# Base Load Power Hub (BLPH)

## DAVIT CRANE Tag.No.X99001

EQUIPMENT MANUFACTURER RECORD BOOK

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Document Class: 2

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# Base Load Power Hub (BLPH)

## DAVIT CRANE Tag.No.X99001

EQUIPMENT MANUFACTURER RECORD BOOK - INDEX

Document Number: 1724001010-QC-LIS-00003

ROSETTI MARINO

| | |
|---|---|
| 1 | NO COMMENTS - APPROVED - WORK MAY PROCEED |
| 2 | MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED |
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| 4 | APPROVAL NOT REQUIRED |

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| Sign | Date |
|---|---|
| ROSETTI MARINO S.p.A. Shipbuilding Quality Control Dept. | 10/12/2024 |

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# Table of contents


1 INTRODUCTION ..... 5

1.1 PROJECT OVERVIEW ..... 5

1.1.1 Project Location ..... 5

1.1.2 Project Concept ..... 6

2 DOCUMENT SCOPE ..... 8

2.1 DEFINITIONS AND ABBREVIATIONS ..... 8

3 EQUIPMENT MANUFACTURER RECORD BOOK-INDEX ..... 9



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# List of Figures

Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map ..... 5
Figure 2 - Wind Park Details ..... 6
Figure 3 – BLPH Concept ..... 6

# List of tables

Table 2 - Definitions and Abbreviations ..... 8

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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.

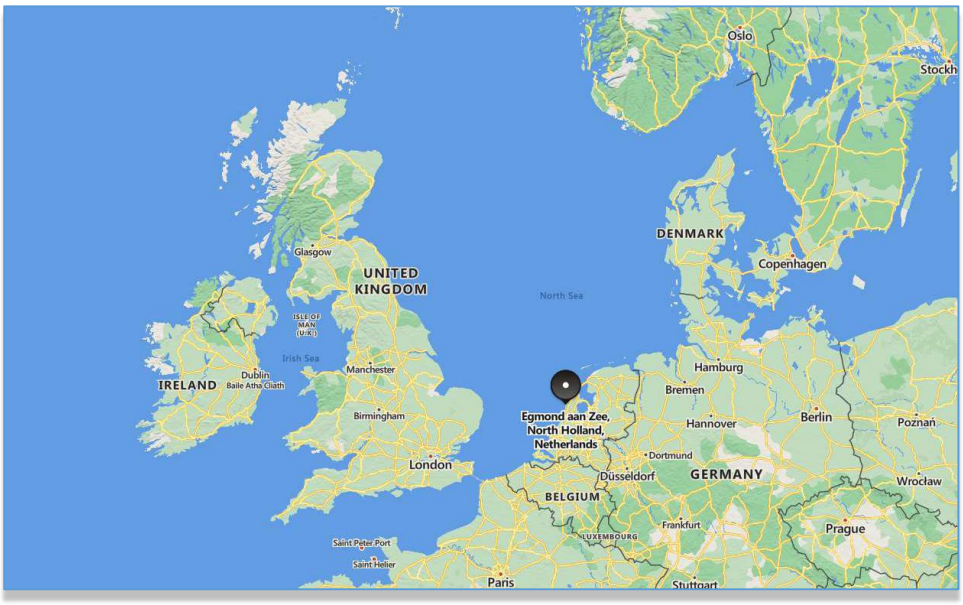



*Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map*




*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.

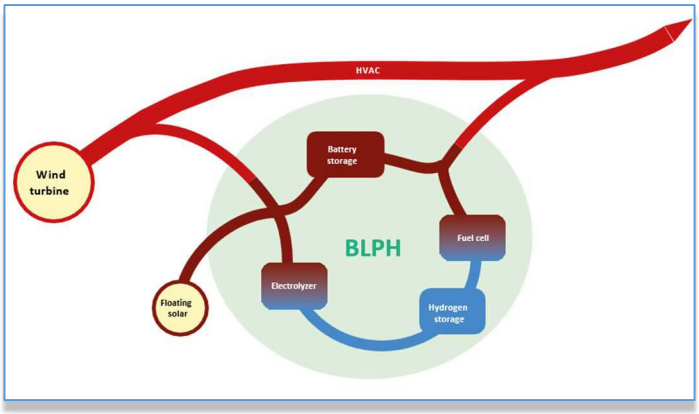



*Figure 3 – BLPH Concept*

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.

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# 2 DOCUMENT SCOPE

EQUIPMENT MANUFACTURERS RECORD BOOK INDEX

## 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 1 - Definitions and Abbreviations*

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# 3 EQUIPMENT MANUFACTURER RECORD BOOK-INDEX

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# MANUFACTURER RECORD BOOK INDEX

# DAVIT CRANE Tag.no.X-99001

# 24-27012

| RESERVED TO Rosetti Marino | | | |
|---|---|---|---|
| **State** | | **Date** | **Signature** |
| Review without comments | ☐ | | |
| Review with comments | ☐ | | |
| Comments: | | | |

| Rev. | Modify desctiption | Issue | Approval | Date |
|---|---|---|---|---|
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| 01 | Issue after Comments | CZB | MPU | 28/08/2024 |
| 02 | Issued for review (revised PART2 CERTIFICATION DOSSIER)<br>Modify Manufacturer Data Book | CZB | MPU | 04/11/2024 |
| 03 | Accepted for construction | CZB | MPU | 25/11/2024 |

**INDEX**

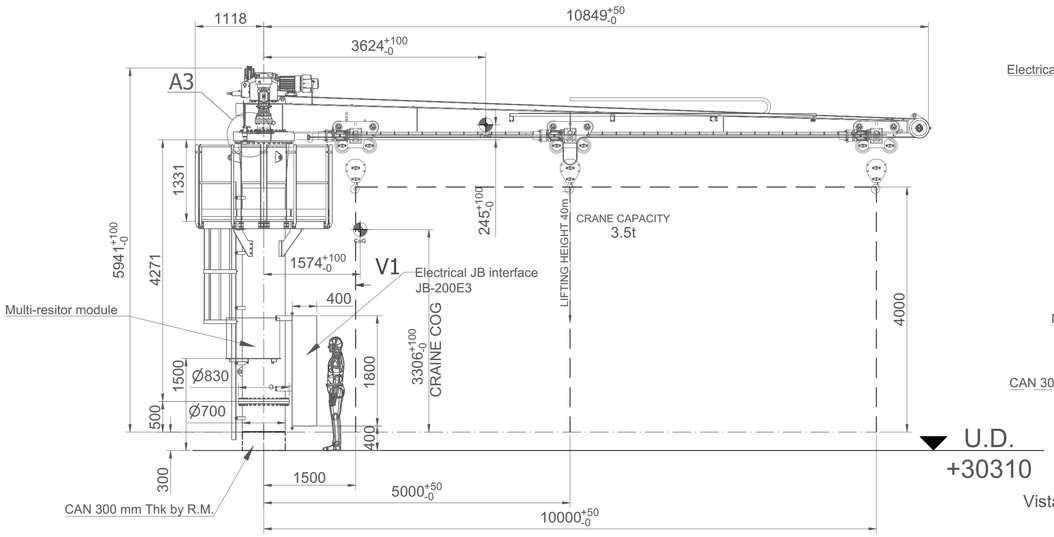

| Title | Document ID n° | Document Title | Page n° |
|---|---|---|---|
| PART1 - DESIGN DOSSIER | 1724001010-MAC-DA-00009 | CRANE GENERAL ARRANGEMENT DRAWINGS | 16 |
| | 1724001010-MAC-MAN-00016<br>1724001010-COM-LIS-00015 | PROJECT PROCEDURES & SPECIFICATION<br>-Operation<br>-Installation Manuals<br>-Spare parts list | 17<br>206 |
| PART -2 CERTIFICATION DOSSIER | 1724001010-QC-ITP-00002 | INSPECTION TEST PLAN | 217 |
| | 1724001010-WEL-PRO-00005 | WELDING PROCEDURE SPECIFICATION (WPS) AND QUALIFICATIONS RECORDS (PQR), WELDING OPERATORS LIST and WELDER QUALIFICATIONS RECORDS (WPQ), WELDING MAP | 242 |
| | 1724001010-NDT-PRO-00006 | NDE PROCEDURE and OPERATORS LIST QUALIFICATIONS | 405 |
| | 1724001010-MAT-PRO-00007 | PAINTING PROCEDURE | 488 |
| | 24-27012-DBK-001_01 | MANUFACTURER DATA BOOK<br>-Manufacturer Certificates<br>-NDT Report<br>-Coating and Paint Reports<br>- TEST CERTIFICATES - WIRE ROPE AND SOCKET / HOOK / SHACKLE / HYDRAULIC CYLINDER AND BLOCKS / PIPING / HOSES / ACCUMULATOR / WINCH<br>- MATERIAL CERTIFICATES /CE DECLARATION FOR COMMERCIAL ITEMS | 523 |
| | 1724001010-QC-PRO-00008 | FAT PROCEDURE<br>Load Test Reports<br>Break Test Reports<br>Dynamic + Static Test Reports<br>Weight Report<br>FAT Report | 779 |

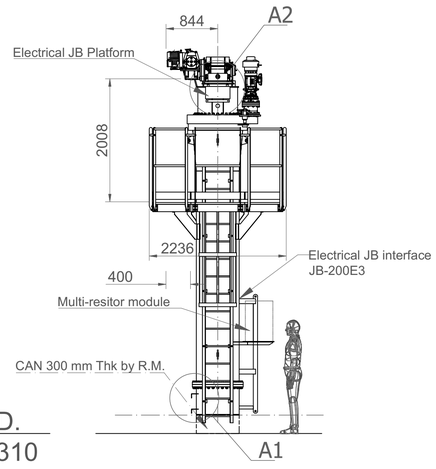
# 3 PART 1 – DESIGN DOSSIER

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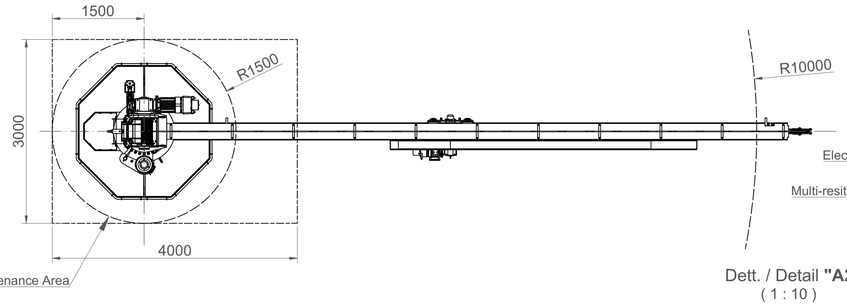
DRAWING NO. 1724001010-MAC-DA-00009

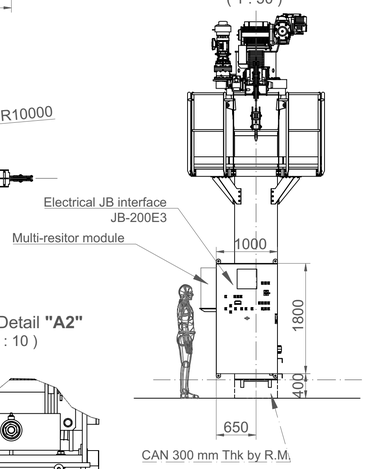
REV. 4



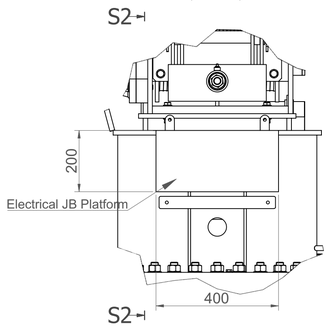




Vista da / View from **"V1"**
( 1 : 50 )

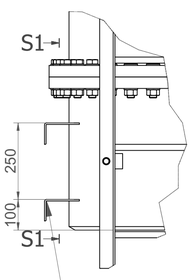



Dett. / Detail **"A2"**
( 1 : 10 )

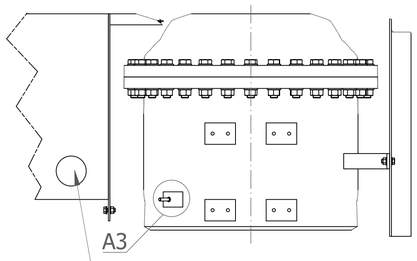



Dett. / Detail **"A1"**
( 1 : 10 )



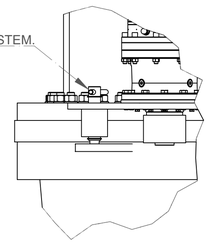

**WELDED "L" PROFILE**
**For supports cable ladder**

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

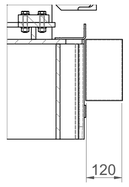



**EL. CABLE IN DN32**
**For cable by R.M.**

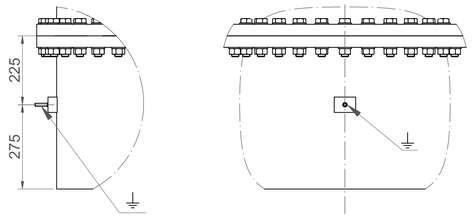
Dett. / Detail **"A3"**
( 1 : 10 )




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




Dett. / Detail **"A3"**
( 1 : 10 )




**EARTING POINT**
**Threaded stud, Ø16mm, L.30mm, material S355J2+N**

| *Material :* |
|---|
| S355 J2+N |

| *Painting Color :* |
|---|
| RAL Code: 7038. |

| EL. | Description Eng | MATERIAL | Q.TY | WEIGHT |
|---|---|---|---|---|
| 3 | Travelling Trolley Assembly | S 355 J2+N UNI EN 10025 | 1 | 256,01 kg |
| 2 | Boom Assembly | S 355 J2+N UNI EN 10025 | 1 | 2542,26 kg |
| 1 | Fixed Column Ass. | S 355 J2+N UNI EN 10025 | 1 | 1241 kg |

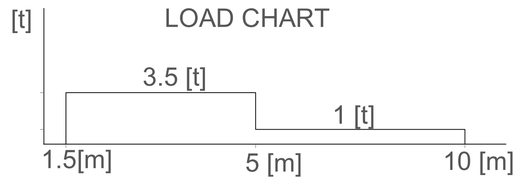
# Load at deck interface

| MAX FORCE ON DECK | |
|---|---|
| $F_{Vmax}$ | -120[kN] |
| $F_{Rmax}$ | 15[kN] |
| $M_{Zmax}$ | ±45[kNm] |
| $M_{Rmax}$ | 520[kNm] |

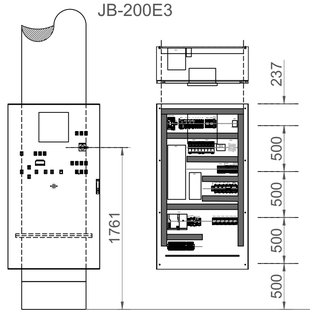
Forces on the table are calculated with 3.5[t]x5[m] outreach.
Forces to be applied at deck level in center of adapter.
DAF= 1.7 (Outboard Lift in Offshore)
Contingency Factor=1.05 (included)
$F_{Vmax}$: vertical load on deck.
$F_{Rmax}$: max radial load on deck in any direction (plane x-y)
$M_{Zmax}$: max Torsion moment in z direction.
$M_{Rmax}$: max tilting moment (perp. to the boom line)

# Test load:

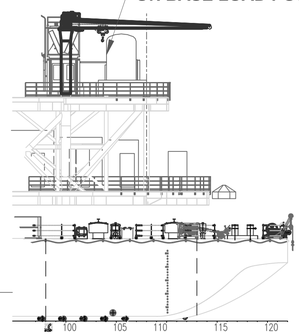
5.6[t]x5[m] - 1.6[t]x10[m]
in according to DNV-ST-0378 rules



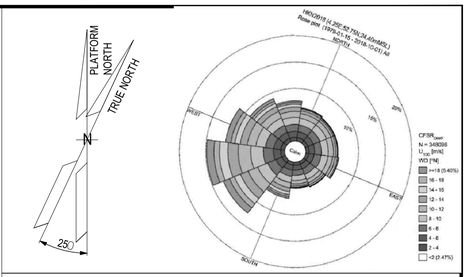

Electrical JB interface
JB-200E3




**STORAGE POSITION**
**ON BASE LOAD POWER HUB**




| Description | Q.ty | Notes |
|---|---|---|
| CRANE TYPE | | PLATFORM CRANE OFF-SHORE |
| LIFTING CAPACITY | 3.5[t] 1.5-5[m]<br>1[t] 1.5-10[m] | STEEL ROPE HOIST WINCH |
| HOOK STROKE | 40[m] | Electric driven by gearbox<br>Brake on the El. Motor |
| LIFTING SPEED | 3.75/15[m/min] | Variable speed motor |
| Hoist winch stroke (radial movement) | 1.5-10[m] | Eletric driven rack - pinion system |
| RADIAL SPEED | 2-8[m/min] | |
| PRELIMINARY WEIGHT | 6000[kg] | |
| ROTATIONAL MOVEMENT | 0-180° | By electric Motor Geqarbox<br>Pinion on slewing bearing |
| ROTATIONAL SPEED | 0.25/0.5[rpm] | Variable speed motor |
| WORKING TEMPERATURE | -9/45[°C] | |
| HAZAEDOUS AREA: | | SAFE AREA |
| PERSONEL LIFT | | NO |
| POWER SUPPLY | 400[v]/3Ph/50[hZ] (3Ph+N) | |
| TOTAL POWER ABS. | 20[kW] | |




