs/Rm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1236 | 07/06/2021 | All weld | 22 | 6.02 | 470 | - | - | 584 | 30 | 28.0 | 60 | - |

Instruments: Galdabini Quasar 250 (Serial no.V901)
Glossary: //
Note: //

## 6. BEND TEST ON WELDS

| Sample no. | Date | Type of test | T °C | $t_s$ mm | l mm | d mm | Bend angle ° | Test Result |
|---|---|---|---|---|---|---|---|---|
| 1236 | 07/06/2021 | SBB | 22 | 10 | 65 | 40 | 180 | No recordable indication |
| 1236 | 07/06/2021 | SBB | 22 | 10 | 65 | 40 | 180 | No recordable indication |
| 1236 | 07/06/2021 | SBB | 22 | 10 | 65 | 40 | 180 | No recordable indication |
| 1236 | 07/06/2021 | SBB | 22 | 10 | 65 | 40 | 180 | No recordable indication |

Instruments: Caliper Sama 18148032 (766)
Glossary: $t_s$= specimen thickness; l= minimum clearance between the shoulders; d= ram diameter; SBB = Side bend on butt welds.
Note: //

## 7. IMPACT TEST ON WELDS

| Sample no. | Date | Position | w mm | T °C | $KV_2$ J | | | $KV_2$ AVG J |
|---|---|---|---|---|---|---|---|---|
| 1236 | 07/06/2021 | VHT 5/1 | 10 | -20 | 236 | 239 | 234 | 236 |
| 1236 | 07/06/2021 | VHT 2/1 | 10 | -20 | 242 | 236 | 241 | 240 |
| 1236 | 07/06/2021 | VHT 0/1 | 10 | -20 | 237 | 125 | 187 | 183 |
| 1236 | 07/06/2021 | VWT 0/1 | 10 | -20 | 142 | 187 | 201 | 177 |

Instruments: Galdabini Impact 300 (Serial no.V88G)
Glossary: T = transversal; L = longitudinal
Note: When absorbed energy is < 8 J or >= 240 J the values are approximate.

## NOTE

//

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# TEST REPORT No. 21.0366 Rev.1

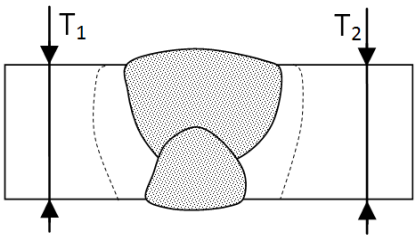
**ISSUED ON 21/06/2021**

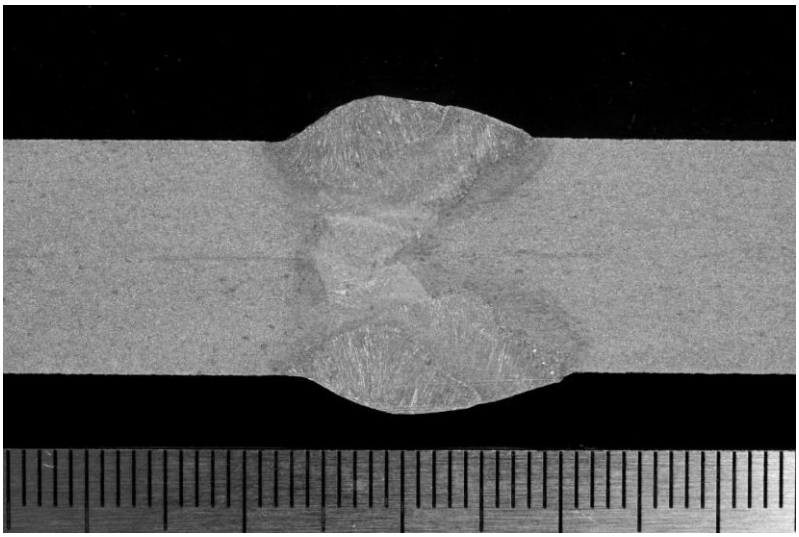
**This document replace the test report no. 21.0366 Rev.0**

## 8. MACROGRAPHIC EXAMINATION

| | |
|---|---|
| **Sample no** | 1236 Macro #1 |
| **Date** | 03/06/2021 |
| **Position** | T to weld |
| **Etching** | HNO3 10% |
| **$T_1$** | 15 mm |
| **$T_2$** | 15 mm |
| **$Z_1$** | n.a. |
| **$Z_2$** | n.a. |
| **Throat Thickness** | n.a. |

**Sketch**



| **Imperfection** |
|---|
| No recordable indications |

Instruments: Wild stereomicroscope (serial no.386471309)

Glossary: //

Note: //

**NOTE**

//

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

# TEST REPORT No. 21.0366 Rev.1

**ISSUED ON 21/06/2021**

**This document replace the test report no. 21.0366 Rev.0**

## 9. HARDNESS TEST ON ARC WELDED JOINTS

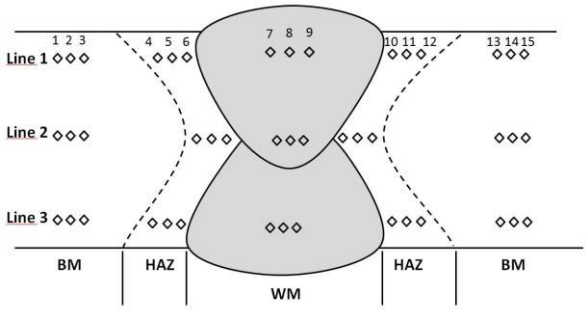
| Sample no. | Date | Type of test | Indentation | Position | Line 1 (HV) | Line 2 (HV) | Line 3 (HV) |
|---|---|---|---|---|---|---|---|
| 1236 Macro #1 | 03/06/2021 | HV10 | 1 | BM | 152 | 162 | 163 |
| | | | 2 | BM | 148 | 154 | 154 |
| | | | 3 | BM | 156 | 157 | 151 |
| | | | 4 | HAZ | 210 | 178 | 191 |
| | | | 5 | HAZ | 227 | 188 | 237 |
| | | | 6 | HAZ | 228 | 206 | 276 |
| | | | 7 | WM | 199 | 207 | 209 |
| | | | 8 | WM | 201 | 214 | 207 |
| | | | 9 | WM | 200 | 200 | 208 |
| | | | 10 | HAZ | 239 | 195 | 271 |
| | | | 11 | HAZ | 195 | 182 | 192 |
| | | | 12 | HAZ | 165 | 159 | 155 |
| | | | 13 | BM | 150 | 158 | 157 |
| | | | 14 | BM | 150 | 161 | 151 |
| | | | 15 | BM | 151 | 153 | 153 |

Instruments: QNESS Q150+ (serial no. Q1294/02/18)

Glossary: //

Note: //

### INDENTATION POSITION




### NOTE

//

### INSPECTOR NOTES(+)

| Laboratory Manager | Inspector (+) |
|---|---|
| p.i. L. Pellegrin | RINA S.p.A. F. Sedran |

DNV·GL

# CERTIFICATE

Certificate No:
**N141X66X**

**FOR STEEL MATERIAL - ROLLED STEEL FOR STRUCTURAL APPLICATION, HIGH STRENGTH**

## This is to certify

| | |
|---|---|
| that the product: | **4 x Hot Rolled Steel plates** |
| Type designation: | **Grade VL E36** |
| Application/context: | **High strength steel** |
| Serial/tag no: | **N.A.** |

Has been found to comply with relevant requirements in:
**DNVGL-RU-SHIP :DNV GL rules for classification: Ships (2019-07)**

The product is intended for

| | |
|---|---|
| Yard: | **-** |
| Yard No: | **-** |
| Name of vessel: | **STOCK** |
| DNV GL Id No: | **-** |

**The product / material has been marked: VL Class Stamp only on: Plates Surface**
**VL material grades are certified and found to be in compliance with the requirements to corresponding NV and GL grades.**

## Particulars of Vendor and Purchaser

| | |
|---|---|
| Vendor: | **Metinvest Trametal S.p.A.** |
| Vendor reference: | **31904901** |
| Purchaser: | **TONELLO S.P.A** |
| Purchaser reference: | **B9001117** |

Issued at **Italy/Malta CMC** on **2019-12-12**

for **DNV GL**

This document has been digitally signed and
will therefore not have handwritten signatures

**Berni, Marco**
**Surveyor**

TONELLO S.p.A.
CONTROLLO QUALITA'
PER
COPIA CONFORME
CENTRO LAVORAZIONE LAMIERE


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## Linked Type Approvals:
AMMM000010C Rev.1, Rolled Steel Products

## Surveyor Supplementary information:
For mechanical test results see manufacturer report No. 47645.



# CERTIFICATO DI CONTROLLO 3.2 / INSPECTION CERTIFICATE 3.2 - EN 10204:2004


**METINVEST**
METINVEST TRAMETAL SPA

Società per azioni con socio unico soggetta a direzione e coordinamento di Metinvest B.V
Registered office: Via XII Ottobre, 3 - 16121 Genova, Italy
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Works: Via E. Fermi, 44 - 33058 San Giorgio di Nogaro UD, Italy
Phone +39 0431 629989 - Fax +39 0431 629985
Cap. Soc. Euro 300.120.000,00 i.v.
C.F., P.IVA e Iscr. Reg. Imp. GE 05956630965 - REA 437720/GE
http://trametal.metinvestholding.com


(A) PROCESSO DI ELABORAZIONE / STEELMAKING PROCESS: E = ELECTRIC ; BO = BASIC OXYGEN
(B) STATO DI FORNITURA / DELIVERY CONDITION: AR = GREZZO DI LAMINAZIONE / AS ROLLED ;
N* = LAMINAZIONE A TEMPERATURA CONTROLLATA / NORMALIZING ROLLING ;
N = NORMALIZZATO / NORMALIZED at 910°C, 1,5 min/mm ; ARIA CALMA / STILL AIR;
R = RICOTTO / ANNEALED;
N+R = NORMALIZZATO + RINVENUTO / NORMALIZED + TEMPERED
(C) TRATTAMENTO TERMICO DEL CAMPIONE / HEAT TREATMENT OF SAMPLE:
N = 910°C, 1,5 min/mm ; ARIA CALMA / STILL AIR
R = 650°C, 1,5 min/mm ; ARIA CALMA / STILL AIR
(D) Ceq_1 = C + Mn/6 ; Ceq_2 = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15 ;
Pcm = C + Si/30 + (Mn + Cu + Cr)/20 + Nl/60 + Mo/15 + V/10 + B*5
(1) POSIZIONE / LOCATION: 1 = TESTA / TOP ; 2 = PIEDE / BOTTOM
(2) POSIZIONE / LOCATION: C = CUORE / 1/2 THICKNESS ; P = PELLE / SURFACE ; D = 1/4 SPESSORE / THICKNESS
(3) DIREZIONE / DIRECTION: L = LONGITUDINALE / LONGITUDINAL ; T = TRASVERSALE / TRANSVERSE
(4) FORMA DEL PROVINO / SHAPE OF TEST PIECE: P = PRISMATICO / PRISMATIC ; C = CILINDRICO / CYLINDRICAL
(5) ESITO PROVA DI PIEGA / RESULT: OK = COMPLYING ; NO = NOT COMPLYING

A06 Cliente / Customer

**TONELLO S.P.A.**
**VIA D'ORMENT N. 6**
**33042 BUTTRIO 33042 IT**
**UD ITALIA**

| A03 N° Certificato / Certificate no. | Z02 Data / Date |
|---|---|
| 47645 | 12/12/2019 |
| A08 N° Ordine Trametal / Works order | A07 N° Ordine cliente / Customer's order |
| 31904901 | B9001117 |
| DDT | del / date |
| Pratica / File no. | N141X66X |
| del / date | 09/12/2019 |

B06 Marcatura di prodotto / Marking of the product
LAMIERA/ORDINE/N° INFORNAMENTO/DIMENSIONI/QUALITÀ/MARCHIO DEL PRODUTTORE
PLATE/ORDER/INTERNAL N°/DIMENSIONS/STEEL GRADE/MANUFACTURER'S MARK

B01/B02/B03

| | |
|---|---|
| Prodotto / Product | Lamiere / Hot rolled plates |
| Qualità / Steel grade | VL E36 |
| Normativa / Specification | IACS-DNVGL |

| B07 ITEM | B07 LAMIERA PLATE | B07 N° INFORN. INTERNAL NUMBER | B09/B11 DIMENSIONI [mm] DIMENSIONS | B12 MASSA TEORICA [t] THEORICAL WEIGHT | B07 LOTTO BATCH NO. | C70 PROCESSO ELAB. (A) STEELMAKING PROCESS | B04 STATO FORNITURA LAMIERA (B) DELIVERY CONDITION | C00 CAMPIONE SAMPLE | B05 TRATT. CAMPIONE (C) HEAT TREATMENT | C00 CAMPIONE PWHT SAMPLE | B05 PWHT BEGINNING TEMPERATURA INIZIO °C | VELOCITA' RISCALDO C/h | TEMPERATURE TREATMENT TEMPERATURA TRATTAMENTO °C | HOLDING TIME PERMANENZA Min | COOLING RATE VELOCITA' RAFFREDDAMENTO °C/h | END TEMPERATURA FINE °C | N° CICLI / CYCLES | C00 CAMPIONE Q+T SAMPLE | B05 Q+T TEMPERATURE TEMPERATURA (Q) °C | HOLDING TIME PERMANENZA (Q) Min | COOLING RAFFREDDAMENTO | TEMPERATURE TEMPERATURA (T) °C | HOLDING TIME PERMANENZA (T) Min | COOLING RAFFREDDAMENTO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1TAN850407A | 1590166 | 15.00X2450X12000 | 3,46 | 632914 | BO | N | W7849 | | 19T829 | | | | | | | | | | | | | | |
| ~~2~~ | ~~1NAM330204A~~ | ~~1590652~~ | ~~30.00X2450X6300~~ | ~~3,63~~ | ~~632911~~ | ~~BO~~ | ~~N~~ | ~~W7846~~ | | | | | | | | | | | | | | | | |
| ~~3~~ | ~~1NAM960403A~~ | ~~1590606~~ | ~~35.00X2450X7200~~ | ~~4,85~~ | ~~632912~~ | ~~BO~~ | ~~N~~ | ~~W7847~~ | | | | | | | | | | | | | | | | |
| ~~4~~ | ~~1NAM960503A~~ | ~~1590550~~ | ~~50.00X2450X6300~~ | ~~6,06~~ | ~~632913~~ | ~~BO~~ | ~~N~~ | ~~W7848~~ | | | | | | | | | | | | | | | | |
| | Total | 4 | | 18,00 | | | | | | | | | | | | | | | | | | | | |

TONELLO S.p.A.
CONTROLLO QUALITA'
PER
COPIA CONFORME
CENTRO LAVORAZIONE LAMIERE

## C71/C92 COMPOSIZIONE CHIMICA DI COLATA / HEAT CHEMICAL ANALYSIS

| B07 COLATA HEAT | C71 C % | C72 Mn % | C73 Si % | C74 P % | C75 S % | C76 Cu % | C77 Ni % | C78 Cr % | C79 Mo % | C80 Al % | C81 V % | C82 Nb % | C83 Ti % | C84 Sn % | C85 Ca % | C86 N % | C87 B % | C88 H % | C89 Ceq1 % (D) | C90 Ceq2 % (D) | C91 Pcm % (D) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VL E36 Min 0.00 - 100.00 | | 0,90 | | | | | | | | 0,020 | 0,050 | 0,020 | 0,007 | | | | | | | | |
| VL E36 Max 0.00 - 100.00 | 0,18 | 1,60 | 0,50 | 0,035 | 0,035 | 0,350 | 0,400 | 0,200 | 0,080 | | 0,100 | 0,050 | 0,020 | | | | | | | | |
| 1NAM33 | 0,16 | 1,50 | 0,20 | 0,012 | 0,003 | 0,060 | 0,040 | 0,030 | <0.005 | 0,035 | <0.005 | 0,021 | <0.005 | <0.005 | 0,0000 | 0,0080 | 0,0005 | 0,0002 | 0,41 | 0,42 | 0,25 |
| 1NAM96 | 0,16 | 1,49 | 0,20 | 0,012 | 0,002 | 0,040 | 0,030 | 0,020 | <0.005 | 0,035 | <0.005 | 0,020 | <0.005 | <0.005 | 0,0000 | 0,0070 | <0.0005 | 0,0002 | 0,41 | 0,42 | 0,24 |
| 1TAN85 | 0,16 | 1,51 | 0,22 | 0,008 | 0,002 | 0,030 | 0,020 | 0,030 | <0.005 | 0,037 | <0.005 | <0.010 | <0.005 | <0.005 | 0,0000 | 0,0070 | <0.0005 | 0,0004 | 0,41 | 0,42 | 0,25 |

| | PROVA DI TRAZIONE TENSILE TEST | | | | | | | | | PROVA DI RESILIENZA IMPACT TEST - CHARPY V-NOTCH TEST | | | | | | PROVA DI PIEGA BEND TEST | | | | PROVA DI DUREZZA HARDNESS TEST | | | | PROVA DI STRIZIONE Z% TEST | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C00 | | C01 | C01 | C02 | C03 | C11 | C12 | | C13 | C14 | C10 | C41 | C02 | C03 | C01 | C42 | C43 | C02 | C51 | C52 | C50 | C01 | C30 | C31 | C32 | C53 | C54 |
| CAMPIONE SAMPLE | SPESSORE LAMIERA PLATE THICKNESS | POSIZIONE (1) LOCATION | POSIZIONE (2) LOCATION | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | ReH [Mpa] YIELD STRENGTH | Rm [Mpa] TENSILE STRENGTH | ReH/Rm | A% ELONGATION | Rp 0,2 [Mpa] PROOF/YIELD STRENGTH | FORMA PROVINO (4) SHAPE OF TEST PIECE | LARGHEZZA [mm] WIDTH | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | POSIZIONE (2) LOCATION | SINGOLI VALORI [J] INDIVIDUAL VALUES | MEDIA [J] MEAN VALUE | DIREZIONE (3) ORIENTATION | MANDRINO [mm] MANDREL | ANGOLO [°] ANGLE | ESITO (5) RESULT | POSIZIONE (2) LOCATION | METODO TEST METHOD | SINGOLI VALORI INDIVIDUAL VALUES | MEDIA MEAN VALUE | Z% VALORE MEDIO Z% MEAN VALUE | Z% SINGOLI VALORI Z% INDIVIDUAL VALUES |
| VL E36 Min 0.00 - 100.00 | | | | | 20 | 355 | 490 | | 21,0 | | | | | | | | | | | | | | | | | | |

| | | | PROVA DI TRAZIONE TENSILE TEST | | | | | | | | PROVA DI RESILIENZA IMPACT TEST - CHARPY V-NOTCH TEST | | | | | | PROVA DI PIEGA BEND TEST | | | | PROVA DI DUREZZA HARDNESS TEST | | | | PROVA DI STRIZIONE Z% TEST | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C00 | | C01 | C01 | C02 | C03 | C11 | C12 | | C13 | C14 | C10 | C41 | C02 | C03 | C01 | C42 | C43 | C02 | C51 | C52 | C50 | C01 | C30 | C31 | C32 | C53 | C54 |
| CAMPIONE SAMPLE | SPESSORE LAMIERA PLATE THICKNESS | POSIZIONE (1) LOCATION | POSIZIONE (2) LOCATION | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | ReH [Mpa] YIELD STRENGTH | Rm [Mpa] TENSILE STRENGTH | ReH/Rm | A% ELONGATION | Rp 0.2 [Mpa] PROOF/YIELD STRENGTH | FORMA PROVINO (4) SHAPE OF TEST PIECE | LARGHEZZA [mm] WIDTH | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | POSIZIONE (2) LOCATION | SINGOLI VALORI [J] INDIVIDUAL VALUES | MEDIA [J] MEAN VALUE | DIREZIONE (3) ORIENTATION | MANDRINO [mm] MANDREL | ANGOLO [°] ANGLE | ESITO (5) RESULT | POSIZIONE (2) LOCATION | METODO TEST METHOD | SINGOLI VALORI INDIVIDUAL VALUES | MEDIA MEAN VALUE | Z% SINGOLI VALORI Z% INDIVIDUAL VALUES | Z% VALORE MEDIO Z% MEAN VALUE |
| VL E36 Max 0.00 - 100.00 | | | | | 20 | | 630 | | | | | | | | | | | | | | | | | | | | |
| VL E36 Min 6.00 - 50.00 | | | | | | | | | | | | | L | -40 | | | 34 | | | | | | | | | | |
| ~~W7846~~ | ~~30,00~~ | ~~2~~ | ~~P~~ | ~~T~~ | ~~20~~ | ~~401~~ | ~~522~~ | ~~0,77~~ | ~~32,7~~ | | ~~P~~ | ~~10,00~~ | ~~L~~ | ~~-40~~ | ~~P~~ | ~~233 250 254~~ | ~~246~~ | | | | | | | | | | |
| ~~W7847~~ | ~~35,00~~ | ~~2~~ | ~~P~~ | ~~T~~ | ~~20~~ | ~~380~~ | ~~511~~ | ~~0,74~~ | ~~32,3~~ | | ~~P~~ | ~~10,00~~ | ~~L~~ | ~~-40~~ | ~~P~~ | ~~284 291 276~~ | ~~284~~ | | | | | | | | | | |
| ~~W7848~~ | ~~50,00~~ | ~~2~~ | ~~P~~ | ~~T~~ | ~~20~~ | ~~378~~ | ~~528~~ | ~~0,72~~ | ~~30,0~~ | | ~~P~~ | ~~10,00~~ | ~~L~~ | ~~-40~~ | ~~P~~ | ~~206 185 187~~ | ~~193~~ | | | | | | | | | | |
| W7849 | 15,00 | 2 | P | T | 20 | 413 | 513 | 0,81 | 31,8 | | P | 10,00 | L | -40 | P | 271 243 263 | 259 | | | | | | | | | | |

C10

UNI EN ISO 6892-1:2016 / UNI EN ISO 148-1:2016

Z01

| ITEM | | TOLLERANZA DI SPESSORE TOLERANCE ON THICKNESS | TOLLERANZE DI LARGHEZZA TOLERANCE ON WIDTH | TOLLERANZE DI LUNGHEZZA TOLERANCE ON LENGTH | CONDIZIONI SUPERFICIALI SURFACE FINISH | PLANARITÀ FLATNESS |
|---|---|---|---|---|---|---|
| 1 | | EN 10029 CL.B | -0+100 MM | -0+200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |
| 2 | | EN 10029 CL.B | -0+100 MM | -0+200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |
| 3 | | EN 10029 CL.B | -0+100 MM | -0+200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |
| 4 | | EN 10029 CL.B | -0+100 MM | -0+200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |

CERTIFICHIAMO che le lamiere elencate sono conformi alla prescrizione dell'ordine, che i controlli della marcatura, dell'aspetto superficiale e dimensionale hanno dato esito positivo.
WE CERTIFY that the above mentioned plates are consistent with the order prescriptions: marking, inspection and measurement without objection.
DICHIARIAMO CHE LE LAMIERE SONO STATE CONTROLLATE IN ACCORDO ALLA NORMATIVA VIGENTE E CHE LE RADIAZIONI IONIZZANTI NON ECCEDONO IL VALORE DEL FONDO NATURALE.
WE DECLARE THAT THE PLATES WERE CONTROLLED ACCORDING TO STANDARD AND RADIATION DO NOT EXCEED THE NATURAL RADIATION.

Z06

Z07

Z03 ENTE COLLAUDO / INSPECTION BODY

TIMBRO DELL'ISPETTORE
STAMP OF THE INSPECTION REPRESENTATIVE

X Witnessed ☐

And found to comply with:

DNV GL Rules

Date: 2019-12-12

Sign: Marco Berni
DNV GL Venice

This document has been digitally signed and will therefore not have handwritten signatures.

Z02

METINVEST TRAMETAL S.p.A.
F. Andrian
CQ Manager

Certificazione valida per materiale fornitoVi con ns. DDT nr. C1000590 del 20/04/2021 relativo a:

PZ. 2 PART. SAGOMATO A DISEGNO: P01 SP. 15mm
PZ. 2 PART. SAGOMATO A DISEGNO: P02 SP. 15mm
PZ. 6 PART. SAGOMATO A DISEGNO: P05 SP. 15mm
RIF. VS. ORD. EMAIL DEL 13/04/2021
RIF. VS. COMM. URGENTE

TONELLO S.p.A.
CONTROLLO QUALITA'
PER
COPIA CONFORME
CENTRO LAVORAZIONE LAMIERE

# 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: 2021-02-19

Numero certificato/Cert no: EC26329874 rev. 0

| | | | |
|---|---|---|---|
| Nostro ordine/Our order: | 0100206249 | Vostro ordine/Your order: | 263/2021 |
| Nostro riferimento/Our ref: | HYBRIS PRD account | Vostro riferimento/Your ref: | |
| Codice Cliente/Cust no: | ITB01537 | Vostro numero fax/Your fax | |
| Data ordine Cliente/Your date: | 20210217 | Vostra e-mail/Your e-mail: | |

Indirizzo di fatturazione/Invoice address
ALLOYS ITALIA SRL
.
VIA DEGLI SCHIAVETTI 9 - ZONA IND.
34074 MONFALCONE
Italy

Destinatario del certificato/Cert receiver

Indirizzo di spedizione/Delivery address
ALLOYS ITALIA SRL
VIA DEGLI SCHIAVETTI 9 - ZONA IND.
34074 MONFALCONE GO
Italy

CONSEGNA/DELIVERY Numero di lotto/Lot no: PVV01022033B Quantità/Quantity: 1098 KGM

## PRODOTTO/PRODUCT

Marchio/Brand: ESAB
Descrizione/Desc: OK AristoRod 12.50 1.2mm 18kg
Codice/Item no: **1A50126910**

## CLASSIFICAZIONE/CLASSIFICATIONS

EN ISO 14341-A: G 3Si1
EN ISO 14341-A: G 38 3 C1 3Si1
EN ISO 14341-A: G 42 4 M20 3Si1
EN ISO 14341-A: G 42 4 M21 3Si1
SFA/AWS A5.18: ER70S-6
CSA W48: B-G 49A 3 C1 S6
JIS Z 3312: YGW 12 (C1)

## COMPOSIZIONE CHIMICA/ CHEMICAL COMPOSITION

**Valori reali/Actual results: in accordo a/acc to E 3.1**

Wire/strip

Altro/Auxiliary:

| | | |
|---|---|---|
| C | | 0.08% |
| Si | | 0.83% |
| Mn | | 1.47% |
| P | | 0.007% |
| S | | 0.012% |
| Cr | | 0.02% |
| Ni | | 0.01% |
| Mo | < | 0.01% |
| Cu | | 0.05% |
| V | < | 0.01% |
| Al | | 0.007% |
| Ti+Zr | | 0.01% |

## CARATTERISTICHE MECCANICHE/MECH PROPS

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

Norma/Standard: EN
Altro/Auxiliary: M21
Condizione/Condition:

TRAZIONE/TENSILE

| ReL | Rm | A4-A5 |
|---|---|---|
| 470 MPa | 560 MPa | 26 % |

RESILIENZA/IMPACT

| Temp | -30 °C | -40 °C | -50 °C |
|---|---|---|---|
| KV | 100 J | 90 J | 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 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,

# 4. Welder Certificates

This document is the property of **REMAZEL Engineering S.p.A.** who will safeguard its rights according to the civil and penal provisions of the Law.

# WELDER APPROVAL CERTIFICATE
# ACCORDING TO UNI EN ISO 9606-1:2017

No. **24TO02491CE1**

| | | | | | |
|---|---|---|---|---|---|
| Designation | **UNI EN ISO 9606-1 135-D/135-S P BW FM1/FM1 S/S s12 PA ss nb** | | | | |
| Welder | **RADASANU GEORGENTIN IONUT** | | | | |
| Born in | **ROMANIA-ROMANIA** | | | on | **07/05/1986** |
| Identification | **3249766AA** | Method of Identification | **C.I.** | Stamp No. | **RI** |
| Employer/Manufacturer | **REMAZEL ENGINEERING S.P.A. - Milano (MI)** | | | | |

WPS used by welder during welding of test coupon: **01/16** Job knowledge: **not tested**

| Welding variables | Test piece | Range of qualification |
|---|---|---|
| **Welding process(es)** | **135-D / 135-S** | **135; 138** |
| **Transfer mode** | **Short-arc / Spray-arc** | **Short, spray, globular and pulsed-arc** |
| **Product type** | **Plate** | **Plates and pipes** |
| **Type of weld** | **BW** | **Butt weld** |
| **Parent Metal group (ISO/TR 15608)** | **1.2** | **1 to 11** |
| **Filler material group(s)** | **FM1** | **FM1, FM2** |
| **Filler material type** | **135-D** | **Root: Solid wire**<br>**Fill/Cap: Solid wire/electrode core: M** |
| | **135-S** | **Solid wire/electrode core: M** |
| **Shielding gas (EN ISO 14175)** | **M21 /** | **All compatible** |
| **Type of current and polarity** | **135-D: DC EP; 135-S: DC EP** | **All compatible** |
| **Deposited thickness (mm)** | **12** | **135-D: 3 to 6** |
| | | **135-S: 3 to 18** |
| | | **135-D / 135-S: >= 3** |
| **Pipe outside diameter (mm)** | **N.A.** | **75 and over** |
| **Welding position(s)** | **PA** | **PA** |
| **Weld details / Layer technique** | **ss nb** | **135-D: ss nb, ss mb, bs, ss gb, ss fb** |
| | | **135-S: ss mb, bs** |

| Type of test | | | | | | | |
|---|---|---|---|---|---|---|---|
| Visual | **Acceptable** | Radiographic | **Not tested** | Magnetic particle | **Not tested** | Penetrant | **Not tested** |
| Macro | **Not tested** | Fracture | **Acceptable** | Bend | **Not tested** | | |

Revalidation method 9.3 a)

| | | | |
|---|---|---|---|
| This certificate is valid from | **29 July 2024** | to | **28 July 2027** |
| Issued at | **GENOVA** | on | **29 July 2024** |

This certificate consist of 2 pages

The contents of this document is confidential and copyrighted.

Filippo Lago
(Italy Industrial & Personnel Certification Services Director)

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO

**PRS N° 066 C**

Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
*Signatory of EA, IAF and ILAC Mutual Recognition Agreements*

**RINA Services S.p.A.**
**PED No. Bo. 0474**
**Via Corsica 12 - 16128 Genova**

| **Prolongation of approval by employer / coordinator for the following 6 months** | | | **Prolongation of approval by examiner or test body** | | |
|---|---|---|---|---|---|
| Date | Signature | Position or title | Date | Signature | Position or title |
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The validity of this certificate is subject to compliance with the RINA document "Rules for the Certification of Industrial Welders and Welding Operators" in force upon release of this certificate

The contents of this document is confidential and copyrighted.

# WELDER APPROVAL CERTIFICATE
# ACCORDING TO UNI EN ISO 9606-1:2017

No. **24TO02491CE2**

| | | | | | |
|---|---|---|---|---|---|
| Designation | **UNI EN ISO 9606-1 135-S P FW FM1 S t12 PB ml** | | | | |
| Welder | **RADASANU GEORGENTIN IONUT** | | | | |
| Born in | **ROMANIA-ROMANIA** | | | on | **07/05/1986** |
| Identification | **3249766AA** | Method of Identification | **C.I.** | Stamp No. | **RI** |
| Employer/Manufacturer | **REMAZEL ENGINEERING S.P.A. - Milano (MI)** | | | | |

WPS used by welder during welding of test coupon: **02/16** Job knowledge: **not tested**

| Welding variables | Test piece | Range of qualification |
|---|---|---|
| **Welding process(es)** | **135-S** | **135; 138** |
| **Transfer mode** | **Spray-arc** | **Spray, globular and pulsed-arc** |
| **Product type** | **Plate** | **Plates and pipes** |
| **Type of weld** | **FW** | **Fillet weld** |
| **Parent Metal group (ISO/TR 15608)** | **1.2** | **1 to 11** |
| **Filler material group(s)** | **FM1** | **FM1, FM2** |
| **Filler material type** | **Solid wire** | **Solid wire/electrode core: M** |
| **Shielding gas (EN ISO 14175)** | **M21** | **All compatible** |
| **Type of current and polarity** | **DC EP** | **All compatible** |
| **Material thickness (mm)** | **12** | **>= 3** |
| **Pipe outside diameter (mm)** | **N.A.** | **75 and over** |
| **Welding position(s)** | **PB** | **PA, PB** |
| **Weld details / Layer technique** | **ml** | **sl, ml** |

| Type of test | | | | | | | |
|---|---|---|---|---|---|---|---|
| Visual | **Acceptable** | Radiographic | **Not tested** | Magnetic particle | **Not tested** | Penetrant | **Not tested** |
| Macro | **Not tested** | Fracture | **Acceptable** | Bend | **Not tested** | | |

Revalidation method 9.3 a)

| | | | |
|---|---|---|---|
| This certificate is valid from | **29 July 2024** | to | **28 July 2027** |
| Issued at | **GENOVA** | on | **29 July 2024** |

This certificate consist of 2 pages

The contents of this document is confidential and copyrighted.

Filippo Lago
(Italy Industrial & Personnel Certification Services Director)

**PRS N° 066 C**

Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
*Signatory of EA, IAF and ILAC Mutual Recognition Agreements*

**RINA Services S.p.A.**
**PED No. Bo. 0474**
**Via Corsica 12 - 16128 Genova**

| **Prolongation of approval by employer / coordinator for the following 6 months** | | | **Prolongation of approval by examiner or test body** | | |
|---|---|---|---|---|---|
| Date | Signature | Position or title | Date | Signature | Position or title |
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The validity of this certificate is subject to compliance with the RINA document "Rules for the Certification of Industrial Welders and Welding Operators" in force upon release of this certificate

The contents of this document is confidential and copyrighted.

# 5. Attachments

This document is the property of **REMAZEL Engineering S.p.A.** who will safeguard its rights according to the civil and penal provisions of the Law.

| SIDERTAGLIO CALANDRATURA S.R.L. Pipes Rolling & Welding | **WELDING BOOK** | R0177-01 WB<br>**Rev.2** |
|---|---|---|

| | |
|---|---|
| **WB N.** | R0177-01 |
| **JOB** | R0177 |
| **P.O.** | 24005073 |
| **CLIENT JOB** | 24-27012 |
| **CODE** | EN 15614-1 |

| **CLIENT DRAWING** | **REV.** |
|---|---|
| C09-0001-P0002 | D |
| | |

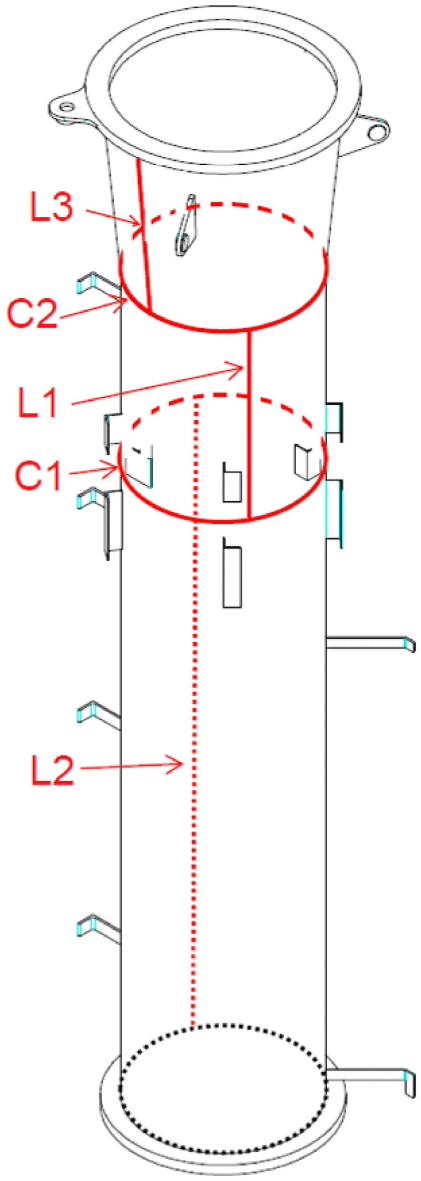
**INDEX**


| | |
|---|---|
| **Sect.1** | SKETCH + WELDING KEY FORM |
| **Sect.2** | WPS |
| **Sect.3** | WPQR |
| **Sect.4** | WPQ / WOPQ |


| REV | DATA | WC | QCM | AI / NoBo / TPI |
|---|---|---|---|---|
| **2** | **22/10/2024** | WELDING DEPUTY | SIDERTAGLIO CALANDRATURA S.R.L. | |
| 1 | 04/10/2024 | | | |
| 0 | 12/09/2024 | | | |

| WKF | JOB: R0177 | FIXED COLUMN AND PEDESTAL CARPENTRY |
|---|---|---|

# DWG: C09-0001-P0002 Rev. D



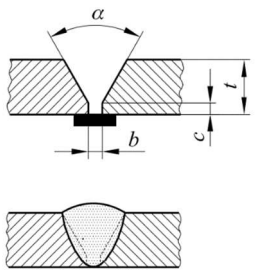

| Weld ID | WPQR | WPS | Process | Material | Thickness (mm) | VT | MT | UT | Notes |
|---|---|---|---|---|---|---|---|---|---|
| L1 | PROSAL-5160-2023 | 04E-23-01 | 135+121 | S355J2+N | 15 | 100% | 100% | 100% | |
| C1 | PROSAL-5160-2023 | 04E-23-01 | 135+121 | S355J2+N | 15 | 100% | 100% | 100% | |
| L2 | PROSAL-5160-2023 | 04E-23-01 | 135+121 | S355J2+N | 15 | 100% | 100% | 100% | |
| C2 | **PROSAL-5160-2023** | **04E-23-02** | **135+121** | S355J2+N | 15 | 100 | 100 | 100 | |
| L3 | PROSAL-5160-2023 | 04E-23-01 | 135+121 | S355J2+N | 15 | 100% | 100% | 100% | |
| | | | | | | | | | |
| | | | | | | | | | |

SIDERTAGLIO CALANDRATURA S.R.L.
Pipes Rolling & Welding

# WELDING PROCEDURE SPECIFICATION (WPS)
## ACCORDING TO EN ISO 15609-1
for welder/welding operator qualificated only

| | | | |
|---|---|---|---|
| MANUFACTURER | **SIDERTAGLIO CALANDRATURA S.R.L.** | | |
| WELDING PROCEDURE SPECIFICATION No. | **04E-23-01 Rev.1** | Date | **12/9/2024** |
| WELDING PROCESS | **135 + 121** | Type(s) | **SEMIAUTOMATIC+MACHINE** |
| WPAR REFERENCE (if required) | PROSAL-5160-2023 Rev.2 | Date | 14/03/2024 |

WELD PREPARATION DETAILS/WELDING SEQUENCE




| Pass | Process | Diam. mm | A | V | mm/min | KJ/mm |
|---|---|---|---|---|---|---|
| 1 | 135 | 1,2 | 180 - 190 | 20,5 – 21,5 | 180-220 | 0,81-1,09 |
| 2 | 121 | 4,0 | 500 – 550 | 28,5 - 29,5 | 500-600 | 1,43-1,95 |
| 3n | 121 | 4,0 | 500 – 550 | 28,5 - 29,5 | 500-600 | 1,43-1,95 |
| | | | | | | |
| | | | | | | |

α: 50±10°; b: 3±2mm; c: 1±1mm; t: thickness

**JOINT**

| | | | |
|---|---|---|---|
| Joint type | **BW - Single V** | Method of preparation and cleaning | **Grinding - Brushing** |
| Backing | **Yes** | Tack welding | **135** |
| Backing material | **Ceramic for root pass** | Other | Preheating by flame |
| Back gouging | **No** | | |

**PARENT MATERIAL**

| | | | | | |
|---|---|---|---|---|---|
| Designation | **P355NL2*** | | | | |
| Group(s) (ISO TR 15608) | **1.2** | to | **1.2** | | |
| Thickness (mm) | **12,5** | to | **50** | | |
| Outside diameter (mm) | **-** | Range | **⩾150** | | |

**WELDING POSITION**

| | |
|---|---|
| Position tested | **PA** |
| Positions qualified | **PA** |
| Branch angle | **N.A.** |
| Other | ***Covers equal and lower MSYS and groups** |

**WELDING CONSUMABLES**

| | | |
|---|---|---|
| Process | **135** | **121** |
| Trade name | **Pittarc G9 Innov-acr** | **OESD3** |
| Designation | **G46 4 M21 4Si1** | **14171-A: S3Si** |
| Size (mm) | **1,2** | **4,0** |
| Thickness deposited | **4mm** | **Up to Thickness** |
| Throat thickness | **/** | |

**ELECTRICAL PARAMETERS**

| | |
|---|---|
| Type of current/Polarity | **DC EP** |
| Current range (A) | **See sequence** |
| Arc voltage range (V) | **See sequence** |
| Mode of metal transfer | **135: Spray** |
| Other | **/** |

**SHIELDING GAS**

| | | |
|---|---|---|
| Shielding composition | **CO2 18% + Ar 82%** | **Flux: AS 630** |
| Flow rate (l/min) | **16-18** | **SA FB 1 55 AC H5** |
| Backing composition | **N.A.** | |
| Flow rate (l/min) | **N.A.** | |

**PREHEAT/INTERPASS/PWHT**

| | |
|---|---|
| Minimum preheat (°C) | **≥ 100°C** |
| Maximum interpass (°C) | **250°C** |
| PWHT temperature & time | **NO** |
| Preheat maintenance | **NO** |

**OTHER INFORMATION**

| | | | |
|---|---|---|---|
| Nozzle diameter (mm) | **135 = 15 121 = 25** | *Oscillation | **N.A.** |
| Tungsten electrode type | **N.A.** | *Stand off distance (mm) | **N.A.** |
| Tungsten electrode diam. (mm) | **N.A.** | *Torch angle | **N.A.** |
| String or weave | **String** | Travel speed (cm/min) | **See sequence** |

*For fully mechanized

**MANUFACTURER**

WELDING DEPOTY

SIDERTAGLIO CALANDRATURA S.R.L.
Pipes Rolling & Welding

# WELDING PROCEDURE SPECIFICATION (WPS)
## ACCORDING TO EN ISO 15609-1
for welder/welding operator qualificated only

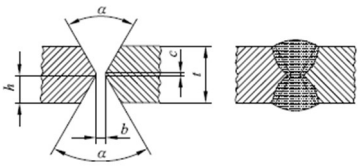
MANUFACTURER **SIDERTAGLIO CALANDRATURA S.R.L.**

WELDING PROCEDURE SPECIFICATION No. **04E-23-02** Date **14/03/2024**

WELDING PROCESS **135 + 121** Type(s) **SEMIAUTOMATIC+MACHINE**

WPAR REFERENCE (if required) PROSAL-5160-2023 Rev.2 Date 14/03/2024

WELD PREPARATION DETAILS/WELDING SEQUENCE




| Pass | Process | Diam. mm | A | V | mm/min |
|---|---|---|---|---|---|
| 1 | 135 | 1,2 | 180 - 190 | 20,5 – 21,5 | 200 |
| 2n | 121 | 4,0 | 500 – 550 | 28,5 - 29,5 | 540 |
| Back Gouging | | | | | |
| Rn | 121 | 4,0 | 500 – 550 | 28,5 - 29,5 | 540 |
| | | | | | |

α: 50±10° b : 3±2mm c: 1±1mm h: t/2

**JOINT**

| | | | |
|---|---|---|---|
| Joint type | **BW** | Method of preparation and cleaning | **Grinding - Brushing** |
| Backing | **Yes** | Tack welding | **135** |
| Backing material | **Ceramic** | Other | - |
| Back gouging | **Yes** | | |

**PARENT MATERIAL**

| | | | |
|---|---|---|---|
| Designation | **P355NL2*** | | |
| Group(s) (ISO TR 15608) | **1.2** to **1.2** | | |
| Thickness (mm) | **12,5** to **50** | | |
| Ouside diameter (mm) | **N.A.** Range ⩾ | | |

**WELDING POSITION**

| | |
|---|---|
| Position tested | **PA** |
| Positions qualified | **PA** |
| Branch angle | **N.A.** |
| Other | ***Covers equal and lower groups and MSYS** |

**WELDING CONSUMABLES**

| | | |
|---|---|---|
| Process | **135** | **121** |
| Trade name | **Pittarc G9 Innov-acr** | **OESD3** |
| Designation | **G46 4 M21 4Si1** | **14171-A: S3Si** |
| Size (mm) | **1,2** | **4,0** |
| Thickness deposited | **4mm** | **Up to Thickness** |
| Throat thickness | / | |

**ELECTRICAL PARAMETERS**

| | |
|---|---|
| Type of current/Polarity | **DC EP** |
| Current range (A) | **See sequence** |
| Arc voltage range (V) | **See sequence** |
| Mode of metal transfer | **135: Spray** |
| Other | / |

**SHIELDING GAS**

| | | |
|---|---|---|
| Shielding composition | **CO2 18% + Ar 82%** | **Flux: AS 630** |
| Flow rate (l/min) | **16-18** | **SA FB 1 55 AC H5** |
| Backing composition | **N.A.** | |
| Flow rate (l/min) | **N.A.** | |

**PREHEAT/INTERPASS/PWHT**

| | |
|---|---|
| Minimum preheat (°C) | **≥ 100°C** |
| Maximum interpass (°C) | **250°C** |
| PWHT temperature & time | **NO** |
| Preheat maintenance | **NO** |

**OTHER INFORMATION**

| | | | |
|---|---|---|---|
| Nozzle diameter (mm) | **135 = 15 121 = 25** | *Oscillation | **N.A.** |
| Tungsten electrode type | **N.A.** | *Stand off distance (mm) | **N.A.** |
| Tungsten electrode diam. (mm) | **N.A.** | *Torch angle | **N.A.** |
| String or weave | **String** | Travel speed (cm/min) | **See sequence** |

*For fully mechanized

**MANUFACTURER**

WELDING DEPOTY

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TÜV SÜD Italia

# CERTIFICATO DI QUALIFICA PROCEDIMENTO DI SALDATURA

WELDING PROCEDURE RECORD TEST CERTIFICATE / ZERTIFIKAT ANERKENNUNG VON SCHWEISSVERFAHREN

## WPQR

## PROSAL-5160-2023 Rev.2

**Riferimento int. No.:** Internal No / Interne No: **722331223**
**Pagina:** Page / Seite: **1 di 5**
**pWPS del Costruttore:** Manufacturer's pWPS: Hersteller Schweißanweisung: **04E-23_r.0**

**Costruttore / Indirizzo:** Manufacturer / Address - Hersteller / Anschrift: **SIDERTAGLIO CALANDRATURA SRL** via Marzotto, 9 – 36031 Povolaro di Dueville (VI)

**Codice/norma:** Code/Testing Standard - Vorschrift/Prüfnorm: **EN ISO 15614.1:2019 liv. 2**

| | | | | | |
|---|---|---|---|---|---|
| **PROCEDIMENTI DI SALDATURA:** Welding Process(es) and Type(s) - Schweißprozeß(e) und Art: | | | | | |
| | | **135** | **121** | --- | |
| 8.4.1 8.5.2.2 | **Procedimento / Tipo:** Process - Schweißverfahren / Type – Sort: | ☐ Manual ☒ Partly Mechanized ☐ Mechanized ☐ Automatic | ☐ Manual ☐ Partly Mechanized ☒ Mechanized ☐ Automatic | ☐ Manual ☐ Partly Mechanized ☐ Mechanized ☐ Automatic | *EN ISO 4063* |
| 8.4.2 | **Posizione di saldatura:** Welding position – Schweißposition: | PA | PA | --- | *EN ISO 6947* |
| | **Campo di validità:** Validity range - Gültigkeitsbereich: | **PA** | | | |
| 8.4.3 | **Tipo di giunto:** Type of Joint - Stoßart und Schweißart: | ☒ **BW** *(coupon test)* ☒ **FW** *(qualified for)* ☒ TBW *(qualified for)* ☐ **Branch connection** – Set Through / Set On / Set In / **with angle ≥ 60°** *(qualified for)* | | | |
| | **Dettagli di saldatura:** Weld details - Schweißen angaben: | bs - sl | ss mb - ml | --- | |
| | **Campo di validità:** Validity range - Gültigkeitsbereich: | **ss mb, bs - sl** | **ss mb, bs - ml** | --- | *J clause for sl/ml* |
| **METALLO BASE:** Parent Metal - Grundwerkstoffes: | | **EN 10028-3** | **EN 10028-3** | | |
| 8.3.1.1 | **Designazione:** Classification - Klassifikation: | **P355 NL2** | **P355 NL2** | | |
| | **UNS number - Werkstoff number:** UNS number - Werkstoff number: | 1.1106 | 1.1106 | | |
| 8.3 Table 5 | **Sottogruppo:** Subgroup - Untergruppe: | 1.2 | 1.2 | | *ISO / TR 15608* |
| | **Campo di validità:** Validity range - Gültigkeitsbereich: | **ISO/TR 15608 – 1.1; 1.2; 1.4 [ReH ≤ 355 MPa]** | | | |
| 8.3.2.1 8.3.2.2 Table 7 Table 8 Table 9 | **Diametro esterno:** Outside diameter - Rohraussendurchmesser: | --- | --- | | *mm* |
| | **Campo di validità:** Validity range - Gültigkeitsbereich: | **≥ 150,0** | **≥ 150,0** | | |
| | **Spessore:** Thickness - Dicke: | 25,0 | 25,0 | | |
| | **Campo di validità:** Validity range - Gültigkeitsbereich: | **12,5 ÷ 50,0** | | | |
| **METALLO D'APPORTO:** Filler Metal - Zusatzwerkstoffes: | | **EN ISO 14341-A** | **EN ISO 14171-A** | **---** | |
| 8.4.4 | **Designazione:** Classification - Klassifikation: | **G46 5 M21 4Si1** | **S3 Si** | **---** | |
| | **Produttore:** Manufacturer - Hersteller: | SIAT | LINCOLN | --- | |
| | **Nome commerciale:** Trade name - Handelsname: | G9 INNOV-ARC | OESD3 | --- | |
| *VdTUV Kennblattliste* | **Numero Kennblatt:** Kennblatt number – Kennblatt nummer: | --- | --- | --- | *Only for AD2000 use* |
| 8.3.2.2 *BW-TJ-BC* Table 7 | **Spessore materiale depositato:** Thickness filler metal - Schweißwerkstoff Dicke: | 4,0 | 21,0 | --- | |
| | **Campo di validità:** Validity range - Gültigkeitsbereich: | **≤ 8,0** | **≤ 50,0** | **---** | *mm* |
| 8.3.2.2 *FW "sl"* Table 8 | **Altezza di gola:** Throat Thickness - Kehlnahtdicke: | --- | | | |
| | **Campo di validità:** Validity range - Gültigkeitsbereich | **No limits** (135: 3,0 ÷ 6,0 – 121: No limits) | | | |

| **Luogo** Location Ort | **Data di Emissione** Date of Issue Datum der Ausstellung | **Esaminatore** Examiner's Name and Signature Name und Unterschrift des Zertifizierers | **Esperto/Responsabile Tecnico** Name and Signature of expert / technical manager Name und Unterschrift Sachverständiger | **Rappresentante del costruttore** Name and Signature of Manufacturer's Representative Name und Unterschrift des Unterschrift |
|---|---|---|---|---|
| **Milano** | **Rev.0 – 25/10/2023**<br>**Rev.1 – 27/10/2023**<br>**Rev.2 – 14/03/2024** | Ing. Enrico Albarelli | **Marco Serafini** | |

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TÜV SÜD Italia

# CERTIFICATO DI QUALIFICA PROCEDIMENTO DI SALDATURA

WELDING PROCEDURE RECORD TEST CERTIFICATE / ZERTIFIKAT ANERKENNUNG VON SCHWEISSVERFAHREN

## WPQR

## PROSAL-5160-2023 Rev.1

**Riferimento int. No.:** 722331223
Internal No / Interne No:
**Pagina:** 2 di 5
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| **TIPO DI PROTEZIONE:** Type of protection - Zündschutzart: | | **EN ISO 14175** | **EN ISO 14174** | **---** | |
|---|---|---|---|---|---|
| **8.5.1** *12x* | **Designazione:** Designation / Bezeichnung: | --- | SA FB 1 55 AC H5 | --- | |
| | **Produttore:** Manufacturer - Hersteller: | --- | Lincoln | --- | |
| | **Nome commerciale:** Trade name - Handelsname: | --- | AS 630 | --- | |
| *VdTUV Kennblattliste* | **Numero Kennblatt:** Kennblatt number – Kennblatt nummer: | --- | --- | --- | *Only for AD2000 use* |
| **8.5.2.1** *13x* **8.5.3.1** *14x* | **Dritto:** Straight - Gerade: | M21 – ArC-18 ($Ar$-$CO_2$ 82-18%) | --- | --- | *%* |
| | **Portata:** Flow rate - Fließrate: | 16 ÷ 18 | --- | --- | *lt/min* |
| **8.5.4** *15x* | **Plasma:** Plasma: | --- | --- | --- | *%* |
| | **Portata:** Flow rate - Fließrate: | --- | --- | --- | *lt/min* |
| **8.5.6** *13x 14x 15x* | **Rovescio:** Backing - Unterstützung: | --- | --- | --- | *%* |
| | **Portata:** Flow rate - Fließrate: | --- | --- | --- | *lt/min* |
| **Note:** | **13x - Per i procedimenti 13x la % massima ammessa di $CO_2$ è del ±20% rispetto a quella utilizzata nella procedura qualificata.**<br>- For processes 13x the maximum allowable% $CO_2$ is ±20% compared to the one used in the qualified procedure.<br>- Bei Prozessen 13x beträgt der maximal zulässige Prozentsatz von CO2 ± 20% im Vergleich zu dem im qualifizierten Verfahren verwendeten.<br>**14x - Per i procedimenti 14x la % massima ammessa di He è del ±10% rispetto a quella utilizzata nella procedura qualificata.**<br>- For processes 14x the maximum permissible percentage of He is ± 10% higher than that used in the qualified procedure.<br>- Bei prozessen 14x ist der maximal zulässige Prozentsatz von He ± 10% höher als der im qualifizierten Verfahren verwendete. | | | | |
| **8.4.8** | **Temperatura di preriscaldo:** Preheat Temperature - Vorwärmtemperatur: | ≥ 100 | | | *°C* |
| **8.4.9** | **Temperatura fra le passate:** Interpass temperature - Zwischenlagentemperatur: | ≤ 250 | | | *°C* |
| **8.4.10** | **Deidrogenazione:** Post-Heating - Post-Heizung: | --- | | | |
| **8.4.11** | **Trattamento termico dopo saldatura:** Post-Weld Heat Treatment: Wärmenachbehandlung: | **Gradiente di riscaldamento:** Heating Rate – Aufheizrate: | --- | | *°C/h* |
| | | **Tempo di mantenimento:** Holding Time – Haltedauer: | --- | | *min* |
| | | **Temperatura di mantenimento:** Hold Temperature – Haltetemperatur: | --- | | *°C* |
| | | **Gradiente di raffreddamento:** Cooling Rate – Abkühlrate: | --- | | *°C/h* |
| | **Temperatura minima di lavoro:** Minimum allowable temperature: Betriebstemperatur jedoch nicht tiefer als: | -50 | | | *°C* |

## VARIABILI NON ESSENZIALI – NOT ESSENTIAL VARIABLES – NICHT WESENTLICHE VARIABLEN

| | | | | | |
|---|---|---|---|---|---|
| | **Elettrodo di Tungsteno:** Tungsten Electrode: | --- | --- | --- | *EN ISO 6848* |
| | **Dimensioni:** Size – Durchmesser: | --- | --- | --- | *mm* |
| | **Nome del Saldatore:** Welder's Name - Name des Schweißers: | CAETANO CLEBER WELLINGTON | CAETANO CLEBER WELLINGTON | --- | |
| | **Punzone:** Stamp - Stempeln: | CCW | CCW | --- | |
| | **Saldatrice:** Welding equipment - Schweißgeräte: | ESAB mod. ORIGO MIG 402cw | ESAB mod. LAF 1001 + ESAB mod. A6SF SAW | --- | |
| | **Altre Informazioni:** Other information - Weitere Informationen: | --- | --- | --- | |

| **Luogo** Location - Ort | **Data di Emissione** Date of Issue - Datum der Ausstellung | **Esaminatore** Examiner's Name and Signatur - Name und Unterschrift des Zertifizierer |
|---|---|---|
| **Milano** | **Rev.0 – 25/10/2023**<br>**Rev.1 – 27/10/2023**<br>**Rev.2 – 14/03/2024** | Ing. Enrico Albarelli |

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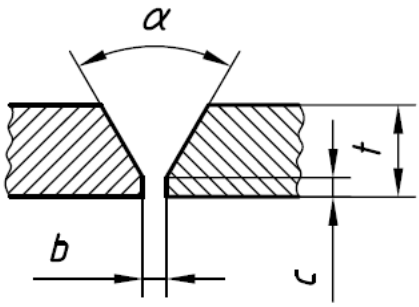
WELDING PROCEDURE RECORD TEST CERTIFICATE / ZERTIFIKAT ANERKENNUNG VON SCHWEISSVERFAHREN

## WPQR

## PROSAL-5160-2023 Rev.1

**Riferimento int. No.:** 722331223
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| **Disegno Giunto** / Joint Design / Gestaltung | **Sequenza Saldatura** / Welding Sequence / Schweißfolge |
|---|---|







b = 3mm; c = 0mm; α = 50 ÷ 60°

| **Layer** Lage | **Process** Prozeß | **Filler Metal** Zusatzmetall Ø [mm] | **Designation** Bezeichnung | **Type** Art Layer Kabeltyp | Arc Lichtbogen | Current Stromart | **Voltage** Voltzahl [V] | **Current** Strom [A] | **Travel Speed** Reisegeschwindigkeit [mm/min] | **Heat Input** Wärmeeinbringung [kJ/mm] | 8.4.7 [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 135 | 1,2 | G46 5 M21 4Si1 | 1 | Spray Arc | DC+ | 24,5 | 210 | 200 | 1,23 | |
| 2 | 121 | 4,0 | S3 Si + SA FB 1 55 AC H5 | 2 | / | DC+ | 29 | 525 | 540 | 1,69 | |
| 3 ÷ n | 121 | 4,0 | S3 Si + SA FB 1 55 AC H5 | 3 ÷ n | / | DC+ | 29 | 525 | 540 | 1,69 | |
| R1 | 135 | 1,2 | G46 5 M21 4Si1 | R1 | Spray Arc | DC+ | 24,5 | 210 | 200 | 1,23 | |
| | | | | | | | | | | | ± 25 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

## CONTROLLI NON DISTRUTTIVI – NON DESTRUCTIVE TESTS – NICHT ZERSTÖRENDE PRÜFUNGEN

| | **Effettuato ed accettabile** Performed and acceptable – Ausgeführt und bestanden |
|---|---|
| **Visivo** – Visual test – Sichtprüfung | **EA Engineering n.063/23_r.0** |
| **Liquidi penetranti** – Penetrant test – Kerbzugprüfung | **---** |
| **Magnetoscopia** – Magnetoscopic test – Magnetoskopischer test | **Antares Control n.366/23** |
| **Radiografia** – Radiographyc test – Radiographische untersuchung | **---** |
| **Ultrasuoni** – Ultrasonic test – Ultraschallprüfung | **Antares Control n.747/23** |
| **---** | **---** |

## PROVA DI TRAZIONE – TENSILE TESTS – ZUGPRÜFUNG

**Temperatura** – Temperature – Temperatur: **+20 °C**

| **N.** No. Nr. | **Posizione** Location Lage | **Dimensioni** Dimensions Abmessungen [mm x mm] | $R_e$ [MPa] | $R_{p\ 0,2/1,0}$ [MPa] | $R_m$ [MPa] | **A** [%] | **Z** [%] | **Osservazioni** Remarks Bemerkungen |
|---|---|---|---|---|---|---|---|---|
| 13443/1 | TW | 24,99 x 25,00 | --- | --- | 534 | --- | --- | Ductile – Out weld |
| 13443/2 | TW | 24,87 x 25,02 | --- | --- | 536 | --- | --- | Ductile – Out weld |
| 13443/3 | LW | Ø 10,02 | --- | 446 | 561 | 34,3 | 74,3 | --- |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |

**TW:** Trasversale – Transversal.
**LW:** Longitudinale – Longitudinal – in Längsrichtung.

| **Luogo** Location - Ort | **Data di Emissione** Date of Issue - Datum der Ausstellung | **Esaminatore** Examiner's Name and Signatur - Name und Unterschrift des Zertifizierers |
|---|---|---|
| **Milano** | **Rev.0 – 25/10/2023**<br>**Rev.1 – 27/10/2023**<br>**Rev.2 – 14/03/2024** | Ing. Enrico Albarelli |

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## WPQR

## PROSAL-5160-2023 Rev.1

**Riferimento int. No.:** 722331223
Internal No / Interne No:



## PROVA DI PIEGA – BEND TEST – BIEGEPRÜFUNG

**Temperatura** – Temperature – Temperatur: +20 °C

| N. No. Nr. | Posizione Location Lage | Dimensioni Dimensions Abmessungen [mm x mm] | Mandrino Spindle Spindel [mm] | Distanza rulli Distances rollers Abstandsrollen [mm] | Angolo Angle Winkel [°] | Esito Results Ergebnisse | Osservazioni Remarks Bemerkungen |
|---|---|---|---|---|---|---|---|
| 13443/4 | SBB | 23,6 x 10,1 | 40 | 63 | 180 | No defects | Accetable |
| 13443/5 | SBB | 23,5 x 10,0 | 40 | 63 | 180 | No defects | Accetable |
| 13443/6 | SBB | 24,1 x 10,1 | 40 | 63 | 180 | No defects | Accetable |
| 13443/7 | SBB | 24,5 x 10,1 | 40 | 63 | 180 | No defects | Accetable |

**SBB:** Trasversali laterali – Transversal side – Transversal seite.
**TFBB:** Trasversali al dritto – Transversal face – Transversal gesicht.
**TRBB:** Trasversali al rovescio – Transversal root – Transversaler Wurzelbiegetest.

## PROVA DI RESILIENZA – IMPACT TEST – AUFPRALLPRÜFUNG

**Energia** – Energy – Energie: 27 Joule

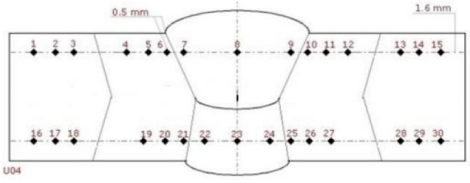
| N. No. Nr. | Posizione Location Lage | Dimensioni Dimensions Abmessungen [mm x mm] | Intaglio Notch Kerb | Temperatura Temperature Temperatur [°C] | Valore Value Wert [J] | Shear [%] | Exp lat Exp lat Sei Aus [mm] | Valore Value Wert [J] | Shear [%] | Exp lat Exp lat Sei Aus [mm] | Valore Value Wert [J] | Shear [%] | Exp lat Exp lat Sei Aus [mm] | Media Average Durch. [J] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13443/4 | VWT 0/22 | 2,5 x 10,0 | $KV_2$ | -78 | 39 | --- | 1,03 | 41 | --- | 1,12 | 38 | --- | 1,02 | **39** |
| 13443/5 | VHT 0/22 | 2,5 x 10,0 | $KV_2$ | -78 | 33 | --- | 0,95 | 35 | --- | 0,99 | 31 | --- | 0,83 | **33** |
| 13443/6 | VHT 2/22 | 2,5 x 10,0 | $KV_2$ | -78 | 56 | --- | 1,16 | 55 | --- | 1,15 | 41 | --- | 1,00 | **51** |
| 13443/7 | VHT 5/22 | 2,5 x 10,0 | $KV_2$ | -78 | 38 | --- | 1,05 | 43 | --- | 1,21 | 45 | --- | 1,29 | **42** |
| 13443/4 | VWT 0/2 | 10,0 x 10,0 | $KV_2$ | -50 | 293 | --- | 2,29 | 280 | --- | 2,21 | 257 | --- | 2,11 | **277** |
| 13443/5 | VHT 0/2 | 10,0 x 10,0 | $KV_2$ | -50 | 255 | --- | 2,16 | 263 | --- | 2,21 | 234 | --- | 2,23 | **251** |
| 13443/6 | VHT 2/2 | 10,0 x 10,0 | $KV_2$ | -50 | 293 | --- | 2,33 | 259 | --- | 2,03 | 296 | --- | 2,39 | **283** |
| 13443/7 | VHT 5/2 | 10,0 x 10,0 | $KV_2$ | -50 | 283 | --- | 2,24 | 295 | --- | 2,31 | 299 | --- | 2,39 | **292** |

**VWT:** Trasversali center line – Transversal in center line – Transversal in der Mittellinie.
**VHT:** Trasversali ZTA – Transversal in HAZ – Transversal in der WEZ.
**FLT:** Trasversali fusion line – Transversal fusion line – Transversaler Transversal in der Fusionslinie.
**T**: Trasversale materiale base – Transversal base metal – Querbasismetall.
**L**: Longitudinale materiale base – Longitudinal base metal – Längslage im Grundwerkstoff.