NOTES

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Sign: M. Di Scipio — Date: 22/11/2024

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

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 4 | 05/11/24 | R.S. | M.P. | A.T. | ACCEPTED FOR CONSTRUCTION |
| 3 | 20/09/24 | R.S. | M.P. | A.T. | ACCEPTED FOR CONSTRUCTION |
| 2 | 21/08/24 | R.S. | M.P. | A.T. | ACCEPTED FOR CONSTRUCTION |
| 1 | 03/07/24 | R.S. | M.P. | A.T. | ACCEPTED FOR CONSTRUCTION |
| 0 | 18/06/24 | R.S. | M.P. | A.T. | ISSUE FOR REVIEW (IFR) |

CROSSWIND — ROSETTI MARINO

TITLE : 123A90A – Base Load Power Hub Platform
CRANE GENERAL ARRANGEMENT DRAWINGS
DAVIT CRANE

| CONTRACT NO./TITLE | CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | SCALE 1:50 |
|---|---|---|---|
| DRAWN R.S. | CHECKED M.P. | APPROVED A.T. | DATE 18/06/24 |
| A1 | DRAWING NO. 1724001010-MAC-DA-00009 | SHEET 001 | REV. 4 |

File Name : 1724001010-MAC-DA-00009

# Base Load Power Hub (BLPH)

## DAVIT CRANE
## INSTALLATION, OPERATING AND MAINTENANCE MANUAL

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# Table of contents


1. INTRODUCTION....5
   - 1.1 PROJECT OVERVIEW....5
     - 1.1.1 Project Location....5
     - 1.1.2 Project Concept....6
2. DOCUMENT SCOPE....8
   - 2.1 REFERENCES....8
   - 2.2 DEFINITIONS AND ABBREVIATIONS....8
3. IDENTIFICATION DATA....11
4. INTRODUCTION....11
5. TABLE OF CONTENTS....12
6. SAFETY INSTRUCTIONS....13
7. TRANSPORT AND STORAGE....16
8. COMMISSIONING....17
9. OPERATION....19
10. MAINTENANCE....21
11. DRAWING LIST....25
12. ELECTRIC DIAGRAMS....25
13. MAIN FEATURE....26
14. LOAD CHART DIAGRAM....27
15. DESCRIPTION OF THE SUPPLY....28
16. SPARE PARTS LIST....32
17. ELECTRICAL PANEL - CRANE CONTROL PUSH-BUTTONS....33
18. CRANE OPERATION....36
19. LOCKING PIN DEVICE....38



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20. LOWERING EMERGENCY OPERATION....39
21. TRAVERSING EMERGENCY OPERATION....40
22. EMERGENCY BRAKE FOR HOISTING (SHOE BRAKE).... 41
23. WIRE ROPE.... 42
24. ROPE INSPECTION AND REPLACEMENT CRITERIA....44
25. OIL LUBRICATION....49
26. GREASE LUBRICATION....49
27. ELECTRICAL PANEL - INTERNAL VIEW.... 50
28. ELECTRIC COMPONENTS LIST.... 53
29. HOISTING LIMIT SWITCHES.... 58
30. SETTING OF LIMIT SWITCH ON THE DRUM.... 60
31. TROLLEY TRAVERSING LIMIT SWITCH.... 62
32. OVERLOAD DEVICE SETUP.... 63
33. AUDIBLE AND VISIBLE ALARM – ITEM C01-CHB-0014.... 65
34. CABLE CHAIN.... 66
35. TROLLEY TRAVERSING GEARBOX.... 68
36. HOISTING GEARBOX.... 69
37. SLEWING GEARBOX.... 70
38. GEARBOXES LUBRICATION.... 71
39. GEARBOXES MAINTENANCE.... 72
40. ELECTRIC MOTORS BRAKE ASSEMBLY – SIZES 90-100-132.... 73
41. ELECTRIC MOTORS SPARE PARTS LIST – SIZES 90-100.... 74
42. ELECTRIC MOTOR SPARE PARTS LIST – SIZES 132.... 75
43. ATTACHMENTS LIST.... 76

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# List of Figures

Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map ..... 6
Figure 2 - Wind Park Details ..... 7
Figure 3 – BLPH Concept ..... 7

# List of tables

Table 1 - Reference Documents ..... 9
Table 2 - Definitions and Abbreviations ..... 9

# List of Attachments

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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.

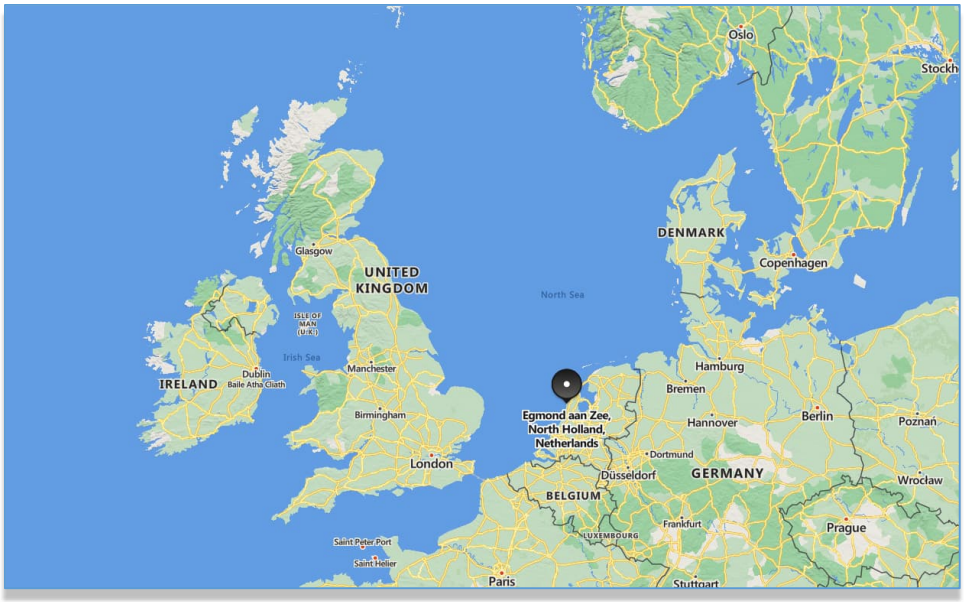



*Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map*




*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.

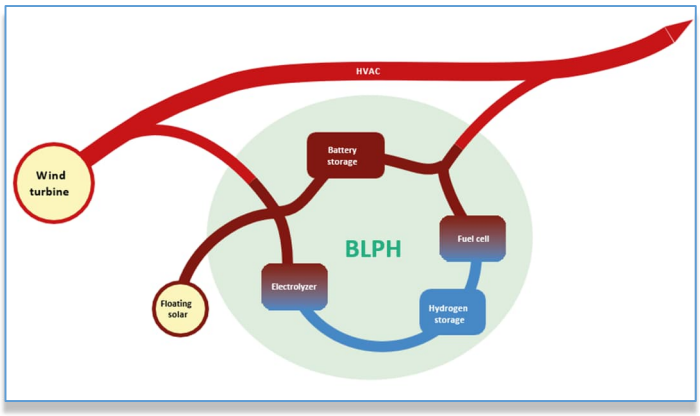



*Figure 3 – BLPH Concept*

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.

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# 2 DOCUMENT SCOPE

The instruction manual uses texts, words, signals, symbols or diagrams, pictures to convey information to those who will use the machine: install it, use it, carry out maintenance.

## 2.1 REFERENCES

| Doc. No. | Description |
|---|---|
| 1724001010-MAC-DA-00009 | Crane General Arrangement Drawings |
| 1724001010-MAC-DG-00012 | Wiring Diagram |
| | |

*Table 1 - Reference Documents*

## 2.2 DEFINITIONS AND ABBREVIATIONS

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

*Table 2 - Definitions and Abbreviations*

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# N°1 ELECTRIC JIB CRANE (DAVIT)
# Capacity: 3,5 t

# MAINTENANCE AND OPERATING INSTRUCTIONS



**JOB: 24-27012**
**(C09-0001)**

ROSETTI MARINO

REMAZEL ENGINEERING

| 3. IDENTIFICATION DATA | |
|---|---|
| CLIENT: | Rosetti Marino |
| ORDER Nº: | 1724001010 123A90A |
| LOCATION: | Hollandse Kust Noord offshore windfarm |
| PROJECT: | Baseload power hub (BLPH) |
| CRANE TYPE: | Davit |
| EQUIPMENT TAG: | X-99001 |
| SERIAL NUMBER: | 4366 |
| JOB: | 24-27012 |
| DELIVERY DATE | December 2024 |
| REVISION | "3" |

| | |
|---|---|
| MAKER: | **REMAZEL ENGINEERING SPA (Ex Concrane Srl)** |
| HEADQUARTERS: | Via Portici Manarini 41/A – 24060, Chiuduno (BG) - ITALY |
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| WEB: | www.remazel.com |

# 4. INTRODUCTION

This document is a manual of a product manufactured by **Remazel Group Company.**
If any questions arise, please contact your contact person at **Remazel Group Company**

***Important***: Immediately upon delivery, inspect the product for any damage which might have been caused during transportation.
Do NOT install or commission a damaged product!
Immediately report damage caused during transportation to **Remazel Group Company.**
After inspection, damaged items must be repaired or replaced, before installation and commissioning.
Assembly, installation, commissioning, tests and maintenance may only be executed by competent persons!
Every operator must have read the manual carefully before using the product.

***Factory warranty:*** The warranty of the product will become void if the instructions in this manual for installation, operation, inspection, maintenance etc. are not followed.

- Repairs and elimination of faults within the scope of the warranty may only be performed by competent persons after **Remazel Group Company** has been consulted and has given its approval.
- The warranty will become void if the product is modified or original spare parts are not used.
- After improper use the warranty will become void.

## 5. TABLE OF CONTENTS


3. IDENTIFICATION DATA ..... 1
4. INTRODUCTION ..... 1
5. TABLE OF CONTENTS ..... 2
6. SAFETY INSTRUCTIONS ..... 3
7. TRANSPORT AND STORAGE ..... 6
8. COMMISSIONING: ..... 7
9. OPERATION: ..... 9
10. MAINTENANCE: ..... 11
11. DRAWING LIST ..... 15
12. ELECTRIC DIAGRAMS ..... 15
13. MAIN FEATURES ..... 16
14. LOAD CHART DIAGRAM ..... 17
15. DESCRIPTION OF THE SUPPLY ..... 17
16. SPARE PARTS LIST ..... 22
17. ELECTRICAL PANEL - CRANE CONTROL PUSH-BUTTONS ..... 23
18. CRANE OPERATION ..... 26
19. LOCKING PIN DEVICE ..... 28
20. LOWERING EMERGENCY OPERATION ..... 29
21. TRAVERSING EMERGENCY OPERATION ..... 30
22. EMERGENCY BRAKE FOR HOISTING (SHOE BRAKE) ..... 31
23. WIRE ROPE ..... 32
24. ROPE INSPECTION AND REPLACEMENT CRITERIA ..... 34
25. OIL LUBRICATION ..... 39
26. GREASE LUBRICATION ..... 39
27. ELECTRICAL PANEL - INTERNAL VIEW ..... 40
28. ELECTRIC COMPONENTS LIST ..... 43
29. HOISTING LIMIT SWITCHes ..... 48
30. SETTING OF LIMIT SWITCH ON THE DRUM ..... 50
31. TROLLEY TRAVERSING LIMIT SWITCH ..... 52
32. OVERLOAD DEVICE SETUP ..... 53
33. AUDIBLE AND VISIBLE ALARM – ITEM C01-CHB-0014 ..... 55
34. CABLE CHAIN ..... 56
35. TROLLEY TRAVERSING GEARBOX ..... 58
36. HOISTING GEARBOX ..... 59
37. SLEWING GEARBOX ..... 60
38. GEARBOXES LUBRICATION ..... 61
39. GEARBOXES MAINTENANCE ..... 62
40. ELECTRIC MOTORS BRAKE ASSEMBLY – SIZES 90-100-132 ..... 63
41. ELECTRIC MOTORS SPARE PARTS LIST – SIZES 90-100 ..... 64
42. ELECTRIC MOTOR SPARE PARTS LIST – SIZES 132 ..... 65
43. ATTACHMENTS LIST ..... 66

# 6. SAFETY INSTRUCTIONS

## *Safety instructions:*

The products of REMAZEL Spa are equipped with safety devices, such as limit switches, overload protection, brakes, etc. however, danger which arises from improper use cannot be prevented with our safety devices. Please read the safety instructions of this manual carefully to work as safe as possible.

## *Safety precautions:*

The product can only be controlled by operators with the following qualifications:
- Complete knowledge of this manual.
- Reached the age of 18.
- Capable both physically and mentally.
- Have been instructed in operating and maintaining the product and have shown proof of their competence.
- May be expected to perform the duties assigned to them reliably and have awareness of the risks and dangers.

The following organizational measures shall be taken:
- A safe and clear working environment shall be ensured.
- The operating instructions must be stored properly and easily available for the operator.
- At regular intervals, check that work is being carried out in a safety-conscious manner.
- Observe the intervals specified for periodic maintenance and tests. File the reports in the product logbook.
- Safety regulation and accident prevention policy are implemented properly.
- Compliance with national regulations.

## *Purpose of use:*

- The product shall be used for vertical lifting and horizontal transport of loads within the limits of the technical specifications. The technical specifications are enclosed within this manual.
- The product may only be loaded up to the safe working load as specified in the technical specifications.
- Always lift and tension in a straight vertical line between load and crane.
- If the product is used for special applications beyond the technical specifications, the individual application must be assessed. In case of doubt contact Remazel Spa
- The product is only to be used in combination with monorails, gantries, suspensions end stops and supporting constructions that are properly designed and dimensioned.
- In case of tandem operation (operating 2 cranes simultaneously with one control) special instructions required of **Remazel Group Company.**
- Use in areas with potentially explosive atmospheres.
- Using the crane to transport people or animals is strictly forbidden.
- Using the crane with people walking / moving underneath the load.
- Exceeding the safe working load of the hoist under the specified conditions.
- Operation exceeding the allowed operating circumstances as mentioned in the technical specification (For example; reduced capacity at a certain sea state, ships angles, off and side lead angles and temperatures).
- Using a damaged crane or crane with defective parts.
- Pulling, dragging or towing loads.
- Lifting loads at an angle exceeding the specified limitations.
- Shorting or knotting of hoisting chain or wire rope.
- Removing the safety latch of the hook.
- Using the hoist with slack or twisted chain or wire rope.
- Touching the moving parts, such as chain, sprockets, wheels, etc.
- Tampering of the overload protection device.
- Using the emergency limit switch as an operational limit switch.
- If the crane forms a part of a machine or installation, customer is responsible that the product meets the specific regulations of the application.

## *Safe operation:*

- The operator is responsible for the safe operation, lifting and avoiding all possible risks involved at the working environment.
- The operator shall have complete knowledge of the manual and the operating instructions before starting to work with the product.
- The operator shall perform daily checks before operating.
- Never put yourself under a suspended load. Danger to life and limbs!
- Find out where the emergency stop button is before starting operation.
- Make sure before starting with lifting, that the safe working load will not be exceeded. See chapter “Safe Working Load”.
- If overload occurs always inspect the crane for any damage.
- Never put limbs between parts which might pinch or cut.
- Do not lift a load with loose parts which can fall down attached.
- Take notice of the relevant instructions when attaching loads.
- Operate from a place with clear sight en overview.
- Never stand between the load and wall or construction.
- Start lifting carefully when picking up the load.
- When lifting and setting down loads, ensure that they are in a stable position in order to avoid accidents.
- Never try to solve a malfunction while the load is suspended.
- Never use bended, distorted or broken load hooks.
- Never attempt to straighten the hook when it is distorted.
- Never apply a heat treatment to the hook.
- Locking the buttons of the control device is forbidden.
- Prevent load shocks on the crane during pick up of the load.
- When the power is off, secure the load.
- Do not kink or crush power and control cabling.
- Never expose power and control cables to tensile stress.
- Never try to join or weld hoist chains or wire rope.
- Never touch metal components that are colder than 0°C or hotter than 55°C without protective gloves.
- Do not use the emergency limit switch as an operational limit switch.
- Immediately report damage and defects of the product to the responsible person. Examples of damage or defects are abnormal noises, impaired braking function, deformations, etc… Do not use the product until the faults have been eliminated.
- Do not remove information plates from the product. Replace illegible or damaged plates.
- It is strictly forbidden to move the hoist by pulling the chain, wire rope, hook block or by other means.
- The crane shall be tested and inspected by a relevant authority before commissioning.

### *Proper load attachment / suspension:*

- Use only tested and certified slings to attach the load.
- Never use the hoist when the load chain or wire rope is damaged.
- Ensure a load is always suspended above the centre of gravity.
- The load must always be suspended from the base of the hook. The tip of the hook must not be subjected to load.
- Removing the safety latch from suspension and load hooks is not permitted.
- When one single load is suspended into two cranes during tandem operation, special instructions required of **Remazel Group Company.**

### *Electrical equipment:*

Products can be supplied with different electrical control systems. The power supply is a dangerous electrical voltage. During assembly, installation, maintenance and repair, the next points shall be observed:

- Disconnect the main power of the electrical installation before opening covers marked with the “Electrical voltage warning” symbol. Only experienced electricians or competent persons may open covers marked with this symbol.
- Check wires for damage and exposed blank cores.