## PROVA DI DUREZZA – HARDNESS TEST – HÄRTEPRÜFUNG

**Tipo** – Type – Art: $HV_{10}$
**Requisiti** – Requirements – Anforderungen: ≤ 380

| Materiale Base Base Metal / Grundwerkstoff | | | ZTA HAZ / WEZ | | | | | Zona Fusa Weld Metal / Schweißgut | | | ZTA HAZ / WEZ | | | | | Materiale Base Base Metal / Grundwerkstoff | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Test n.13443/16** | | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | Indent. Suppl. | Indent. Suppl. | 7 | 8 | 9 | Indent. Suppl. | Indent. Suppl. | 10 | 11 | 12 | 13 | 14 | 15 |
| 156 | 155 | 156 | 183 | 189 | 206 | --- | --- | 175 | 173 | 185 | --- | --- | 216 | 203 | 192 | 157 | 153 | 164 |
| 16 | 17 | 18 | 19 | 20 | 21 | Indent. Suppl. | Indent. Suppl. | 22 | 23 | 24 | Indent. Suppl. | Indent. Suppl. | 25 | 26 | 27 | 28 | 29 | 30 |
| 158 | 159 | 160 | 198 | 205 | 227 | --- | --- | 228 | 239 | 221 | --- | --- | 216 | 207 | 184 | 163 | 162 | 163 |
| **Test n. 13443/17** | | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | Indent. Suppl. | Indent. Suppl. | 7 | 8 | 9 | Indent. Suppl. | Indent. Suppl. | 10 | 11 | 12 | 13 | 14 | 15 |
| 158 | 155 | 159 | 187 | 195 | 209 | --- | --- | 169 | 175 | 175 | --- | --- | 216 | 210 | 184 | 159 | 158 | 159 |
| 16 | 17 | 18 | 19 | 20 | 21 | Indent. Suppl. | Indent. Suppl. | 22 | 23 | 24 | Indent. Suppl. | Indent. Suppl. | 25 | 26 | 27 | 28 | 29 | 30 |
| 159 | 161 | 158 | 183 | 201 | 223 | --- | --- | 201 | 221 | 207 | --- | --- | 216 | 207 | 185 | 160 | 160 | 162 |
| **Test n. 13443/18** | | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | Indent. Suppl. | Indent. Suppl. | 7 | 8 | 9 | Indent. Suppl. | Indent. Suppl. | 10 | 11 | 12 | 13 | 14 | 15 |
| 154 | 156 | 155 | 187 | 196 | 201 | --- | --- | 193 | 178 | 183 | --- | --- | 212 | 207 | 196 | 158 | 158 | 163 |
| 16 | 17 | 18 | 19 | 20 | 21 | Indent. Suppl. | Indent. Suppl. | 22 | 23 | 24 | Indent. Suppl. | Indent. Suppl. | 25 | 26 | 27 | 28 | 29 | 30 |
| 161 | 159 | 158 | 198 | 214 | 227 | --- | --- | 229 | 221 | 238 | --- | --- | 221 | 219 | 183 | 160 | 162 | 162 |




| Luogo Location - Ort | Data di Emissione Date of Issue - Datum der Ausstellung | Esaminatore Examiner's Name and Signatur - Name und Unterschrift des Zertifizierer |
|---|---|---|
| **Milano** | **Rev.0 – 25/10/2023**<br>**Rev.1 – 27/10/2023**<br>**Rev.2 – 14/03/2024** | Ing. Enrico Albarelli |

TÜV Italia Srl Industrie Service TÜV SÜD Italia

**TÜV Italia S.r.l. - TÜV SÜD Group**
Viale Fulvio Testi, 280/6
I-20126 Milano – www.tuvsud.com/it

ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO
PRD N° 081B
Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
Signatory of EA, IAF and ILAC Mutual Recognition Agreements

TÜV SÜD Italia

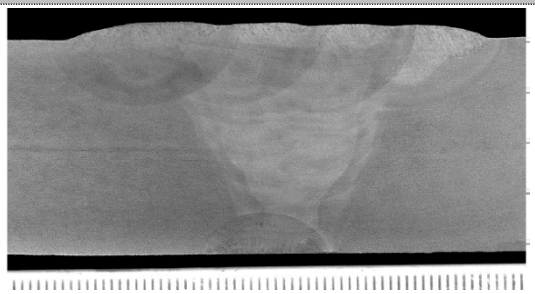
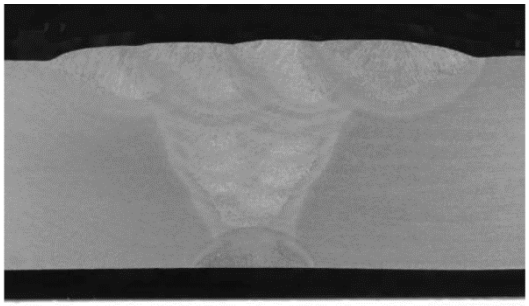
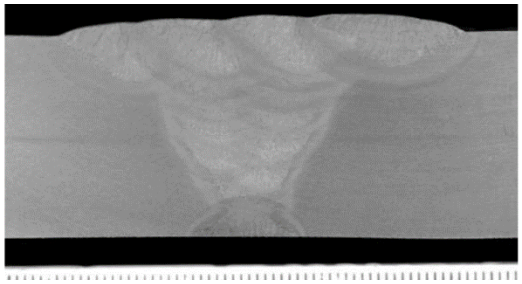
# CERTIFICATO DI QUALIFICA PROCEDIMENTO DI SALDATURA

WELDING PROCEDURE RECORD TEST CERTIFICATE / ZERTIFIKAT ANERKENNUNG VON SCHWEISSVERFAHREN

## WPQR

## PROSAL-5160-2023 Rev.1

**Riferimento int. No.:** 722331223
Internal No / Interne No:
**Pagina:** 5 di 5
Page / Seite:

| MACROGRAFIA – MACROGRAPHY – MAKROGRAFIE | MICROGRAFIA – MICROGRAPHY – MICROGRAFIE |
|---|---|
|  *Test n.13443/16* | --- |
|  *Test n.13443/17* | |
|  *Test n.13443/18* | |
| **Attacco** – Etching – Ätzen: Nital 10% | **Attacco** – Etching – Ätzen: --- |
| **Ingrandimento** – Magnification – Vergrößerung: --- | **Ingrandimento** – Magnification – Vergrößerung: --- |
| **Risultato** – Result – Resultat: **GLOBAL TEST SRL report n. 29616** | **Risultato** – Result – Resultat: --- |

**Tutte le verifiche preliminari prescritte al Cap. 8.2 della procedura PSAL _01 in rev. corrente sono state eseguite dall'esaminatore:**
All preliminary checks have been performed by the examiner in accordance with the Ch. 8.2 of the procedure PSAL _01 in current rev.:
Alle vorläufigen Tests wurden vom Prüfer entsprechend Kap. 8.2 Prüfanweisung PSAL_01 bei der gegenwärtigen Revision durchgeführt:
Ing. Enrico Albarelli

**Luogo / Data della saldatura:**
Location / Date of Welding - Ort / Datum derSchweißung:
via Marzotto, 9 - 36031 Povolaro di Dueville (VI) – 2023/10/06

**Il tallone è stato saldato in presenza di:**
Test piece was welded in the presence of - Prüfstück wurde geschweißt in Anwesenheit von:
Ing. Enrico Albarelli

**Le prove meccaniche sono state effettuate in presenza di:**
Test carried out in the presence of - Die Prüfungen wurden ausgeführt in Anwesenheit von:
Ing. Enrico Albarelli

**Le prove sono state eseguite in conformità alle norme:**
The tests have been performed in accordance with the specifications - Die Prüfungen wurden entsprechend den Prüfgrundlagen durchgeführt:
UNI EN ISO 15614-1 liv.2 +
Spec. SNAM n.000-CA-E-17027 r.0

**Si certifica che i saggi di prova sono stati preparati, saldati e controllati con esito soddisfacente in conformità ai requisiti del codice/norma di prova sopra indicato.**
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 code/standard above mentioned.
Hiermit wird bestätigt, daß die Prüfungsschweißungen in Übereinstimmung mit den Anforderungen der vorbezeichneten Vorschriften bzw. Prüfnormen zufriedenstellend vorbereitet, geschweißt und geprüft wurden.

**Allegati** - Annex - Anlage

| | |
|---|---|
| *WPS n°:* | 04E-23_r.0 |
| *Mill certificate n°:* | Metinvest n.553065 |
| *Filler Metal Certificate n°:* | SIAT n.6697/2022/A – Lincoln Electric n.01845530 – Lincoln Electric n.02069342 |
| *NDT Test Report n°:* | EA Engineering n.063/23_r.0 – Antares Control n.366/23 – Antares Control n.747/23 |
| *Laboratory Test Report n°:* | GLOBAL TEST SRL report n. 29616 |

**Note:**

☒ **1 Qualifica valida ai sensi della direttiva PED, Allegato 1, punto 3.1.2 – TUV Italia Srl – Organismo Notificato 0948 / Welding procedure in according to PED, Annex 1, point 3.1.2 – TUV Italia Srl – Notified Body 0948**

☐ **2 - Il presente documento è conforme anche ai requisiti previsti dalla EN ISO 15614-1:2019 liv. 1 / This document also complies with the requirements of EN ISO 15614-1: 2019 liv. 1**

| **Luogo**<br>Location - Ort | **Data di Emissione**<br>Date of Issue - Datum der Ausstellung | **Esaminatore**<br>Examiner's Name and Signatur - Name und Unterschrift des Zertifizierer |
|---|---|---|
| **Milano** | **Rev.0 – 25/10/2023**<br>**Rev.1 – 27/10/2023**<br>**Rev.2 – 14/03/2024** | Ing. Enrico Albarelli |

TÜV Italia Srl Industrie Service
TÜV SÜD Italia

SIDERTAGLIO CALANDRATURA S.R.L.
Pipes Rolling & Welding

# PRELIMINARY WELDING PROCEDURE SPECIFICATION (pWPS) ACCORDING TO EN ISO 15609-1

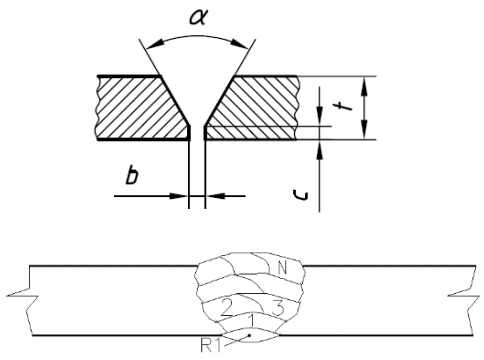
MANUFACTURER: **SIDERTAGLIO CALANDRATURA S.R.L.**

WELDING PROCEDURE SPECIFICATION No.: **04E-23_r.0** Date: **06/10/2023**

WELDING PROCESS: **EN ISO 4063 – 135 / 121** Type(s): **SEMIAUTOMATIC / MACHANIZED**

WPQR REFERENCE (if required): 04E-23 Date:

WELD PREPARATION DETAILS/WELDING SEQUENCE




| Pass | Process | Diam. M.A. mm | A | V | W. Speed mm/min |
|---|---|---|---|---|---|
| 1 | 135 | 1,2 | 205 ÷ 215 | 24 ÷ 25 | 200 |
| 2 | 121 | 4,0 | 500 ÷ 550 | 28,5 ÷ 29,5 | 540 |
| 3 ÷ n | 121 | 4,0 | 500 ÷ 550 | 28,5 ÷ 29,5 | 540 |
| R1 | 135 | 1,2 | 205 ÷ 215 | 24 ÷ 25 | 200 |

α: 50-60° - c: 0 mm – b: 3 mm

Dopo saldatura passate da 1 a n rimuovere suporto ceramico, spianare rovescio ed eseguire ripresa R1. Spianare ripresa R1 con molatura.

Impianti di saldatura:

135: ESAB ORIGO MIG 402cw

121: ESAB mod. A6SF SAW + ESAB mod. LAF 1001

## JOINT

| | | | |
|---|---|---|---|
| Joint type | **BW** | Method of preparation and cleaning | **Spazzolat. – Molatura** |
| Backing | **Si** | Tack welding | **Saldatura 135** |
| Backing material | **Ceramica per 135** | Other | - |
| Back gouging | **No** | | |

## PARENT MATERIAL

| | | | | | |
|---|---|---|---|---|---|
| Designation | **EN 10028-3 – P355 NL2** | | | | |
| Group(s) (ISO/TR 15608) | **1.2** | Range | - | | |
| Thickness (mm) | **25** | Range | - | | |
| Ouside diameter (mm) | **N.A.** | Range | - | | |

## WELDING POSITION

| | |
|---|---|
| Position tested | **EN ISO 6947 - PA** |
| Positions qualified | - |
| Branch angle | **N.A.** |
| Other | - |

## WELDING CONSUMABLES

| | | |
|---|---|---|
| Process EN ISO 4063 | **135** | **121** |
| Trade name | **Pittarc G9 Innov-Arc** | **Lincoln OESD3** |
| Designation | **EN ISO 14341-A G46 4 M21 4Si1** | **EN ISO 14171-A S3Si** |
| Size (mm) | **Ø 1,2** | **Ø 4,0** |
| Thickness deposited | **4 mm** | **21 mm** |
| Throat thickness | / | / |

## ELECTRICAL PARAMETERS

| | |
|---|---|
| Type of current/Polarity | **135: DC-EP – 121: DC-EP** |
| Current range (A) | **Vedi Sequenza** |
| Arc voltage range (V) | **Vedi Sequenza** |
| Mode of metal transfer | **135: Spray Arc** |
| Other | / |

## SHIELDING GAS

| | | |
|---|---|---|
| Shielding composition | **135: EN ISO 14175 M21 – ArC-18** | **121: FLUX Lincoln AS 630** |
| Flow rate (l/min) | **135: 16-18** | **121: EN ISO 14174: SA FB 1 55 AC H5** |
| Backing gas composition | - | |
| Flow rate (l/min) | - | |

## PREHEAT/INTERPASS/PWHT

| | |
|---|---|
| Minimum preheat (°C) | **EN ISO 13916 – Tp 100°C** |
| Maximum interpass (°C) | **EN ISO 13916 – Ti 250°C** |
| PWHT temperature & time | **NO** |
| Preheat maintenance | **NO** |

## OTHER INFORMATION

| | | | |
|---|---|---|---|
| Nozzle diameter (mm) | **135 = 15 121 = 25** | *Oscillation | **N.A.** |
| Tungsten electrode type | **N.A.** | *Stand off distance (mm) | **N.A.** |
| Tungsten electrode diam. (mm) | **N.A.** | *Torch angle | **N.A.** |
| String or weave | **Tirati** | Travel speed (cm/min) | **Vedi Sequenza** |

*For fully mechanized

MANUFACTURER

TÜV Italia ☐ Review ☒ Witness Date 06/10/23 Name:

SIDERTAGLIO CALANDRATURA S.R.L. Pipes Rolling & Welding

# RAPPORTO DI CONTROLLO VISIVO

VISUAL TEST CONTROL REPORT
mod. 006_r.0

**Rapporto n°** Report $n_o$ 063/23
rev. 0
Data Date 06/10/23

| | | | |
|---|---|---|---|
| **Committente** Customer | SIDERTAGLIO CALANDRATURA SRL | **Fabbricante** Manufacturer | idem |
| **Committente prove** Test customer | ☒ Committente Customer ☐ Fabbricante Manufacturer | **Ordine di lavoro** Job order | 23036C_r.0 |
| **Commessa** Job | 23036C_r.0 | **Procedura di controllo** Control procedure | IST_VT_EA_r.0 |
| **Norma di prodotto** Product code | UNI EN ISO 15614-1 liv.2 | **Disegno/ WPS** Drawing/ WPS | vedere tabella |
| **Oggetto** Object | QW | **Identificazione** Identification | vedere tabella |
| **Norma di controllo** Control code | UNI EN ISO 17637 | **Accettabilità** Acceptability | §7.5 – UNI EN ISO 15614-1 liv.2 |
| **Materiale base** Base metal | gr. 1.2 – EN ISO/TR 15608 | **Spessore** Thickness | vedere tabella |
| **Processo EN ISO 4063** Welding process | 135+121 | **Tipo di giunto** Joint type | vedere tabella |
| **Tecnica di controllo** Control technique | Diretto | **Attrezzatura** Equipment | Calibro di Saldatura, Lenti |
| **Estensione controllo** Control extension | 100% | **Illuminazione** Lighting | ≥ 500 Lx |

| **Tipologia campione** Sample type | | **WPS** | **Superficie** Surface | **Giunto** Joint | **Dimensioni** Size | | | | **Indicazioni EN ISO 6520** Indications | **Esito**[1] Result |
|---|---|---|---|---|---|---|---|---|---|---|
| **Personale** Personel | **Processo** Procedure | | | | **Spessore** Thickness | **Diametro** Diameter | **Spes. dep.** Dep. thick. | **Gola** Throat | | |
| CCW | 04E-23 | 04E-23_r.0 | as welded | BW | 25 | - | 25 (4+21) | - | Nothing relevant | OK |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |

**Note** – notes
[1] OK = Accettabile – Accetable; KO = Non Accettabile – Not Accetable

| **Tecnico controllore** Controller technician | **Esaminatore/ Ispettore** Examiner/ Inspector | **Ente/ Cliente** Body/ Client |
|---|---|---|
| Ing. Enrico Albarelli<br>EA Engineering<br>III° liv. VT, PT, MT, ~~UT, RT – EN ISO 9712~~<br>~~IWE-C~~ | ☐ Review<br>☒ Witness<br>Date: 06/10/23 Name: | |

# *RAPPORTO DI ESAME MAGNETOSCOPICO*

**MAGNETOSCOPIC**
EXAMINATION REPORT

*N°* ***366/23***

del of **07/10/2023**

*Pag. Sheet* *1 di of 1*


**ANTARES CONTROL**
di Righetto Davide
Via Roma,15/7
36040 Grumolo delle Abbad.(VI)
P.IVA: 04382150243
Cell. 3487376550
antarescontrolli@gmail.com


**Cliente** SIDERTAGLIO GALANDRATURA S.R.L.
Customer Via Marzotto, 9, 36031 Povolaro VI

**Ordine*** **Del**
Order* Of

**Comm. Vs cliente*** **Comm.*** 04E-23
Custoner Job* Job

**Incarico** 04E-23-01
Assignment*

**Data/Luogo del controllo** 07/10/2023 SIDERTAGLIO S.R.L.
Date and place of the check Via Marzotto, 9, 36031 Povolaro VI

**Descrizione del pezzo*** TALLONE SALDATO
Description object* L= 570 mm Thk = 25 mm pWPS 04E-23

**Disegno*** **Quantità** 1
Drawing* Quantity

**Codice pezzo*** pWPS 04E-23
Code name*

**Materiale*** P355NL2 **Colata***
Material* Heat*

**Tipo Giunto** Testa a Testa
Joint type Butt Weld

**Tipo prodotto** Laminato / Saldato
Product Type Laminate / welded

**Fase di controllo** Finale
Inspection Phase Final

**Stadio di controllo** Trattamento termico non richiesto
Inspection Phase Heat treatment not required

**Condizioni superficiali** Spazzolato
Tests surface status Brushed

**WPS di riferimento*** **Norme di rif. :**
Reference WPS* Procedure

**Procedura/Specifica*** UNI EN ISO 17638
Specification - Standard* ***Ultima edizione / Latest edition***

**Classe accettazione*** UNI EN ISO 23278 Lev. 2
Acceptance criteria* ***Ultima edizione / Latest edition***

**Estensione del controllo*** Come disegno allegato
Extension examination* As shown in the annex

* DATI FORNITI DAL CLIENTE - *THESE DATA ARE SUPPLIED BY THE CUSTOMER Allegato/Annex : 07/10/2023

**Corrente** corrente alternata
Current alternating current

**Metodo di controllo** Diretto
Examination method Direct

**Apparecch.** ***Model KY-2 Matricola 220824***
Equipment ***CONFORMITY REPORT n. PRONDT 22-Y02***

**Metodo di magnetizzazione** elettromagnete
Magnetizing method electromagnet

**Tipo di magnetizzazione** Longitudinale
Type of magnetization Longitudinal

**Tipo di polvere** Umido
Type of podwer Wet

**Distanza tra i poli** 75 - 200 mm
Poles pitch 75 - 200 mm

**Piastra di sollevamento** 10 LB ( 4500 g )
Matricola - Lifting plate Matr. PRO - NDT 21 - 054

**Intensità di corrente** >2,4 kA/m
Current intensity

**Intensità di Campo** >2,4 kA/m
Field intensity

**Densità di flusso** **> T**
Density flux

**Gaussmetro- Gaussmeter -** LINKJOIN + SONDA LZ-643
Matricola/ Serial n° S180423355 SONDA 64100782160117

**Radiometer UV-A** Delta Ohm HD2102,2 + LP 471 UVA
Matricola/ Serial n° **14004390 + 13041178**

**Tipo luce** Artificiale luce fredda
Light type Artificial warm light

**Intensità di luce** Superfice del pezzo >500 LUX
Light intensity Piece surface >500 LUX

**Temperatura** ambiente tra 20° 40° Attuale 21 C°
Temperature environment from 20° to 40° Actual 21 C°

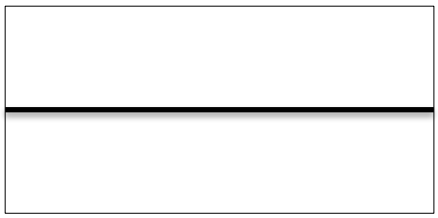
**Produttore** PRO NDT
Productor

**Vernice a contrasto di colore** **FLUXO 4**
White contrast paint ***Lotto - Batch L220619/1*** ***scad. 19/06/2027***

**Mezzo Rilevatore** Magnetico Nero base acqua **FLUXO 215**
Detector type ***Lotto - Batch L220406/1 scad. 06/04/2025***

**Smagnetizzazione** non richiesta
Demagnetization not required

**Note o schizzo :** **Sessione esame TUV: 722331223**
Notes or sketch:



| Risultato / Result | OPERATORE - OPERATOR | RESPONSABILE - WORD REFERENCE | ISPETTORE - INSPECTOR |
|---|---|---|---|
| **Conforme a Norma**<br>Acceptable | Righetto Davide<br>II° Liv. SNT-TC1A / ISO 9712 | SIDERTAGLIO GALANDRATURA S.R.L. | ☒ Review ☐ Witness<br>Date: 20/10/23 Name: |

# *RAPPORTO DI PROVA ULTRASUONI*

**ULTRASONIC**
EXAMINATION REPORT

*N°* ***747/23***

del of **07/10/2023**

*Pag. Sheet* *1 di of 1*


**ANTARES CONTROL**
di Righetto Davide
Via Roma,15/7
36040 Grumolo delle Abbad.(VI)
P.IVA: 04382150243
Cell. 3487376550
antarescontrolli@gmail.com


**Cliente** SIDERTAGLIO GALANDRATURA S.R.L.
Customer Via Marzotto, 9, 36031 Povolaro VI

**Descrizione del pezzo*** TALLONE SALDATO
Description object* L= 570 mm Thk = 25 mm pWPS 04E-23

**Ordine*** **Del**
Order* Of

**Disegno*** **Quantità** 1
Drawing* Quantity

**Comm. Vs cliente*** **Comm.*** 04E-23
Custoner Job* Job

**Codice pezzo*** pWPS 04E-23
Code name*

**Incarico** 04E-23-01
Assignment*

**Materiale*** P355NL2 **Colata***
Material* Heat*

**Data/Luogo del controllo** 07/10/2023 SIDERTAGLIO S.R.L.
Date and place of the check Via Marzotto, 9, 36031 Povolaro VI

**Tipo Giunto** Testa a Testa
Joint type Butt Weld

**Tipo prodotto** Laminato / Saldato
Product Type Laminate / welded

**WPS di riferimento*** **Norme di rif. :**
Reference WPS* Procedure

**Fase di controllo** Intermedio
Inspection Phase Intermediate

**Procedura/Specifica*** ISO 17640 liv. B
Specification* ***Ultima Edizione***

**Stadio di controllo** Trattamento termico non richiesto
Inspection Phase Heat treatment not required

**Classe accettazione*** UNI EN ISO 11666 Met.1 Liv.2
Acceptance criteria* ***Ultima Edizione***

**Condizioni superficiali** Spazzolato
Tests surface status Brushed

**Estensione del controllo*** 100% saldatura
Extension examination* weld 100%

* DATI FORNITI DAL CLIENTE - *THESE DATA ARE SUPPLIED BY THE CUSTOMER Allegato/Annex : 07/10/2023

**Metodo di controllo** Manuale - contatto **Accoppiante** COUPLANT FYp **Sovrap. Sonda** 10%
Scanning method Manual - contact reflection Coupling medium COUPLANT FYp Overlap

**Strumento tipo** GE Sensing & Inspection Technologies **Cavo** MPKLL2 **Vel. di scans.**
Instrument : Type USM 36S Serial nember 15017577 Cable L 2000 Scanning velocity

Report taratura - calibration EN n° E220182 scad. 24/11/23
Report taratura - calibration ASME n° A220215 scad. 24/11/2023

**Blocco di calibrazione** Eco di fondo/ Back Raflection
Calibration Block

**Sonde piane ad onde long.** PRO NDT MD10-4 N°178220
Probes Long. waves type Matricola - Serial n°

**Foro di Riferimento** FBH Ø 2 mm
Reference pole Sonde piane / Plain Probes

**Dimens. crist.** Ø 10 mm. **freq.** 4 MHZ
Crystal dim. freq.

**Curve di riferimento**
Reference curve Sonde piane / Plain Probes

**Sonde angol. ad onde trasv.** PRO NDT MA45-4 2031 12
Probes Transv. waves type Matricola - Serial n°

**Limite di Registrazione** <20% Back raflection
Recording level Sonde piane / Plain Probes

**Dimens. crist.** 8 X 9 **freq.** 4 MHZ
Crystal dim. freq.

**Blocco di calibrazione** V2 - IIW 1018 STEEL 21-V2-01
Calibration Block Sonde angolate / Angular Probes

**Sonde angol. ad onde trasv.** PRO NDT MA60-4 2032 10
Probes Transv. waves type Matricola - Serial n°

**Foro di Riferimento** SDH Ø 3 mm
Reference pole Sonde angolate / Angular Probes

**Dimens. crist.** 8 X 9 **freq.** 4 MHZ
Crystal dim. freq.

**Curve di riferimento** Curva DAC
Reference curve Sonde angolate / Angular Probes

**Sonde angol. ad onde trasv.** PRO NDT MA70-4 2033 08
Probes Transv. waves type Matricola - Serial n°

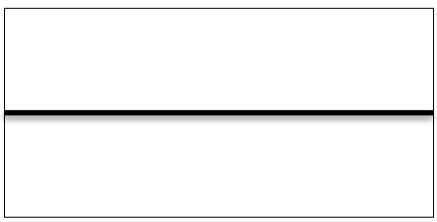
**Limite di Registrazione** -4 dB Curva DAC
Recording level Sonde angolate / Angular Probes

**Dimens. crist.** 8 X 9 **freq.** 4 MHZ
Crystal dim. freq.

**Cavo** PKLL1 **Vel. di scans.**
Cable L 2000 Scanning velocity

**Note o schizzo :** **Sessione esame TUV: 722331223**
Notes or sketch:

***CONTROLLO MATERIALE BASE:***
***Non sono state riscontrate indicazioni degne di nota.***
***BASIC MATERIAL CHECK:***
***No noteworthy indications were found.***



| Risultato / Result | OPERATORE - OPERATOR | RESPONSABILE - WORD REFERENCE | ISPETTORE - INSPECTOR |
|---|---|---|---|
| **Conforme a Norma**<br>Acceptable | Davide Righetto<br>II° Liv. SNT-TC1A / ISO 9712 | SIDERTAGLIO CALANDRATURA S.R.L. | ☒ Review ☐ Witness<br>Date: 20/10/23 Name: |

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LAB N° 1230 L

**Seda A: legale, amministrativa e operativa**
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Tel 041923994 - E-mail: laboratorio@globaltest.it
**Seda B: operativa**
Via A. Moro 10/C, 45026 Lendinara (RO)

| CLIENTE / CUSTOMER | |
|---|---|
| **SIDERTAGLIO CALANDRATURA S.r.l.** Via Marzotto, 8 - 36031 Dueville (VI) | |
| ORDINE / ORDER N° Conferma Ordine | DATA / DATE 20/10/2023 |
| RAPPORTO DI PROVA N° / TEST REPORT **29616** | DATA / DATE 20/10/2023 |
| | PAG. 1 di 12 |

# RAPPORTO DI PROVA / TEST REPORT

| Prodotto<br>Product | Id. Cliente<br>Client Id. | Ricevuto il<br>Received on | Id. Global Test<br>Global Test Id. | Dimensioni dichiarate<br>Declared dimensions | Materiale dichiarato<br>Declared material | Note<br>Remarks |
|---|---|---|---|---|---|---|
| Weld Coupon | WPS 04E-23 | 10/10/2023 | 13121 | Thk 25 mm | P355NL2 | Welding Process: 135 + 121<br>Welding Type: Semiautomatic + Machine<br>Welding Position: PA<br>Pratica TUV: 722331223<br>**Qualifica procedimento UNI EN ISO 15614-1:2019 Lev. 2** |

| Prove eseguite e Normative di riferimento<br>Performed Tests and Reference Standards | Eseguita il<br>Performed on | Esecuzione<br>Testing by |
|---|---|---|
| Room temperature tensile test according to UNI EN ISO 4136:2022 + UNI EN ISO 6892-1:2020 | 20/10/2023 | Sede A ☒ Sede B ☐ Altro ☐ |
| Room temperature tensile test according to UNI EN ISO 5178:2019 + UNI EN ISO 6892-1:2020 | 20/10/2023 | Sede A ☒ Sede B ☐ Altro ☐ |
| Bend test according to UNI EN ISO 5173:2023 | 20/10/2023 | Sede A ☒ Sede B ☐ Altro ☐ |
| Charpy Impact test according to UNI EN ISO 148-1:2016 + UNI EN ISO 9016:2022 | 20/10/2023 | Sede A ☒ Sede B ☐ Altro ☐ |
| Macrographic examination according to UNI EN ISO 17639:2022 | 20/10/2023 | Sede A ☒ Sede B ☐ Altro ☐ |
| Hardness test according UNI EN ISO 6507-1:2018 | 20/10/2023 | Sede A ☒ Sede B ☐ Altro ☐ |

Non è permessa la riproduzione parziale del presente rapporto di prova senza l'autorizzazione di Global Test. Il campionamento dei saggi è stato effettuato a cura del Cliente. I risultati riportati nel presente documento si riferiscono esclusivamente alle prove effettuate sui saggi consegnati in laboratorio così come ricevuti ed indicate in tabella "identificazione cliente". I residui dei saggi lavorati e le provette verranno conservati per 1 mese; dopo tale periodo verranno rottamati. Il presente documento è archiviato per minimo di 10 anni. Quando riportata, l'incertezza di misura è espressa con fattore di copertura k=2 pari a livello di fiducia del 95% circa.

*Partial reproduction of this report without Global Test authorization is strictly forbidden. The sampling of materials was performed by Customer. The test results given here, only refer to tests carried out on materials delivered in the laboratory as received and shown in table "Client identification". The residual of samples machined and test samples will be kept for 1 month; after which they will be scrapped. This document will be kept in memory for 10 years at least. When reported, the uncertainty of measurement is expressed with a coverage factor k = 2 equal to 95% level of confidence.*

**Approvato da: RESPONSABILE LABORATORIO**
Marco Canato
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**Spazio riservato ad eventuali approvazioni esterne** / Space reserved for possible external approvals

TÜV Italia — ☒ Review ☐ Witness
Date: 23/10/23 Name:

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| ORDINE / ORDER N° | DATA / DATE |
|---|---|
| Conferma Ordine | 20/10/2023 |
| RAPPORTO DI PROVA N° / TEST REPORT | DATA / DATE |
| **29616** | 20/10/2023 |
| | PAG. 2 di 12 |

Prove eseguite e Normative di riferimento - Performed Tests and Reference Standards
Room temperature tensile test according to UNI EN ISO 4136:2022 + UNI EN ISO 6892-1:2020

Standards Correlati - Related Standards
None

## PROVA DI TRAZIONE / TENSILE TEST

| **Identificativo Campione** Sample Identification | | **Provino** Specimen | **Posizione** Position | **Dimensioni** Dimensions | **Area** Area | **Carico Max** Maximum Load $F_m$ | **Carico Rottura** Ultimate Tensile Strength **Rm** | **Aspetto frattura** Fracture Appearance | **Zona rottura** Fracture Location |
|---|---|---|---|---|---|---|---|---|---|
| **Cliente** / Client | **Lab**. / Lab. | | | mm | $mm^2$ | N | MPa | | |
| WPS 04E-23 | 13443 / 1 | F | TW | 24.99 x 25.00 | 624.8 | 333617 | 534 | Ductile | Out Weld |
| WPS 04E-23 | 13443 / 2 | F | TW | 24.87 x 25.02 | 622.3 | 333526 | 536 | Ductile | Out Weld |

| **Posizione:** *Position:* | **Tipo di campione:** *Specimen Tipe:* | **Tipo di velocità di prova:** *Testing Rate method:* |
|---|---|---|
| TB: trasversale in materiale base / transversal on base metal<br>LB: longitudinale in materiale base / longitudinal on base metal<br>TW: trasversale attraverso saldatura / transversal across weld metal<br>LW: longitudinale su saldatura / longitudinal on weld metal | F – prismatica / flat<br>C – cilindrica / cilyndrical<br>T – tubo intero / entire pipe<br>P – provetta da tubo / specimen from pipe | "A224" method |

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| ORDINE / ORDER N° | DATA / DATE |
|---|---|
| Conferma Ordine | 20/10/2023 |
| RAPPORTO DI PROVA N° / TEST REPORT | DATA / DATE |
| **29616** | 20/10/2023 |
| | PAG. 3 di 12 |

Prove eseguite e Normative di riferimento - Performed Tests and Reference Standards
Room Temperature tensile test according to UNI EN ISO 5178:2019 + UNI EN ISO 6892-1:2020

Standards Correlati - Related Standards
None

## PROVA DI TRAZIONE / TENSILE TEST

| **Identificativo Campione** Sample Identification | | **Provino** Specimen | **Posizione** Position | **Dimensioni** Dimensions | **Area** Area | **Lunghezza Iniziale** Original Length $L_0$ | **Snervamento** Yield Strength **Rp0.2%** | **Rottura** Tensile Strength **Rm** | **Allungamento** Elongation **A** | **Strizione** Area Reduction **Z** | **Zona di rottura** Break position |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cliente** / Client | **Lab.** / Lab. | | | mm | $mm^2$ | mm | MPa | MPa | % | % | |
| WPS 04E-23 | 13443 / 3 | C | LW | Ø 10.02 | 78.9 | 50.0 | 446 | 561 | 34.3 | 74.3 | *** |

| **Posizione:** *Position:* | **Tipo di campione:** *Specimen Tipe:* | **Tipo di velocità di prova:** *Testing Rate method:* |
|---|---|---|
| TB: trasversale in materiale base / transversal on base metal<br>LB: longitudinale in materiale base / longitudinal on base metal<br>TW: trasversale attraverso saldatura / transversal across weld metal<br>LW: longitudinale su saldatura / longitudinal on weld metal | F – prismatica / flat<br>C – cilindrica / cilyndrical<br>T – tubo intero / entire pipe<br>P – provetta da tubo / specimen from pipe | "A224" method |

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| ORDINE / ORDER N° | DATA / DATE |
|---|---|
| Conferma Ordine | 20/10/2023 |
| RAPPORTO DI PROVA N° / TEST REPORT | DATA / DATE |
| **29616** | 20/10/2023 |
| | PAG. 4 di 12 |

| Prove eseguite e Normative di riferimento - Performed Tests and Reference Standards | Standards Correlati - Related Standards |
|---|---|
| Bend test according to UNI EN ISO 5173:2023 | None |

## PROVA DI PIEGA / BEND TEST

| **Identificativo Campione** Sample Identification | | **Posizione** Position | **Dimensioni** Dimensions | **Mandrino** Jig | **Angolo** Angle | **Distanza Rulli** Rolls Distance | **Esito** Results |
|---|---|---|---|---|---|---|---|
| **Cliente** / Client | **Lab**. / Lab. | | mm | mm | mm | mm | |
| WPS 04E-23 | 13443 / 4 | SBB | 23.6 x 10.1 | 40 | 180° | 63 | Not defects noted according to UNI EN ISO 15614-1:2019 Par. 7.4.2 (*) |
| WPS 04E-23 | 13443 / 5 | SBB | 23.5 x 10.0 | 40 | 180° | 63 | Not defects noted according to UNI EN ISO 15614-1:2019 Par. 7.4.2 (*) |
| WPS 04E-23 | 13443 / 6 | SBB | 24.1 x 10.1 | 40 | 180° | 63 | Not defects noted according to UNI EN ISO 15614-1:2019 Par. 7.4.2 (*) |
| WPS 04E-23 | 13443 / 7 | SBB | 24.5 x 10.1 | 40 | 180° | 63 | Not defects noted according to UNI EN ISO 15614-1:2019 Par. 7.4.2 (*) |

| **Tipo di provino:** *Specimen Type:* | **Note:** Remarks: |
|---|---|
| TFBB: Piega trasversale al dritto / transversal face bend test<br>TRBB: Piega trasversale al rovescio / transversal root bend test<br>SBB: Piega trasversale laterali / transversal side bend test | Testing Procedure: Former Bend Test<br>Test Temperature: (23±5)°C |

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| ORDINE / ORDER N° | DATA / DATE |
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| Conferma Ordine | 20/10/2023 |
| RAPPORTO DI PROVA N° / TEST REPORT | DATA / DATE |
| **29616** | 20/10/2023 |
| | PAG. 5 di 12 |

Prove eseguite e Normative di riferimento - Performed Tests and Reference Standards
Charpy Impact test according to UNI EN ISO 148-1:2016

Standards Correlati - Related Standards
UNI EN ISO 9016:2022

## PROVA DI RESILIENZA / CHARPY IMPACT TEST

| **Identificativo Campione** Sample Identification | | **Temperatura** Temperature | **Posizione** Position | **Dimensioni** Dimensions | **Intaglio** Notch | **Resilienza** Impact energy Joule | | | | **Espansione laterale** Lateral expansion mm | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cliente** / Client | **Lab.** / Lab. | °C | | mm | | 1 | 2 | 3 | AVG | 1 | 2 | 3 | AVG |
| WPS 04E-23 | 13443 / 8 | - 78 | VWT 0/22 | 2.5 x 10.0 | $KV_2$ | 39 | 41 | 38 | 39 | 1,03 | 1,12 | 1,02 | 1,06 |
| WPS 04E-23 | 13443 / 9 | - 78 | VHT 0/22 | 2.5 x 10.0 | $KV_2$ | 33 | 35 | 31 | 33 | 0,95 | 0,99 | 0,83 | 0,92 |
| WPS 04E-23 | 13443 / 10 | - 78 | VHT 2/22 | 2.5 x 10.0 | $KV_2$ | 56 | 55 | 41 | 51 | 1,16 | 1,15 | 1,00 | 1,10 |
| WPS 04E-23 | 13443 / 11 | - 78 | VHT 5/22 | 2.5 x 10.0 | $KV_2$ | 38 | 43 | 45 | 42 | 1,05 | 1,21 | 1,29 | 1,18 |
| WPS 04E-23 | 13443 / 12 | - 50 | VWT 0/2 | 10.0 x 10.0 | $KV_2$ | 293 | 280 | 257 | 277 | 2,29 | 2,21 | 2,11 | 2,20 |
| WPS 04E-23 | 13443 / 13 | - 50 | VHT 0/2 | 10.0 x 10.0 | $KV_2$ | 255 | 263 | 234 | 251 | 2,16 | 2,21 | 2,23 | 2,20 |
| WPS 04E-23 | 13443 / 14 | - 50 | VHT 2/2 | 10.0 x 10.0 | $KV_2$ | 293 | 259 | 296 | 283 | 2,33 | 2,03 | 2,39 | 2,25 |
| WPS 04E-23 | 13443 / 15 | - 50 | VHT 5/2 | 10.0 x 10.0 | $KV_2$ | 283 | 295 | 299 | 292 | 2,24 | 2,31 | 2,39 | 2,31 |

| **Posizione provino:** *Position of specimen:* | **Note:** *Remarks:* |
|---|---|
| BM: Materiale Base / Base Metal<br>VHT: Linea di Fusione / Fusion Line<br>VWT: Zona Fusa / Weld Metal | Tempo di condizionamento provini: >15 min<br>Conditioning time: >15 min<br>1) Valore approssimativo KV eccede 80% della capacità dell'apparecchiatura - Approximate KV value exceeds 80% of the equipment's capacity<br>2) Valore approssimativo di provino non rotto – Approximate value of unbroken specimen |

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Marco Canato
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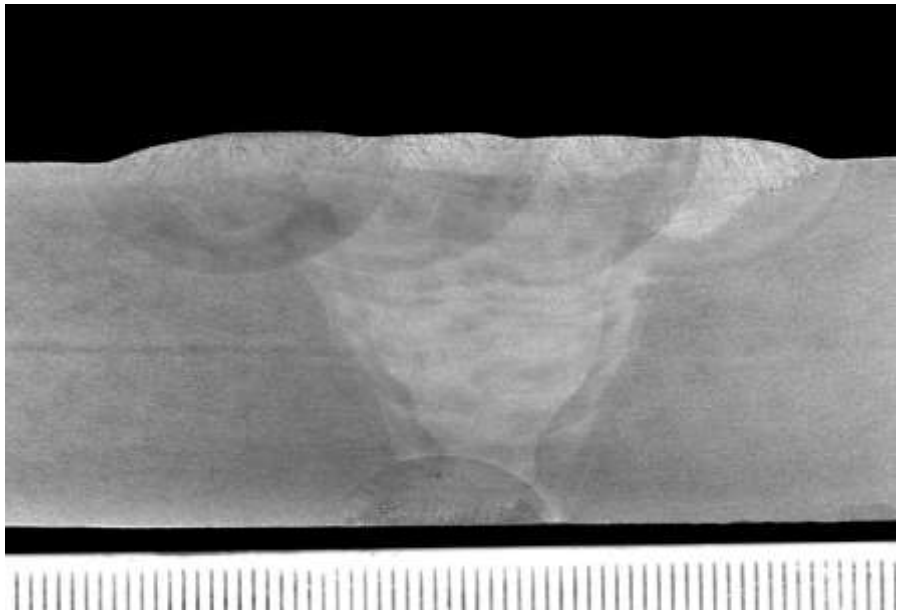
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**Seda A: legale, amministrativa e operativa**
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| CLIENTE / CUSTOMER | |
|---|---|
| **SIDERTAGLIO CALANDRATURA S.r.l.** Via Marzotto, 8 - 36031 Dueville (VI) | |
| ORDINE / ORDER N° Conferma Ordine | DATA / DATE 20/10/2023 |
| RAPPORTO DI PROVA N° / TEST REPORT **29616** | DATA / DATE 20/10/2023 |
| | PAG. 6 di 12 |

| Prove eseguite e Normative di riferimento - Performed Tests and Reference Standards | Standards Correlati - Related Standards |
|---|---|
| Macrographic examination according to UNI EN ISO 17639:2022 | UNI 3138:1984 |

## ESAME MACROGRAFICO / MACROGRAPHIC EXAMINATION



| | | |
|---|---|---|
| **Identificativo Campione** Sample Identification | **Cliente** Client | WPS 04E-23 |
| | **Lab.** Lab. | 13443 / 16 |
| **Posizione Prelievo** / Sampling position **Zona Esaminata /** Examinated Area | | Transversal Weld Joint |
| **Tipo di saldatura/** Weld Joint type | | Butt Weld |
| **Tipo di Attacco** / Etching Type | | Nital 10% |
| **Metodo di attacco /** Ethching method | | Immersione – 30s Swabbing – 30s |
| **Designazione** / Designation | | Esame-ISO 17639-A-E-1.2/1.2-1.2/1.2-A.1 |
| **Esito** / Result (*) | | No defects noted according to UNI EN ISO 5817:2023 Lev. B + UNI EN ISO 15614-1:2019 Lev.2 Para 7.5 |

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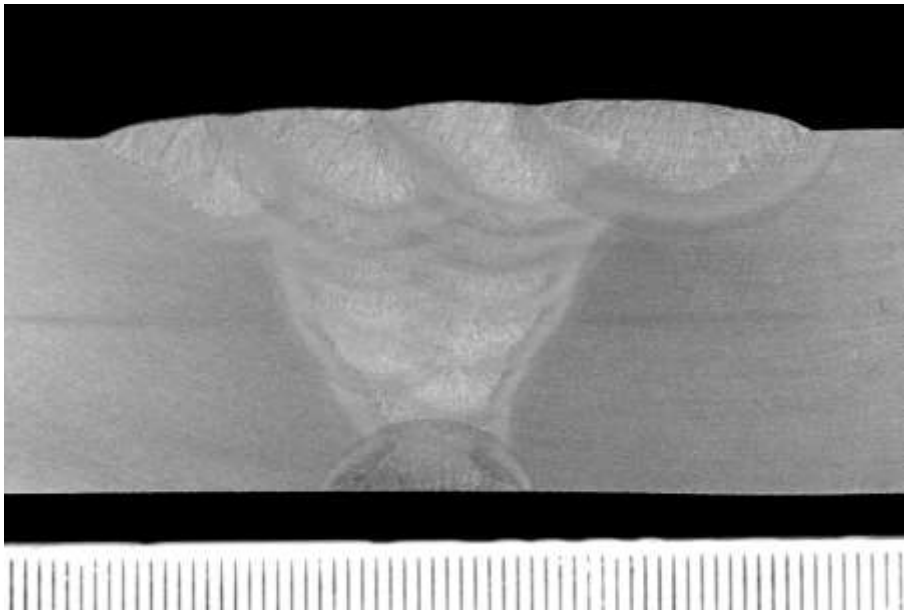
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| CLIENTE / CUSTOMER | |
|---|---|
| **SIDERTAGLIO CALANDRATURA S.r.l.** Via Marzotto, 8 - 36031 Dueville (VI) | |
| ORDINE / ORDER N° Conferma Ordine | DATA / DATE 20/10/2023 |
| RAPPORTO DI PROVA N° / TEST REPORT **29616** | DATA / DATE 20/10/2023 |
| | PAG. 7 di 12 |

| Prove eseguite e Normative di riferimento - Performed Tests and Reference Standards | Standards Correlati - Related Standards |
|---|---|
| Macrographic examination according to UNI EN ISO 17639:2022 | UNI 3138:1984 |

## ESAME MACROGRAFICO / MACROGRAPHIC EXAMINATION



| | | |
|---|---|---|
| **Identificativo Campione** Sample Identification | **Cliente** Client | WPS 04E-23 |
| | **Lab.** Lab. | 13443 / 17 |
| **Posizione Prelievo** / Sampling position **Zona Esaminata /** Examinated Area | | Transversal Weld Joint |
| **Tipo di saldatura/** Weld Joint type | | Butt Weld |
| **Tipo di Attacco** / Etching Type | | Nital 10% |
| **Metodo di attacco /** Ethching method | | Immersione – 30s Swabbing – 30s |
| **Designazione** / Designation | | Esame-ISO 17639-A-E-1.2/1.2-1.2/1.2-A.1 |
| **Esito** / Result (*) | | No defects noted according to UNI EN ISO 5817:2023 Lev. B + UNI EN ISO 15614-1:2019 Lev.2 Para 7.5 |

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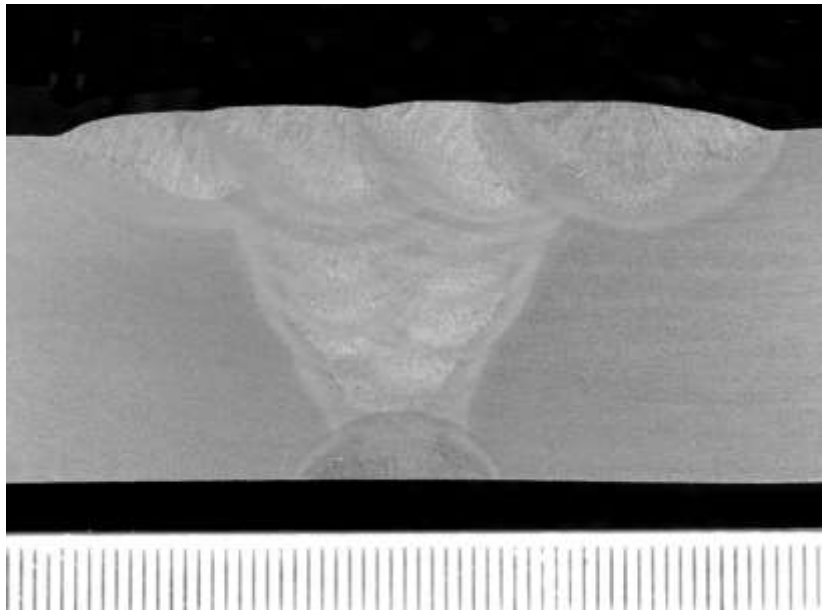
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| ORDINE / ORDER N° Conferma Ordine | DATA / DATE 20/10/2023 |
| RAPPORTO DI PROVA N° / TEST REPORT **29616** | DATA / DATE 20/10/2023 |
| | PAG. 8 di 12 |

| Prove eseguite e Normative di riferimento - Performed Tests and Reference Standards | Standards Correlati - Related Standards |
|---|---|
| Macrographic examination according to UNI EN ISO 17639:2022 | UNI 3138:1984 |

## ESAME MACROGRAFICO / MACROGRAPHIC EXAMINATION



| | | |
|---|---|---|
| **Identificativo Campione** Sample Identification | **Cliente** Client | WPS 04E-23 |
| | **Lab.** Lab. | 13443 / 18 |
| **Posizione Prelievo** / Sampling position **Zona Esaminata /** Examinated Area | | Transversal Weld Joint |
| **Tipo di saldatura/** Weld Joint type | | Butt Weld |
| **Tipo di Attacco** / Etching Type | | Nital 10% |
| **Metodo di attacco /** Ethching method | | Immersione – 30s Swabbing – 30s |
| **Designazione** / Designation | | Esame-ISO 17639-A-E-1.2/1.2-1.2/1.2-A.1 |
| **Esito** / Result (*) | | No defects noted according to UNI EN ISO 5817:2023 Lev. B + UNI EN ISO 15614-1:2019 Lev.2 Para 7.5 |

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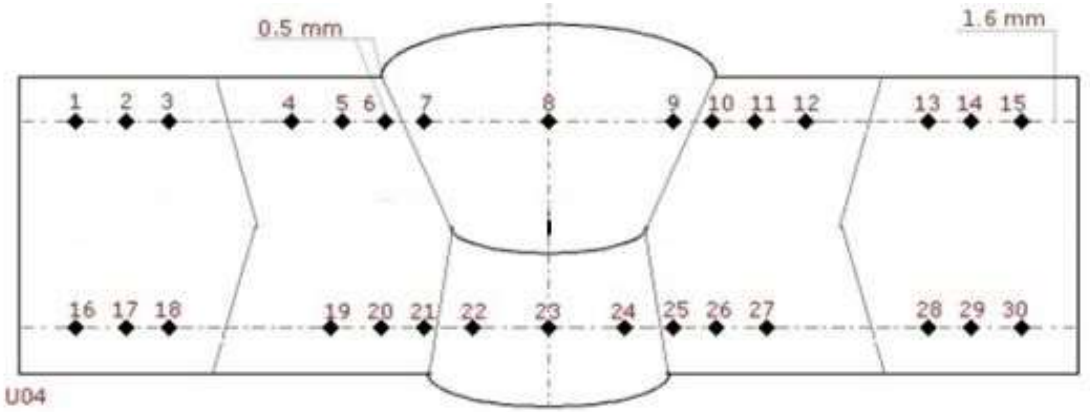
| ORDINE / ORDER N° | DATA / DATE |
|---|---|
| Conferma Ordine | 20/10/2023 |
| RAPPORTO DI PROVA N° / TEST REPORT | DATA / DATE |
| **29616** | 20/10/2023 |
| | PAG. 9 di 12 |

Prove eseguite e Normative di riferimento - Performed Tests and Reference Standards
Hardness test according to UNI EN ISO 6507-1:2018

Standards Correlati - Related Standards
UNI EN ISO 9015-1:2011

## PROVA DI DUREZZA / HARDNESS TEST

| **Identificativo Campione** Sample Identification | | **Prova di durezza** Hardness Test |
|---|---|---|
| **Cliente** / Client | **Lab.** / Lab. | |
| WPS 04E-23 | 13443 / 16 | HV10 |




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 156 | 155 | 156 | 183 | 189 | 206 | 175 | 173 | 185 | 216 | 203 | 192 | 157 | 153 | 164 |
| **16** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** |
| 158 | 159 | 160 | 198 | 205 | 227 | 228 | 239 | 221 | 216 | 207 | 184 | 163 | 162 | 163 |

**Approvato da: RESPONSABILE LABORATORIO**
Marco Canato
GLOBAL TEST Srl

**Spazio riservato ad eventuali approvazioni esterne** / Space reserved for possible external approvals

TÜV Italia
☒ Review
☐ Witness
Date: 23/10/23 Name: .....

GLOBAL TEST srl

LAB N° 1230 L

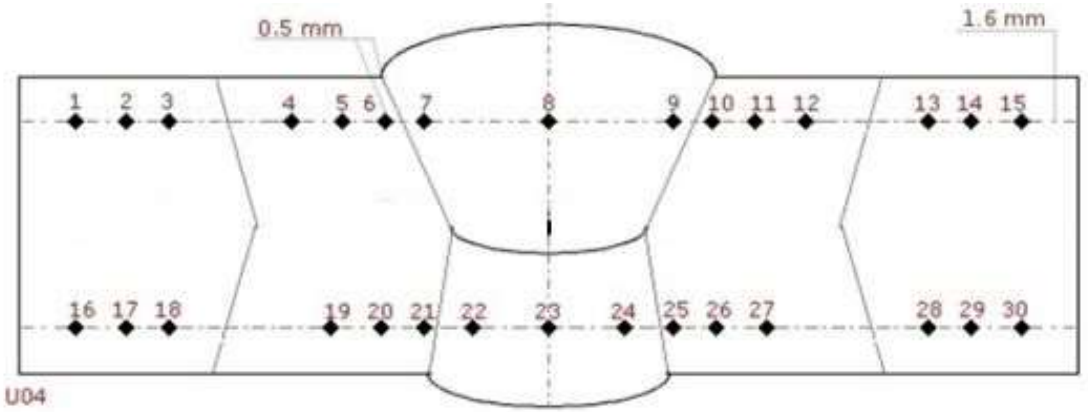
**Seda A: legale, amministrativa e operativa**
Via Venier,21/B – 30020 Marcon (VE)
Tel 041923994 - E-mail: laboratorio@globaltest.it
**Seda B: operativa**
Via A. Moro 10/C, 45026 Lendinara (RO)

| CLIENTE / CUSTOMER | |
|---|---|
| **SIDERTAGLIO CALANDRATURA S.r.l.** Via Marzotto, 8 - 36031 Dueville (VI) | |
| ORDINE / ORDER N° Conferma Ordine | DATA / DATE 20/10/2023 |
| RAPPORTO DI PROVA N° / TEST REPORT **29616** | DATA / DATE 20/10/2023 |
| | PAG. 10 di 12 |

| Prove eseguite e Normative di riferimento - Performed Tests and Reference Standards | Standards Correlati - Related Standards |
|---|---|
| Hardness test according to UNI EN ISO 6507-1:2018 | UNI EN ISO 9015-1:2011 |

# PROVA DI DUREZZA / HARDNESS TEST

| **Identificativo Campione** Sample Identification | | **Prova di durezza** Hardness Test |
|---|---|---|
| **Cliente** / Client | **Lab.** / Lab. | |
| WPS 04E-23 | 13443 / 17 | HV10 |




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 158 | 155 | 159 | 187 | 195 | 209 | 169 | 175 | 175 | 216 | 210 | 184 | 159 | 158 | 159 |
| **16** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** |
| 159 | 161 | 158 | 183 | 201 | 223 | 201 | 221 | 207 | 216 | 207 | 185 | 160 | 160 | 162 |

**Approvato da: RESPONSABILE LABORATORIO**
Marco Canato
GLOBAL TEST Srl

**Spazio riservato ad eventuali approvazioni esterne** / Space reserved for possible external approvals

Review
Witness
Date: 23/10/23 Name:

GLOBAL TEST srl

LAB N° 1230 L

**Seda A: legale, amministrativa e operativa**
Via Venier,21/B – 30020 Marcon (VE)
Tel 041923994 - E-mail: laboratorio@globaltest.it
**Seda B: operativa**
Via A. Moro 10/C, 45026 Lendinara (RO)

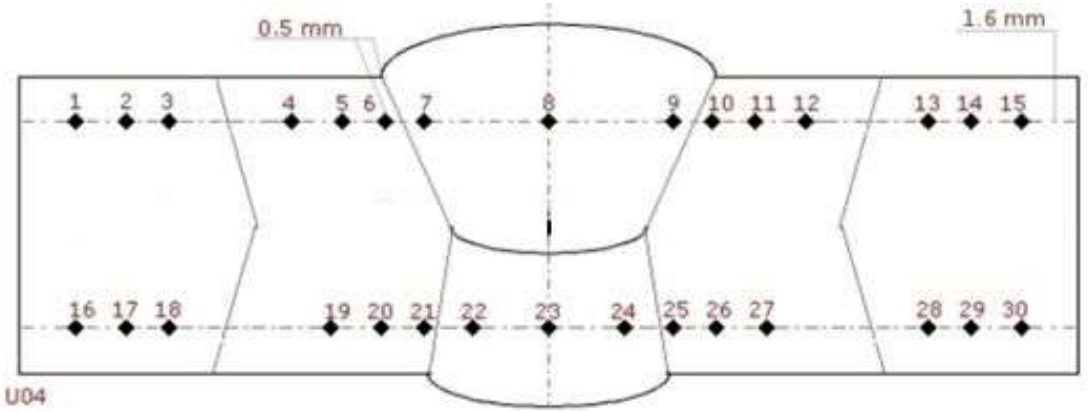
CLIENTE / CUSTOMER
**SIDERTAGLIO CALANDRATURA S.r.l.**
Via Marzotto, 8 - 36031 Dueville (VI)

| ORDINE / ORDER N° | DATA / DATE |
|---|---|
| Conferma Ordine | 20/10/2023 |
| RAPPORTO DI PROVA N° / TEST REPORT | DATA / DATE |
| **29616** | 20/10/2023 |
| | PAG. 11 di 12 |

| Prove eseguite e Normative di riferimento - Performed Tests and Reference Standards | Standards Correlati - Related Standards |
|---|---|
| Hardness test according to UNI EN ISO 6507-1:2018 | UNI EN ISO 9015-1:2011 |

# PROVA DI DUREZZA / HARDNESS TEST

| **Identificativo Campione** Sample Identification | | **Prova di durezza** Hardness Test |
|---|---|---|
| **Cliente** / Client | **Lab.** / Lab. | |
| WPS 04E-23 | 13443 / 18 | HV10 |




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 154 | 156 | 155 | 187 | 196 | 201 | 193 | 178 | 183 | 212 | 207 | 196 | 158 | 158 | 163 |
| **16** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** |
| 161 | 159 | 158 | 198 | 214 | 227 | 229 | 221 | 238 | 221 | 219 | 183 | 160 | 162 | 162 |

**Approvato da: RESPONSABILE LABORATORIO**
Marco Canato
GLOBAL TEST Srl

**Spazio riservato ad eventuali approvazioni esterne** / Space reserved for possible external approvals
☒ Review ☐ Witness
Date: 23/10/23 Name: .....