### *Installation, commissioning, maintenance and repairs:*

- Only competent persons may perform installation, commissioning, maintenance and repairs.
- Only original spare parts may be used for repairs.
- We recommend having installation and commissioning carried out by personnel engaged by the manufacturer.
- Do not carry out any alterations or modifications.
- Any additional outfitting must be approved by the manufacturer.
- Dismantled guards and safety devices must be properly re-installed.
- The system shall always be tested before putting it back into operation.

### *Periodic inspection and tests:*

- A competent person must test the product and supporting structures once a year. It may be necessary to carry out tests more often if the operating conditions demand it.
- The results of the tests must be recorded and filed in the log book.

### *Safe Working Load*

The design is based on the safe working load specified in the technical specification of the crane. It is the operator’s responsibility not to go beyond what is permitted.

- The safe working load indicated with S.W.L describes what load is permitted and can be found on the nameplate. Below an illustration of a nameplate. (The nameplate’s image is only an example.)



# 7. TRANSPORT AND STORAGE

### *Transport:*

The products will be delivered as complete construction with or without custom built support frames. The products must be fixated properly for transportation.

### *Storage:*

When the product is going to be stored, pay attention to the following points:

- The surroundings should be clean, dry and conditioned and free from excessive vibrations.
- Temperature not colder than 0°C or hotter than 55°C.
- Store the product always straight up and secure against toppling.
- Observe environmental protection laws for storage (do not allow oil etc. to leak).
- If possible rotate all bearings and shafts every six months.
- When storing for more than six months replace the oil breather plugs with blind plugs in every gearbox (only for slewing gearbox). Check the thread and length by dismantling the breather plug and obtain a blind cap with the correct thread and length.
- **Attention!** Put the breather plugs back in place when the products will be installed.
- When the product will be stored for more than six months, fully fill up the gearboxes with oil and generously grease the sealings, shafts and bearings.
- **Attention!** Drain the oil to the normal level before putting the product in service.
- If possible rotate all shafts and bearings every 6 months.
- In case of a spare product in storage it is recommend switching the operating product with the spare product every 2 years.

### *Sea fastening:*

Products installed on ships shall be sea fastened when necessary. Sea fastening is fixating the product, so the product cannot move. This shall prevent damage. The owner is responsible for proper sea fastening of the crane.
The following measures shall be taken:

- Fixate the crane and its components by lashing or other means.
- Make sure the hoist trolley unit is fixated.
- Be sure the trolley is not able to travel on the girder.
- Lift the hook block to its highest limit.
- If present, the chain should be stored in the chain box and the chain box should be fixated.

# 8. COMMISSIONING:

After installation, it is important to make sure that the complete system is functioning properly by following the next tests and checks in the correct order. The tests and checks before commissioning must also be executed when the system has been stored or has been out of operation for a longer period of time.

Warning! Installation may only be carried out by competent persons!

## *Checks before commissioning*

1. Visual check that installation is performed correctly for:
    a. Crane (winch or other types of lifting machines)
    b. Hoist and, if installed, the trolley
    c. Power supply
2. Check tightening of all bolted connections. For reference see chapter “Tightening torques”.
3. Check that all gearboxes are equipped with proper breather plugs. (Especially when taking out of storage).
4. Check the oil level of the gearboxes and bring, if needed, to a normal level.
5. Check the oil level in the tank of the electro-hydraulic unit (only in the case of an electro-hydraulic crane), and fill it if necessary.
6. Check that there are no oil spills and therefore any breakages in the hydraulic parts (pipes, valves, etc.), (only in the case of electro-hydraulic cranes).
7. Check load chain or wire rope on the following criteria:
    a. Not twisted
    b. Lubricated and clean
8. Check presence of all limit switches.
9. Check if all electrical wiring is properly connected according the electrical diagram. See Appendix “Electrical drw. “1724001010-MAC-DG-00012”
10. Check strain relieving elements of the control and power cables for damage.
11. Check the control device housing for damage.
12. Visually check if the warning lights and junction boxes are not damaged.
13. Check if the end stops are properly mounted onto the gantry.
14. Visually check if runway is clean and without obstacles.
15. Visually check if tooth rack and pinions are clean and lubricated.

## *Test and checks during commissioning*

- Always ensure that there is enough space for travelling and hoisting without the risk of collision or direct activation of the limit switches.
- Ensure the emergency stop is functioning correctly immediately after switching on the installation. See chapter “Operating the control device” section “Emergency stop”.
- Always push the button directional movement up for hoisting first, hook must go upwards.
- The directional movements of the system must correspond with the control device.
- Check all movements. All movements must be smoothly and without any abnormal noises or vibrations.
- If tandem operation is applicable, switching over between individual control and tandem control must be tested.
  **Caution! Tandem operation must be understood well by the operator, as this is a special function.**
- If applicable, an emergency control pendant must be checked the same way as the standard control device.
- Check the braking of all movements.
- Test the functioning of all limit switches.
- Register the results if necessary.

### *Load test*

The crane should be function- and load tested according to the directives given in “DNV-ST-0378 rules and standards”.

**Warning!** Function and load tests may only be carried out by competent and qualified persons.
**Attention!**

- Suitable test load shall be used (life load).
- Both static and dynamic load tests must be carried out.
- Use a calibrated load cell between load and hoist.

### Dynamic test with Class

For dynamic testing the overload device must be bypassed.

**Danger!** The overload device may only be bypassed during dynamic load testing and shall be reinstalled properly afterwards. Only competent persons may bypass the overload protection.

The crane shall be tested with a suspended load. The load shall be lifted 100 mm to 200 mm above the ground at slow speed. The following test loads shall be applied for the dynamic test:

| S.W.L. of unit, in metric ton | Test Load |
|---|---|
| Up to 20 t | 125% S.W.L. |
| Exceeding 20 t but not exceeding 50 t | S.W.L. + 5 ton |
| Exceeding 50 t | 110% S.W.L. |

The test load shall be suspended for a period necessary to make the observations and measurements and tests are considered successful if no fractures, permanent deformations or damages affecting the function or safety of the product are visible and if no connections have loosened or show signs or damage.

### Overload test

After testing the crane with the Class, the Load Limiter has to be set in order to stop the hoisting movement with a load more than the 110 % S.W.L.
The tests shall include repeated starting and stopping of each motion, including all combined movements as provided by the intended use over the whole sequence and range of the movements.

During these tests the product shall be continuously monitored to check for:

- Overload protection shut down.
- Smooth operation of the product.
- Effective operation of the braking systems.
- Effectiveness and accuracy of limiting and indicating devices.

The overload tests are considered successful if the involved components have fulfilled their function, the subsequent examination does not reveal any damage to the drive or supporting structure and if no connection had loosened or has been damaged.

- Start lifting and pre stressing the chain or wire rope at low speed.
- Use the maximum speed that the control system allows in this situation.
- Run the hoist up to the triggering point of the overload protection device.
- Test is considered satisfactory when the triggering point is correct.

# 9. OPERATION:

***Duties of the operator***

Personal protective equipment shall be provided by the operator or owner and shall be used where necessary, for example:

- Safety boots.
- Head protection.
- Protective gloves.
- Eye protection.
- Ear protection.
- Closely fitting clothes (danger of clothing being drawn into equipment).
- When operating a hoist or standing close to it there is a danger of fingers, clothing, jewelry, etc. being drawn into equipment.



***Working environment***

- The operator must have excellent sight.
- Movements of the load in all directions must be clearly visible.
- Clean up disturbing objects.
- The operator must not stand in the hazard area.

***Instructions for safe operation***

The following guidelines are for working with the hoist trolley unit:

- Before operation, the operator must carefully observe:
    a. If there is any visible damage, functionality of the brakes and limit switches.
    b. The load to be lifted.
    c. The working environment, such as people, obstacles, the moving directions of the load and sufficient workspace.
    d. Safety instructions of the manual.

- The operator should always have a clear sight of the working environment, workload and lifting equipment.
- When it is not possible for the operator to observe the load and/or lifting equipment, a signaler should give directions to the operator. The operator must always follow the directions of the signaler.
- If another person than the operator attaches the load, clear signals must be given to the operator.
- Stop operating if any failure or defect is noticed.
- Do not exceed the safe working load. See chapter “Safe Working Load”.
- Never move suspended load above people.
- Never leave the hoist with suspended load unattended.
- Always keep the control device in easy reach.
- Do not move the load in opposite direction until the initial movement has completely stopped.
- Do not pull jammed loads.

## *Operating the control device*

**This chapter gives a short description of the control device.**

**Emergency stop**

**Danger!** In case of an emergency situation, immediately press the red emergency stop button on the bottom of the control device. All movements will stop immediately and all functions will become inoperative. This button must be freely accessible at all times.

**Danger!** After using the emergency stop, a competent person must eliminate the fault which led to an emergency situation. After all faults are eliminated and when there is no danger, the operator may restart the crane.

When the emergency stop is used, it can be released by turning in the direction shown on top of the button.

**Warning!** Lethal voltage remains present in the switch panel after the emergency stop is used.

The crane and hoist trolley unit may only be operated by competent persons. The operating instructions and button layout of the control device must be available near the equipment and accessible for the operator of the crane.

- Read chapter “Safety instructions”
- Read chapter “Duties of the operator” for use of personal protective equipment.
- See column “Before use” of table “Maintenance schedule”.

# 10. MAINTENANCE:

In this chapter the maintenance, lubrication and torques are given.

- **Warning!** Maintenance, inspection and damage assessment may only be executed by competent maintenance personnel.
- Malfunctions have to be reported immediately, in writing, to the owner, who has to initiate repair work, which is to be carried out by a trained specialist.
- All maintenance, measurements, shortcomings, damages and repairs must be written in a logbook
- **Warning!** Repair work may only be performed after the equipment is unloaded and the main power supply is turned off by the main power switch.
- **Warning!** Parts must always be replaced when damage occurs that directly or indirectly endangers the safety or operation of the hoist.
- Shorten the periods between maintenance works in harsh operating conditions. For example multi-shift operation, high number of switch actuation, poor environmental conditions.

### *Daily and monthly maintenance schedule*

The following regular maintenance intervals are for reference. Regular maintenance work must be adapted to the service conditions if the product is used in higher than normal service conditions.

| Maintenance and checks | Daily / Before use | Monthly |
|---|---|---|
| Visual check of wire rope is clean, well lubricated and not twisted | x | |
| Visual check of hook block and hook safety latch | x | |
| Check operation of emergency stop | x | |
| Check operation of hoisting and lowering limit switches | x | |
| Check operation of braking | x | |
| Check operation of all limit switches | x | |
| Check for damage to electrical cables and control boxes | | x |
| Check for oil leaks from gearboxes | x | |

### *Mid-long term maintenance schedule*

| 1ST MAINTENANCE (6 MONTHS) | PERSONNEL (n°) | EXPECTED TIME (hours) |
|---|---|---|
| Check operation of all limit switches | 1 | 8 |
| Check operation of emergency stop | | |
| Check pinion for wear | | |
| Check wire rope for wear | | |
| Check hook block for wear | | |
| Grease rack and pinions | | |
| Clean and lubricate wire rope | | |
| Check for oil leaks from gearboxes | | |

| 2ND MAINTENANCE (12 MONTHS) | PERSONNEL (n°) | EXPECTED TIME (hours) |
|---|---|---|
| Check operation of all limit switches | 2 | 8 |
| Check operation of emergency stop | | |
| Check pinion for wear | | |
| Check wire rope for wear | | |
| Check hook block for wear | | |
| Grease rack and pinions | | |
| Clean and lubricate wire rope | | |
| Check for oil leaks from gearboxes | | |
| Change gearboxes oil | | |
| Grease slewing bearing | | |
| Check terminals tightening | | |
| Check UPS battery | | |
| Main components tightening torques check | | |

| 3RD MAINTENANCE (18 MONTHS) | PERSONNEL (n°) | EXPECTED TIME (hours) |
|---|---|---|
| Check operation of all limit switches | 1 | 8 |
| Check operation of emergency stop | | |
| Check pinion for wear | | |
| Check wire rope for wear | | |
| Check hook block for wear | | |
| Grease rack and pinions | | |
| Clean and lubricate wire rope | | |
| Check for oil leaks from gearboxes | | |

| 4TH MAINTENANCE (24 MONTHS) | PERSONNEL (n°) | EXPECTED TIME (hours) |
|---|---|---|
| Check operation of all limit switches | 2 | 16 |
| Check operation of emergency stop | | |
| Check pinion for wear | | |
| Check wire rope for wear | | |
| Check hook block for wear | | |
| Grease rack and pinions | | |
| Clean and lubricate wire rope | | |
| Check for oil leaks from gearboxes | | |
| Change gearboxes oil | | |
| Grease slewing bearing | | |
| Check of calibration of load cell | | |
| Check terminals tightening | | |
| Electric insulation test | | |
| Change UPS battery | | |
| Main components tightening torques check | | |
| Hoisting brake test | | |
| Rocking test | | |

## *TIGHTENING TORQUES*

Tightening torques of fasteners in components such as motors gearboxes etc. should be checked according to the specific instruction manual of the component. Other fasteners are according to below tables.
All bolts are of 8.8 quality unless otherwise noted.

| BOLTS PRELOAD - Class 8.8 | | | |
|---|---|---|---|
| **Dimension** | **Axial preload [kN]** | **Lubricated Torque STD / HV300 Whaser [Nm]** | **Lubricated Torque Heico Lock Whaser or Dry Torque STD/HV300 [Nm]** |
| **M 8** | 18 | 20 | 24 |
| **M 10** | 29 | 40 | 47 |
| **M 12** | 43 | 68 | 81 |
| **M 16** | 80 | 165 | 200 |
| **M 20** | 124 | 323 | 392 |
| **M 22** | 154 | 438 | 534 |
| **M 24** | 179 | 557 | 675 |
| **M 27** | 233 | 812 | 993 |
| **M 30** | 285 | 1.110 | 1.352 |
| **M 33** | 353 | 1.489 | 1.827 |
| **M 36** | 415 | 1.922 | 2.350 |
| **M 39** | 496 | 2.470 | 3.038 |
| **M 42** | 569 | 3.060 | 3.751 |
| **M 45** | 666 | 3.812 | 4.698 |
| **M 48** | 748 | 4.603 | 5.655 |
| **M 52** | 896 | 5.896 | 7.282 |
| **M 56** | 1.033 | 7.349 | 9.064 |

| BOLTS PRELOAD - Class 10.9 | | | |
|---|---|---|---|
| **Dimension** | **Axial preload [kN]** | **Lubricated Torque STD / HV300 Whaser [Nm]** | **Lubricated Torque Heico Lock Whaser or Dry Torque STD/HV300 [Nm]** |
| **M 8** | 26 | 28 | 34 |
| **M 10** | 41 | 56 | 66 |
| **M 12** | 60 | 96 | 115 |
| **M 16** | 112 | 232 | 282 |
| **M 20** | 175 | 455 | 551 |
| **M 22** | 216 | 615 | 751 |
| **M 24** | 252 | 784 | 949 |
| **M 27** | 328 | 1.142 | 1.396 |
| **M 30** | 401 | 1.561 | 1.902 |
| **M 33** | 496 | 2.094 | 2.569 |
| **M 36** | 584 | 2.703 | 3.305 |
| **M 39** | 698 | 3.473 | 4.272 |
| **M 42** | 801 | 4.303 | 5.275 |
| **M 45** | 937 | 5.361 | 6.606 |
| **M 48** | 1.051 | 6.473 | 7.952 |
| **M 52** | 1.260 | 8.291 | 10.241 |
| **M 56** | 1.453 | 10.334 | 12.747 |

***Taking out from operation***

Taking the crane out of service for a period longer than 6 month requires the following steps to keep the crane in good condition:

- Fill all gearboxes generously with oil and let the motors run briefly
- Let the motors run briefly with a monthly interval to keep them in good shape.
- Turn off the power supply.
- **Warning!** If the crane contains switch panel and motor heaters, keep the power supply for heating switched on otherwise turn the power supply off.
- Coat all wheels with a light film of oil.
- Make sure the load chain or wire rope is clean and well lubricated.
- Perform routine maintenance before taking the crane out of operation. See chapter “Maintenance schedule”.
- Finally read chapter “Storage”.

When the crane, hoist trolley unit or its components have reached their end of service live, they shall be replaced or taken out of service.