## STRUMENTI USATI PER LE PROVE / EQUIPMENT USED FOR TESTS

| Equipment used | Trademark | | Calibration expiry (±15 days) |
|---|---|---|---|
| Digital Caliper | Borletti CDJB15 | Sn: 032819-186295 | 27/10/2025 |
| Tensile Test Machine – 1200kN | GALDABINI QUASAR 1200 | Sn: VB3Z | 13/03/2024 |
| Electronic Exstensometer | GALDABINI MICRO | Sn: 34547 | 13/03/2024 |
| Hydraulic Press | OMCN P30/MR | Sn: 589557 | - |
| Charpy pendulum | Wolpert PW30/15K | Sn: 1216 | 13/03/2024 |
| Digital Thermometer + Probe | TC Direct + PT100 | Sn: 220606695 + 220606695/PT100 | 05/12/2023 |
| Camera | CANON EOS 4000D | Sn: 153070020586 | - |
| Hardness Testing Machine | QNESS Q30A+ | Sn: Q1788/02/20 | 13/03/2024 |

(*) Metodo di prova non accreditata da ACCREDIA – Ente Italiano di Accreditamento
*Test method not accredited by ACCREDIA - Italian Accreditation System*

La decorrenza del presente Rapporto di Prova coincide con la data di emissione del documento, posta in alto a destra. Non rileva il fatto che la firma digitale sia eventualmente apposta successivamente.
*The effective date of this Test Report corresponds with the emission date, placed in the upper right corner. It does not have relevance the fact that the digital signature is eventually affixed afterwards.*

**Approvato da: RESPONSABILE LABORATORIO**
Marco Canato
GLOBAL TEST Srl

**Spazio riservato ad eventuali approvazioni esterne** / Space reserved for possible external approvals
☒ Review
☐ Witness
Date: 23/10/23 Name:

A02

# CERTIFICATO DI CONTROLLO 3.1 / INSPECTION CERTIFICATE 3.1 - EN 10204:2004

A04/A05

METINVEST
METINVEST TRAMETAL SPA

A01

Società per azioni con socio unico soggetta a direzione e coordinamento di Metinvest B.V
Registered office: Via XII Ottobre 1, 5° piano - 16121 Genova, Italy
Phone +39 010 5762911 - Fax +39 010 5762990
Works: Via E. Fermi, 44 - 33058 San Giorgio di Nogaro UD, Italy
Phone +39 0431 629989 - Fax +39 0431 629985
Cap. Soc. Euro 300.120.000,00 i.v.
C.F., P.IVA e Iscr. Reg. Imp. GE 05956630965 - REA 437720/GE
http://trametal.metinvestholding.com

(A) PROCESSO DI ELABORAZIONE / STEELMAKING PROCESS: E = ELECTRIC ; BO = BASIC OXYGEN
(B) STATO DI FORNITURA / DELIVERY CONDITION: AR = GREZZO DI LAMINAZIONE / AS ROLLED ;
N* = LAMINAZIONE A TEMPERATURA CONTROLLATA / NORMALIZING ROLLING ;
N = NORMALIZZATO / NORMALIZED at 910°C, 1,5 min/mm ; ARIA CALMA / STILL AIR;
R = RICOTTO / ANNEALED;
N+R = NORMALIZZATO + RINVENUTO / NORMALIZED + TEMPERED
(C) TRATTAMENTO TERMICO DEL CAMPIONE / HEAT TREATMENT OF SAMPLE:
N = 910°C, 1,5 min/mm ; ARIA CALMA / STILL AIR
R = 650°C, 1,5 min/mm ; ARIA CALMA / STILL AIR
(D) Ceq_1 = C + Mn/6 ; Ceq_2 = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15 ;
Pcm = C + Si/30 + (Mn + Cu + Cr)/20 + NI/60 + Mo/15 + V/10 + B*5
(1) POSIZIONE / LOCATION: 1 = TESTA / TOP ; 2 = PIEDE / BOTTOM
(2) POSIZIONE / LOCATION: C = CUORE / 1/2 THICKNESS ; P = PELLE / SURFACE ; D = 1/4 SPESSORE / THICKNESS
(3) DIREZIONE / DIRECTION: L = LONGITUDINALE / LONGITUDINAL ; T = TRASVERSALE / TRANSVERSE
(4) FORMA DEL PROVINO / SHAPE OF TEST PIECE: P = PRISMATICO / PRISMATIC ; C = CILINDRICO / CYLINDRICAL
(5) ESITO PROVA DI PIEGA / RESULT: OK = COMPLYING ; NO = NOT COMPLYING

A03 N° Certificato / Certificate no.: 553065

Z02 Data / Date: 01/04/2022

A08 N° Ordine Trametal / Works order: 32200448

A07 N° Ordine cliente / Customer's order: 6-2022

DDT: BOL 32205952

del / date: 30/03/2022

Pratica / File no.:

del / date:

B01/B02/B03

Prodotto / Product: Lamiere / Hot rolled plates

Qualità / Steel grade: P355NL2

Normativa / Specification: EN10028-3:2017

A06 Cliente / Customer

**SIDERURGICA LEONESSA S.R.L.**

**Via Don. Milani 13-19**
**25020 FLERO 25020 IT**
**BS ITALIA**

B06 Marcatura di prodotto / Marking of the product

LAMIERA/ORDINE/N° INFORNAMENTO/DIMENSIONI/QUALITÀ/MARCHIO DEL PRODUTTORE
PLATE/ORDER/INTERNAL N°/DIMENSIONS/STEEL GRADE/MANUFACTURER'S MARK

TÜV Italia — ☒ Review ☐ Witness — Date: 06/10/23 Name:

| B07 ITEM | B07 LAMIERA PLATE | B07 N° INFORN. INTERNAL NUMBER | B09/B11 DIMENSIONI [mm] DIMENSIONS | B12 MASSA TEORICA [t] THEORICAL WEIGHT | B07 LOTTO BATCH NO. | C70 PROCESSO ELAB. (A) STEELMAKING PROCESS | B04 STATO FORNITURA LAMIERA (B) DELIVERY CONDITION | C00 CAMPIONE SAMPLE | B05 TRATT. CAMPIONE (C) HEAT TREATMENT | C00 CAMPIONE PWHT SAMPLE | B05 PWHT BEGINNING TEMPERATURE °C | TEMPERATURA INIZIO | B05 PWHT HEATING RATE VELOCITA' RISCALDO C/h | B05 PWHT TEMPERATURE TREATMENT TEMPERATURA TRATTAMENTO °C | B05 PWHT HOLDING TIME PERMANENZA Min | B05 PWHT COOLING RATE VELOCITA' RAFFREDDAMENTO °C/h | B05 PWHT END TEMPERATURE TEMPERATURA FINE °C | B05 PWHT N° CICLI / CYCLES | C00 CAMPIONE Q+T SAMPLE | B05 Q+T TEMPERATURE TEMPERATURA (Q) °C | B05 Q+T HOLDING TIME PERMANENZA (Q) Min | B05 Q+T COOLING RAFFREDDAMENTO | B05 Q+T TEMPERATURE TEMPERATURA (T) °C | B05 Q+T HOLDING TIME PERMANENZA (T) Min | B05 Q+T COOLING RAFFREDDAMENTO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22 | 1NAR920901A | 1779110 | 25.00X3000X12000 | 7,07 | 728735 | BO | N | GD860 | | | | | | | | | | | | | | | | | |
| ~~22~~ | ~~1NAR920902A~~ | ~~1779109~~ | ~~25.00X3000X12000~~ | ~~7,07~~ | ~~728736~~ | ~~BO~~ | ~~N~~ | ~~GD861~~ | | | | | | | | | | | | | | | | | |

## C71/C92 COMPOSIZIONE CHIMICA DI COLATA / HEAT CHEMICAL ANALYSIS

| B07 COLATA HEAT | C71 C % | C72 Mn % | C73 Si % | C74 P % | C75 S % | C76 Cu % | C77 Ni % | C78 Cr % | C79 Mo % | C80 Al % | C81 V % | C82 Nb % | C83 Ti % | C84 Sn % | C85 Ca % | C86 N % | C87 B % | C88 H % | C89 Ceq1 % (D) | C90 Ceq2 % (D) | C91 Pcm % (D) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ordine Min 22 | | | | | | | | | | | | | | | | | | | | | |
| Ordine Max 22 | | 1,50 | | | | | | | | | | 0,050 | | | | | | | | | |
| P355NL2 Min 0.00 - 60.00 | | 1,10 | | | | | | | | 0,020 | | | | | | | | | | | |
| P355NL2 Max 0.00 - 60.00 | 0,18 | 1,70 | 0,50 | 0,020 | 0,005 | 0,300 | 0,500 | 0,300 | 0,080 | | 0,100 | 0,050 | 0,030 | | | 0,0120 | | | | 0,43 | |
| 1NAR92 | 0,17 | 1,18 | 0,27 | 0,013 | 0,002 | 0,020 | 0,180 | 0,020 | <0.005 | 0,030 | <0.005 | 0,022 | <0.005 | <0.005 | 0,0000 | 0,0060 | 0,0003 | 0,0002 | 0,37 | 0,38 | 0,24 |

| C00 CAMPIONE SAMPLE | | C01 POSIZIONE (1) LOCATION | PROVA DI TRAZIONE TENSILE TEST: C01 POSIZIONE (2) LOCATION | C02 DIREZIONE (3) ORIENTATION | C03 TEMPERATURA [°C] TEST TEMPERATURE | C11 ReH [Mpa] YIELD STRENGTH | C12 Rm [Mpa] TENSILE STRENGTH | ReH/Rm | C13 A% ELONGATION | C14 Rp 0.2 [Mpa] PROOF/YIELD STRENGTH | C10 FORMA PROVINO (4) SHAPE OF TEST PIECE | PROVA DI RESILIENZA IMPACT TEST - CHARPY V-NOTCH TEST: C41 LARGHEZZA [mm] WIDTH | C02 DIREZIONE (3) ORIENTATION | C03 TEMPERATURA [°C] TEST TEMPERATURE | C01 POSIZIONE (2) LOCATION | C42 SINGOLI VALORI [J] INDIVIDUAL VALUES | C43 MEDIA [J] MEAN VALUE | PROVA DI PIEGA BEND TEST: C02 DIREZIONE (3) ORIENTATION | C51 MANDRINO [mm] MANDREL | C52 ANGOLO [°] ANGLE | C50 ESITO (5) RESULT | PROVA DI DUREZZA HARDNESS TEST: C01 POSIZIONE (2) LOCATION | C30 METODO TEST METHOD | C31 SINGOLI VALORI INDIVIDUAL VALUES | C32 MEDIA MEAN VALUE | PROVA DI STRIZIONE Z% TEST: C53 Z% SINGOLI VALORI Z% INDIVIDUAL VALUES | C54 Z% VALORE MEDIO Z% MEAN VALUE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ORDINE Min 22 | | | | | | | | | | | | | L | -46 | | 27 | 0 | | | | | | | | | | |
| P355NL2 Min 16.10 - 40.00 | | | | | 20 | 345 | 490 | | 22,0 | | | | | | | | | | | | | | | | | | |
| P355NL2 Max 16.10 - 40.00 | | | | | 20 | | 630 | | | | | | | | | | | | | | | | | | | | |

| | | | PROVA DI TRAZIONE TENSILE TEST | | | | | | | | | PROVA DI RESILIENZA IMPACT TEST - CHARPY V-NOTCH TEST | | | | | | PROVA DI PIEGA BEND TEST | | | | PROVA DI DUREZZA HARDNESS TEST | | | | PROVA DI STRIZIONE Z% TEST | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C00 | | C01 | C01 | C02 | C03 | C11 | C12 | | C13 | C14 | C10 | C41 | C02 | C03 | C01 | C42 | C43 | C02 | C51 | C52 | C50 | C01 | C30 | C31 | C32 | C53 | C54 |
| CAMPIONE SAMPLE | SPESSORE LAMIERA PLATE THICKNESS | POSIZIONE (1) LOCATION | POSIZIONE (2) LOCATION | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | ReH [Mpa] YIELD STRENGTH | Rm [Mpa] TENSILE STRENGTH | ReH/Rm | A% ELONGATION | Rp 0.2 [Mpa] PROOF/YIELD STRENGTH | FORMA PROVINO (4) SHAPE OF TEST PIECE | LARGHEZZA [mm] WIDTH | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | POSIZIONE (2) LOCATION | SINGOLI VALORI [J] INDIVIDUAL VALUES | MEDIA [J] MEAN VALUE | DIREZIONE (3) ORIENTATION | MANDREL [mm] MANDRINO | ANGOLO [°] ANGLE | ESITO (5) RESULT | POSIZIONE (2) LOCATION | METODO TEST METHOD | SINGOLI VALORI INDIVIDUAL VALUES | MEDIA MEAN VALUE | Z% SINGOLI VALORI Z% INDIVIDUAL VALUES | Z% VALORE MEDIO Z% MEAN VALUE |
| P355NL2 Min 6.00 - 999.00 | | | | | | | | | | | | | T | -50 | | | 27 | | | | | | | | | | |
| GD860 | 25,00 | 2 | P | T | 20 | 407 | 518 | 0,79 | 32,0 | | P | 10,00 | L | -46 | P | 278 222 267 | 256 | | | | | | HRC < | 22 | | | |
| GD860 | 25,00 | 2 | | | | | | | | | | 10,00 | T | -50 | P | 135 126 126 | 129 | | | | | | | | | | |
| GD861 | 25,00 | 2 | P | T | 20 | 405 | 531 | 0,76 | 32,9 | | P | 10,00 | L | -46 | P | 259 241 236 | 245 | | | | | | HRC < | 22 | | | |
| GD861 | 25,00 | 2 | | | | | | | | | | 10,00 | T | -50 | P | 110 105 111 | 109 | | | | | | | | | | |

C10

UNI EN ISO 6892-1:2020 / UNI EN ISO 148-1:2016

**Z01**

| ITEM | | TOLLERANZA DI SPESSORE TOLERANCE ON THICKNESS | TOLLERANZE DI LARGHEZZA TOLERANCE ON WIDTH | TOLLERANZE DI LUNGHEZZA TOLERANCE ON LENGTH | CONDIZIONI SUPERFICIALI SURFACE FINISH | PLANARITÀ FLATNESS |
|---|---|---|---|---|---|---|
| 22 | | -0 +2 MM | -0 +100 MM | -0 +200 MM | EN 10163/2 CL B3 | EN 10029 CL. N |

CERTIFICHIAMO che le lamiere elencate sono conformi alla prescrizione dell'ordine, che i controlli della marcatura, dell'aspetto superficiale e dimensionale hanno dato esito positivo.
WE CERTIFY that the above mentioned plates are consistent with the order prescriptions: marking, inspection and measurement without objection.
DICHIARIAMO CHE LE LAMIERE SONO STATE CONTROLLATE IN ACCORDO ALLA NORMATIVA VIGENTE E CHE LE RADIAZIONI IONIZZANTI NON ECCEDONO IL VALORE DEL FONDO NATURALE.
WE DECLARE THAT THE PLATES WERE CONTROLLED ACCORDING TO STANDARD AND RADIATION DO NOT EXCEED THE NATURAL RADIATION.

**Z06**

**FULLY KILLED FINE GRAIN STEEL**

**HARDNESS IN ACC. TO NACE MR 0175 / ISO15156**

**STEEL VACUUM DEGASSED**

| Z07 | Z03 ENTE COLLAUDO / INSPECTION BODY | Z02 |
|---|---|---|
| **Plates acc. to PED 2014/68/EU** | **TIMBRO DELL'ISPETTORE STAMP OF THE INSPECTION REPRESENTATIVE** | METINVEST TRAMETAL S.p.A. F. Andrian CQ Manager |

**S.I.A.T. S.p.A. - Società Italiana Acciai Trafilati**
Via Facini 54, 33013 Gemona del Friuli, UD - Italy
Tel +39 0432 062811, Fax +39 0432 062960
s.i.a.t.spa@legalmail.it, www.siatspa.com

Partita I.V.A., Cod. Fisc., Reg. Imprese C.C.I.A.A. Udine 00166750307
Rea Udine 115789 - Cap. Soc. € 5.000.000 I.V.
"Società soggetta all'attività di direzione e coordinamento da parte di Compagnia Siderurgica Italiana S.r.l."

**Divisione Pittarc**
Via Cartiera 3, 33010 Osoppo, UD - Italy
Tel +39 0432 062811, Fax +39 0432 062903
www.pittarc.com

**Azienda con i seguenti sistemi di gestione certificati:**
**- qualità secondo UNI EN ISO 9001:2015**
**- ambiente secondo UNI EN ISO 14001:2015**

# CERTIFICATO DI COLLAUDO

Inspection Certificate - Abnahmeprüfzeugins - Certificate de Réception

CHEMICAL ANALYSIS ACCORDING TO EN 10204:2004 TYPE 3.1

**N°** 6697/2022/A
**DATA** 05/12/2022

**PRODOTTO** C1200196
Product FILO G9 INNOV-ARC Ø 1,20
Erzeugnis
Produit

**NORMATIVA** AWS A5.18 ER70S-6
Standard EN ISO 14341 A G46 5 M21/2C1 4Si1

**N° DOC. di TRASP. 10507 del 05/12/2022**
Dispatch Note / Lieferschein / Avis d'expédition

**N° ORDINE 202207232 / 0001**
Order / Bestellung / Commande

**CONFERMA 5884 SCHIO**
Confirmation / Auftragsbestätigung / Confirmation de commande

**CLIENTE** **051108**
Customer / Besteller / Client

AIRGAS NORDEST S.R.L.
VIA GLORIA 2, MARGHERA 30175 VENEZ

**COLATA N°**
Heat / Schmelze / Coulée

**13616/2022**

ANALISI CHIMICA di COLATA % - Heat Chemical composition % - Schmelze Chemische zusammensetzung % - Composition chimique sur coulée %

| C | Mn | Si | P | S | Cr | Ni | Mo | Cu* | Sn | Al | V | Ti | B | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,06 | 1,64 | 0,91 | 0,006 | 0,002 | 0,03 | 0,03 | 0,01 | 0,03 | 0,004 | 0,002 | 0,000 | | | |

*Se non specificato, %Cu totale del filo entro i limiti norme prodotto di riferimento / Wenn nicht angegeben liegt der Gesamtwert von %CU am Draht in der von der Produkt-Richtlinien eingesetzten Grenzen / Si non spécifié %Cu total sur le fil rentre dans les limites fixées par la norme de référence du produit / If not specified the total %CU on wire is within the limits set up by the Product Reference Standard

CARATTERISTICHE MECCANICHE - Mechanical properties - Mechanische kennwerte - Characteristics mecaniques

| | Diametro effettivo<br>Actual diameter | Larghezza effettiva<br>Actual Width | Altezza Effettiva<br>Actual Height | Resistenza snervamento<br>Yield strength ReL (Rp0,2) | Resistenza rottura<br>Tensile strength Rm | Allungamento<br>Elongation A5 | Strizione<br>Reduction Z | Resilienza KV<br>Impact Test | | Durezza<br>Hardness HRB |
|---|---|---|---|---|---|---|---|---|---|---|
| | mm | mm | mm | MPa | MPa | % | % | C° | J | |
| **SUL PRODOTTO** On product<br>Am Endprodukt / Sur produit | 10,00 | | | 500 | 586 | 24,0 | 70 | -50 | 55 | |

ALTRE PROVE:
Other tests

ANNOTAZIONI:
Notes
Mechanical test all weld metalAccording to EN 10204 2.2.With gas M21

TÜV Italia
☒ Review
☐ Witness
Date: 06/10/23 Name:

SIDERTAGLIO CALANDRATURA S.R.L.
Pipes Rolling & Welding

Si certifica che il materiale sopra descritto è conforme all'ordine.

We hereby certify that the material described above complies with the terms of the order contract.

Es wird bestatig dass die Lieferung den Vereinbarungen bei der bestellannahme entspricht.

Nous certifions que la livraison est conforme aux stipulations de l'acceptation de la commande.

S.I.A.T. Società Italiana Acciai Trafilati S.P.A.

Controllo Qualità / Quality Control / Qualitätsstelle / Contrôle de Qualité
R. Maida

# Inspection Certificate 3.1

LINCOLN ELECTRIC
THE WELDING EXPERTS

| | |
|---|---|
| Product Line | SAW |
| Product | OESD3 |
| Size(s) mm | 4,0 |
| Item No. | OESD3-4-400 |
| Lot/Batch | F1SW220311 |
| Class | AWS A5.17/A5.17M : EH12K<br>ISO 14171-A : S3Si |

| | |
|---|---|
| Customer Ref | 20721788 |
| Our Reference | 817785451 |
| Quantity | 2400.0 KG |
| Customer | SIDERTAGLIO CALANDRATURA S.R.L |

VIA MARZOTTO 9
DUEVILLE 36031
Italia

**Chemical analysis (%)** According to EN10204 3.1

| C | Si | Mn | P | S | Cr | Ni | Mo | Cu | V | Al | Co | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.120 | 0.30 | 1.76 | 0.009 | 0.002 | 0.02 | 0.02 | 0.01 | 0.02 | < 0.01 | < 0.01 | 0.007 | 0.003 |

TÜV Italia
☒ Review
☐ Witness
Date: 06/10/23 Name:

**Mechanical tests, all weld metal**

**Remarks**

Rivestimento di rame aggiuntivo : 0,12% max

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
Loc. Casalmenini 3
37010 Rivoli Veronese
Italy

Issued By

Printed By: Christian Grigoli
Function: Warehouse Operator
Date: 20/SEP/2022

Cert. No. 01845530
ZEU_CMN , 1

METRODE

SPECIAL ALL

# Inspection Certificate 3.1

| | |
|---|---|
| Product Line | FLUX |
| Product | AS 630 |
| Item No. | W000280317 |
| Lot/Batch | D1FX230030 |
| Wire Class | OESD3-4-25VCI OESD3 4.0x25 STEIN + |
| | EN ISO 14174: SA FB 1 55 AC H5 |
| | AWS/ASME Sec. II C / SFA 5.17: F7A8-EH12K |

LINCOLN ELECTRIC
THE WELDING EXPERTS

☒ Review ☐ Witness
Date: 06/10/23 Name:

Customer Ref 42
Our Reference 818848531
Quantity 2000.0 KG
Customer SIDERTAGLIO CALANDRATURA S.R.L

VIA MARZOTTO 9
DUEVILLE 36031
Italia

**Flux Composition (%)** According to EN10204 3.1

| Al2O3 | Fe2O3 | SiO2 | TiO2 | MnO | CaO | MgO | CaF2 |
|---|---|---|---|---|---|---|---|
| 20.7 | 1.3 | 14.0 | 0.1 | 1.0 | 6.5 | 27.5 | 24.1 |

**Sieve analysis (%)** According to EN10204 3.1

| <0,315 | 0,315-0,5 | 0,5-1 mm | 1-1,6 mm | >1,6 mm |
|---|---|---|---|---|
| 0.30 | 5.50 | 62.20 | 28.80 | 3.30 |

**Chemical analysis (%) / Batch: F1SW190366 OESD3 4.0x25 STEIN + VCI 25KG** According to EN10204 3.1

| C | Si | Mn | P | S | Cr | Ni | Mo | Cu | V | Al | N |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.10 | 0.28 | 1.75 | 0.008 | 0.002 | 0.04 | 0.03 | <0.01 | 0.030 | <0.01 | <0.01 | 0.004 |

**Chemical analysis (%) / Weld Metal** According to EN10204 2.2

| C | Si | Mn | P | S | Cr | Ni | Mo |
|---|---|---|---|---|---|---|---|
| 0.10 | 0.36 | 1.52 | 0.010 | 0.005 | 0.03 | 0.02 | 0.01 |

**Mechanical tests, all weld metal** According to EN10204 2.2

**Tensile testing**

| Cond. | Temp. °C | Rp0.2 MPa | Rm MPa | A5 % | Z % |
|---|---|---|---|---|---|
| AW | 20 | 501 | 638 | 25 | 67 |

**Impact testing**

| Temp. °C | C1a J | C1b J | C1c J | KV J |
|---|---|---|---|---|
| -60 | 163 | 163 | 162 | 162 |

**Remarks**

QC 6/6/23
SIDERTAGLIO CALANDRATURA S.R.L.

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
Loc. Casalmenini 3
37010 Rivoli Veronese
Italy

D.Weismann
QC Manager

Printed By Emil Cristian Pavel
Function Warehouse operator
Date 05/JUN/2023

Cert. No. 02069342
ZEU_FLUX , 1

METRODE
SPECIAL ALLO

# Calibration 11.01.2023.3



MEI SERVICE S.R.L.
Via Pascoli 42/s
30020 - Quarto d'Altino - VE
P.IVA/C.F. 03786710271
0422-1628348
info@meiservice.it

**Procedure complies:** IEC 60974-14 and ISO 17662

**Verification accuracy** Standard class

☒ Review ☐ Witness
Date: 06/10/23 Name:

**Customer** **SIDERTAGLIO CALANDRATURA S.r.l.**

| | |
|---|---|
| Location: | Via Marzotto 9, 36031 - Povolaro di Dueville - VI, P.IVA/C.F. 04069960245 |
| Department: | ------- |
| Date: | 11/01/2023 |
| Time | 11:02:56 |

## Equipment

| | |
|---|---|
| Manufacturer: | ESAB |
| Type: | ORIGO MIG 402cw |
| Serial No.: | 712-939-0045 |
| Asset Number: | 170/D |
| No-load voltage | 53 V |
| Max. rated welding current | 400 A |
| Inspection Interval: | annually |

## Test procedure

| | |
|---|---|
| Technology: | Calib DC (RAMV) |
| Method of test: | Load resistor |
| Type: | Accuracy |
| Function Under Test: | GMAW_CV |
| Characteristic: | U = 14 V + 0.05 Ω * I |
| Meas. range: | Section, A (100/400) |
| Next Inspection: | 11/01/2024 |

| | | | |
|---|---|---|---|
| 1. Additional Equipment: | Feed 304 | Serial Number: | 620-937-9418 |
| 2. Additional Equipment: | ___ | Serial Number: | ___ |
| 3. Additional Equipment: | ___ | Serial Number: | ___ |
| 4. Additional Equipment: | ___ | Serial Number: | ___ |
| 5. Additional Equipment: | ___ | Serial Number: | ___ |

## Calibrator

| | | | |
|---|---|---|---|
| Manufacturer: | HKS | Software version: | 1.4.1.5 |
| Type: | S3 | | |
| Serial No.: | 7022209 | | |

| | Type: | SN: | Calib. valid: |
|---|---|---|---|
| Current: | P350/500 | 15422045 | 07.2023 |
| Voltage: | P350/500 | 15422045 | 07.2023 |
| Gas flow: | ___ | ___ | ___ |
| Wire: | ___ | ___ | ___ |
| Speed | ___ | ___ | ___ |

The measurement system is tested and suitable according to VDI/VDE/DGQ/DKD guideline 2622.

## Conditions:

| | |
|---|---|
| Voltage | 400V |
| Temperature | 10deg. |

**Remark**

## Inspection result:

| | |
|---|---|
| PASS | X |
| FAIL | |

## Safety test

| | |
|---|---|
| PASS | X |
| FAIL | |

QCL 13/1/23

MEI SERVICE s.r.l.
Via Pascoli, 42/S
30020 QUARTO D'ALTINO (VE)
Tel. 0422 1628348
C.F. / P. IVA 03786710271

*Company stamp*

SIDERTAGLIO CALANDRATURA S.R.L.

ZAFFALON ALBERTO, 11/01/2023

*Inspector name, date and signature*

Current, Standard class: 2.50 %

| Measuring points | Calibrator, A | Device, A | Resistance, Ω | Permitted tolerance, A | Difference, A | Results |
|---|---|---|---|---|---|---|
| 1 | 102.4 | 98.0 | 0.190 | 10.0 | -4.4 | pass |
| 2 | 189.6 | 186.0 | 0.130 | 10.0 | -3.6 | pass |
| 3 | 264.8 | 262.0 | 0.106 | 10.0 | -2.8 | pass |
| 4 | 341.6 | 338.0 | 0.093 | 10.0 | -3.6 | pass |
| 5 | 404.5 | 402.0 | 0.085 | 10.0 | -2.5 | pass |

Voltage, Standard class: +/-1.50 V

| Measuring points | Calibrator, V | Device, V | Resistance, Ω | Permitted tolerance, V | Difference, V | Results |
|---|---|---|---|---|---|---|
| 1 | 19.00 | 19.3 | 0.190 | 1.50 | 0.30 | pass |
| 2 | 22.82 | 23.0 | 0.130 | 1.50 | 0.18 | pass |
| 3 | 26.90 | 27.5 | 0.106 | 1.50 | 0.60 | pass |
| 4 | 30.94 | 31.7 | 0.093 | 1.50 | 0.76 | pass |
| 5 | 33.64 | 34.5 | 0.085 | 1.50 | 0.86 | pass |

Gas flow: 20.00 %

| Measuring points | Calibrator, l/min | Device, l/min | Resistance, Ω | Permitted tolerance, l/min | Difference, l/min | Results |
|---|---|---|---|---|---|---|
| 1 | 11.9 | 10.0 | | 2.4 | -1.9 | pass |
| 2 | 15.3 | 13.0 | | 3.1 | -2.3 | pass |
| 3 | 18.2 | 16.0 | | 3.6 | -2.2 | pass |
| 4 | 22.6 | 20.0 | | 4.5 | -2.6 | pass |
| 5 | 25.4 | 25.0 | | 5.1 | -0.4 | pass |

# Calibration 23.03.2023.1



MEI SERVICE S.R.L.
Via Pascoli 42/s
30020 - Quarto d'Altino - VE
P.IVA/C.F. 03786710271
0422-1628348
info@meiservice.it

Review ☒ Witness ☐
Date: 06/10/23 Name:

**Procedure complies:** IEC 60974-14

**Verification accuracy** Standard class

**Customer** **SIDERTAGLIO CALANDRATURA S.r.l.**

Location: Via Marzotto 9, 36031 - Povolaro di Dueville - VI, P.IVA/C.F. 04069960245
Department: -------
Date: 23/03/2023
Time 10:20:54

## Equipment

| | |
|---|---|
| Manufacturer: | ESAB |
| Type: | LAF 1001 |
| Serial No.: | 126-311-0090 |
| Asset Number: | 171/A |
| No-load voltage | 53 V |
| Max. rated welding current | 1000 A |
| Inspection Interval: | annually |

## Test procedure

| | |
|---|---|
| Technology: | Calib DC (RAMV) |
| Method of test: | Load resistor |
| Type: | Accuracy |
| Function Under Test: | SAW_CC |
| Characteristic: | U = 20 V + 0.04 Ω * I |
| Meas. range: | Section, A (300/700) |
| Next Inspection: | 23/03/2024 |

| | | | |
|---|---|---|---|
| 1. Additional Equipment: | PEK | Serial Number: | 049-314-0370 |
| 2. Additional Equipment: | ___ | Serial Number: | ___ |
| 3. Additional Equipment: | ___ | Serial Number: | ___ |
| 4. Additional Equipment: | ___ | Serial Number: | ___ |
| 5. Additional Equipment: | ___ | Serial Number: | ___ |

## Calibrator

| | | | |
|---|---|---|---|
| Manufacturer: | HKS | Software version: | 1.4.1.5 |
| Type: | S3 | | |
| Serial No.: | 7022209 | | |

| | Type: | SN: | Calib. valid: |
|---|---|---|---|
| Current: | P1400/2000 | 12422046 | 07.2023 |
| Voltage: | P1400/2000 | 12422046 | 07.2023 |
| Gas flow: | ___ | ___ | ___ |
| Wire: | ___ | ___ | ___ |
| Speed | ___ | ___ | ___ |

The measurement system is tested and suitable according to VDI/VDE/DGQ/DKD guideline 2622.

## Conditions:

| | |
|---|---|
| Voltage | 400V |
| Temperature | 15deg. |

**Remark**

## Inspection result:

PASS X
FAIL

## Safety test

PASS X
FAIL

MEI SERVICE s.r.l.
Via Pascoli, 42/S
30020 QUARTO D'ALTINO (VE)
Tel. 0422 1628348
C.F. / P. IVA 03786710271

*Company stamp*

ZAFFALON ALESSANDRO, 23/03/2023

*Inspector name, date and signature*

SIDERTAGLIO CALANDRATURA S.R.L.
23/03/23

Current, Standard class: 2.50 %

| Measuring points | Calibrator, A | Device, A | Resistance, Ω | Permitted tolerance, A | Difference, A | Results |
|---|---|---|---|---|---|---|
| 1 | 292.4 | 295.0 | 0.107 | 25.0 | 2.6 | pass |
| 2 | 374.9 | 379.0 | 0.090 | 25.0 | 4.1 | pass |
| 3 | 451.1 | 453.0 | 0.080 | 25.0 | 1.9 | pass |
| 4 | 630.6 | 635.0 | 0.073 | 25.0 | 4.4 | pass |
| 5 | 689.0 | 698.0 | 0.063 | 25.0 | 9.0 | pass |

Voltage, Standard class: +/-1.50 V

| Measuring points | Calibrator, V | Device, V | Resistance, Ω | Permitted tolerance, V | Difference, V | Results |
|---|---|---|---|---|---|---|
| 1 | 31.05 | 31.9 | 0.107 | 1.50 | 0.85 | pass |
| 2 | 34.84 | 35.9 | 0.090 | 1.50 | 1.06 | pass |
| 3 | 38.73 | 39.8 | 0.080 | 1.50 | 1.07 | pass |
| 4 | 42.36 | 43.8 | 0.073 | 1.50 | 1.44 | pass |
| 5 | 41.91 | 43.4 | 0.063 | 1.50 | 1.49 | pass |

23/03/23

SIDERMIGLIO CALANDRATURA S.R.L.

# Welding Procedure Qualification Certificate (EN ISO 15614-1)

| | | | |
|---|---|---|---|
| Manufacturer's Welding Procedure Qualification Record No.: | **01E-22** | Examining body Reference No: | **- / -** |

| | |
|---|---|
| Manufacturer: | **SIDERTAGLIO CALANDRATURA S.R.L** |
| Address: | **Via Marzotto , 9 - 36031 Povolaro di Dueville - Vicenza - Italy** |
| Welders Name | **Stefanut Rosca (ID. S)** |
| Code/Testing Standard: | **EN ISO 15614-1:2019 Level 2** |
| Date of Welding: | **20 July 2022** |

## Range of Qualification

| | |
|---|---|
| Welding Process(es): | **135 (GMAW) Semi-automatic** |
| Type of joint and weld: | **Butt Weld full and partial penetration; T-butt weld; FW (T & P)** |
| Parent material group(s) and sub-group(s): | **1 - 1 cover the equal or lower specified yield strength steels of the same group.** |
| Parent Material Thickness (mm): | **20 to 80mm** |
| Weld Metal Thickness (mm): | **up to 80mm** |
| Throat Thickness (mm) | **All** |
| Single Run/Multi Run | **Multi-run** |
| Outside Pipe Diameter (mm): | **OD>500mm or when OD>150mm if welded in rotated position PC, PF or PA** |
| Filler Material Designation: | **EN ISO 14341-A G465M21/2C1 4Si1 and othe similar characterist** |
| Filler Material Make: | **All with equivalent mechanical prop. same covering or flux core,same nom. chem. composition**** |
| Filler Material Size: | **All** |
| Designation of Shielding Gas/Flux: | **EN ISO 14175: M21 (Argon 82% + CO2 18%)** |
| Designation of Backing Gas: | **------** |
| Type of Welding Current and Polarity: | **DC EP** |
| Mode of Metal Transfer: | **Spray , Pulse and Globular transfer mode** |
| Heat Input: | **+25% (for impact test requirements); -25% (for hardness requirements) - see table on page 2** |
| Welding Positions: | **ALL except PJ - J-L045 if impact/hardness not required_ Otherwise 135) PA;** |
| Preheat Temperature: | **>=100° C (a decrease according to 8.4.8 of 15614-1 is permitted)** |
| Interpass Temperature: | **Max 250 °C** |
| Post-Heating: | **Yes and No** |
| Post-Weld Heat Treatment and/or Ageing: | **None** |

## Other Information

**** and the same or Lower H" than ones used in this Wpar. See page 2**

Certified that test welds were prepared, welded and tested satisfactorily in accordance with the requirements of the code/testing standard indicated above.

Location: **Genoa**

Date of Issue: **20 September 2022**

Surveyor

Germano De Grandis
Surveyor to Lloyd's Register EMEA

A subsidiary of Lloyd's Register Group Limited

Examining Body **Lloyd's Register**

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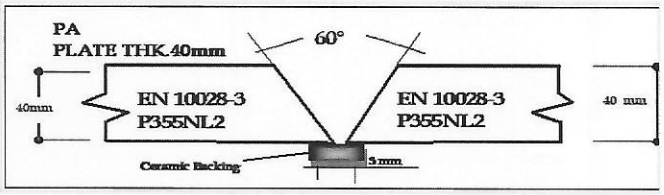
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## Details of Test Weld

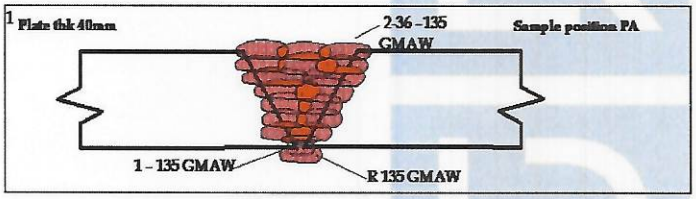
| | | | |
|---|---|---|---|
| Manufacturer's provisional Welding Procedure Specification Reference No. | **pWPS n 01E-22 rev.0** | Examining Body: Reference No: | -/ - |
| Manufacturer's Welding Procedure Qualification Record No.: | **01E-22** | | |
| Manufacturer: | **SIDERTAGLIO CALANDRATURA S.R.L** | Date of Welding: | **20 July 2022** |
| | | Location: | **Via Marzotto , 9 - 36031 Povolaro di Dueville - Vicenza - Italy** |
| Welder's Name: | **Stefanut Rosca (ID. S)** | Method of Preparation and Cleaning: | **Preparation by Grinding; Cleaning by Grinding and Brushing** |
| Mode of Metal Transfer: | **Spary Arc** | Parent Material Specification: (attach material certificates)* | **EN 10028-3 P355NL2** |
| Joint Type and Weld: | **Butt joint in plate with fulll penetration** | Parent Material Thickness (mm): | **40mm** |
| Test Piece/Welding Position: | **PA** | Outside Pipe Diameter (mm): | **--** |

### Weld Preparation Details (Sketch)

Joint Design




Welding Sequences




### Welding Details

| Run | Process | Size of Filler Metal | Current A | Voltage V | Type current Polarity | Wire Feed m/min | Travel Speed mm/min | Heat Input kJ/mm | Metal Transfer |
|---|---|---|---|---|---|---|---|---|---|
| **1** | **135** | **1.2 mm** | **250** | **31.2** | **DCEP** | **Autoreg.** | **200** | **1.872** | **Spray Arc** |
| **2-12** | **135** | **1.2 mm** | **270** | **31.5** | **DCEP** | **Autoreg.** | **200** | **2.041** | **Spray Arc** |
| **13-20** | **135** | **1.2 mm** | **270** | **32** | **DCEP** | **Autoreg.** | **200** | **2.074** | **Spray Arc** |
| **21-35** | **135** | **1.2 mm** | **250** | **32** | **DCEP** | **Autoreg.** | **200** | **1.920** | **Spray Arc** |
| **36** | **135** | **1.2 mm** | **270** | **31.7** | **DCEP** | **Autoreg.** | **200** | **2.054** | **Spray Arc** |
| **Back** | **Gauging** | | | | | | | | |
| **R** | **135** | **1.2 mm** | **255** | **31.5** | **DCEP** | **Autoreg.** | **200** | **1.928** | **Spray Arc** |

| | | | | |
|---|---|---|---|---|
| Filler Material: | **135) G9 Innov-Arc** | **Diameter 1,2mm ;** | | |
| Type, Designation, Trade Name: | | **135) EN ISO 14341-A G465M21/2C1 4Si1;** | | |
| Any Special Baking or Drying: | | **None** | Other Information*: | |
| Gas/Flux: | Shielding | **ISO 14175 M21 - Ar+Co2** | **Weld metal deposit __135) 40mm** | |
| | Backing | ----- | | |
| Gas Flow Rate : | Shielding | **16-18 l/min** | | |
| | Backing | ----- | Post-Weld Heat Treatment and/or Ageing | **NO** |
| Tungsten Electrode – Type/Size: | | ----- | Time, Temperature, Method: | **None** |
| Details of Back Gouging/Backing: | | **by grinding** | Heating and Cooling Rates*: | **None** |
| Preheat Temperature: | | **Min 100° C** | | |
| Interpass Temperature: | | **Max 250° C** | | |
| Post-Heating: | | **None** | | |
| Manufacturer's Name | | SIDERTAGLIO **CALANDRATURA S.R.L** | Surveyor | |
| Manufacturer's Signature | | | | |

Germano De Grandis
Surveyor to Lloyd's Register EMEA
A subsidiary of Lloyd's Register Group Limited

Date: **20 September 2022** Examining Body **Lloyd's Register**

* *As Required*

Form 4102 (2016.10)

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## Test Results

Manufacturer's Welding Procedure Qualification Record No.: **01E-22**

Examining Body: Reference No: **- / -**

Visual Examination: **Acceptable - Report n° 144/2022**

Radiography*: **Acceptable - Report n° 2248/2022**

Penetrant/Magnetic Particle Test*: **Acceptable - Report n° 365/2022**

Ultrasonic Examination*: **-**

Coloration Assessment**: **None**

### Tensile Tests*

| Type/No | Re N/mm² | Rm N/mm² | A% on | Z% | Fracture Location | Temperature: | Remarks |
|---|---|---|---|---|---|---|---|
| Requirements | | 490 to 630 | | | | | |
| 47653A1-Upper | ------- | 535 | -------- | ------- | In Base metal | room | ductile break |
| 47653A1-Lower | ------- | 528 | -------- | ------- | In Base metal | room | ductile break |
| 47653A2-Upper | ------- | 533 | -------- | ------- | In Base metal | room | ductile break |
| 47653A2-Lower | ------- | 532 | -------- | ------- | In Base metal | room | ductile break |

### Bend Tests*

| Type/No | Bend Angle | Former Diameter | Elongation* | Result |
|---|---|---|---|---|
| 47653A1-1 | 180 | 64 | ------- | Side bend - Satisfactory |
| 47653A1-2 | 180 | 64 | ------- | Side bend - Satisfactory |
| 47653A1-3 | 180 | 64 | ------- | Side bend - Satisfactory |
| 47653A1-4 | 180 | 64 | ------- | Side bend - Satisfactory |

Macroscopic Examination: **Acceptable**

Microscopic Examination: **None**

### Impact Tests*

Type: **KV** Size: **10 x 10 x 55** Requirement: **30 Joule**

| Notch Location/Direction | Temp °C | Values (J) 1 | 2 | 3 | Average (J) | Remarks |
|---|---|---|---|---|---|---|
| 47653A - VWT0/0 | -40° | 55 | 62 | 67 | 61 | / |
| 47653A - VHT2/0 | -40° | 73 | 43 | 56 | 57 | / |

### Hardness Tests*

Type/Load: **Vikers KV10**

Values - Parent Metal: **145 to 160**

- H.A.Z.: **161 to 273**

- Weld Metal: **204 to 218**

Other Tests: -------

Remarks: -------

Location of Measurements (Sketch)* see attached

Tests carried out in accordance with the requirements of: **UNI EN 15614-1:2019**

Laboratory Report Reference No: **Laboratorio Prove Materiali S.Marco srl, report no. 57148 r.0 dated 05-08-2022**

Test Results were acceptable

Test carried out in the presence of: **LR Surveyor**

Surveyor

Germano De Grandis
Surveyor to Lloyd's Register EMEA

A subsidiary of Lloyd's Register Group Limited

Examining Body **Lloyd's Register**

* *As Required*
** *15614-5 only*

Form 4102 (2016.10)

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# TEST REPORT 57148 rev0 dated 05/08/2022 - sheet 1 of 4

| | |
|---|---|
| Customer | SIDERTAGLIO CALANDRATURA S.r.l. - Via Marzotto, 9 - 36031 POVOLARO DI DUEVILLE (VI) - info@sidertagliocalandratura.com |
| Material | n° 1 butt weld (single side, V, welding process 135 semiatomatic) with full penetration between plates declared th.40 mm in P355NL2 (Gr. 1.2)<br>qualification testing of qualification of welding procedures acc. to UNI EN ISO 15614-1:2019 |
| Documents | delivery note 383 dated 28/07/2022; e-mail dated 22/07/2022 and 29/07/2022 |
| Customer reference | job P0186 |
| Receipt date | 29/07/2022 |
| Sampling | by Customer and LRQA. The results refer to the sample as received. |
| Third party | LRQA (Mr. Mattia Crivellari) and Sidertaglio Calandratura (Mr. Davide De Rizzo) |
| Remarks | |

| Required test | Applicable test standard | Remarks |
|---|---|---|
| Transverse tensile test on weld | UNI EN ISO 4136:2012 + UNI EN ISO 6892-1:2020 | |
| Bend test | UNI EN ISO 5173:2012 | |
| Impact test | UNI EN ISO 9016:2012 + UNI EN ISO 148-1:2016 | |
| Macroscopic examination | UNI EN ISO 17639:2013 | |
| Vickers hardness test | UNI EN ISO 6507-1:2018 | |

| | |
|---|---|
| Reference standards for Customer | UNI EN ISO 15614-1:2019 para.7.5 level 2; UNI EN ISO 9015-1:2011 |

| Internal identification | Customer identification |
|---|---|
| 47653A | WPS 01E-22 |

SIDERTAGLIO CALANDRATURA S.R.L. Pipes Rolling & Welding

☐ LRQA verification ltd ☐ 0094 ☐ ____
☑ Witnessed ☐ Monitored ☐ Reviewed
MATTIA CRIVELLARI
Ref. No.:
Office: Milan 05/08/2022

The results refer to the tested articles exclusively – The information in the fields "Material", "Customer reference" and "Customer identification" are provided by Customer and the Laboratory refuses any responsibility - All the tests are intended to be performed at Laboratory headquarters, unless otherwise specified - Test specimens and any remaining material will be retained for three months - If a statement of conformity is issued, it's intended to be expressed according to the "shared risk" rules without taking into account measurement uncertainty, unless otherwise specified - The end on the Test Report corresponds with the Technical Director signature - This document shall not be reproduced partially.



**LABORATORIO PROVE MATERIALI S. MARCO srl**
36015 Schio - VI - Via Lago di Alleghe, 30/32 - Tel. 0445 575623 - info@labsanmarco.it - C.F. e P.IVA IT01983950245

## TEST RESULTS

### Transverse tensile test on weld acc. to UNI EN ISO 4136:2012 + UNI EN ISO 6892-1:2020 A4

Equipment:
Macchina Universale Galdabini CTM60 matr. 33814; Calibro Mitutoyo 200 mm matr. A19102596, Micrometro Alpa matr. 180602697, Proiettore Profili LTF Orion 400H Matr. 24FCN0024

| Internal identification | Customer Identification | Dimensions [mm] | $S_0$ [mm²] | $R_m$ [MPa] | Failure location | Date of test |
|---|---|---|---|---|---|---|
| 47653A1 upper | WPS 01E-22 | 16,70x25,00 | 417,5 | 535 | B.M. | 05/08/2022 |
| 47653A1 lower | WPS 01E-22 | 18,20x25,00 | 455,0 | 528 | B.M. | 05/08/2022 |
| 47653A2 upper | WPS 01E-22 | 18,40x25,00 | 460,0 | 533 | B.M. | 05/08/2022 |
| 47653A2 lower | WPS 01E-22 | 16,50x25,00 | 412,5 | 532 | B.M. | 05/08/2022 |

### Bend test acc. to UNI EN ISO 5173:2012

Equipment:
Pressa OMCN 204/WEC64 matr.587819/2017; Calibro Mitutoyo 200 mm matr. A19102596

| Internal identification | Customer identification | Dimensions [mm] | Bend type | Bend angle [°] | Former diameter [mm] | Distance between rollers [mm] | Result[a] | Date of test |
|---|---|---|---|---|---|---|---|---|
| 47653A1÷4 | WPS 01E-22 | 16x40x150 | n° 4 side bends | 180 | 64 | 99 | Satisfactory | 03/08/2022 |

[a] According to UNI EN ISO 15614-1:2019 para. 7.4.2

### Impact test acc. to UNI EN ISO 9016:2012 + UNI EN ISO 148-1:2016

Equipment:
Pendolo GALDABINI IMPACT 300 matr. VADV, Calibro Mitutoyo 200 mm matr. A19102596, Micrometro Alpa matr. 180602697, Proiettore Profili LTF Orion 400H Matr.24FCN0024, Catena termometrica DELTAOHM HD2107.1 + TP472I Pt100 matr. 14013876+15005743

| Internal identification | Customer identification | Location | Dimensions [mm] | Temp. [°C] | Impact values $KV_2$ [J] | Date of test |
|---|---|---|---|---|---|---|
| 47653A | WPS 01E-22 | VWT0/0 | 10x10x55 | -40 | 55 - 62 - 67 | 05/08/2022 |
| 47653A | WPS 01E-22 | VHT2/0 | 10x10x55 | -40 | 73 - 43 - 56 | 05/08/2022 |

SIBERTAGLIO CALANDRATURA S.R.L.

IRQA verification ltd 0094
Witnessed Monitored Reviewed
MATTIA CRIVELLARI
Ref. No.
Office: Milan 05/08/2022

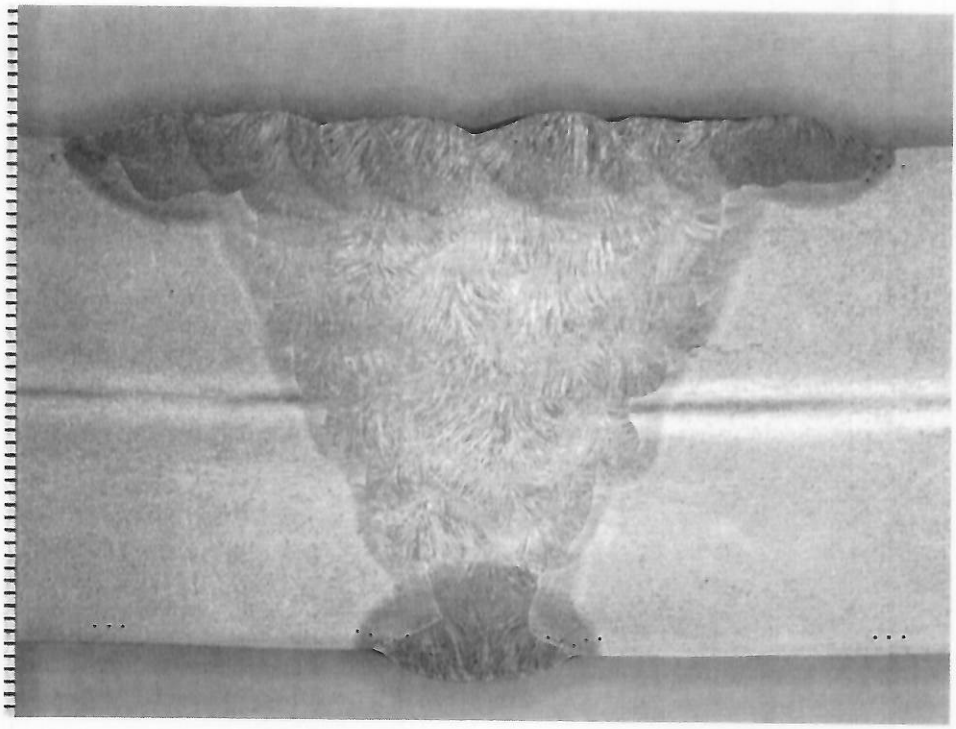


**LABORATORIO PROVE MATERIALI S. MARCO srl**
36015 Schio - VI - Via Lago di Alleghe, 30/32 - Tel. 0445 575623 - info@labsanmarco.it - C.F. e P.IVA IT01983950245

## TEST RESULTS

**Macroscopic examination acc. to UNI EN ISO 17639:2013**

Equipment:
Direct examination



The metric reference spacing is 1 mm

| | |
|---|---|
| Internal identification | 47653A |
| Customer identification | WPS 01E-22 |
| Designation | UNI EN ISO 17639-A-E-1.2-1.2/A.6 |
| Magnification | 1,7X |
| Etching | Ammonium persulfate |
| Notes | Satisfactory according to UNI EN ISO 15614-1:2019 paragraph 7.5 level 2. |
| Date of test | 02/08/2022 |

SIDERTAGLIO CALANDRATURA S.R.L. Pipes Rolling & Welding

☐ LRQA verification ltd ☐ 0094 ☐
☑ Witnessed ☐ Monitored ☐ Reviewed
MATTIA CRIVELLARI
Ref. Nr.:
Office: Milan 05/08/2022



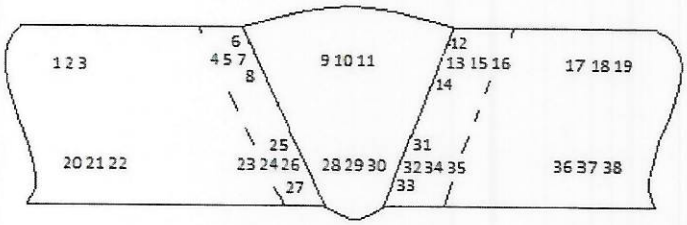
**LABORATORIO PROVE MATERIALI S. MARCO srl**
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## TEST RESULTS

**Vickers hardness test acc. to UNI EN ISO 6507-1:2018**

Equipment:
Durometro Qness Q30A+ matr. Q02110313

| Internal identification | Customer identification | Date of test |
|---|---|---|
| 47653A | WPS 01E-22 | 02/08/2022 |




Indentations rows sketch according to UNI EN ISO 9015-1:2011

Hardness values HV10 obtained on position:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 154 | 159 | 160 | 163 | 177 | 229 | 255 | 264 | 204 | 206 | 218 | 266 | 224 | 206 | 186 | 161 | 153 | 152 | 152 |

| 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 145 | 148 | 148 | 170 | 195 | 216 | 222 | 228 | 210 | 211 | 209 | 273 | 265 | 254 | 191 | 165 | 148 | 147 | 148 |

Laboratorio Prove Materiali S. Marco S.r.l.
*The Technical Director: Ing. Fabio Toldo*
Firmato digitalmente da: TOLDO FABIO
Data: 05/08/2022 12:09:38

SIDERTAGLIO CALANDRATURA S.R.L.

☐ IRQA verification Id ☐ 0094 ☐
☑ Witnessed ☐ Monitored ☐ Reviewed
MATTIA CRIVELLARI
Ref. No
Office: Milan 05/08/2022



**LABORATORIO PROVE MATERIALI S. MARCO srl**
36015 Schio - VI - Via Lago di Alleghe, 30/32 - Tel. 0445 575623 - info@labsanmarco.it - C.F. e P.IVA IT01983950245

# RAPPORTO RADIOGRAFICO
## RADIOGRAPHIC REPORT

N° 2248/2022
del of 29/07/2022
Pag. Sheet 1 di of 1

M.C. CONTROL s.r.l. TEL.0444/411135 - FAX 0444 / 412154 - Viale Venezia,40 - 36043 CAMISANO VIC. (VI)

**Cliente** SIDERTAGLIO CALANDRATURA S.R.L.
Customer

**Ordine*** — **Del** Of — **Commessa*** Job

**Descrizione*** N°01 TALLONE 300x400 THK. 40 mm (BW PA) — **Tipo Giunto** Testa a Testa
Description

**Fase di lavoro** Dopo saldatura - After welding — **Materiale*** P355NL2 — **PROC.SALD.*** Welding process
Work stage — Material

**Marche di riferimento*** 01E-22 — **Tipo di marcatura** Pennarel. Indel. — **Rinf. di Sald.**
Reference marking — Type of marking — Perm. marker — Weld reinforcement

**Norme di riferimento:** **Procedura/specifica** ISO 17636-1 — **Accettabilità difetti** ISO 10675-1 LIV. 2
Procedure — Specification — Ultima ed. - Last ed. — Acceptance criteria — Ultima ed. - Last ed.

**Tipo prodotto** Laminato / Saldato — **Stadio di controllo** Finale — **Fase di controllo**
Product Type — Inspection Phase — Inspection Phase

**Dati forniti dal Cliente - * these data are supplied by the custoner* — Allegato/Annex :

**Sorgente** Raggi x / x-Ray — **Corrente mA** 3 — **Tensione kV** 300 — mC /// — **Distanza Fuoco Oggetto (D)** 700 mm
Source — Current — Voltage — F - object distance (D)

**Distanza Oggetto - Film (d)** 40 mm — **Apparecchio** SEIFERT ERESCO 65MF4 — **Dimensione Sorgente** 3 mm (1,5 x 1,5)
Object - film distance (d) — Radiog. apparatus — Source size

**Tipo penetrametro** 6 FE EN — **Posizione** Lato Sorgente — **Tipo Pellicola** CARESTREAM T200 - C4
I.Q.I. Type — Position — Source side — Film type

**Film per cassetta** Singolo — **Tempo di esposizione** 8' — **Penombra geometrica** $Ug = \frac{F * d}{D}$
N° Film on film older single — Exposition Time — Geometric unsharpness

**Schermi al piombo Sp. : Lato sorgente** 0,05 — **LATO PELLICOLA** 0,10 — **Densità** >=2,3 ÷ 3,2 — **Filo Essenziale**
Lead screen — Source side — Film side — Density — Essenzial wire

**Metodo di sviluppo** Automatico — Note : — **Filo Visibile**
Film processing tecnique — Automatic — Notes : — Visible wire

| Tratto Position | Esito Result | Difetti Defects | Disp. di rip. Test. Arrang. | Densità Density |
|---|---|---|---|---|
| 01E-22 | | | | |
| 1 - 2 | C | | 7.1.3 f2 | |
| 2 - 3 | C | | 7.1.3 f2 | |

**Difetti - Defects**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 - | C | Cricca<br>Crack | 2015- | IG | Inclusione di gas allungata<br>Elongated cavity | 3041- | IW | Inclusione di tungsteno<br>Tungsten inclusion | 517- | RD | Ripresa difettosa<br>Poor restart |
| 1 - | MF | Mancanza di fusione<br>Lack of fusion (Incollatura) | 2016- | T | Tarlo<br>Worm-hole | 5011 - | IM | Incisione marginale<br>Undercut | 601 - | CD | Colpo d'arco<br>Stray flash , arc strike |
| 2 - | MP | Mancanza di penetrazione<br>Lack of penetration | 202 - | CA | Cavità di ritiro<br>Shrinkage cavity | 504 - | EP | Eccesso di penetrazione<br>Excessive penetration | 602 - | SP | Spruzzi<br>Spatters |
| 11- | P | Porosità (isolate)<br>Gas pore | 2024 - | K | Cavità di cratere<br>Crater pipe | 5041 - | SG | Sgocciolamento<br>Local protusion | 514 - | | Superficie irregolare<br>Irregular surface |
| 12- | PD | Porosità distribuita uniform.<br>Uniformly distribuited porosity | 301- | IS | Inclusioni di scoria<br>Slag inclusion | 507 - | SL | Slivellamento<br>Linear misalignment | 606 - | EM | Eccesso di molatura<br>Underflushing |
| 13- | PP | Nido di soffiature<br>Clustered porosity | 302- | IF | Inclusioni di flusso<br>Flux inclusion | 509 - | SL | Avvallamento<br>Sagging | | H | Difetto superficiale<br>Superficial defect |
| 14- | PA | Pori allineati<br>Linear porosity | 303- | IO | Inclusione di ossido<br>Oxide inclusion | 511- | IN | Insellamento<br>Incompletely filled groove | | DF | Difetto film<br>Film defect |

**ESITO : RESULT** **C = CONFORME** - ACCEPTABLE **R = RIPARARE** - TO REPEIR **R/R = RIPETERE RX** - TO REPEAT RX

RESPONSABILE - WORD REFERENCE

SIDERTAGLIO CALANDRATURA S.R.L.

OPERATORE - OPERATOR

Esbon Maurizio

ISPETTORE - ISPECTOR

☐ LRQA verification nd ☐ 009 ☐
☐ Witnessed ☐ Monitored ☑ Reviewed
LRQA
MATTIA CRIVELLARI
Ref. No..
Office: Milan 29/07/2022

# VERBALE DI CONTROLLO VISIVO
## VISUAL EXAMINATION REPORT

N. 144/2022

del of 29/07/2022

Pag. Sheet 1 di of 1

M.C. CONTROL s.r.l. TEL.0444/411135 - FAX 0444 / 412154 - Viale Venezia,40 - 36043 CAMISANO VIC. (VI)

**Cliente** SIDERTAGLIO CALANDRATURA S.R.L.
Customer

**Ordine*** | **Del** | **Commessa***
Order | Of | Job

**Codice pezzo*** 01E-22 | **Oggetto** | **Tipo Giunto**
Code name | Subject | Joint type

**Descrizione del pezzo*** N°01 TALLONE 300x400 THK. 40 mm (BW PA) | **Quantità** 1
Description object | Quantity

**Materiale*** P355NL2 | **Disegno*** | **WPS di riferimento***
Material | Drawing | Reference WPS

**Estensione del controllo** su saldatura | **Condizioni superficiali** Spazzolato
Extension examination | Tests surface status | Brushed

**Norme di rif. :** **Procedura/Specifica** ISO 5817 | **Classe accettazione** ISO 5817 LIV. C
Procedure | Specification | Ultima ed. - Last ed. | Acceptance criteria | Ultima ed. - Last ed.

**Illuminamento** **> 1000 Lux** | **Luxometro DT -1306** **Matr. 00070681** | **Distanza massima 600 mm** Max distance 600 mm | **Angolo di visione > 30°** Visual angle >30° | **Diretto / Direct**
Light

**Controllo** Non assistito | **Controllo** Localizzato | **Strumenti di controllo**
Test | No support | Test | Localized | Equipment

**Tipo prodotto** | **Stadio di controllo** | **Fase di controllo**
Product Type | Inspection Phase | Inspection Phase

* DATI FORNITI DAL CLIENTE - *THESE DATA ARE SUPPLIED BY THE CUSTOMER Allegato/Annex : 00/01/19

**Risultato / result**

■ **Conforme a Norma**
Acceptable

| RESPONSABILE - WORD REFERENCE | OPERATORE - OPERATOR | ISPETTORE - INSPECTOR |
|---|---|---|
| SIDERTAGLIO CALANDRATURA S.R.L. Pipes Rolling & Welding | II° Liv. SNT-TC-1A / ISO 9712 | ☐ LRQA verification ltd ☐ 0094 ☐ ☑ Witnessed ☐ Monitored ☐ Reviewed MATTIA CRIVELLARI Ref. No.. Office: Milan 29/07/2022 |

# VERBALE DI CONTROLLO
# LIQUIDI PENETRANTI
## PENETRANT EXAMINATION REPORT

N. **365/2022**

del of **29/07/2022**

Pag. Sheet 1 di of 1

M.C. CONTROL s.r.l. TEL.0444/411135 - FAX 0444 / 412154 - Viale Venezia,40 - 36043 CAMISANO VIC. (VI)

**Cliente** SIDERTAGLIO CALANDRATURA S.R.L.
Customer

**Ordine*** Order | **Del** Of | **Commessa*** Job

**Codice pezzo*** 01E-22 Code name | **Oggetto** Subject | **Tipo Giunto** Joint type

**Descrizione del pezzo*** N°01 TALLONE 300x400 THK. 40 mm (BW PA) Description object | **Quantità** 1 Quantity

**Materiale*** P355NL2 Material | **Colata* - Heat** | **Disegno*** Drawing | **WPS di riferimento*** Reference WPS

**Estensione del controllo** su saldatura Extension examination | **Condizioni superficiali** Spazzolato Tests surface status | Brushed

**Norme di rif. : Procedura/Specifica** UNI EN ISO 3452-1 Procedure Specification | **Classe accettazione** UNI EN ISO 23277 CL. 2 Acceptance criteria

**Tipo prodotto** Laminato / Saldato Product Type | **Stadio di controllo** Finale Inspection Phase | **Fase di controllo** Inspection Phase

* DATI FORNITI DAL CLIENTE - *THESE DATA ARE SUPPLIED BY THE CUSTOMER Allegato/Annex :

Visibile a contrasto di colore - Visible color contrast
Lavabile con acqua - water washable
Marca - type : CGM
Illuminamento - enviroment : Naturale - natural
Superfice del pezzo - Piece surface >500 LUX
Luxometro DT -1307 Matr. 00070683
Temp. amb. /enviroment 10 C°> T° < 52°C Actual 21 C°

| | |
|---|---|
| **Pulizia superfice** surface cleaning | VELNET-SOLNET Lotto - Batch L20/546 scad. 01/2023 |
| **Penetrante** Penetrant : | RED WW Lotto - Batch L21/021 scad. 02/2023 |
| **Applicazione penetrante con** Penetrant application by | Spray Spray |
| **Tempo minimo di penetrazione** Penetration minimum time | Dwell time 10' |
| **Rimozione penetrante con** Penetrant removal | Acqua - Panno Water - dust cloth |
| **Pressione acqua ≤ 3,5 bar** Water spray - pressure | actual 1,3 bar |
| **Rilevatore :** Developer : | ROTRIVEL U Lotto - Batch L 20/480 scad. 11/2022 |
| **Tempo minimo di Sviluppo** Developing minimun time | Dwell time 15' |
| **Tempo interpretazione finale** Final interpretation time | > 10' ÷ < 60' |

**Note :**
Notes :

■ **Conforme a Norma**
Acceptable

| RESPONSABILE - WORD REFERENCE | OPERATORE - OPERATOR | ISPETTORE - INSPECTOR | |
|---|---|---|---|
| SIDERTAGLIO CALANDRATURA S.R.L. | Cabai Maurizio<br>II° Liv. SNT - TC-1A / ISO 9712 | ☐ IRQA verification ltd ☐ 0094 ☐<br>☑ Witnessed ☐ Monitored ☐ Reviewed<br>MATTIA CRIVELLARI<br>Ref. No..<br>Office: Milan 29/07/2022 | IRQA |

# CERTIFICATO DI CONTROLLO 3.1 / INSPECTION CERTIFICATE 3.1 - EN 10204:2004


METINVEST
METINVEST TRAMETAL SPA

Società per azioni con socio unico soggetta a direzione e coordinamento di Metinvest B.V
Registered office: Via XII Ottobre, 3 - 16121 Genova, Italy
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Cap. Soc. Euro 300.120.000,00 i.v.
C.F., P.IVA e Iscr. Reg. Imp. GE 05956630965 - REA 437720/GE
http://trametal.metinvestholding.com