## 11. DRAWING LIST

| *DWG Number* | *Title* |
|---|---|
| 1724001010-MAC-DA-00009 – Rev.3 | Crane general arrangement assembly |
| 1724001010-MAC-DA-00010 – Rev.1 | Pedestal adaptor |
| C09-0001-A0002 Rev.A | Mechanical assembly |
| C09-0001-A0003 Rev.A | Boom assembly |
| C09-0001-A0004 Rev.A | Winch assembly |
| C09-0001-A0005 Rev.A | Trolley traversing assembly |
| C09-0001-A0006 Rev.A | Fixed column assembly |
| C09-0001-A0007 Rev.A | Hook assembly |
| C09-0001-A0008 Rev.A | Wheel assembly Ø167 |
| C09-0001-A0009 Rev.A | Ladder assembly |
| C09-0001-A0010 Rev.A | Aft gangway assembly |
| C09-0001-A0011 Rev.A | Pulley assembly Øc209 |
| C09-0001-A0012 Rev.A | Rope presser assembly |
| C09-0001-A0013 Rev.A | Pulley assembly Øc285 |
| C09-0001-A0014 Rev.A | Locking pin assembly |
| C09-0001-A0015 Rev.A | Fore gangway assembly |
| C09-0001-A0016 Rev.A | Electrical panel support assembly |

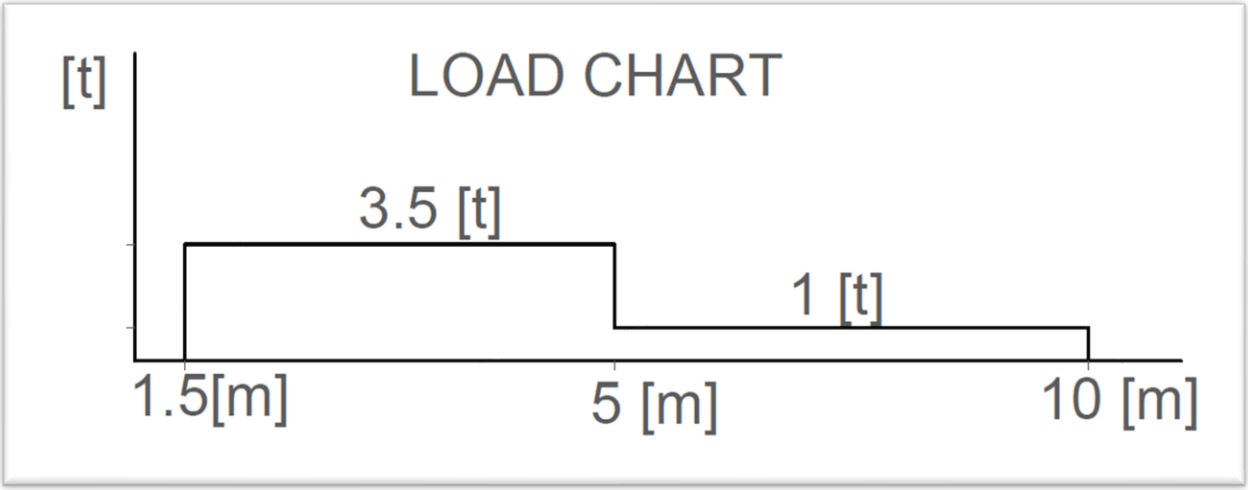
## 12. ELECTRIC DIAGRAMS

| *DWG Number* | *Title* |
|---|---|
| 24-27012-BD-001 – Rev.0 | Blocks diagrams |
| 1724001010-MAC-DG-00012 – Rev.1 | Electric wiring diagrams |

## 13. MAIN FEATURES

| GENERAL DATA | | |
|---|---|---|
| **MODEL** | | **ELECTRIC JIB CRANE** |
| **TYPE** | | **JBO** |
| **GENERAL ASSEMBLY** | Drw. | 1724001010-MAC-DA-00009 |
| **DESIGN CRITERIA – AND APPLICABLE DOCUMENTS** | | |
| Design class | | A4/M4 |
| Operating life | Years | 2 |
| Zone Area | | Safe area |
| Wave height | m | 1.5 |
| Working Temperature | °[C] | -9/45° [C] |
| **TECHNICAL DATA** | | |
| **Hoisting** | | |
| Capacity | SWL | 3.5t@5m/ 1t @10m |
| Minimum Outreach | m | 1.5 |
| Maximum Outreach | m | 5/10 |
| Lifting Speed (Min/Max) | m/min | 3.75/15 |
| Hook stroke | m | 40 |
| Personnel handling | | NO |
| **Travelling** | | |
| Travelling stroke | m | 1.5 - 10 |
| Radial speed | min | 2/8[min] |
| **Slewing** | | |
| Max slewing speed (Min/Max) | rpm | 0.25/0.5 |
| Slewing range angle | degrees | 0-180° |
| **Weights (preliminary)** | | |
| Total weight | Kg | **~ 6000** |
| **Voltage rating and frequency** | | |
| Current for motor power available | | 400 V, 50Hz, 3ph |
| **Power pack** | | |
| Power installed | | 20 kW |

## 14. LOAD CHART DIAGRAM



# 15. DESCRIPTION OF THE SUPPLY

***Certification And Atex***

Cranes are intended for installation in safe area & C E certificate.

***Pedestal Adapter***

It is made up of welded plates and lets the crane to be directly welded or bolted to the pedestal supplied by shipyard.

The upper part of the basement is flanged, machined, and holed for the fixing of the swing bearing.

The cross section is circular, and his bottom part will be flanged and suitable for bolting to the platform structure. A manhole is fitted for inspection or maintenance.

In the pedestal adapter are installed the JB for the incoming line and data exchange (where required) and the hydraulic and electric swivel.

The ladder and platform in upper side included.

***Slewing Column***

Made up of welded plates. The bottom part is machined and holed, to be coupled to the swing bearing. Are fitted the swing mechanism and the main panels and junction boxes.

Ladders and gangways allow an easy access to all points that require maintenance.

***Rotation unit***

The rotation unit will consist of an electric motor with negative brake, connected to a gearbox and pinion. The system will allow the rotation of the arm and therefore the rotation of the crane through pinion-slew gear.
The crane will be able to rotate of limited 360 °.
Appropriate electromechanical limit switches will be provided to control the limited rotation with a zero-point defined case by case.

***Slew Bearing***

The rotation of the crane arm will be guaranteed by the slew bearing. The inner ring will be fixed on the column, and the outer ring at the base of the crane arm. The inner ring will be equipped with teeth to ensure rotation by means of pinion/crown drive.

***Boom***

It is composed by high tensile welded plates, and it is welded on the slewing column.

At the end of the boom is fitted the sheave for the hoist.

On the bottom will be mounted the travelling trolley for hoisting and near the slewing column is fitted the hoisting load cell

***Main Hoist Winch***

The winch will be installed or on the top of the slewing column.

The winch is composed of:

- One electric axial motor, constant displacement type.
- A brake, mounted between motor and reduction gear, which blocks the winch in case of failure or, anyhow, at the end of the operation.
- A gearbox, fitted in the drum, working in an oil-bath.
- A drum, made up of steel tube, turned and grooved, suitable to receive, on one or more layers, the requested length of rope plus 3 full safety wraps; the pitch diameter is not less than 18 times the nominal diameter of the rope. The maximum number or wire rope layers on the drum is 5.
- A roller, loaded by springs, to prevent the wire rope from becoming slack when the load block is empty, or the hoist drum is unwinding at its maximum speed.
- Galvanized wire rope extra-flexible, rotation-resistant type.
- No bolted connections are foreseen for the construction of winch drum or main shafts.

***Travelling trolley***

The trolley structure in made of welded plates, machined for the installation of:

- Hoisting sheaves.
- Traversing mechanism

The trolley traversing mechanism (travelling system on crane boom) consists of:

- One electric motor completes of an electro-magnetic self-closing disc brake mounted on the motor, which blocks the trolley in case of failure or, anyhow, at the end of the operation.
- a gearbox, working in an oil-bath.
- wheels, flanged design, running on the bottom flange of the boom.

***Wire Rope***

It is composed of hot dip galvanized steel, extra-flexible, rotation-resistant type, safety factor according to applicable rules. Thimble hot dip galvanized.

***Sheaves***

All sheaves, made of steel or plastic, have pitch diameter not less 20 times the nominal diameter of the rope used. The sheaves are mounted on waterproof roller bearings.

Sheaves will be steel made welded or plastic material.

***Hoisting Block***

The hoisting block of hoist is composed of a counterweight, which contains an axial ball bearing, fitted in a waterproof housing; the counter-weight is connected to the rope by means of a shackle; the axle of the swivel is connected to a cargo DIN 15402 hook. The hook rotates on an axial thrust bearing.

The swivels are tested at 2xSWL. A positive locking means is foreseen for hook intended for personnel lifting. A double mark indicates the SWL for both personnel and Non personnel lifting operation.

***Slewing Mechanism***

A swing mechanism is installed inside the crane; it is composed of:

- One electric motor.
- One electric disc brake (stationary brake), mounted between motor and reduction gear, which blocks the crane rotation in case of failure or, anyhow, at the end of the operation.
- One planetary reduction gear.
- One pinion, made up of high tensile steel, mounted on the slow axis of the reduction gear; this pinion works on the toothed gear of the swing bearing.

***Lubrication***

All mechanisms that require grease lubrication are equipped with grease nipples. The first lubrication will be performed in our Workshop; reduction gears will be sent full of oil.

***Electrical Motors***

Motors will be in IP56 protection F as minimum, equipped with thermistors and heaters.

***Main Electrical Panels***

All panels installed on the cranes will be in aluminium marine grade painted.

***Control***

The crane is commanded by means of a push button installed on the control cabin.

Following reported main controls:

- Emergency push-button
- Alarm reset button.
- ON/OFF button
- Buttons for the hosting, slewing, and travelling.

***Safety Devices***

The following safety devices are installed on the crane:

- Hoisting limit switch (cam type), mounted on the drum axis, to limit the run of the hook when lifting (hook close to the boom head) or lowering (only 3 wraps of rope on the drum).
- overload device (load cell).
- Emergency push button/lever on column.
- Anti-two block.

***Overload Device***

The purpose of the overload device is:

- to stop the hoisting winch when the lifted load is over than this one allowed by the loading diagram.
- MOPS (Mean Operating Pressure System), AOPS (Automatic Overload Protection System), are incorporated to ensure adherence to safety regulations and prevent overloading.

***Emergency Operation***

In case of failure, it is possible to perform the following emergency operations, at a very low speed Lowering of the hook.

The emergency operation is done by means of a mechanical lever on the brakes (only to open brakes for manual lowering of the load).

***Anti spalking***

No Sparkling: Chain, Trolley (wheel only), Pulley, Hook.

***Painting and environmental protection***

Structural steel of equipment will be painted according to the following specification:

| **Surface preparation** | |
|---|---|
| Standard | SSPC-SP1 + ISO 8501-1 |
| Steel imperfection | ISO 8501-3 – Grade P1 |
| Blasting degrees | ISO 8501-1 SA 2.5 |
| Roughness | ISO 8503 Grade Medium G |
| **Painting** | |
| **Product** | **DFT µm** |
| HB Epoxy Surface Tolerant | 150 |
| HB Epoxy Polyamide Cured | 150 |
| Top Coat Polyurethane | 50 |
| **TOTAL** | **350** |

Notes:

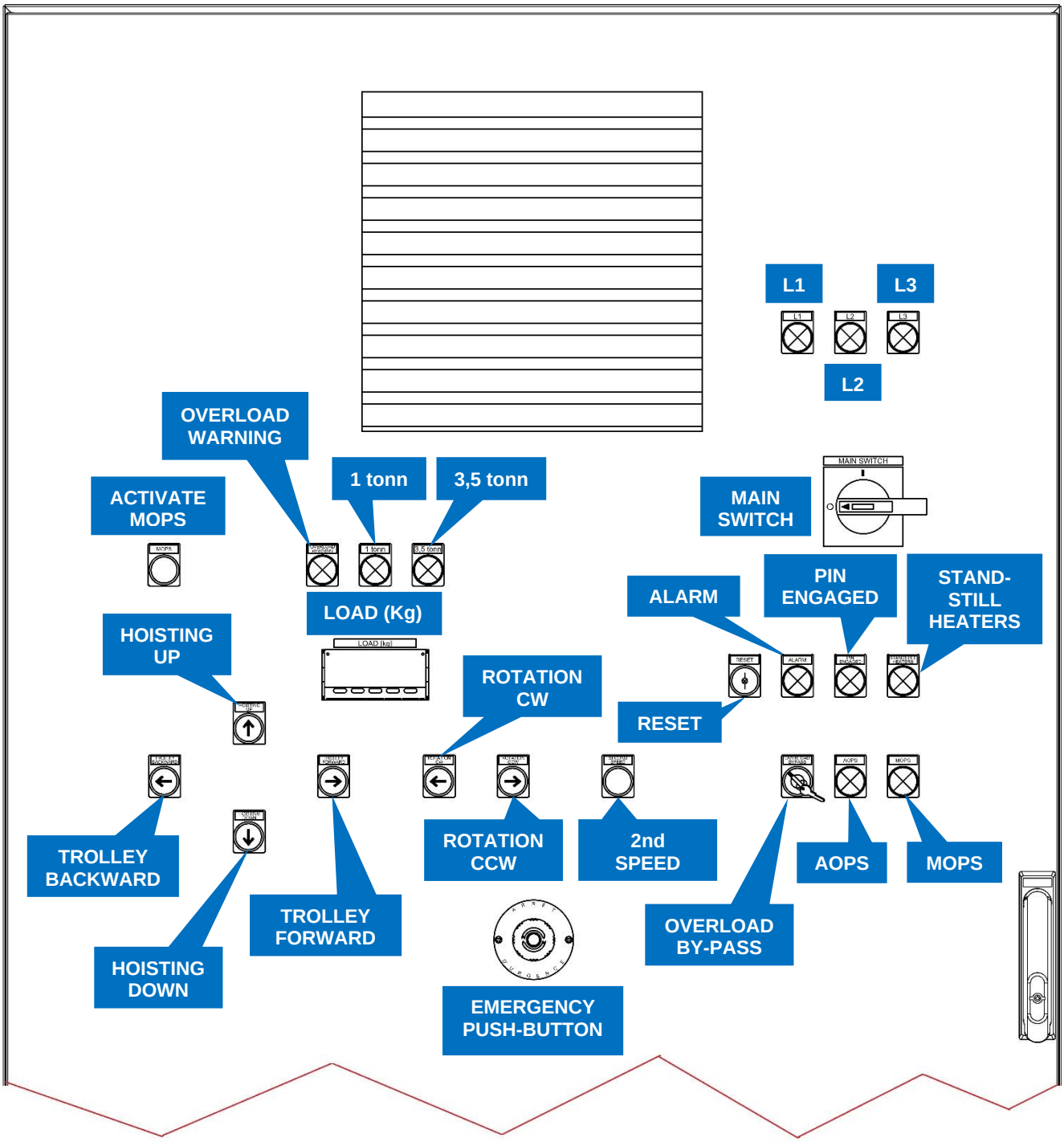
- Painting procedure applicable to structural steel.
- Other commercial items: painting suitable for the installation area, according to manufacturer's standard.

# 16. SPARE PARTS LIST

The following spare parts, contained in an inventoried box, are supplied for the set of 1 cranes:

| Item | ID-Code | Q.ty | Units | Item Description | Description Additional | Item n° |
|---|---|---|---|---|---|---|
| 1 | 011-0014-C1311 | 2 | Each | Fuse | 10,3x38 CH10 1A gG | 50Q2 |
| 2 | 011-0014-C1315 | 6 | Each | Fuse | 10,3x38 CH10 2A gG | 32Q1 |
| 3 | 011-0014-C0643 | 1 | Each | Fuse | 10,3x38 CH10 6A gG | 40Q2 |
| 4 | 011-0014-C0641 | 1 | Each | Fuse | 10,3x38 CH10 10A gG | 34Q1 |
| 5 | 011-0014-C2598 | 2 | Each | Fuse | 22x58, CH22, 50A, aM | 50Q1 |
| 6 | 011-0014-C1527 | 1 | Each | Contactor | Contactor TeSys LC1D - 3 poles - AC3 440V 9 A - 24 V CC | 50KM1 |
| 7 | 011-0014-C2604 | 1 | Each | Contactor | Contactor TeSys LC1D - 4 poles - AC1 440V 32 A- 24 V CC | KM11 |
| 8 | 011-0014-C2605 | 1 | Each | Contactor | Contactor aux TeSys CA3SK - 10 A - 24 V CC | 74KM1 |
| 9 | 011-0014-C1828 | 1 | Each | Contactor | Contactor TeSys LC1D - 3 poles - AC3 440V 9 A - 230 V AC | 84KM1 |
| 10 | 011-0014-C2599 | 2 | Each | Relay | PLC-INTERFACE, with PLC-BPT.../21 with connection Push-in and relay, mounting on NS 35/7,5, 1 contact, input voltage 24 V DC | 32KA1 |
| 11 | 011-0015-C0034 | 1 | Each | Load cell amplifier | Load cell amplifier, output 4-20mA | 80E1 |
| 12 | 007-0003-C0579 | 1 | m | Cable chain | Dim. 100mm, pitch: 75, curvature radius: 75mm, pitch n°: 72 | N.A. |
| 13 | 011-0008-C2429 | 1 | Each | Limit switch | Proximity switch, M12, 4 mm, DC, 3 wires, PNP NA, IO-Link COM3, cable 5 m | LS0024-0025 |
| 14 | 011-0008-C2430 | 1 | Each | Limit switch | Proximity switch, M12, 4 mm, DC, 3 wires, PNP NA, IO-Link COM3, cable 15 m | LS0034-0035 |
| 15 | 006-0003-C0210 | 3 | Each | Cylindrical roller bearing | Wheel roller bearing NNF 5008 ADA-2LSV (40x68x38) | N.A. |
| 16 | 006-0003-C0849 | 3 | Each | Cylindrical roller bearing | Pulley roller bearingNNF 5012 ADB-2LSV (60x95x46) | N.A. |
| 17 | 007-0006-C1220 | 1 | Each | Electric motor | Slewing motor MGM BAHK2 100 LB4 Enhanced Power (E.P.) | M2 |
| 18 | 007-0006-C1221 | 1 | Each | Electric motor | Hoisting motor MGM BAHK2 132 MC4 Enhanced Power (E.P.) | M1 |
| 19 | 007-0006-C1222 | 1 | Each | Electric motor | Traversing motor MGM BAHK2 90 SA4 Enhanced Power (E.P.) | M3 |

# 17. ELECTRICAL PANEL - CRANE CONTROL PUSH-BUTTONS



**L1, L2, L3**
The lights, independent by PLC, are on when the electrical panel is powered up.

**Standstill heaters**
The light signals that the heaters of the motors are on. They turn off when the motors are running.

**Alarm**
The light signals an alarm condition.

**Pin Engaged**
The light signals the state of the block pin. When it's ON, the pin is engaged and the crane can't rotate.

**Reset**
The reset lamp is:

- **ON** when the safety ESD is active.
- **FLASH** when the safety condition is not active, but a reset action is required.
- **OFF** when the system is ready to work.

When the light is flashing, the button must be pressed for reset the system.

**MOPS**
The light is on when the manual overload protection system (MOPS) is active

**AOPS**
The light is on when the automatic overload protection system (AOPS) is active

**Overload Bypass**
The key selector permits to bypass the overload alarm. The command must be maintained by the operator.

**Overload Warning**
The light signals when the load is over the 90% of the SWL.

**1 ton**
The light is ON when the SWL is 1 ton (over 5 meters of trolley run)

**3,5 ton**
The light is ON when the SWL is 3,5 ton (within 5 meters of trolley run)

**MOPS**
The push button actives the MOPS. The command is full electric, the PLC receives only the feedback of the activation of the command.

**LOAD**
The display visualizes the weight of the load in real time. The data is expressed in kg.

**Hoisting Up**
The push button commands the hoisting up of the winch. The command must be maintained by the operator.

**Hoisting Down**
The push button commands the hoisting down of the winch. The command must be maintained by the operator.

**Trolley backward**
The push button commands the movement backward of the trolley. The command must be maintained by the operator.

**Trolley forward**
The push button commands the movement forward of the trolley. The command must be maintained by the operator.

**Rotation CW**
The push button commands the movement of clockwise rotation. The command must be maintained by the operator.

**Rotation CCW**
The push button commands the movement of counterclockwise rotation. The command must be maintained by the operator.

**Second Speed**
The push button active the second speed of the selected movement. The command must be maintained by the operator.

# 18. CRANE OPERATION

**Foreword:**

The Main switch of the crane should always remain in the ON (I) position, even when the crane is not operational. This allows the engine heaters to always remain active, to avoid condensation, humidity or anything else that could compromise their functioning.

If the main switch must be turned OFF (O) position for more than a week, or if, upstream, the power supply reaching the crane electrical panel from the platform is deactivated, we recommend placing silica gel bags inside the crane electrical panel and inside the motor terminal blocks to avoid condensation, humidity, etc.

Remember, before starting operations with the crane, to unlock the locking pin (see following pages for details on the locking pin).

## *STARTING OF THE CRANE*

Perform as follows (for reference, see previous page):

- switch ON (I position) the main switch fitted on the electrical panel (although normally, as explained before, it should already be in the ON position);
- the Light L1 – L2 – L3, are on when the electrical panel is powered up.
- unlock the Emergency push-button, if it is locked;
- the Reset button/light, after unlocking the emergency button, will be flashing.
  Then press the button Reset to activate the crane functions. The flashing light will turn off.
- if the Alarm light is on it will not be possible to operate the crane. Once the (electrical) problem has been solved, the light will go off.
- if the locking pin is still inserted, a PIN ENGAGED light on will indicate that we are in this condition and it will not be possible to continue (the crane controls are electrically inhibited). Then unlock the pin. The light will turn off and you will be able to continue with the controls;
- the Standstill Heaters light turns off when the electric motors are activated (when we are using the crane movement controls). If the light turns off while the crane is moving, it may mean that the Heaters are faulty (or the bulb is broken). Check before proceeding.
- the Overload Warning light turns on when the lifted load is greater than 90% of the maximum load.
- The 1 tonn light turn on when we are lifting a load of maximum 1 ton;
- The 3,5 tonn light turn on when we are lifting a load of maximum 3,5 ton;

  As shown by the Load Chart diagram (see previous pages) the crane has a capacity of 3.5 t with up to 5m Outreach. The crane's capacity, from 5 to 10m Outreach, is 1t.
  If the load lifted is 3.5t the trolley will automatically stop (via PLC) at 5m Outreach;

- move the hook Up or Down, pushing the buttons Hoisting UP or Hoisting DOWN;
- move the trolley Backward or Forward, pushing the buttons Trolley Backward or Trolley Forward;
- rotate the crane CW (Clockwise) or CCW (Counterclowise) pushing the buttons Rotation CW or Rotation CCW;

  All crane movement buttons, if released, instantly interrupt the manoeuvre, so they must be kept pressed to continue the manoeuvre;

- by pressing the 2nd Speed button we can obtain the second speed for all crane movements. The button must be kept constantly pressed to obtain the second speed. If released it will return to normal (slow) speed;
- by pressing the Activate Mops (Manual Overload Protection System) button activates the emergency brake which will release the load (slowly) in case of emergency.
  The MOPS light button (on the right side of the panel) will turn on and at the same time the crane siren will also be activated;
- The Overload By-pass key switch can be used (very conservatively) to lift a load greater than the nominal one. Turn the key to the right to activate it. To use it, the key must be kept turned to the right continuously. If released it will return to the initial position and immediately deactivate the Overload By-pass;
- The AOPS (Automatic Overload Protection System) light button (on the right side of the panel) will turn on and at the same time the crane siren will also be activated, in case the system AOPS activates.

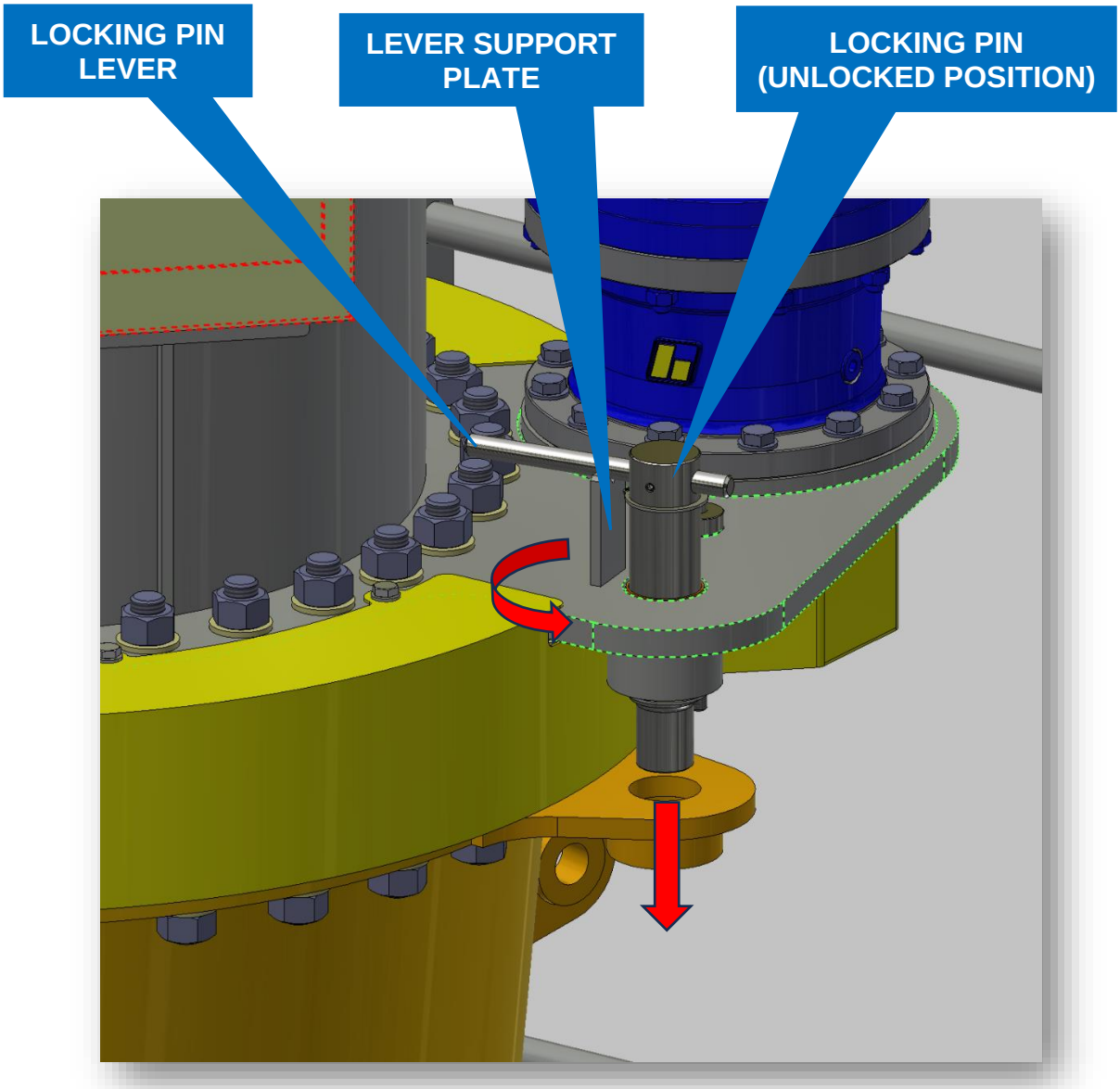
At the end of the crane operations, put the Locking pin on the locking position and press the button Emergency Stop push-button

## 19. LOCKING PIN DEVICE

A manually operated locking pin, mounted between the fixed column and the slewing column, mechanically prevents (when inserted) rotation when the crane is not in use. A proximity sensor, connected to the electrical panel, will also prevent other movements, lifting and translation (with the pin inserted).

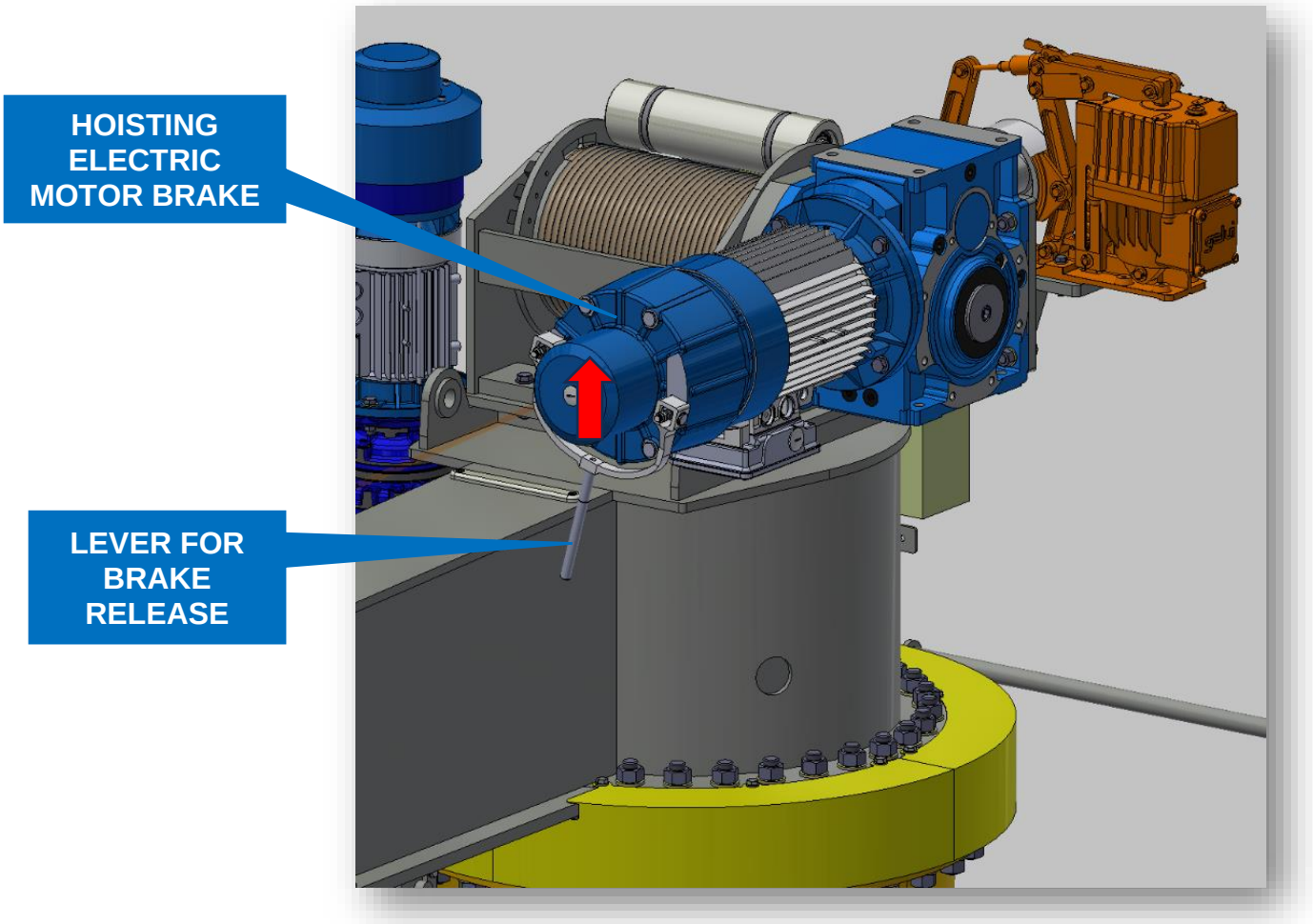
In the picture below the pin is not inserted, to insert it, lift the lever and rotate it to the left (as indicated by the rotating red arrow in the figure below) and lower it (as indicated by the red arrow in the figure below).

The pin will finally be inserted into the support with a hole in the fixed column, mechanically blocking the rotation movement.



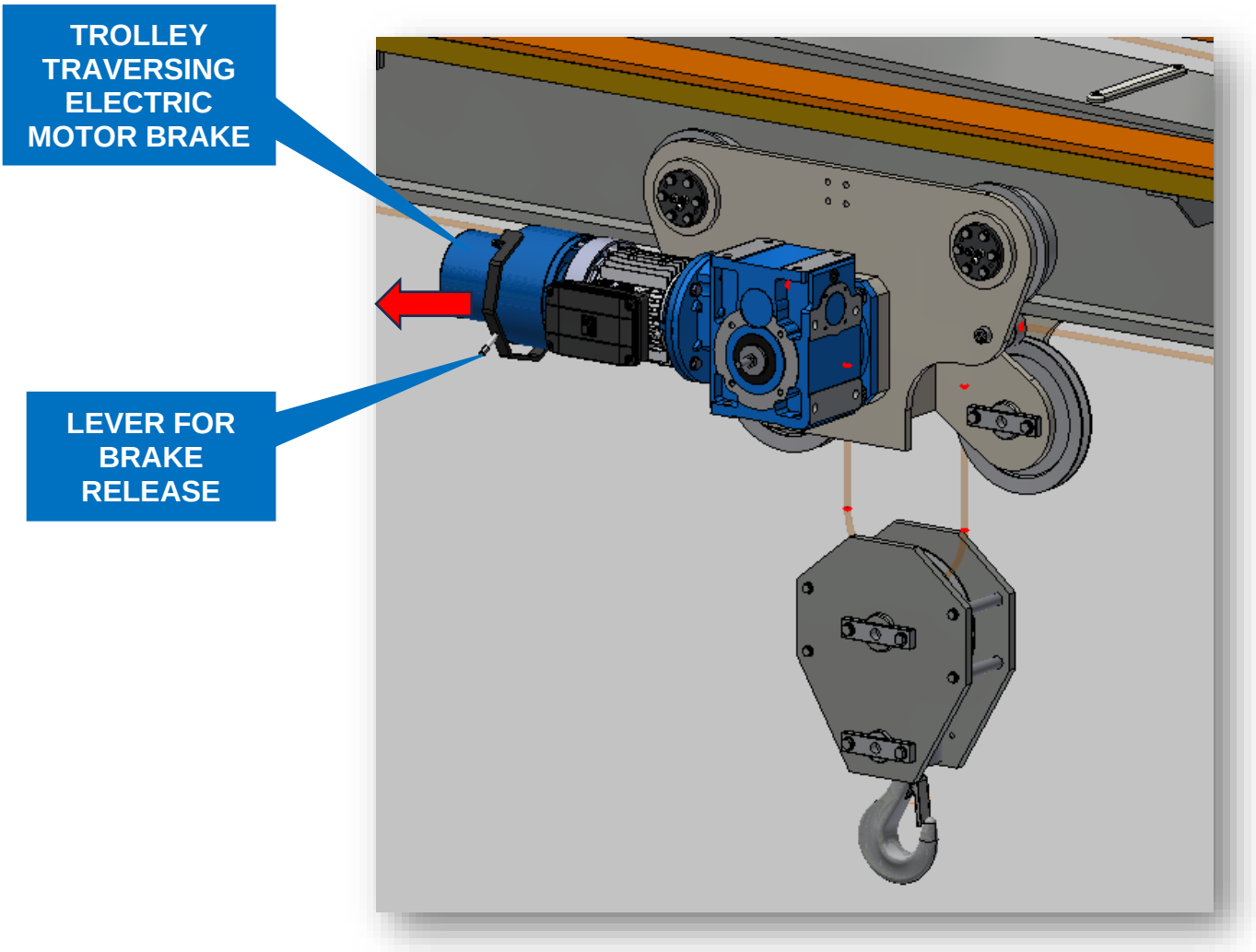
## 20. LOWERING EMERGENCY OPERATION

In case of emergency (for example due to power failure during use of the crane) the electric hoisting motor is equipped with an emergency brake, which can be released using a lever (shown in the figure below) in order to lower the load.
Pull the lever upwards as indicated by the red arrow in the figure below to lower the load.