(A) PROCESSO DI ELABORAZIONE / STEELMAKING PROCESS: E = ELECTRIC ; BO = BASIC OXYGEN
(B) STATO DI FORNITURA / DELIVERY CONDITION: AR = GREZZO DI LAMINAZIONE / AS ROLLED ;
N° = LAMINAZIONE A TEMPERATURA CONTROLLATA / NORMALIZING ROLLING ;
N = NORMALIZZATO / NORMALIZED at 910°C, 1,5 min/mm ; ARIA CALMA / STILL AIR;
R = RICOTTO / ANNEALED;
N+R = NORMALIZZATO + RINVENUTO / NORMALIZED + TEMPERED
(C) TRATTAMENTO TERMICO DEL CAMPIONE / HEAT TREATMENT OF SAMPLE:
N = 910°C, 1,5 min/mm ; ARIA CALMA / STILL AIR
R = 650°C, 1,5 min/mm ; ARIA CALMA / STILL AIR
(D) Ceq_1 = C + Mn/6 ; Ceq_2 = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15 ;
Pcm = C + Si/30 + (Mn + Cu + Cr)/20 + Ni/60 + Mo/15 + V/10 + B*5
(1) POSIZIONE / LOCATION: 1 = TESTA / TOP ; 2 = PIEDE / BOTTOM
(2) POSIZIONE / LOCATION: C = CUORE / 1/2 THICKNESS ; P = PELLE / SURFACE ; D = 1/4 SPESSORE / THICKNESS
(3) DIREZIONE / DIRECTION: L = LONGITUDINALE / LONGITUDINAL ; T = TRASVERSALE / TRANSVERSE
(4) FORMA DEL PROVINO / SHAPE OF TEST PIECE: P = PRISMATICO / PRISMATIC ; C = CILINDRICO / CYLINDRICAL
(5) ESITO PROVA DI PIEGA / RESULT: OK = COMPLYING ; ND = NOT COMPLYING

A06 Cliente / Customer

**SIDERTAGLIO LAMIERE S.R.L.**

**VIA DELL'AGRICOLTURA9 FRAZIONE MELEDO**

**36040 SAREGO 36040 IT**
**VI ITALIA**

| A01 N° Certificato / Certificate no. | A02 Data / Date |
|---|---|
| 545196 | 10/01/2022 |
| A03 N° Ordine Trametal / Works order | A04 N° Ordine cliente / Customer's order |
| 32107033 | mail 29/10 |
| DDT | del / date |
| BOL 32200079 | 05/01/2022 |
| Pratica / File no. | |
| del / date | |

B06 Marcatura di prodotto / Marking of the product
LAMIERA/ORDINE/N° INFORNAMENTO/DIMENSIONI/QUALITÀ/MARCHIO DEL PRODUTTORE
PLATE/ORDER/INTERNAL N°/DIMENSIONS/STEEL GRADE/MANUFACTURER'S MARK

B01/B02/B03

| | |
|---|---|
| Prodotto / Product | Lamiere / Hot rolled plates |
| Qualità / Steel grade | P355NL2 |
| Normativa / Specification | EN10028-3:2017 |

| B07 ITEM | B07 LAMIERA PLATE | B07 N° INFORN. INTERNAL NUMBER | B09/B11 DIMENSIONI [mm] DIMENSIONS | B12 MASSA TEORICA [t] THEORICAL WEIGHT | B07 LOTTO BATCH NO. | C70 PROCESSO ELAB. (A) STEELMAKING PROCESS | B04 STATO FORNITURA LAMIERA (B) DELIVERY CONDITION | C00 CAMPIONE SAMPLE | B05 TRATT. CAMPIONE (C) HEAT TREATMENT | C00 CAMPIONE PWHT SAMPLE | B05 PWHT TEMPERATURA INIZIO °C BEGINNING TEMPERATURE | VELOCITA' RISCALDO °C/h HEATING RATE | TEMPERATURA TRATTAMENTO °C TEMPERATURE TREATMENT | PERMANENZA Min HOLDING TIME | VELOCITA' RAFFREDDAMENTO °C/h COOLING RATE | TEMPERATURA FINE °C END TEMPERATURE | N° CICLI / CYCLES | C00 CAMPIONE Q+T SAMPLE | B05 Q+T TEMPERATURE (Q) °C | PERMANENZA (Q) Min HOLDING TIME | RAFFREDDAMENTO COOLING | TEMPERATURA (T) °C TEMPERATURE | PERMANENZA (T) Min HOLDING TIME | RAFFREDDAMENTO COOLING |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | 1NAY560302A | 1755576 | 40.00X2450X12000 | 9,23 | 718026 | BO | N | GQ851 | | | | | | | | | | | | | | | | | |
| 12 | 1NAY390501A | 1755438 | 70.00X2450X8000 | 10,77 | 717717 | BO | N | GQ739 | | | | | | | | | | | | | | | | | |
| 13 | 1NAY360202A | 1755349 | 80.00X2450X6000 | 9,23 | 717712 | BO | N | GQ735 | | | | | | | | | | | | | | | | | |

## C71/C92 COMPOSIZIONE CHIMICA DI COLATA / HEAT CHEMICAL ANALYSIS

| B07 COLATA HEAT | C71 C % | C72 Mn % | C73 Si % | C74 P % | C75 S % | C76 Cu % | C77 Ni % | C78 Cr % | C79 Mo % | C80 Al % | C81 V % | C82 Nb % | C83 Ti % | C84 Sn % | C85 Ca % | C86 N % | C87 B % | C88 H % | C89 Ceq1 % (D) | C90 Ceq2 % (D) | C91 Pcm % (D) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ordine Min 12 | | | | | | | | | | | | | | | | | | | | | |
| Ordine Max 12 | | 1,50 | | | | | | | | | | 0,040 | | | | | | | | | |
| Ordine Min 13 | | | | | | | | | | | | | | | | | | | | | |
| Ordine Max 13 | | 1,50 | | | | | | | | | | 0,040 | | | | | | | | | |
| Ordine Min 9 | | | | | | | | | | | | | | | | | | | | | |
| Ordine Max 9 | | 1,50 | | | | | | | | | | 0,040 | | | | | | | | | |
| P355NL2 Min 0.00 - 60.00 | | 1,10 | | | | | | | | 0,020 | | | | | | | | | | | |
| P355NL2 Max 0.00 - 60.00 | 0,18 | 1,70 | 0,50 | 0,020 | 0,005 | 0,300 | 0,500 | 0,300 | 0,080 | | 0,100 | 0,050 | 0,030 | | | 0,0120 | | | | 0,43 | |
| P355NL2 Min 60.10 - 150.00 | | 1,10 | | | | | | | | 0,020 | | | | | | | | | | | |
| P355NL2 Max 60.10 - 150.00 | 0,18 | 1,70 | 0,50 | 0,020 | 0,005 | 0,300 | 0,500 | 0,300 | 0,080 | | 0,100 | 0,050 | 0,030 | | | 0,0120 | | | | 0,45 | |
| 1NAY36 | 0,16 | 1,47 | 0,22 | 0,014 | 0,002 | 0,050 | 0,020 | 0,040 | <0.005 | 0,031 | <0.005 | 0,023 | <0.005 | <0.005 | 0,0000 | 0,0050 | <0.0005 | 0,0003 | 0,41 | 0,42 | 0,25 |
| 1NAY39 | 0,17 | 1,47 | 0,20 | 0,014 | 0,002 | 0,030 | 0,030 | 0,040 | <0.005 | 0,027 | <0.005 | 0,022 | <0.005 | <0.005 | 0,0000 | 0,0070 | <0.0005 | 0,0002 | 0,42 | 0,43 | 0,25 |
| 1NAY56 | 0,16 | 1,46 | 0,21 | 0,012 | 0,002 | 0,040 | 0,020 | 0,040 | <0.005 | 0,032 | <0.005 | 0,022 | <0.005 | <0.005 | 0,0000 | 0,0080 | <0.0005 | 0,0002 | 0,40 | 0,42 | 0,24 |

☐ LRQA verification ltd ☐ 008 ☐
☐ Witnessed ☐ Monitored ☑ Reviewed
MATTIA CRIVELLARI
Ref. No..
Office: Milan
27/07/2022

SIDERTAGLIO CALANDRATURA S.R.L.

| | | | PROVA DI TRAZIONE TENSILE TEST | | | | | | | | | PROVA DI RESILIENZA IMPACT TEST - CHARPY V-NOTCH TEST | | | | | PROVA DI PIEGA BEND TEST | | | | PROVA DI DUREZZA HARDNESS TEST | | | | PROVA DI STRIZIONE Z% TEST | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C00 | | C01 | C01 | C02 | C03 | C11 | C12 | | C13 | C14 | C10 | C41 | C02 | C03 | C01 | C42 | C43 | C02 | C51 | C52 | C50 | C01 | C30 | C31 | C32 | C53 | C54 |
| CAMPIONE SAMPLE | SPESSORE LAMIERA PLATE THICKNESS | POSIZIONE (1) LOCATION | POSIZIONE (2) LOCATION | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | ReH [Mpa] YIELD STRENGTH | Rm [Mpa] TENSILE STRENGTH | ReH/Rm | A% ELONGATION | Rp 0.2 [Mpa] PROOF/YIELD STRENGTH | FORMA PROVINO (4) SHAPE OF TEST PIECE | LARGHEZZA [mm] WIDTH | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | POSIZIONE (2) LOCATION | SINGOLI VALORI [J] INDIVIDUAL VALUES | MEDIA [J] MEAN VALUE | DIREZIONE (3) ORIENTATION | MANDRINO [mm] MANDREL | ANGOLO [°] ANGLE | ESITO (5) RESULT | POSIZIONE (2) LOCATION | METODO TEST METHOD | SINGOLI VALORI INDIVIDUAL VALUES | MEDIA MEAN VALUE | Z% SINGOLI VALORI Z% INDIVIDUAL VALUES | Z% VALORE MEDIO Z% MEAN VALUE |
| ORDINE Min 12 | | | | | | | | | | | | | L | -46 | | 27 | 0 | | | | | | | | | | |
| ORDINE Min 13 | | | | | | | | | | | | | L | -46 | | 27 | 0 | | | | | | | | | | |
| ORDINE Min 9 | | | | | | | | | | | | | L | -46 | | 27 | 0 | | | | | | | | | | |
| P355NL2 Min 16.10 - 40.00 | | | | | 20 | 345 | 490 | | 22,0 | | | | | | | | | | | | | | | | | | |
| P355NL2 Max 16.10 - 40.00 | | | | | 20 | | 630 | | | | | | | | | | | | | | | | | | | | |
| P355NL2 Min 6.00 - 999.00 | | | | | | | | | | | | | T | -50 | | | 27 | | | | | | | | | | |
| P355NL2 Min 60.10 - 100.00 | | | | | 20 | 315 | 470 | | 21,0 | | | | | | | | | | | | | | | | | | |
| P355NL2 Max 60.10 - 100.00 | | | | | 20 | | 610 | | | | | | | | | | | | | | | | | | | | |
| GQ735 | 80,00 | 2 | D | T | 20 | 376 | 513 | 0,73 | 35,2 | | C | 10,00 | L | -46 | D | 238 218 246 | 234 | | | | | | HRC < | 22 | | | |
| GQ735 | 80,00 | 2 | | | | | | | | | | 10,00 | T | -50 | D | 127 153 151 | 144 | | | | | | | | | | |
| GQ739 | 70,00 | 2 | D | T | 20 | 379 | 526 | 0,72 | 34,6 | | C | 10,00 | L | -46 | D | 258 255 263 | 259 | | | | | | HRC < | 22 | | | |
| GQ739 | 70,00 | 2 | | | | | | | | | | 10,00 | T | -50 | D | 163 187 177 | 176 | | | | | | | | | | |
| GQ851 | 40,00 | 2 | D | T | 20 | 414 | 523 | 0,79 | 34,2 | | C | 10,00 | L | -46 | P | 224 201 229 | 218 | | | | | | HRC < | 22 | | | |
| GQ851 | 40,00 | 2 | | | | | | | | | | 10,00 | T | -50 | P | 140 119 158 | 139 | | | | | | | | | | |

C10

UNI EN ISO 6892-1:2020 / UNI EN ISO 148-1:2016

Z01

| ITEM | | TOLLERANZA DI SPESSORE TOLERANCE ON THICKNESS | TOLLERANZE DI LARGHEZZA TOLERANCE ON WIDTH | TOLLERANZE DI LUNGHEZZA TOLERANCE ON LENGTH | CONDIZIONI SUPERFICIALI SURFACE FINISH | PLANARITÀ FLATNESS |
|---|---|---|---|---|---|---|
| 9 | | -0.3 +2.3 MM | -0 +100 MM | -0 +200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |
| 12 | | -0.3 +2.3 MM | -0 +100 MM | -0 +200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |
| 13 | | -0.3 +2.9 MM | -0 +100 MM | -0 +200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |

CERTIFICHIAMO che le lamiere elencate sono conformi alla prescrizione dell'ordine, che i controlli della marcatura, dell'aspetto superficiale e dimensionale hanno dato esito positivo.
WE CERTIFY that the above mentioned plates are consistent with the order prescriptions: marking, inspection and measurement without objection.
DICHIARIAMO CHE LE LAMIERE SONO STATE CONTROLLATE IN ACCORDO ALLA NORMATIVA VIGENTE E CHE LE RADIAZIONI IONIZZANTI NON ECCEDONO IL VALORE DEL FONDO NATURALE.
WE DECLARE THAT THE PLATES WERE CONTROLLED ACCORDING TO STANDARD AND RADIATION DO NOT EXCEED THE NATURAL RADIATION.

Z06

**FULLY KILLED FINE GRAIN STEEL**

**HARDNESS IN ACC. TO NACE MR 0175 / ISO15156**

**STEEL VACUUM DEGASSED**

| Z07 | Z03 ENTE COLLAUDO / INSPECTION BODY | Z02 |
|---|---|---|
| Plates acc. to PED 2014/68/EU | TIMBRO DELL'ISPETTORE<br>STAMP OF THE INSPECTION REPRESENTATIVE | METINVEST TRAMETAL S.p.a.<br>F. Andrian<br>CQ Manager |

SIDERTAGLIO LAMIERE srl
Via dell'Agricoltura, 8/D
36040 MELEDO DI SAREGO (VI)
Tel. 0444 823059
Fax Amm. 0444 823364
Uff. Tec. 0444 823201
C. F. e Part. IVA 02510610245

# CERTIFICATO DI CONTROLLO 3.1 / INSPECTION CERTIFICATE 3.1 - EN 10204:2004

A04/A05

**METINVEST**
METINVEST TRAMETAL SPA

A01

Società per azioni con socio unico soggetta a direzione e coordinamento di Metinvest B.V
Registered office: Via XII Ottobre, 3 - 16121 Genova, Italy
Phone +39 010 5762911 - Fax +39 010 5762990
Works: Via E. Fermi, 44 - 33058 San Giorgio di Nogaro UD, Italy
Phone +39 0431 629989 - Fax +39 0431 629985
Cap. Soc. Euro 300.120.000,00 i.v.
C.F., P.IVA e Iscr. Reg. Imp. GE 05956630965 - REA 437720/GE
http://trametal.metinvestholding.com

(A) PROCESSO DI ELABORAZIONE / STEELMAKING PROCESS: E = ELECTRIC ; BO = BASIC OXYGEN
(B) STATO DI FORNITURA / DELIVERY CONDITION: AR = GREZZO DI LAMINAZIONE / AS ROLLED ;
N* = LAMINAZIONE A TEMPERATURA CONTROLLATA / NORMALIZING ROLLING ;
N = NORMALIZZATO / NORMALIZED at 910°C, 1,5 min/mm ; ARIA CALMA / STILL AIR;
R = RICOTTO / ANNEALED;
N+R = NORMALIZZATO + RINVENUTO / NORMALIZED + TEMPERED
(C) TRATTAMENTO TERMICO DEL CAMPIONE / HEAT TREATMENT OF SAMPLE:
N = 910°C, 1,5 min/mm ; ARIA CALMA / STILL AIR
R = 650°C, 1,5 min/mm ; ARIA CALMA / STILL AIR
(D) Ceq_1 = C + Mn/6 ; Ceq_2 = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15 ;
Pcm = C + Si/30 + (Mn + Cu + Cr)/20 + Ni/60 + Mo/15 + V/10 + B*5
(1) POSIZIONE / LOCATION: 1 = TESTA / TOP ; 2 = PIEDE / BOTTOM
(2) POSIZIONE / LOCATION: C = CUORE / 1/2 THICKNESS ; P = PELLE / SURFACE ; D = 1/4 SPESSORE / THICKNESS
(3) DIREZIONE / DIRECTION: L = LONGITUDINALE / LONGITUDINAL ; T = TRASVERSALE / TRANSVERSE
(4) FORMA DEL PROVINO / SHAPE OF TEST PIECE: P = PRISMATICO / PRISMATIC ; C = CILINDRICO / CYLINDRICAL
(5) ESITO PROVA DI PIEGA / RESULT: OK = COMPLYING ; NO = NOT COMPLYING

A03 N° Certificato / Certificate no.: 545199

A02 Data / Date: 10/01/2022

A08 N° Ordine Trametal / Works order: 32107033

A07 N° Ordine cliente / Customer's order: mail 29/10

DDT: BOL 32200079

del / date: 05/01/2022

Pratica / File no.

del / date

A06 Cliente / Customer

**SIDERTAGLIO LAMIERE S.R.L.**

**VIA DELL'AGRICOLTURA9 FRAZIONE MELEDO**

**36040 SAREGO 36040 IT**
**VI ITALIA**

B06 Marcatura di prodotto / Marking of the product

LAMIERA/ORDINE/N° INFORNAMENTO/DIMENSIONI/QUALITÀ/MARCHIO DEL PRODUTTORE
PLATE/ORDER/INTERNAL N°/DIMENSIONS/STEEL GRADE/MANUFACTURER'S MARK

B01/B02/B03

Prodotto / Product: Lamiere / Hot rolled plates

Qualità / Steel grade: SA516GR70MT/LTV

Normativa / Specification: ASME

| B07 ITEM | B07 LAMIERA PLATE | B07 N° INFORN. INTERNAL NUMBER | B09/B11 DIMENSIONI DIMENSIONS [mm] | B12 MASSA TEORICA [t] THEORICAL WEIGHT | B07 LOTTO BATCH NO. | C70 PROCESSO ELAB. (A) STEELMAKING PROCESS | B04 STATO FORNITURA LAMIERA (B) DELIVERY CONDITION | C00 CAMPIONE SAMPLE | B05 TRATT. CAMPIONE HEAT TREATMENT (C) | C00 CAMPIONE PWHT SAMPLE | B05 PWHT BEGINNING TEMPERATURE °C | TEMPERATURA INIZIO | VELOCITA' RISCALDO C/h HEATING RATE | TEMPERATURA TRATTAMENTO °C TEMPERATURE TREATMENT | PERMANENZA Min HOLDING TIME | VELOCITA' RAFFREDDAMENTO °C/h COOLING RATE | TEMPERATURA FINE °C END TEMPERATURE | N° CICLI / CYCLES | C00 CAMPIONE Q+T SAMPLE | B05 Q+T TEMPERATURA (Q) °C TEMPERATURE | HOLDING TIME PERMANENZA (Q) Min | COOLING RAFFREDDAMENTO | TEMPERATURA (T) °C TEMPERATURE | HOLDING TIME PERMANENZA (T) Min | COOLING RAFFREDDAMENTO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | 1NAY560302A | 1755576 | 40.00X2450X12000 | 9,23 | 718026 | BO | N | GQ851 | | | | | | | | | | | | | | | | | |
| 12 | 1NAY390501A | 1755438 | 70.00X2450X8000 | 10,77 | 717717 | BO | N | GQ739 | | | | | | | | | | | | | | | | | |
| 13 | 1NAY360202A | 1755349 | 80.00X2450X6000 | 9,23 | 717712 | BO | N | GQ735 | | | | | | | | | | | | | | | | | |

## C71/C92 COMPOSIZIONE CHIMICA DI COLATA / HEAT CHEMICAL ANALYSIS

| B07 COLATA HEAT | C71 C % | C72 Mn % | C73 Si % | C74 P % | C75 S % | C76 Cu % | C77 Ni % | C78 Cr % | C79 Mo % | C80 Al % | C81 V % | C82 Nb % | C83 Ti % | C84 Sn % | C85 Ca % | C86 N % | C87 B % | C88 H % | C89 Ceq1 % (D) | C90 Ceq2 % (D) | C91 Pcm % (D) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ordine Min 12 | | | | | | | | | | | | | | | | | | | | | |
| Ordine Max 12 | | 1,50 | | | | | | | | | | 0,040 | | | | | | | | | |
| Ordine Min 13 | | | | | | | | | | | | | | | | | | | | | |
| Ordine Max 13 | | 1,50 | | | | | | | | | | 0,040 | | | | | | | | | |
| Ordine Min 9 | | | | | | | | | | | | | | | | | | | | | |
| Ordine Max 9 | | 1,50 | | | | | | | | | | 0,040 | | | | | | | | | |
| SA51670LTV Min 12.60 - 50.00 | | 0,85 | 0,15 | | | | | | | | | | | | | | | | | | |
| SA51670LTV Max 12.60 - 50.00 | 0,28 | 1,20 | 0,40 | 0,025 | 0,025 | | | | | | | | | | | | | | | | |
| SA51670LTV Min 50.10 - 100.00 | | 0,85 | 0,15 | | | | | | | | | | | | | | | | | | |
| SA51670LTV Max 50.10 - 100.00 | 0,30 | 1,20 | 0,40 | 0,025 | 0,025 | | | | | | | | | | | | | | | | |
| 1NAY36 | 0,16 | 1,47 | 0,22 | 0,014 | 0,002 | 0,050 | 0,020 | 0,040 | <0.005 | 0,031 | <0.005 | 0,023 | <0.005 | <0.005 | 0,0000 | 0,0050 | <0.0005 | 0,0003 | 0,41 | 0,42 | 0,25 |
| 1NAY39 | 0,17 | 1,47 | 0,20 | 0,014 | 0,002 | 0,030 | 0,030 | 0,040 | <0.005 | 0,027 | <0.005 | 0,022 | <0.005 | <0.005 | 0,0000 | 0,0070 | <0.0005 | 0,0002 | 0,42 | 0,43 | 0,25 |
| 1NAY56 | 0,16 | 1,46 | 0,21 | 0,012 | 0,002 | 0,040 | 0,020 | 0,040 | <0.005 | 0,032 | <0.005 | 0,022 | <0.005 | <0.005 | 0,0000 | 0,0080 | <0.0005 | 0,0002 | 0,40 | 0,42 | 0,24 |

| | | | PROVA DI TRAZIONE TENSILE TEST | | | | | | | | | | PROVA DI RESILIENZA IMPACT TEST - CHARPY V-NOTCH TEST | | | | | | PROVA DI PIEGA BEND TEST | | | | PROVA DI DUREZZA HARDNESS TEST | | | | PROVA DI STRIZIONE Z% TEST | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C00 | | C01 | C01 | C02 | C03 | C11 | C12 | | C13 | C14 | C10 | C41 | C02 | C03 | C01 | C42 | C43 | C02 | C51 | C52 | C50 | C01 | C30 | C31 | C32 | C53 | C54 | |
| CAMPIONE SAMPLE | SPESSORE LAMIERA PLATE THICKNESS | POSIZIONE (1) LOCATION | POSIZIONE (2) LOCATION | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | ReH [Mpa] YIELD STRENGTH | Rm [Mpa] TENSILE STRENGTH | ReH/Rm | A2" ELONGATION | Rp 0.2 [Mpa] PROOF/YIELD STRENGTH | FORMA PROVINO (4) SHAPE OF TEST PIECE | LARGHEZZA [mm] WIDTH | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | POSIZIONE (2) LOCATION | SINGOLI VALORI [J] INDIVIDUAL VALUES | MEDIA [J] MEAN VALUE | DIREZIONE (3) ORIENTATION | MANDRINO [mm] MANDREL | ANGOLO [°] ANGLE | ESITO (5) RESULT | POSIZIONE (2) LOCATION | METODO TEST METHOD | SINGOLI VALORI INDIVIDUAL VALUES | MEDIA MEAN VALUE | Z% SINGOLI VALORI Z% INDIVIDUAL VALUES | Z% VALORE MEDIO Z% MEAN VALUE |
| ORDINE Min 12 | | | | | | | | | | | | | L | -46 | | 27 | 0 | | | | | | | | | | |
| ORDINE Min 13 | | | | | | | | | | | | | L | -46 | | 27 | 0 | | | | | | | | | | |
| ORDINE Min 9 | | | | | | | | | | | | | L | -46 | | 27 | 0 | | | | | | | | | | |
| SA51670LTV Min 20.10 - 120.00 | | | | | 20 | | 485 | | 21,0 | 260 | | | | | | | | | | | | | | | | | |
| SA51670LTV Max 20.10 - 120.00 | | | | | 20 | | 620 | | | | | | | | | | | | | | | | | | | | |
| SA51670LTV Min 25.10 - 50.00 | | | | | | | | | | | | | L | -40 | | | 20 | | | | | | | | | | |
| SA51670LTV Min 50.10 - 75.00 | | | | | | | | | | | | | L | -35 | | | 20 | | | | | | | | | | |
| SA51670LTV Min 75.10 - 125.00 | | | | | | | | | | | | | L | -29 | | | 20 | | | | | | | | | | |
| GQ735 | 80,00 | 2 | D | T | 20 | | 513 | | 35,2 | 363 | C | 10,00 | L | -46 | D | 238 218 246 | 234 | | | | | | HRC < | 22 | | | |
| GQ735 | 80,00 | 2 | | | | | | | | | | 10,00 | T | -50 | D | 127 153 151 | 144 | | | | | | | | | | |
| GQ739 | 70,00 | 2 | D | T | 20 | | 526 | | 34,6 | 368 | C | 10,00 | L | -46 | D | 258 255 263 | 259 | | | | | | HRC < | 22 | | | |
| GQ739 | 70,00 | 2 | | | | | | | | | | 10,00 | T | -50 | D | 163 187 177 | 176 | | | | | | | | | | |
| GQ851 | 40,00 | 2 | D | T | 20 | | 523 | | 34,2 | 407 | C | 10,00 | L | -46 | P | 224 201 229 | 218 | | | | | | HRC < | 22 | | | |
| GQ851 | 40,00 | 2 | | | | | | | | | | 10,00 | T | -50 | P | 140 119 158 | 139 | | | | | | | | | | |

C10

ASME SA-370 FIG. 3 AND FIG. 10 / 11 - SAMPLE TAKEN AFTER PLATE HEAT TREATMENT

Z01

| ITEM | | TOLLERANZA DI SPESSORE TOLERANCE ON THICKNESS | TOLLERANZE DI LARGHEZZA TOLERANCE ON WIDTH | TOLLERANZE DI LUNGHEZZA TOLERANCE ON LENGTH | CONDIZIONI SUPERFICIALI SURFACE FINISH | PLANARITÀ FLATNESS |
|---|---|---|---|---|---|---|
| 9 | | -0.3 +2.3 MM | -0 +100 MM | -0 +200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |
| 12 | | -0.3 +2.3 MM | -0 +100 MM | -0 +200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |
| 13 | | -0.3 +2.9 MM | -0 +100 MM | -0 +200 MM | EN 10163/2 CL B2 | EN 10029 CL. N |

CERTIFICHIAMO che le lamiere elencate sono conformi alla prescrizione dell'ordine, che i controlli della marcatura, dell'aspetto superficiale e dimensionale hanno dato esito positivo.
WE CERTIFY that the above mentioned plates are consistent with the order prescriptions: marking, inspection and measurement without objection.
DICHIARIAMO CHE LE LAMIERE SONO STATE CONTROLLATE IN ACCORDO ALLA NORMATIVA VIGENTE E CHE LE RADIAZIONI IONIZZANTI NON ECCEDONO IL VALORE DEL FONDO NATURALE.
WE DECLARE THAT THE PLATES WERE CONTROLLED ACCORDING TO STANDARD AND RADIATION DO NOT EXCEED THE NATURAL RADIATION.

Z06

**FULLY KILLED FINE GRAIN STEEL**

**HARDNESS IN ACC. TO NACE MR 0175 / ISO15156**

**STEEL VACUUM DEGASSED**

| Z07 | Z03 ENTE COLLAUDO / INSPECTION BODY | Z02 |
|---|---|---|
| **PRODUCED FROM CONTINOUS CAST SLAB AND HAVE A MINIMUN REDUCTION RATIO OF 3 TO 1. ACCORDING TO ASME II PART A ED. 2019. FULLY KILLED, FINE GRAIN STEEL. Value of Mn maximun in derogation permitted up to 1.50%**<br>**Plates acc. to PED 2014/68/EU** | **TIMBRO DELL'ISPETTORE**<br>**STAMP OF THE INSPECTION REPRESENTATIVE** | METINVEST TRAMETAL S.p.a.<br>F. Andrian<br>CQ Manager |

SIDERTAGLIO LAMIERE srl
Via dell'Agricoltura, 8/D
36040 MELEDO DI SAREGO (VI)
Tel. 0444 823059
Fax Amm. 0444 823364
Uff. Tec. 0444 823201
C. F. e Part. IVA 02510610245

SIAT
S.I.A.T. S.p.A. - Società Italiana Acciai Trafilati
Via Facini 54, 33013 Gemona del Friuli, UD - Italy
Tel +39 0432 062811, Fax +39 0432 062960
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Partita I.V.A., Cod. Fisc., Reg. Imprese C.C.I.A.A. Udine 00166750307
Rea Udine 115789 - Cap. Soc. € 5.000.000 I.V.
"Società soggetta all'attività di direzione e coordinamento da parte di Compagnia Siderurgica Italiana S.r.l."

Divisione Pittarc
Via Cartiera 3, 33010 Osoppo, UD - Italy
Tel +39 0432 062811, Fax +39 0432 062903
www.pittarc.com

PITTARC

Azienda con i seguenti sistemi di gestione certificati:
- qualità secondo UNI EN ISO 9001:2015
- ambiente secondo UNI EN ISO 14001:2015

# CERTIFICATO DI COLLAUDO

Inspection Certificate - Abnahmeprüfzeugins - Certificate de Réception

CHEMICAL ANALYSIS ACCORDING TO EN 10204:2004 TYPE 3.1

| | |
|---|---|
| N° | 7249/2021/A |
| DATA | 01/12/2021 |

**PRODOTTO** C1200196
Product FILO G9 INNOV-ARC Ø 1,20
Erzeugnis
Produit

**NORMATIVA** AWS A5.18 ER70S-6
Standard EN ISO 14341 A G46 5 M21/2C1 4Si1

**N° DOC. di TRASP. 12126 del 01/12/2021**
Dispatch Note / Lieferschein / Avis d'expédition

**N° ORDINE 202107548 / 0001**
Order / Bestellung / Commande

**CONFERMA 4961 BRUGINE**
Confirmation / Auftragsbestätigung / Confirmation de commande

**CLIENTE** 051108
Customer / Besteller / Client

AIRGAS NORDEST S.R.L.
VIA GLORIA 2, MARGHERA 30175 VENEZ

**COLATA N°**
Heat / Schmelze / Coulée

**13896/2021**

ANALISI CHIMICA di COLATA % - Heat Chemical composition % - Schmelze Chemische zusammensetzung % - Composition chimique sur coulée %

| C | Mn | Si | P | S | Cr | Ni | Mo | Cu* | Sn | Al | V | Ti | B | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,07 | 1,63 | 1,00 | 0,007 | 0,018 | 0,04 | 0,02 | 0,01 | 0,03 | 0,003 | 0,002 | 0,000 | | | |

*Se non specificato, %Cu totale del filo entro i limiti norme prodotto di riferimento / Wenn nicht angegeben liegt der Gesamtwert von %CU am Draht in der von der Produkt-Richtlinien eingesetzten Grenzen / Si non spécifié %Cu total sur le fil rentre dans les limites fixées par la norme de référence du produit / if not specified the total %CU on wire is within the limits set up by the Product Reference Standard

CARATTERISTICHE MECCANICHE - Mechanical properties - Mechanische kennwerte - Characteristics mecaniques

| | Diametro effettivo<br>Actual diameter | Larghezza effettiva<br>Actual Width | Altezza Effettiva<br>Actual Height | Resistenza snervamento<br>Yield strength ReL (Rp0,2) | Resistenza rottura<br>Tensile strength Rm | Allungamento<br>Elongation A5 | Strizione<br>Reduction Z | Resilienza KV<br>Impact Test | | Durezza<br>Hardness HRB |
|---|---|---|---|---|---|---|---|---|---|---|
| | mm | mm | mm | MPa | MPa | % | % | C° | J | |
| **SUL PRODOTTO** On product<br>Am Endprodukt / Sur produit | 10,00 | | | 500 | 586 | 24,0 | 70 | -50 | 55 | |

ALTRE PROVE:
Other tests

ANNOTAZIONI:
Notes
Mechanical test all weld metalAccording to EN 10204 2.2.