## 21. TRAVERSING EMERGENCY OPERATION

In the event of an emergency (for example due to a power cut while using the crane) the electric traversing motor is equipped with an emergency brake, which can be released using a lever (shown in the figure below) to move the trolley.
Pull the lever to the left as indicated by the red arrow in the figure below to unlock the trolley.

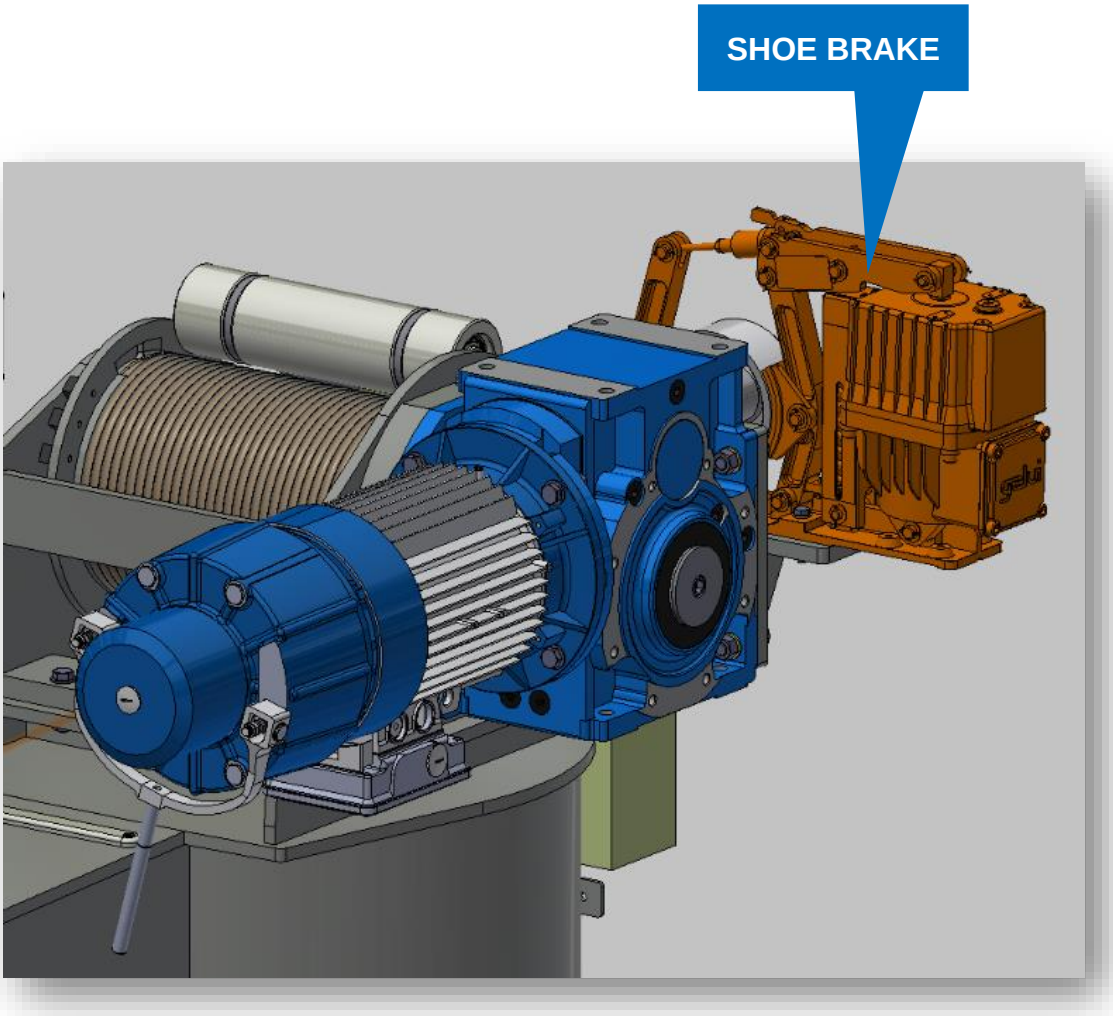


## 22. EMERGENCY BRAKE FOR HOISTING (SHOE BRAKE)

Shoe brake is negative brakes. Two opposing shoes, coated with friction material, act on a cast iron pulley (brake band half-joint) by means to the push of a spring. They are negative brakes as the opening of the braking is obtained by activating an electro-hydraulic brake booster which counteracts the action of the brake spring; in the absence of electrical power the blocks keep the pulley braked and therefore the load lifted.

The shoe brake is supplied assembled and already set.

See attachments for installation and maintenance manual.



# 23. WIRE ROPE

Two hoisting ropes, made of galvanised steel, are supplied with the crane and have the following characteristics:

| ***ROPE***<br><br>***CHARACTERISTICS*** | | ***Hoisting*** |
|---|---|---|
| Rope structure | | 19x7 |
| Rope type | | A7 ALC - Non rotating |
| Diameter | mm | 11 |
| Length | m | 107 |
| Working Load (SWL) | kN | 23,1 |
| Minimum breaking load | kN | 115,5 |
| Remarks | | Thimble spliced by Talurit clamp |

| Item | Description | ID-Code | Off |
|---|---|---|---|
| Rope | Galvanized wire rope ø11 mm L=107 m – 19x7-CR>115,5kN, one end with thimble and sleeve talurit | 002-0011-C1893 | 1 |

***Rope service***

The rope should be inspected at least EVERY SIX MONTHS; if any of the wires is broken, or if any other damage due to the corrosion may be seen, the rope should be changed. For rope mounting see the relevant page.

During changing unwind the new rope from its reel or coil with careful, in order to avoid kinks.

***Rope greasing***

Before commissioning and then every six months, rope should be cleaned and then greased with:

**MOBIL *MOBILARMA 798*** or other equivalent grease

***Lubrication recommendations***

Lubrication It is important to state that the internal lubrication of wire ropes can be made only during the rope manufacturing with different products, depending on rope using. The purpose of internal lubricant is to facilitate the reciprocal sliding of the wires during bending and to inhibit the formation of oxide. The initial quantity of lubricant put into the rope is higher than the quantity that the rope can hold after its settlement. Therefore, once in place, it may occur leakage of the lubricant, that will be sunk on the outer surface of the wires protecting the wire rope against oxidation in the first period of life. The lubrication in service must be made with high quality products and with excellent viscosity and adhesion characteristics. The frequency of re-lubrication depends on working conditions and environmental characteristics; if the wire rope works running on the pulley the re-lubrication is not necessary to protect it against the oxidation because the continuous contact with the pulleys inhibits oxide formation on the wire rope.

The re-lubrication of ropes to protect them from external oxidation must comply with the following general rules:

• do the necessary operations with rope completely dry, if environmental conditions were not ideal it is preferable not make lubrication

• clean the surface of rope from grease accumulation dry, powder, rubber or anything else with only mechanical action (brush or scraper shaped).

For cleaning cannot be used chemicals and solvents solutions. It is necessary to remember that the lubricant adheres to the clean surface of the rope and it has no benefit when applied on the dirt below. If the used grease is fluidized with solvents, during the application, the product should be thoroughly mixed. Apply small quantity of grease in a uniform way to build a thin continuous and transparent coating, that permit to see the entire surface of the steel. After application the grease need some time to dry. Approximately, the required quantity of lubricant to be applied can be determined using the following formula:

P = 0.2 d L

where:

P = amount of product required in kg

d = rope diameter in mm

L = cable length in km

# 24. ROPE INSPECTION AND REPLACEMENT CRITERIA

**See type "A7 ALC"**

| Rope type | N° of bearing wires in the external strands | Maximum number of broken wires | | | |
|---|---|---|---|---|---|
| | | Machine classification groups | | | |
| | | M1 - M2 - M3 - M4 | | M5 - M6 - M7 - M8 | |
| | | Regular lay on a length of: | | | |
| | | 6d | 30d | 6d | 30d |
| Non-rotating ropes | | 6d | 30d | 6d | 30d |
| **A4 L - A4 ALC - A6 < 30 A6 ALC < 34 - A7 ALC < 34** | | 1 | 2 | 2 | 4 |
| A6 > 32 - A6 ALC > 34 A7 ALC > 36 | | 2 | 4 | 4 | 8 |

In compliance with ISO 4309, the operating safety of a rope is ensured above all by correct evaluation of:

- number of breakages and their position
- wear of wires
- internal and external corrosion
- damage and deterioration of the rope.

Breakage of wires

(according to ISO 4309/90)

The broken wires that are visible on the outside surface of the rope must be counted, naturally taking into consideration the most worn section of the rope. The table below gives the maximum number of broken wires allowed for a length of rope of 6 or 30 times the diameter of the rope.

The broken wires have to be checked on both lengths; the rope must be replaced if the number of broken wires exceeds the indicated minimum even on just one of the two lengths.

Wear of the wires

The check of the rope for its replacement must take in consideration, not only the number of broken wires. The flattening of wires due to wear anticipates their imminent breakage. In the presence of worn wires, the time between inspections must be shortened and the check of broken wires must take into consideration wires whose diameter is visibly reduced by around 50% compared to the original value.

Internal and external corrosion

External corrosion reduces the diameter of the wires.

The indications in the paragraph above apply also in this case, adopting even tighter criteria of caution because corrosion causes more serious deterioration than wear.
Evaluation of internal corrosion requires expertise. Clamps can be used to open the rope, with a careful untwisting manoeuvre (see ISO 4309/90).

Remarks:

Ø = nominal rope diameter

The filling wires are not considered bearing wires and are therefore not included to the count.

In multi-layered ropes and ropes with metal core, inspection should be made only of the external layer.

Broken wires must have two clearly visible broken ends.

The values indicated are adapted to the types of ropes offered in this catalogue and are recommended on the basis of our experience. These values apply only to ropes wound around winches and sheaves that are not coated with synthetic material.

When consulting the table bear in mind that the wire breakage in 6 and 8 strand ropes is greater in the external layers. This is not the case in the case in multi- strand ropes where breakage involves the inner part and so it is not visible.

We recommend replacing ropes in the presence of broken wires close to each other, in a length of not more than 6 d or concentrated in a single strand even if the number of broken wires is less than that indicated in the table.

## ROPE DETERIORATION AND REPLACEMENT CRITERIA (AS PER ISO 4309)

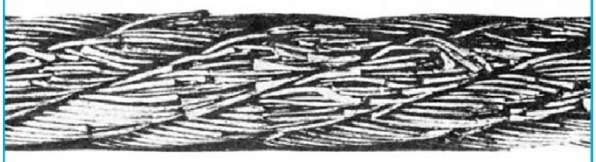
Broken wires out of position in two strands of a regular lay rope. This rope must be replaced.



Broken wires in several strands, close to a return sheave (sometimes hidden by the sheave). This rope must be replaced.



Major wear and high number of broken wires in a regular lay rope. This rope must be replaced immediately.



Broken wires in two strands due to bending fatigue, linked to major localised wear. This rope must be replaced.



Broken wires in a single strand and slight wear in a lang lay rope. In this case the broken wires must be removed to make the rope smooth.



Birdcage in a multilayer (non- rotating) type rope Caused by forced rotation around small grooves or excessive fleet angle. This rope must be replaced immediately.



More serious example of the previous defect with protrusion of the inner wires of the strands. Major localised defect caused by applying shock loads. This rope must be replaced immediately.



Confined increase of diameter of a lang lay rope, caused by distortion of the metal core caused by a dynamic load. There are also traces of corrosion and major wear of the external wires. This rope must be replaced immediately.



Protrusion of the steel core, generally linked to basket deformation. This rope must be replaced immediately.



Confined increase of diameter of the rope, due to the protrusion of the textile core between the external strands. This rope must be replaced.



Wire rope which has been twisted during installation and used. Now subject to localised wear and lengthening of the strands. This rope must be replaced.



Major kink causing fibrecore protrusion. This rope must be replaced immediately.



More serious example of the previous defect with protrusion of the inner wires of the strands. Major localised defect caused by applying shock loads. This rope must be replaced immediately.



The wires of a single strand have loosened although inspection of a section of rope has shown that the deformation can be seen at regular intervals, normally equal to the lay pitch. This defect must be kept under



Confined reduction in the rope diameter because the outer strands tend to fill the volume of the textile core which has been destroyed. This rope must be replaced immediately.



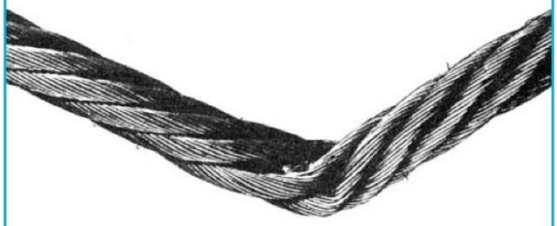
Flattened section caused by local crushing due to mechanical action; this causes a lack of equilibrium in the strands. There are also broken wires. This rope must be replaced.



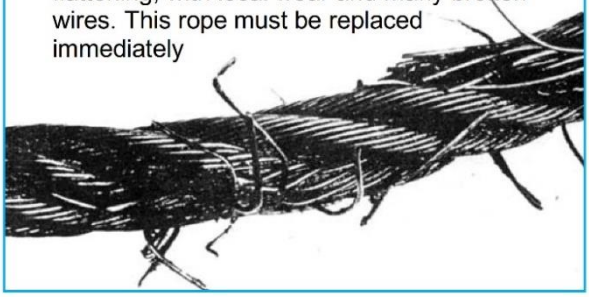
Flattened section of a multi- strand rope caused by mechanical action on a long section caused by incorrect unwinding from a winch. Note the increased lay pitch of the external strands with unbalanced tension in load conditions. This rope must be replaced.



Example of major bending. This rope must be replaced.



Typical example of a rope which has come out of the groove of a sheave and has been trapped with resulting deformation and flattening, with local wear and many broken wires. This rope must be replaced immediately



Cumulative effects of several deterioration factors. Note the major wear of the external wires, which has caused loosening of the wires resulting in basket deformation; the risk here is that the rope could be expulsed from the sheave.
This rope must be replaced immediately.



A: Slight flattening of external wires. Small reduction of the rope diameter.

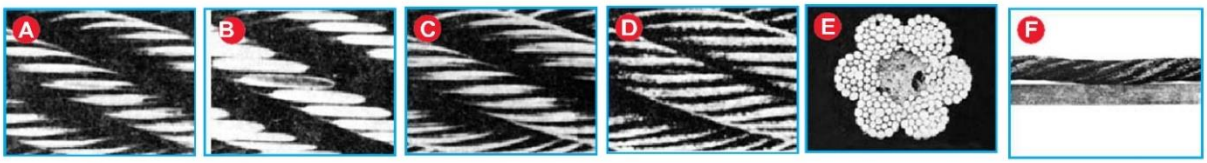
B: Continuous flattening; metal wires which begin to loosen, with a reduction of diameter that can be estimated at approx.. 40%. Immediate replacement.

C: Start of surface corrosion.

D: Highly perforated surface and completely loosened wires. Serious reduction in diameter with space between the wires of more than half their diameter. Immediate replacement.

E: Example of major internal corrosion. Clear reduction of the area of many external wires of the strands, in the contact area of the core, the high level of compression, the lack of space between the strands and the ensuing reduction in the diameter of the rope. Immediate replacement.

F: Helical distortion is a distortion where the longitudinal axis of the rope has a helical shape. In this condition the rope must be inspected continuously. There may be wear and broken wires in the event of prolonged use. The rope must be replaced if the deformation exceeds the value set in UNI ISO 4309/84




**1**

- Check the end connection of the rope at winch.
- Check for any defective winding around the winch which cause deformations (flattened sections) and wear, which could be major around the deviated pull area.
- Check for broken wires.
- Check for corrosion.
- Check for deformations caused by dynamic loads.

**2**

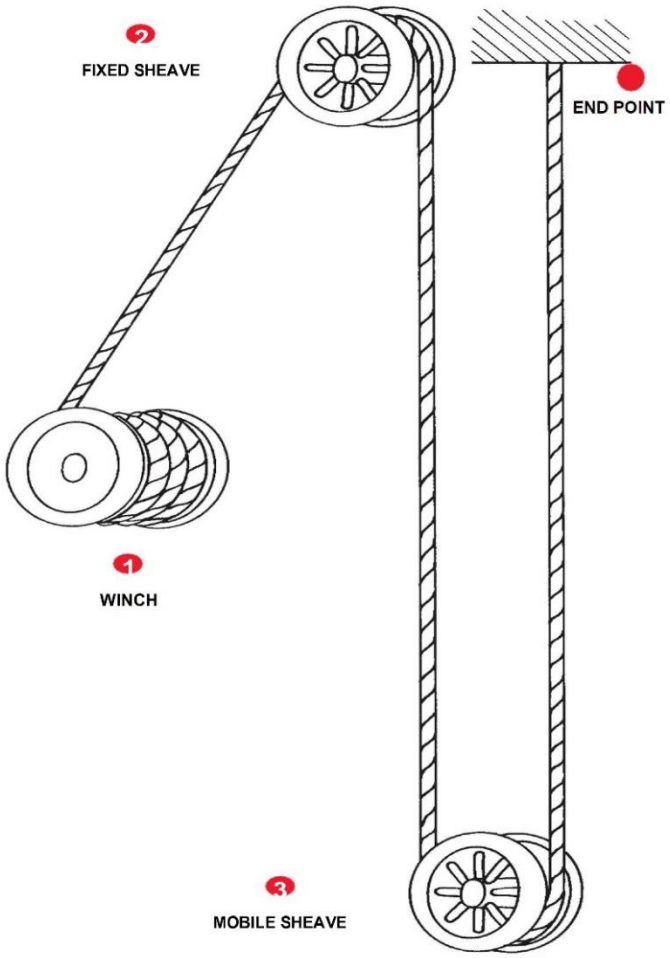
- Check the section of the rope which winds around the sheave for broken wires and wear.
- Check the groove of the sheave in according to the instructions

**3**

- Carefully inspect the section which winds around mobile sheaves and above all the section on the sheave when the equipment is under load conditions.
- Check for broken wires and surface wear.
- Check for corrosion.
- Check the groove of the sheave in according to the instructions

**4**

- End points:
- check for broken wires;
- similarly, inspect the section of rope above or close to the compensation sheave.
- Check for deformations.
- Check the rope diameter.
- Check the condition of the end device according to the instructions



## 25. OIL LUBRICATION

All gears are working in an oil-bath. The reduction gears are supplied already filled with oil.

This oil should be changed at least every two years (for more details see the attached gearbox data sheet).

Fill, drain and level oil plugs are indicated in the relative drawings or on gearboxes parts list (see attachments list)

| ITEM (ID-CODE) | DRAWING | OIL QUANTITY (L) |
|---|---|---|
| Hoisting gearbox (002-0027-C1432) | C09-0001-A0004 | 6,8 |
| Trolley traversing gearbox (002-0027-C1433) | C09-0001-A0005 | 1,6 |
| Slewing traversing gearbox (002-0027-C1431) | C09-0001-A0003 | 2,3 |

RECOMMENDED OIL TYPE:

MOBIL **MOBILGEAR SHC XMP220**

or another equivalent type.

## 26. GREASE LUBRICATION

The following points, provided with lubricators M10x1 DIN 3404 and indicated on relative assemblies, should be greased at least every two months.

If lubrication is only possible every 6 months we recommend another type of grease (see below).

| ITEM | DRAWING | N. OF GREASERS |
|---|---|---|
| Winch assembly | C09-0001-A0004 | 2 |
| Trolley traversing assembly | C09-0001-A0005 | 7 |
| Hook assembly | C09-0001-A0007 | 2 |
| Rope presser assembly | C09-0001-A0012 | 1 |

RECOMMENDED GREASE TYPE:

MOBIL **MOBILGREASE XHP 222** (every 2 months)

or another equivalent type.

MOBIL MOBILITH SHC 460 (every 6 months)

or another equivalent type.

**RACKS and PINIONS**

must be lubricated by means of a brush, at least every 6 months.

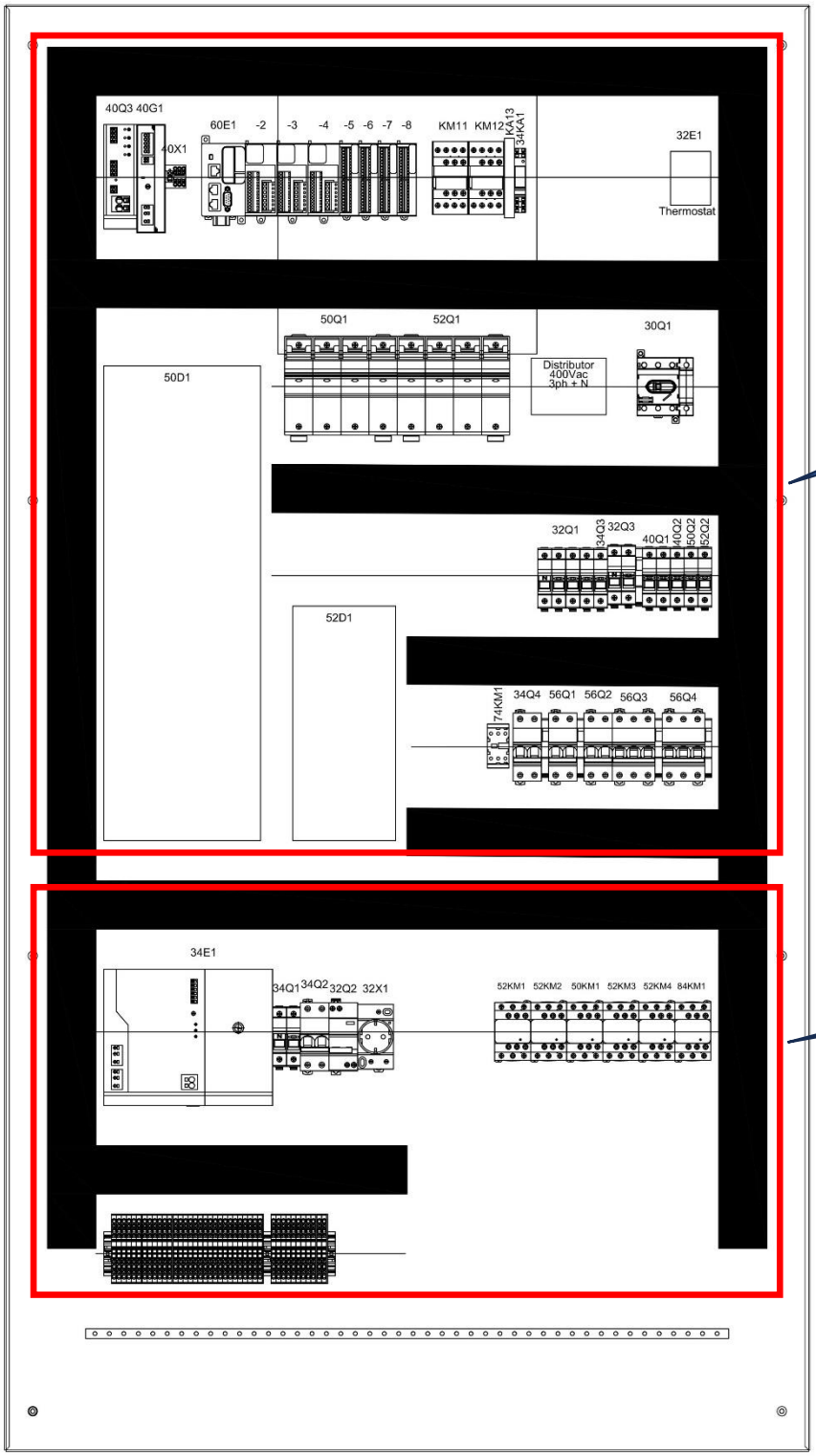
***GREASE TYPE***: MOBIL MOBILTAC A or

or other equivalent grease.

**WIRE ROPE**

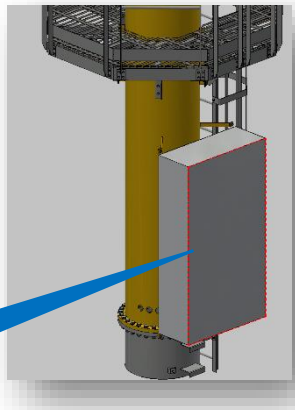
See the relevant page in this book

# 27. ELECTRICAL PANEL - INTERNAL VIEW



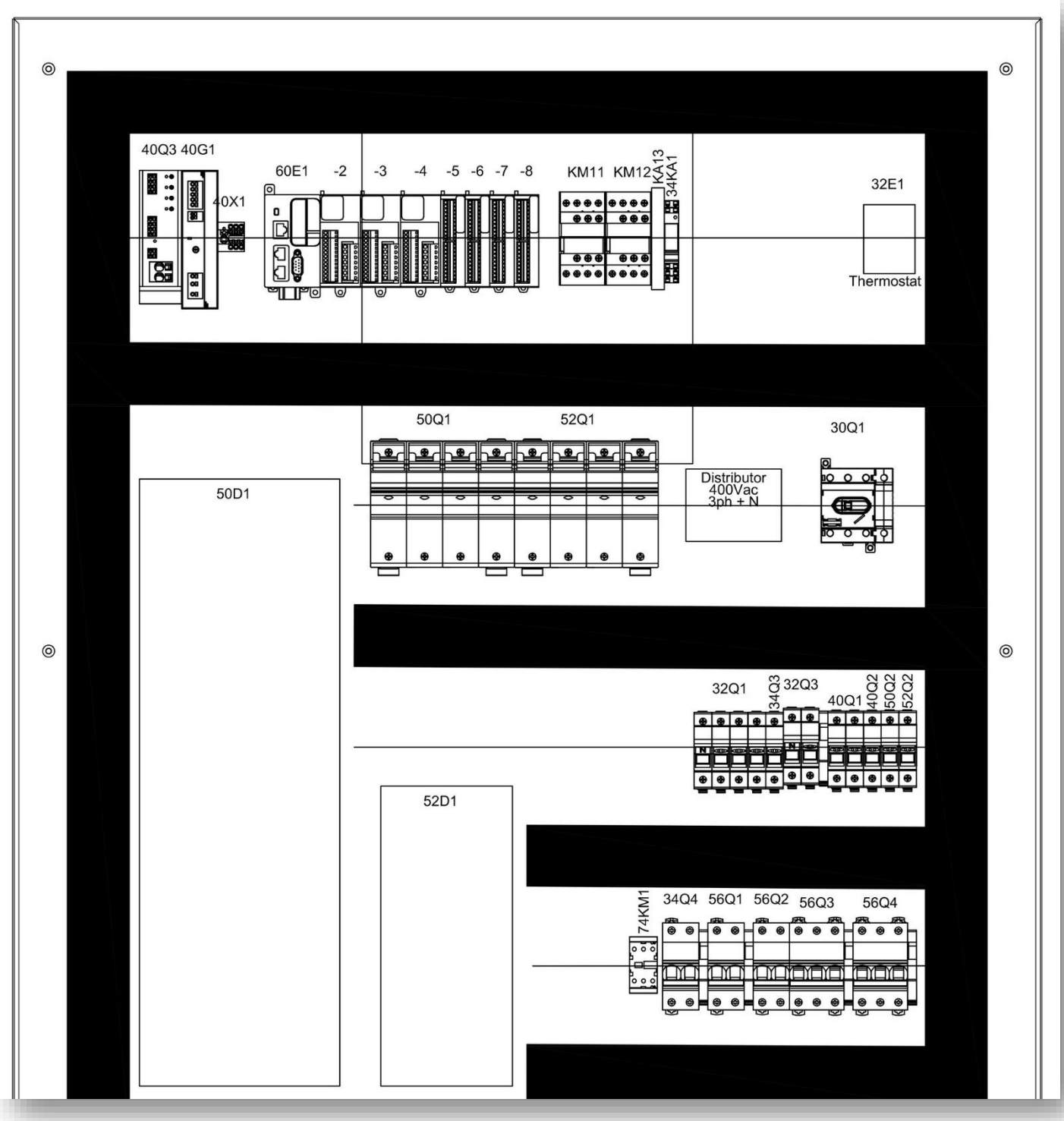

See next pages
Detail “1”

See next pages
Detail “2”