LRQA verification ltd ☐ 0004 ☐
☐ Witnessed ☐ Monitored ☐ Reviewed LRQA
MATTIA CRIVELLARI
Ref. No.
Office: Milan 27/07/2022

SIDERTAGLIO CALANDRATURA S.R.L.
Pipes Rolling & Welding

Si certifica che il materiale sopra descritto è conforme all'ordine.
We hereby certify that the material described above complies with the terms of the order contract.
Es wird bestatig dass die Lieferung den Vereinbarungen bei der bestellannahme entspricht.
Nous certifions que la livraison est conforme aux stipulations de l'acceptation de la commande.

Controllo Qualità / Quality Control / Qualitätsstelle / Contrôle de Qualité

R. Maida

# SCHEDA TECNICA

## ARCAR C18

Scheda N. 010 C18

| Specifiche di Fornitura | | | | | |
|---|---|---|---|---|---|
| Gas Base/Componenti | | | Purezza | Impurezze | |
| Simb. | Composizione | | | Simb. | Requisiti |
| CO2 | 18 %v | ± 10 %v (nom.) | ≥ 99,9 %v | H2O | ≤ 80 ppmv |
| Ar | Resto | - | | N2 | ≤ 1.000 ppmv |
| - | - | - | | - | - - |
| - | - | - | | - | - - |
| - | - | - | | - | - - |
| - | - | - | | - | - - |

| | Specifiche di Imballaggio | | | | | |
|---|---|---|---|---|---|---|
| | Cap.tà* | Contenuto | Pressione | Valvola | Colore Ogiva | Colore Fusto |
| Bombole | 40 lt | 9,5 m3 | 200 bar | 8-UNI 11144:2005 W 24,51 x 1/14" Fil. Femm. DX | Verde Brillante RAL 6018 | Qualsiasi |
| | 50 lt | 11,5 m3 | | | | |
| Pacchi Bombola | 12 bb x 40 lt | 114 m3 | | | Verde Brillante RAL 6018 | |
| | 16 bb x 40 lt | 152 m3 | | | | |
| | 12 bb x 50 lt | 138 m3 | | | | |
| | 16 bb x 50 lt | 184 m3 | | | | |
| - | | | | | | |

* Altri formati sono disponibili su richiesta e previa disponibilità

| Applicazioni |
|---|
| Saldatura MAG degli acciai al carbonio |
| - |
| - |

| Informazioni sulle Regolamentazioni |
|---|
| Prodotto conforme alla norma UNI EN ISO 14175:2008 - Gas e miscele di gas per la saldatura per fusione e per i processi connessi; Classificazione ISO 14175 - M21; Designazione ISO 14175 - M21 - ArC - 18 |
| - |

Per tutte le altre informazioni fare riferimento alla Scheda di Dati di Sicurezza Sico MIX 036

SICO S.p.A. non è responsabile circa l'uso e relative conseguenze delle informazioni contenute nella presente ST

LRQA verification ltd 0094
Witnessed Monitored Reviewed
MATTIA CRIVELLARI
Ref. No.
Office: Milan
27/07/2022

SUBERTAGLIO CALANDRATURA S.R.L.

SICO Società Italiana Carburo Ossigeno S.p.A.
Via Giovanni Morandi, 10 - 21047 Saronno (VA)
Tel. +39 02 9642661, Fax +39 02 9603044

**TÜV Italia s.r.l.**
**TÜV SÜD Group**
Viale Fulvio Testi 280/6 Milano
I-20126 www.tuvsud.com

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Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
Signatory of EA, IAF and ILAC Mutual Recognition Agreements

TÜV SÜD Italia



# Certificato n° - Certificate No – Zertifikat Nr:

SAL-4536-2024

## CERTIFICATO DI QUALIFICA DEL SALDATORE

WELDER APPROVAL TEST CERTIFICATE – SCHWEISSER PRÜFUNGSBESCHEINIGUNG-ZERTIFIKAT

**Designazione:**
Designation -Bezeichnung: **EN ISO 9606-1 135 T/P BW FM2 S s20 D20 PB bs**

**WPS del Costruttore:**
Manufacturer's WPS - Hersteller -Schwelßanweisung: **05E/24_r.0**

**Data della Saldatura:**
Date of Welding - Datum derSchweißung: **10/05/2024**

**Rapporto di Prova n°**
Test Report Nr - Prüfbericht Nr..: **See page 2**

**Riferimento interno No.:**
Internal Reference No. – Interne Referenz No: **722351772**

**Nome del Saldatore:**
Welder's name - Name des Schweißers: **HAMZA MUHAMMAD BHATTI – code: BMH**

**Identificazione:**
Identification - Legitimation: **AY2750689**

**Metodo di identificazione:**
Method of identification - Art der Legitimation: **CARTA IDENTITA'**

**Data e luogo di nascita:**
Date and place of birth - Geburtsdatum und Ort: **12/10/1996 - GUJRAT PAK [PAK]**

**Foto (se richiesto)**
Photo (if required)
Fotografie (falls nötig)

**Datore di lavoro:**
Employer - Beschäftigt bei: **SIDERTAGLIO CALANDRATURA SRL**
via Marzotto, 9 – 36031 Povolaro di Dueville (VI)

**Codice / Norma di collaudo:**
Code / testing standard - Vorschrift / Prüfnorm: **EN ISO 9606-1: 2017 + AD 2000-Merkblatt HP3**

**Conoscenze tecniche:**
Job knowledge - Fachprüfung: ☒ **Acceptable** ☐ **Not Tested**

**Prova supplementare di saldatura ad angolo:**
Supplementary fillet weld test - Ergänzende Kehlnaht Test: ☐ **Yes** ☒ **No**

☒ **Qualifica valida ai sensi della direttiva PED, Allegato 1, punto 3.1.2. – TUV Italia Srl – Organismo Notificato 0948**

| | | **Dettagli della prova di saldatura** Weld Test Details – Prüfdaten-Angaben | **Campo di validità** Range of Approval –Geltungsbereich |
|---|---|---|---|
| **5.2** | **Procedimento di saldatura:** Welding process - Schweißprozess(e): | **135** | **135, 138** |
| | **Modalità di Trasferimento [131 – 135 – 138]** Transfer Mode - Transfermodus: | **SPRAY** | **All but not Short** |
| **5.3** | **Tipo di prodotto:** Product Type – Produkttyp: | **Round on plate** | **Round on plate** |
| **5.4** | **Tipo di giunto:** Joint Type – Nahtart: | **BW** | **BW** |
| **5.5** | **Materiale(i) d'apporto (Tabella 2-3) :** Filler Metal (Table 2-3) – Schweißzusatz(e) (Tabelle 2-3) | **FM2** | **FM1, FM2** |
| **5.6** | **Tipo di Materiale d'apporto (Tabella 4-5):** Filler Metal Type (Table 4-5) – Zusatzwerktyp (Tabelle 4-5) | **S** | **S, M** |
| **5.7** | **Spessore del materiale [mm]:** Material thickness [mm] - Werkstoffdicke [mm]: | **40,0** | **---** |
| | **Spessore depositato [mm]:** Deposited thickness [mm] - Schweißgutdicke[mm]: | **20,0** / **---** | **≥ 3,0** / **---** |
| | **Diametro esterno del tubo - Ø [mm] :** Tube-∅ (outside) - Rohr-∅ (außen) [mm]: | **20** | **20,0 ÷ 40,0** |
| 5.8 | **Posizione di saldatura (Tabelle 9-10):** Welding position (Tab. 9-10) – Schweißpositionen (Tab. 9-10) : | **PB** | **PB** |
| **5.9** | **Dettagli di saldatura (Tabella 11):** Weld Details (Tab.11) – Schweißnahteinzelheiten (Tab.11): | **bs** | **ss mb, bs** |
| | **Saldatura passata singola / Multipla (Tabella 12):** Multi layer/Single Layer (Tab.12)-Einlagig/Mehrlagig (Tab. 12): | **---** | **---** |
| **Informazioni addizionali** – Additional Information – Zusätzliche Hinweise: | | | |
| **Gruppo di Materiali: [CEN ISO/TR 15608]** Parent metals (groups) – Werkstotffgruppe(n): | | **1.2 / 1.1** | **1 ÷ 11** |
| **Gas di protezione: [EN ISO 14175]** Shielding gas – Schutzgas: | | **M21 – ArC-18** | **All Active Gases** |
| **Ausiliari:** Auxiliaries – Hilfsstoffe: | | **---** | **---** |

| **Data e luogo:** Date and location Datum und ort: | Riqualificazione 9.3 a) Requalification 9.3 a) Requalifizierung 9.3 a) | | Rivalidazione 9.3 b) Revalidation 9.3 b) Revalidierung 9.3 b) | | Rivalidazione 9.3 c) Revalidation 9.3 c) Revalidierung 9.3 c) | | **Nome e firma del certificatore:** Certifier's Name and Signature Name und Unterschrift des Zertifizierers: |
|---|---|---|---|---|---|---|---|
| **01/07/2024 - Milano** | **Validità fino a** Validity until Gültigkeit | **09/05/2027** | **Validità fino a** Validity until Gültigkeit | **/** | **Validità fino a** Validity until Gültigkeit | **/** | **A.Carelli** |

# Welder Qualification Test Certificate EN ISO 9606-1: 2017

| | |
|---|---|
| Designation: | **EN ISO 9606-1:2017 135 P FW FM1 S t40 PB ml** |
| Welding Procedure Specification Reference No. | **pWPS 03E-22** |
| Examining Body: Reference No: | **- / -** |
| Welder's Name | **BHATTI M.ASAD (ID. C)** |
| Identification: | **AY 1606057** |
| Method of Identification: | **Identity card** |
| Date and place of birth: | **03-08-1965 GUJRAT - PAKISTAN** |
| Employer: | **SIDERTAGLIO CALANDRATURA SRL** |
| Code/Testing Standard: | **EN ISO 9606-1:2017** |
| Code/Testing Standard: | **EN ISO 9606-1: 2017** |
| Job knowledge: | **Not Tested** |

Photograph (if required)

| | Test piece | Range of qualification |
|---|---|---|
| Welding process(es) | **135 semiautomatic** | **135,138 semiautomatic** |
| Transfer Mode | **Spary Arc** | **Spray, globular and pulsed arc.** |
| Product type (plate or pipe) | **Plate** | **Pipe (T) & Plate (P)** |
| Type of weld | **T Joint, Fillet Weld** | **FW** |
| Parent material group(s)/subgroups | **1** | **1 to 11** |
| Filler material group(s) | **FM1** | **FM1 - FM2** |
| Filler material (Designation) | **EN ISO 14341 A G46 5 M21/2C1 4Si1 and others with similar caracteristique** | **S and M (solid and metal cored electrode)** |
| Shielding gas | **EN ISO 14175: M21 AR 82% + CO2 18%** | **all compatible** |
| Auxiliaries | **---** | **---** |
| Type of current and polarity | **DCEP** | **all compatible** |
| Material thickness (mm) | **40** | **3 to unlimited** |
| Deposited thickness (mm) | **Fillet weld** | **No restriction** |
| Outside pipe diameter (mm) | **N.A** | **≥ 75 (PA,PB rotating pipe); ≥ 500 (fixed pipe)** |
| Welding positions | **PB** | **PA - PB** |
| Weld details | **---** | **---** |
| Multi-layer/single layer | **Multi-layer** | **Single and Multi-layer (sl, ml)** |

Supplementary fillet weld test (completed in conjunction with a butt weld qualification): **Not Applicable**
Additional information is available on attached sheet and/or welding procedure specification: **pWPS 03E-22**

| Type of test | Performed and acceptable | Not tested | Notes (Report Numbers, etc) |
|---|---|---|---|
| Visual testing | X | | **146/2022** |
| Radiographic testing | | X | |
| Ultrasonic testing | | X | |
| Magnetic particle / Penetrant test | X | | **367/2022** |
| Macroscopic examination | X | | **57150 Rev.0** |
| Fracture test | | X | |
| Bend test | | X | |
| Notch tensile test | | X | |

Germano De Grandis
Surveyor to LR EMEA
A subsidiary of Lloyd's Register Group Limited

Date of issue: **20 September 2022**
Location: **Genoa**
Date of welding: **20 July 2022**

| Revalidation 9.3 a) | | Next review **19 July 2025** |
|---|---|---|

| Revalidation 9.3 b) | | Next review |
|---|---|---|

| Revalidation 9.3 c) | | Next review |
|---|---|---|

Approved for Pressure Equipment Directive (PED) Annex I Par. 3.1.2. on behalf LRQA Inspection Iberia, SA NoBo 0094
Milan Office
04 SET. 2023

**Note: /**

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Confirmation of the validity by employer / welding coordinator / examiner or examining body for the following 6 months [refer 9.2)]
**Revalidation for qualification by examiner or examining body for the following 2 years [refer to 9.3 b)] (if applicable)

| | Date | Valid until | Confirmation based on (Report numbers etc) | Signature / Position or Title |
|---|---|---|---|---|
| | 19/01/2023 | 19/07/2023 | P0186 | WC |
| | 09/06/2023 | 09/12/2023 | Q0084 | WC |
| | 08/12/2023 | 08/06/2024 | Q0208 | QCR/WD |
| ** | 08/06/2024 | 08/12/2024 | R0033 | QCR/WD |
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# Certificato n° - Certificate No – Zertifikat Nr:

SAL-4817-2024

## CERTIFICATO DI QUALIFICA DELL'OPERATORE DI SALDATURA

WELDING OPERATOR APPROVAL TEST CERTIFICATE – BEDIENER VON SCHWEISSEINRICHTUNGEN-ZERTIFIKAT

**WPS del Costruttore:**
Manufacturer's WPS - Hersteller -Schwelßanweisung: **09E-24 r.0**

**Data della Saldatura:**
Date of Welding - Datum derSchweißung **10/05/2024**

**Rapporto di Prova No.**
Test Report Nr. - Prüfbericht Nr..: **See page 2**

**Riferimento interno No.:**
Internal Reference Nr. – Interne Referenz Nr: **722351772**

**Nome dell'operatore di saldatura:**
Weldeing Operator's name - Name des Bedieners: **BHATTI MUHAMMAD ASAD**

**Identificazione:**
Identification - Legitimation: **AV 9488035**

**Metodo di identificazione:**
Method of identification - Art der Legitimation: **CARTA IDENTITA'**

**Data e luogo di nascita:**
Date and place of birth - Geburtsdatum und Ort: **03/08/1965 – GUJRAT PAKISTAN (PAK)**

**Foto (se richiesto)**
Photo (if required)
Fotografie (falls nötig)

**Datore di lavoro:**
Employer - Beschäftigt bei: **SIDERTAGLIO CALANDRATURA SRL**
via Marzotto, 9 – 36031 Povolaro di Dueville (VI)

**Codice / Norma di collaudo:**
Code / testing standard - Vorschrift / Prüfnorm: **UNI EN ISO 14732: 2013 + AD 2000-Merkblatt HP3**

**Prova di conoscenza del funzionamento:**
Functional knowledge test -Functional Fachprüfung: **Acceptable (according to Annex A)**

**Conoscenze tecniche:**
Job knowledge – Fachprüfung: ☒ **Acceptable** ☐ **Not Tested**

**Note:**
Remarks – Bemerkung: **Code: C**

☒ **Qualifica valida ai sensi della direttiva PED, Allegato 1, punto 3.1.2. – TUV Italia Srl – Organismo Notificato 0948**

| | **Dettagli della prova di saldatura**<br>Weld Test Details - Prüfdaten-Angaben | **Campo di validità**<br>Range of Approval - Geltungsbereich |
|---|---|---|
| **Procedimento di saldatura:**<br>Welding process - Schweißprozeß: | **121** | **121** |
| **Impianto di saldatura:**<br>Welding equipment - Schweißeinrichtung: | - | - |
| **Unità di saldatura:**<br>Welding unit - Schweißgerät: | - | - |
| **Particolari per saldatura automatizzata in accordo a par 4.2.2**<br>Specifications for automatic welding according to par. 4.2.2 - Angaben nur für automatisches Schweißen nach 4.2.2 | | |
| **Sensore del giunto:**<br>Joint sensor - Nahtsensor: | - | - |
| **Controllo del sensore dell'arco**<br>Arc Sensor Control - | - | - |
| **Passata singola / Passate multiple:**<br>Single run / Multi run - Einlagig / Mehrlagig: | - | - |
| **Tipo di unità di saldatura:**<br>Type of Welding unit - Art des Schweißgerät: | - | - |
| **Particolari per saldatura automatica in accordo a par 4.2.3**<br>Specifications for mechanized welding according to par. 4.2.3 - Angaben nur für Mechanisches Schweißen nach 4.2.3 | | |
| **Controllo Visivo / Controllo visivo remoto**<br>Visual control/visual remote control–Visuelle Kontrolle/visuelle Fernbedienung | **DIRECT** | **THE SAME** |
| **Controllo automatico della lunghezza dell'arco**<br>Automatic arc length control – Automatische Lichtbogenlängensteuerung | **WITHOUT** | **WITH AND WITHOUT** |
| **Monitoraggio automatico del giunto**<br>Automatic joint tracking - Automatische Fugenfolge | **WITHOUT** | **WITH AND WITHOUT** |
| **Posizione di saldatura:**<br>Welding position - Schweißposition: | **PA** | **PA** |
| **Passata singola / Passate multiple:**<br>Single run / Multi run - Einlagig / Mehrlagig: | **MULTIPLE** | **SINGLE AND MULTIPLE** |
| **Materiale di supporto:**<br>Material Backing – Material Badsicherung | **ss mb** | **ss mb, bs** |
| **Inserto Consumabile:**<br>Consumable Insert Verbrauchsmaterial insert | **WITHOUT** | **WITH AND WITHOUT** |

**Informazioni addizionali** – Additional Information – Zusätzliche Hinweise:

| **Data e luogo:**<br>Date and location<br>Datum und ort: | Riqualificazione 5.3 a)<br>Requalification 5.3 a)<br>Requalifizierung 5.3 a) | | Rivalidazione 5.3 b)<br>Revalidation 5.3 b)<br>Revalidierung 5.3 b) | | Rivalidazione 5.3 c)<br>Revalidation 5.3 c)<br>Revalidierung 5.3 c) | | **Nome e firma del certificatore:**<br>Certifier's Name and Signature<br>Name und Unterschrift des Zertifizierers: |
|---|---|---|---|---|---|---|---|
| **12/07/2024**<br>**Milano** | **Validità fino a**<br>Validity until<br>Gültigkeit | 2030/05/09 | **Validità fino a**<br>Validity until<br>Gültigkeit | | **Validità fino a**<br>Validity until<br>Gültigkeit | | **Alberto Carelli** |

ZERTIFIKAT | CERTIFICATE | CERTIFICAT | CERTIFICADO | СЕРТИФИКАТ | شهادة | 证书 | 인증서

# Qualification test certificate for ☒ welding operators ☐ weld setter

## according EN ISO 14732:2013

| | | | |
|---|---|---|---|
| welding procedure specification: | 01E-23 | Certificate No: | IT/23/P/0367 |
| Reference No. (if applicable): | | Examiner: | Mariano Polichetti |
| Name: | Muhammad Hamza Bhatti | Welder sign: | E |
| Method of Identification: | ID-Card | Examining body: | TÜV AUSTRIA CERT GMBH<br>1230 Vienna, Deutschstraße 10<br>Recognized third party organization according article 20, 24 and annex I 3.1.2. of directive 2014/68/EU |
| Identification no.: | AY2750689 | | |
| Date and place of birth: | 12/10/1996 Gujrat Pak (Pakostan) | | |
| Employer: | Sidertaglio Calandratura S.r.l. | | |
| Code/testing standard: | EN ISO 14732:2013 + AD2000HP3 | | |
| Functional knowledge: | ☒ acceptable | ☐ not acceptable (cross where applicable) | |
| Job knowledge: | ☒ acceptable | ☐ not tested (cross where applicable) | |

| Weld details | | Range of qualification |
|---|---|---|
| Welding process: | 121 mechanized | 121 mechanized |
| Welding equipment: | | |
| Welding unit: | FRO STARMATIC 1200 I SN: 217-4894262 | No restriction |

**Details for mechanized welding:**

| | | | |
|---|---|---|---|
| Visual control: | ☒ direct | ☐ remote | Direct visual control |
| Automatic arc length control: | ☐ yes | ☒ no | No restriction |
| Automatic joint tracking: | ☐ yes | ☒ no | No restriction |
| Welding position: PA | | | PA |
| ☐ Single run technique | ☒ Multi run technique | | Multi run & single run |
| Material backing: | ☒ yes | ☐ no | With backing |
| Consumable insert: | ☐ yes | ☒ no | No restriction |

**Details for automatic welding:**

| | | | |
|---|---|---|---|
| Joint sensor: | ☐ yes | ☐ no | |
| Arc sensor control: | ☐ yes | ☐ no | |
| ☐ Single run technique | ☐ Multi run technique | | |

Additional information is available on welding procedure specification No: 01E-23

| | |
|---|---|
| The qualification is based on: | Certification body: TÜV AUSTRIA CERT GMBH |
| welding procedure test (see 4.1a)) ☒ | |
| pre-production welding test (see 4.1b)) ☐ | |
| standard test piece (see 4.1c)) ☐ | Name and signature: Ing. Daniele Tempesti |
| production test or production sample testing (see 4.1d)) ☐ | Place of issue: Erbusco (BS) |
| Results of the qualification test see document No.: | Date of issue: 24/05/2023 |
| 1201/2023, UT 090-2023, 59128, VT 088-2023 | Place of welding: Povaloro (VI) |
| | Date of welding: 27/03/2023 |
| Validity according 5.3: ☒a) ☐b) ☐c) | Valid until: 26/03/2029 |

Re-validation for qualification by employer/welding coordinator for the following 6 months (see clause 5.2):

| Date | Signature | Position or title | Date | Signature | Position or title |
|---|---|---|---|---|---|
| 27/09/2023 | | QCS/WD | | | |
| 27/03/2024 | | QCS/WD | | | |
| 27/09/2024 | | QCS/WD | | | |
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TÜV SÜD Italia



# Certificato n° - Certificate No – Zertifikat Nr:

SAL-4687-2023

## CERTIFICATO DI QUALIFICA DEL SALDATORE

WELDER APPROVAL TEST CERTIFICATE – SCHWEISSER PRÜFUNGSBESCHEINIGUNG-ZERTIFIKAT

**Designazione:**
Designation -Bezeichnung: **EN ISO 9606-1 – 135 P BW FM1 S t15 PA ss mb**

**WPS del Costruttore:**
Manufacturer's WPS - Hersteller -Schweißanweisung: **P28912315-01**

**Data della Saldatura:**
Date of Welding - Datum derSchweißung: **2023/09/15**

**Rapporto di Prova n°**
Test Report Nr - Prüfbericht Nr..: **see page 2**

**Riferimento interno No.:**
Internal Reference No. – Interne Referenz No: **722329947**

**Nome del Saldatore:**
Welder's name - Name des Schweißers: **ASAD MUHAMMAD BHATTI – code: C**

**Identificazione:**
Identification - Legitimation: **AV9488035**

**Metodo di identificazione:**
Method of identification - Art der Legitimation: **CARTA IDENTITA'**

**Data e luogo di nascita:**
Date and place of birth - Geburtsdatum und Ort: **03/08/1965 – GUJRAT PAKISTAN [PAK]**

**Foto (se richiesto)**
Photo (if required)
Fotografie (falls nötig)

**Datore di lavoro:**
Employer - Beschäftigt bei: **SIDERTAGLIO CALANDRATURA SRL**
via Marzotto, 9 – 36031 Povolaro di Dueville (VI)

**Codice / Norma di collaudo:**
Code / testing standard - Vorschrift / Prüfnorm: **EN ISO 9606-1: 2017**

**Conoscenze tecniche:**
Job knowledge - Fachprüfung: ☐ **Acceptable** ☒ **Not Tested**

**Prova supplementare di saldatura ad angolo:**
Supplementary fillet weld test - Ergänzende Kehlnaht Test: ☐ **Yes** ☒ **No**

☒ **Qualifica valida ai sensi della direttiva PED, Allegato 1, punto 3.1.2. – TUV Italia Srl – Organismo Notificato 0948**

| | | Dettagli della prova di saldatura<br>Weld Test Details – Prüfdaten-Angaben | Campo di validità<br>Range of Approval –Geltungsbereich |
|---|---|---|---|
| 5.2 | **Procedimento di saldatura:**<br>Welding process - Schweißprozess(e): | 135 | 135, 138 |
| | **Modalità di Trasferimento [131 – 135 – 138]**<br>Transfer Mode - Transfermodus: | SPRAY ARC | All but not Short |
| 5.3 | **Tipo di prodotto:**<br>Product Type – Produkttyp: | P | P, T |
| 5.4 | **Tipo di giunto:**<br>Joint Type – Nahtart: | BW | BW |
| 5.5 | **Materiale(i) d'apporto (Tabella 2-3) :**<br>Filler Metal (Table 2-3) – Schweißzusatz(e) (Tabelle 2-3) | FM1 | FM1, FM2 |
| 5.6 | **Tipo di Materiale d'apporto (Tabella 4-5):**<br>Filler Metal Type (Table 4-5) – Zusatzwerktyp (Tabelle 4-5) | S | S, M |
| 5.7 | **Spessore del materiale [mm]:**<br>Material thickness [mm] - Werkstoffdicke [mm]: | 15,0 | - |
| | **Spessore depositato [mm]:**<br>Deposited thickness [mm] - Schweißgutdicke[mm]: | 15,0<br>- | ≥ 3,0<br>- |
| | **Diametro esterno del tubo - Ø [mm] :**<br>Tube-Ø (outside) - Rohr-Ø (außen) [mm]: | - | ≥ 75,0 |
| 5.8 | **Posizione di saldatura (Tabelle 9-10):**<br>Welding position (Tab. 9-10) – Schweißpositionen (Tab. 9-10) : | PA | PA |
| 5.9 | **Dettagli di saldatura (Tabella 11):**<br>Weld Details (Tab.11) – Schweißnahteinzelheiten (Tab.11): | ss mb | ss mb, bs, ss gb |
| | **Saldatura passata singola / Multipla (Tabella 12):**<br>Multi layer/Single Layer (Tab.12)-Einlagig/Mehrlagig (Tab. 12): | - | - |
| **Informazioni addizionali** – Additional Information – Zusätzliche Hinweise: | | | |
| **Gruppo di Materiali: [CEN ISO/TR 15608]**<br>Parent metals (groups) – Werkstoffgruppe(n): | | 1.2 | 1 ÷ 11 |
| **Gas di protezione: [EN ISO 14175]** Shielding gas – Schutzgas: | | M21 – ArC-18 | All Active Gas |
| **Ausiliari:** Auxiliaries – Hilfsstoffe: | | - | - |

| **Data e luogo:**<br>Date and location<br>Datum und ort: | Riqualificazione 9.3 a)<br>Requalification 9.3 a)<br>Requalifizierung 9.3 a) | | Rivalidazione 9.3 b)<br>Revalidation 9.3 b)<br>Revalidierung 9.3 b) | | Rivalidazione 9.3 c)<br>Revalidation 9.3 c)<br>Revalidierung 9.3 c) | | **Nome e firma del certificatore:**<br>Certifier's Name and Signature<br>Name und Unterschrift des Zertifizierers: |
|---|---|---|---|---|---|---|---|
| **02/10/2023**<br>**Milano** | **Validità fino a**<br>Validity until<br>Gültigkeit | **2026/09/14** | **Validità fino a**<br>Validity until<br>Gültigkeit | | **Validità fino a**<br>Validity until<br>Gültigkeit | | **Maria Fernandez** |

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PRS N° 077C
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Signatory of EA, IAF and ILAC Mutual Recognition Agreements

TÜV SÜD Italia



## Certificato n° - Certificate No – Zertifikat Nr:

SAL-4687-2023

## CERTIFICATO DI QUALIFICA DEL SALDATORE

WELDER APPROVAL TEST CERTIFICATE – SCHWEISSER PRÜFUNGSBESCHEINIGUNG-ZERTIFIKAT

| **Tipo di prova**<br>Type of test<br>Art der Prüfung | **Effettuato ed accettabile**<br>Performed and accepted<br>Ausgeführt und bestanden | **Non Eseguito**<br>Not tested<br>Nicht geprüft |
|---|---|---|
| **Esame visivo (EN ISO 17637)**<br>Visual Test – Sichtprüfung | ☒ **EA Engineering n.051-23_r.0** | ☐ |
| **Radiografia (EN ISO 17636)**<br>Radiography- Durchstrahlungsprüfung | ☐ | ☒ |
| **Ultrasuoni (EN ISO 17640)**<br>Ultrasonic – Ultraschall | ☒ **Antares Control n.714/23** | ☐ |
| **Macrografia (EN ISO 17639)**<br>Macro – Makroskop | ☐ | ☒ |
| **Frattura (EN ISO 9017)**<br>Fracture – Bruchprüfung | ☐ | ☒ |
| **Piega (EN ISO 5173)**<br>Bend – Biegeprüfung | ☐ | ☒ |
| **Test addizionali**<br>Additional Test - Zusätzliche tests | /// | |

| **PROLUNGAMENTO DELLA QUALIFICA DA PARTE DEL DATORE DI LAVORO O DEL SUPERISORE (9.2)**<br>PROLONGATION FOR APPROVAL BY EMPLOYER OR SUPERVISOR (9.2)<br>VERLÄNGERUNG DER PRÜFUNG DURCH BESTÄTIGUNG DES(R) ARBEITGEBER(S) ODER AUFSICHTSPERSON (9.2) | | | **PROLUNGAMENTO DELLA QUALIFICA DA PARTE DELL'ESAMINATORE E DELL'ENTE DI PROVA (9.3 b)**<br>PROLONGATION FOR APPROVAL BY INSP. AUTHORITY (9.3 b)<br>VERLÄNGERUNG DER PRÜFUNG DURCH PRÜFSTELLE (9.3 b) | | |
|---|---|---|---|---|---|
| **Data**<br>Date<br>Datum | **Firma**<br>Signature<br>Unterschrift | **Posizione o titolo**<br>Position or title<br>Dienststellung oder Titel | **Data**<br>Date<br>Datum | **Firma**<br>Signature<br>Unterschrift | **Posizione o titolo**<br>Position or title<br>Dienststellung oder Titel |
| 15/03/24 | | QCR / WD | | | |
| 13/09/24 | | QCR / WD | | | |
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**Nota 1 : La qualificazione deve essere confermata ogni sei mesi .**
Note 1 : The certificate needs to be confirmed every 6 months.
Note 1: Das Zertifikat braucht alle 6 Monate zu bestätigt werden.

| **Data e luogo:**<br>Date and location<br>Datum und ort: | Riqualificazione 9.3 a)<br>Requalification 9.3 a)<br>Requalifizierung 9.3 a) | | Rivalidazione 9.3 b)<br>Revalidation 9.3 b)<br>Revalidierung 9.3 b) | | Rivalidazione 9.3 c)<br>Revalidation 9.3 c)<br>Revalidierung 9.3 c) | | **Nome e firma del certificatore:**<br>Certifier's Name and Signature<br>Name und Unterschrift des Zertifizierers: |
|---|---|---|---|---|---|---|---|
| **02/10/2023**<br>**Milano** | **Validità fino a**<br>Validity until<br>Gültigkeit | **2026/09/14** | **Validità fino a**<br>Validity until<br>Gültigkeit | | **Validità fino a**<br>Validity until<br>Gültigkeit | | **Mario Fernandez** |