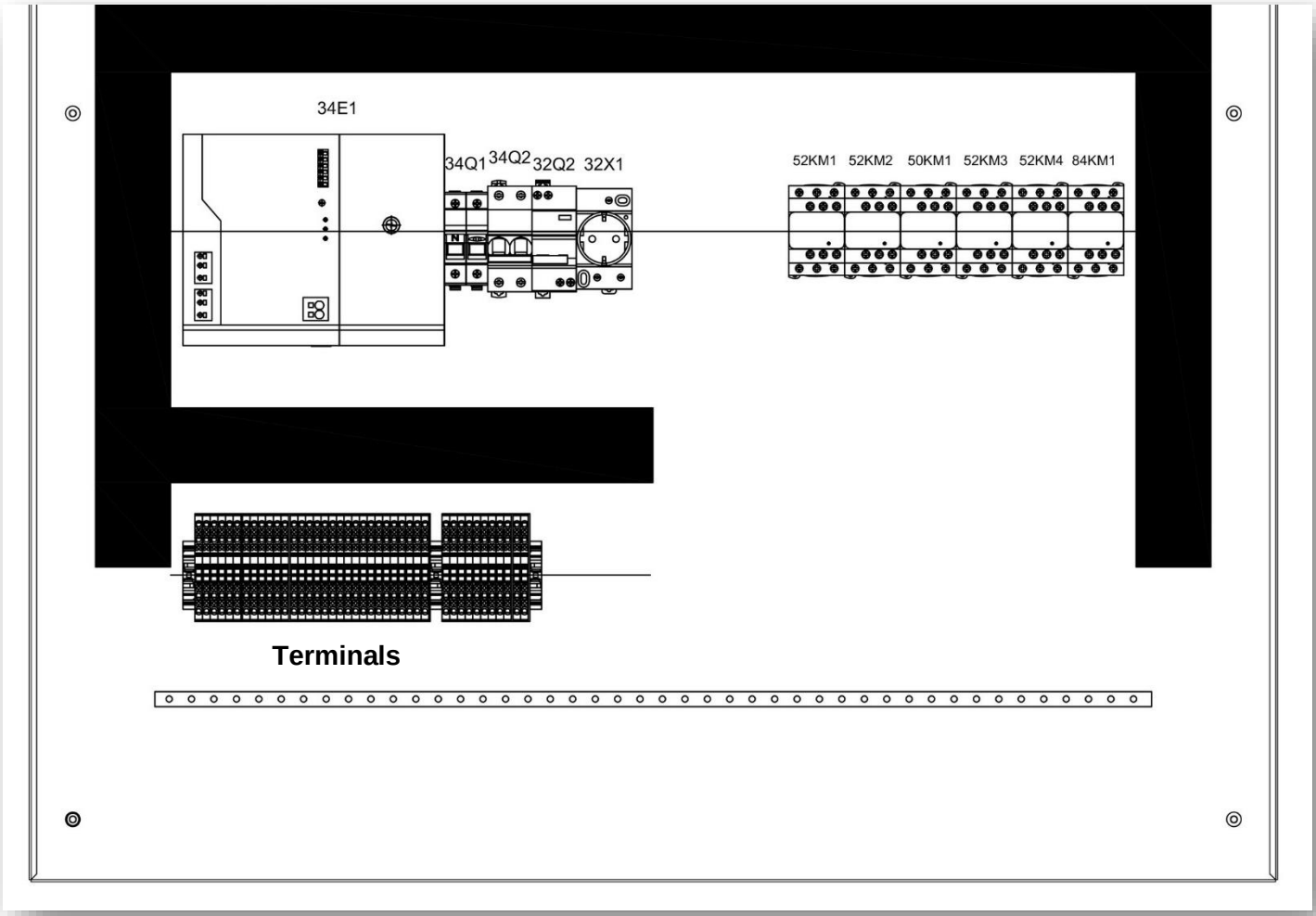


POSITION ON
THE PEDESTAL

## *ELECTRICAL PANEL – DETAIL "1"*



***ELECTRICAL PANEL – DETAIL "2"***



## 28. ELECTRIC COMPONENTS LIST

| ID-Code | Q.ty | Description | Item |
|---|---|---|---|
| **ELECTRICAL PANEL C01-EP-0001** | | | |
| 011-0003-C1359 | 1 | Frequency Converter NXP 380-500 V, 38 A, 15 kW, IP21, Alpha-numeric display, Integrated Brake chopper, Interface boards: A1, AF, A5, E6 | 50D1 |
| 011-0003-C1360 | 1 | Frequency Converter NXP 380-500 V, 12 A, 4 kW, IP21, Alpha-numeric display, Integrated Brake chopper, Interface boards: A1, AF, B5, E6 | 52D1 |
| 011-0014-C2596 | 1 | Switch-disconnector, 4P, 63A | 30Q1 |
| 011-0014-C2550 | 1 | Handle for power circuit breaker, IP66 (NEMA 4X), AISI 316 | 30Q1 |
| 011-0014-C2597 | 1 | Shaft for pistol handle, 6mm, Shaft Length 360mm | 30Q1 |
| 011-0014-C2611 | 1 | Holder for cylindrical fuses, 3P+N, 10x38, 32A | 32Q1 |
| 011-0014-C1315 | 3 | Fuse 10,3x38 CH10 2A gG | 32Q1 |
| 011-0014-C2599 | 1 | Plc-interface, consisting of PLC-BPT.../21-21 basic terminal block with Push-in connection and plug-in miniature relay with power contact, for mounting on DIN rail NS 35/7,5, 2 changeover contacts, input voltage 24 V DC | 32KA1 |
| 011-0014-C2602 | 1 | Residual current breaker with overcurrent protection (RCBO) 1P+N, 6 A, C Curve, 6000 A, 30 mA, AC type | 32Q2 |
| 007-0004-C0534 | 1 | Socket 220V 2P+T 16Astandard Italian/German | 32X1 |
| 007-0004-C0075 | 1 | Support for mounting system range components on din rail - 2 gang - 3 modules din | 32X1 |
| 011-0014-C2612 | 1 | Holder for cylindrical fuses, 1P+N, 10x38, 32A | 32Q3 |
| 011-0014-C1315 | 1 | Fuse 10,3x38 CH10 2A gG | 32Q3 |
| 007-0019-C0051 | 1 | Thermostat, NO, NC | 32E1 |
| 007-0010-C0133 | 1 | Anti-condensation heater, 150W | 32R1 |
| 007-0019-C0052 | 1 | Extraction fan, 413mc/h, 322x322 | 32E2 |
| 007-0019-C0053 | 2 | Guard, 340x326 | 32E2 |
| 007-0019-C0054 | 1 | Intake filter FPO 118, 322x322 | 32E2 |
| 007-0019-C0055 | 1 | Filter mat | 32E2 |
| 011-0014-C2612 | 1 | Holder for cylindrical fuses, 1P+N, 10x38, 32A | 34Q1 |
| 011-0014-C0641 | 1 | Fuse 10,3x38 CH10 10A gG | 34Q1 |
| 007-0008-C0131 | 1 | 1AC/1AC/750 VA uninterruptible power supply with integrated battery, lead AGM, VRLA technology, 24 V DC, 4 Ah for 230 V AC applications. | 34E1 |
| 011-0014-C2032 | 1 | circuit breaker iC60N 2P C 6A 6000A | 34Q2 |
| 011-0014-C2599 | 1 | Plc-interface, consisting of PLC-BPT.../21-21 basic terminal block with Push-in connection and plug-in miniature relay with power contact, for mounting on DIN rail NS 35/7,5, 2 changeover contacts, input voltage 24 V DC | 34KA1 |
| 011-0014-C2032 | 1 | Circuit breaker iC60N 2P C 6A 6000A | 34Q4 |
| 011-0014-C2603 | 1 | Auxiliary contact, iOF, 100mA to 6A, 24VAC to 415VAC, 24-130 VDC, bottom connection | 34Q4 |

| ID-Code | Q.ty | Description | Item |
|---|---|---|---|
| 011-0014-C1874 | 1 | Holder for cylindrical fuses, 1P, 10x38, 32A | 34Q3 |
| 011-0014-C1315 | 1 | Fuse 10,3x38 CH10 2A gG | 34Q3 |
| 011-0014-C2129 | 1 | Holder for cylindrical fuses, 2P, 10x38, 32A | 40Q1 |
| 011-0014-C1315 | 1 | Fuse 10,3x38 CH10 2A gG | 40Q1 |
| 007-0017-C0226 | 1 | Primary-switched TRIO POWER power supply for DIN rail mounting, input: 3-phase, output: 24 V DC/5 A | 40G1 |
| 011-0014-C1874 | 1 | Holder for cylindrical fuses, 1P, 10x38, 32A | 40Q2 |
| 011-0014-C0643 | 1 | Fuse 10,3x38 CH10 6A gG | 40Q2 |
| 007-0024-C0047 | 1 | 6/6X2,5 GY - Distribution block | 40X1 |
| 011-0014-C2600 | 1 | Multi-channel, electronic circuit breaker with active current limitation for protecting four loads at 24 V DC in the event of overload and short circuit. With nominal current assistant and electronic locking of the set nominal currents. For installation on DIN rails. | 40Q3 |
| 011-0014-C1896 | 1 | Holder for cylindrical fuses, 3P, 22x58, 63A | 50Q1 |
| 011-0014-C2598 | 1 | Fuse 22x58, CH22, 50A, aM | 50Q1 |
| 011-0014-C1874 | 1 | Holder for cylindrical fuses, 1P, 10x38, 32A | 50Q2 |
| 011-0014-C1311 | 1 | Fuse 10,3x38 CH10 1A gG | 50Q2 |
| 011-0014-C1527 | 1 | Contactor TeSys LC1D - 3P - AC3 440V 9 A - 24 V CC | 50KM1 |
| 011-0014-C1896 | 1 | Holder for cylindrical fuses, 3P, 22x58, 63A | 52Q1 |
| 011-0014-C2598 | 1 | Fuse 22x58, CH22, 50A, aM | 52Q1 |
| 011-0014-C1874 | 1 | Holder for cylindrical fuses, 1P, 10x38, 32A | 52Q2 |
| 011-0014-C1311 | 1 | Fuse 10,3x38 CH10 1A gG | 52Q2 |
| 011-0014-C1527 | 1 | Contactor LC1D - 3P- AC3 440V 9 A - 24 V CC | 52KM1 |
| 011-0014-C1527 | 1 | Contactor LC1D - 3P - AC3 440V 9 A - 24 V CC | 52KM2 |
| 005-0008-C0330 | 1 | Mechanical interlock | 52KM1 / 52KM2 |
| 011-0014-C1527 | 1 | Contactor LC1D - 3P - AC3 440V 9 A - 24 V CC | 52KM3 |
| 011-0014-C1527 | 1 | Contactor LC1D - 3P - AC3 440V 9 A - 24 V CC | 52KM4 |
| 011-0014-C2032 | 1 | Circuit breaker iC60N 2P C 6A 6000A | 56Q1 |
| 011-0014-C2603 | 1 | Auxiliary contact, iOF, 100mA to 6A, 24VAC to 415VAC, 24-130 VDC, bottom connection | 56Q1 |
| 011-0014-C2032 | 1 | Circuit breaker iC60N 2P C 6A 6000A | 56Q2 |
| 011-0014-C2603 | 1 | Auxiliary contact, iOF, 100mA to 6A, 24VAC to 415VAC, 24-130 VDC, bottom connection | 56Q2 |
| 011-0014-C2032 | 1 | Circuit breaker iC60N 2P C 6A 6000A | 56Q3 |
| 011-0014-C2603 | 1 | Auxiliary contact, iOF, 100mA to 6A, 24VAC to 415VAC, 24-130 VDC, bottom connection | 56Q3 |
| 011-0014-C2032 | 1 | Circuit breaker iC60N 2P C 6A 6000A | 56Q4 |
| 011-0014-C2603 | 1 | Auxiliary contact, iOF, 100mA to 6A, 24VAC to 415VAC, 24-130 VDC, bottom connection | 56Q4 |

| ID-Code | Q.ty | Description | Item |
|---|---|---|---|
| 011-0002-C0848 | 1 | Controller M251 Ethernet CAN | 60E1 |
| 011-0002-C0626 | 1 | Modicon TM3 Safety module - 1 Function, Cat 3 PL d/SIL CL2 (screw) 24Vdc | 60E1-2 |
| 011-0002-C0626 | 1 | Modicon TM3 Safety module - 1 Function, Cat 3 PL d/SIL CL2 (screw) 24Vdc | 60E1-3 |
| 011-0014-C2604 | 1 | Contactor LC1D - 4P - AC1 440V 32 A- 24 V CC | KM11 |
| 011-0014-C1518 | 1 | Auxiliary contact block, 2NO + 2NC, front mounting, screw clamp terminals | KM11 |
| 011-0014-C2604 | 1 | Contactor LC1D - 4P - AC1 440V 32 A- 24 V CC | KM12 |
| 011-0014-C1518 | 1 | Auxiliary contact block, 2NO + 2NC, front mounting, screw clamp terminals | KM12 |
| 011-0014-C2601 | 1 | Coupling relay for SIL 3 high-demand and low-demand applications, couples digital output signals to the I/O, 3 enabling current paths, safe state off and safe state on applications, test pulse filter, plug-in screw terminal block | KA13 |
| 011-0002-C0626 | 1 | Modicon TM3 Safety module - 1 Function, Cat 3 PL d/SIL CL2 (screw) 24Vdc | 60E1-4 |
| 011-0002-C0623 | 2 | Modicon TM3 - 16 inputs (screw) 24Vdc | 60E1-5 / 60E1-6 |
| 011-0002-C0625 | 1 | Modicon TM3 - 16 relay outputs (screw) 24Vdc | 60E1-7 |
| 011-0002-C0849 | 1 | Modicon TM3 - 4 analog inputs, 2 analog output (screw) 24Vdc | 60E1-8 |
| 007-0023-C0162 | 1 | electronic alarm sounder with LED light up to 120dB output | HAL1 |
| 011-0014-C2605 | 1 | Control relay TeSys CA3SK - 10 A - 24 V CC | 74KM1 |
| 011-0014-C1828 | 1 | Contactor LC1D - 3P - AC3 440V 9 A - 230 V AC | 84KM1 |
| 011-0014-C1520 | 1 | Contactor - 3P(3 NO) - AC-3 440 V 9 A - 230 V AC coil | 84KM1 |
| 007-0013-C1023 | 1 | Electrical panel 1000x1800x400, AISI 316 | C01-JB-0002/1 |
| 007-0013-C1024 | 1 | Door 1000x1800, AISI 316 | C01-JB-0002/2 |
| 007-0013-C1025 | 1 | Back plates FeZn for QCXB 1000x1800 | C01-JB-0002/3 |
| 007-0013-C1027 | 1 | Fixing brackets, AISI 316 | C01-JB-0002/4 |
| 007-0013-C1026 | 1 | Roof for QCHB and QCXB 1000x400, AISI 316 | C01-JB-0002/5 |
| 007-0024-C0013 | 5 | End bracket | C01-JB-0002/6 |
| 007-0024-C0087 | 2 | End cover | C01-JB-0002/7 |
| 011-0003-C1377 | 1 | 9 Way Panel Mount Dsub Connector Socket, 2.77mm Pitch DB9 | C01-JB-0002/8 |
| 011-0003-C1378 | 1 | Dataphone Shell (To be locked by hand) for D-Sub | C01-JB-0002/9 |
| **FRONT ELECTRICAL PANEL C01-EP-0001** | | | |
| 007-0002-C0735 | 3 | Head for pilot light, universal LED, white, plain lens Ø22 | 32HL1-2-3 |
| 007-0002-C0796 | 3 | Light block, universal LED, screw clamp terminals, 230...240V AC-Ø22 | 32HL1-2-3 |
| 007-0002-C0781 | 3 | Body/fixing collar for electrical block, metal Ø22mm | 32HL1-2-3 |
| 007-0002-C0741 | 1 | Head for pilot light, universal LED, orange, plain lens Ø22 | 34HL1 |
| 007-0002-C0796 | 3 | Light block, universal LED, screw clamp terminals, 230...240V AC-Ø22 | 34HL1 |

| ID-Code | Q.ty | Description | Item |
|---|---|---|---|
| 007-0002-C0781 | 1 | Body/fixing collar for electrical block, metal Ø22mm | 34HL1 |
| 007-0002-C1277 | 1 | Emergency stop switching off, metal, red mushroom, Ø40, Ø22, trigger latching turn to release, 2 NC | ESB1 |
| 007-0002-C1197 | 1 | Illuminated push button, metal, blue flush, 22mm, universal LED, plain lens, 1NO + 1NC, 24V AC DC | 62SB1 |
| 007-0002-C1278 | 7 | Push button, metal, flush, black, Ø22, spring return, unmarked, 1 NO | SB1-7 |
| 007-0002-C1281 | 1 | Pilot light,metal, orange, 22mm, universal LED, plain lens, 24V AC DC | 74SB2 |
| 007-0002-C1280 | 1 | Pilot light, metal, red, 22mm, universal LED, plain lens, 24V AC DC | 74SB3 |
| 007-0002-C1281 | 1 | Pilot light,metal, orange, 22mm, universal LED, plain lens, 24V AC DC | 74SB4 |
| 007-0002-C0794 | 4 | Light block, white, for head 22mm, universal LED, screw clamp terminals, 24V AC DC | 76SB1-4 |
| 007-0002-C0781 | 4 | Body/fixing collar for electrical block, metal Ø22mm | 76SB1-4 |
| 007-0002-C1208 | 4 | Head for pilot light, universal LED, yellow, plain lens Ø22 | 76SB1-4 |
| 011-0017-C0022 | 1 | Instrument, 96x48 mm format, 5-digit display, for DC current/voltage measurements, 2 NO relay outputs, 24V AC/DC power supply. | 78E1 |
| 011-0017-C0023 | 1 | Watertight Cover for display | 78E1 |
| 007-0002-C1282 | 1 | Yellow flush pushbutton head Ø22 push-push unmarked | 84SB1/1 |
| 007-0002-C0781 | 1 | Body/fixing collar for electrical block, metal Ø22mm | 84SB1/2 |
| 007-0002-C0787 | 2 | Single contact block, silver alloy, screw clamp terminal, 1 NO | 84SB1/3 |
| 007-0002-C1209 | 1 | Yellow padlockable flap for Ø22 flush pushbutton | 84SB1/4 |
| 007-0002-C0824 | 8 | Transparent boot for circular projecting push button Ø22 | 84SB1/5 |
| 007-0002-C1283 | 1 | Key switch selector, metal, black, Ø22, key n°455, 2 positions, spring return right to left, 1 NO | SB8 |
| **JUNCTION BOX C01-JB-0002** | | | |
| 011-0015-C0034 | 1 | Load cell amplifier, with 4-20mA output | 80E1 |
| 007-0013-C1021 | 1 | Junction box, AISI 316, 200x400x120 | C01-JB-0002 /1 |
| 007-0013-C1022 | 1 | Wall fixing brackets for junction box | C01-JB-0002 /2 |
| 007-0024-C0086 | 38 | Feed-through terminal block | - |
| 007-0024-C0013 | 3 | End bracket | - |
| 007-0024-C0087 | 2 | End cover | - |
| **EXTERNAL COMPONENTS** | | | |
| 007-0023-C0162 | 1 | Electronic alarm sounder with led light, 12-24V AC / 12-60V DC, 100-240V AC (AC: 50/60 Hz), IP66-IP69K | C01-CHB-0014 |
| 011-0008-C2428 | 3 | Inductive Hollow shaft encoder, Absolute, diam. 58mm, AISI 316L | ENC13-23-33 |
| 007-0003-C0579 | 5,4 | Cable chain | - |
| 011-0008-C1961 | 1 | A2B limit switch | SW0036 |
| 011-0008-C2429 | 2 | Proximity sensor, inductive, nickel-brass, short body, M12, 5 m cable | LS0024-0025 |
| 011-0008-C2430 | 4 | Proximity sensor, inductive, nickel-brass, short body, M12, 15 m cable | LS0034-0035 |

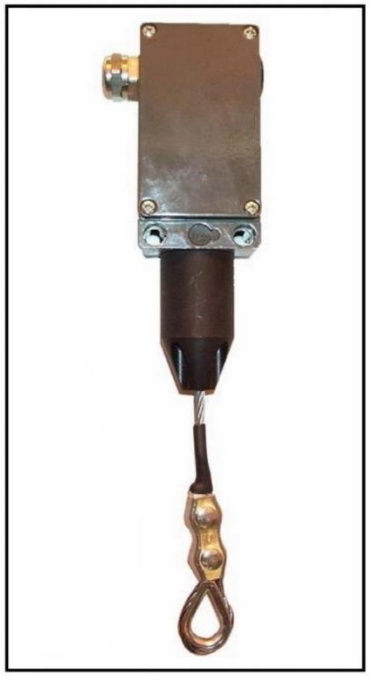
| ID-Code | Q.ty | Description | Item |
|---|---|---|---|
| 007-0006-C1221 | 1 | Hoisting electric motor 3 phase type BAHK2E 132 MC4 Enhanced Power (E.P.) 4poli 1500rpm 14,0kW @ 50Hz S3 60% voltage 3x230/400V - 50Hz with brake inverter 1x230Vac (PMG250) and release lever (type unlocking and automatic spring return) IP56; Cl.F Tropicalized; brake Disc K2 (brake torque max 150Nm) PTC; flange B5, heaters 1x230Vac, with encoder, painting C5M RAL 7038 | C01-M-0010 |
| 007-0006-C1220 | 1 | Slewing motor 3 phase type BAHK 100 LB4 Enhanced Power (E.P.) 4poli 1500rpm 3.9kW @ 50Hz S3 60% voltage 3x230/400V - 50Hz brake inverter AC Vb=Vm and release lever (type unlocking and automatic spring return) IP56; Cl.F Tropicalized; brake Disc type standard (brake torque 60-70% of max value 50Nm) PTC; flange B5 (V1) heaters 1x230Vac painting C5M RAL 7038 | C01-M-0020 |
| 007-0006-C1222 | 1 | Trolley traversing motor 3 pahse type BAH 90 SA4 Enhanced Power (E.P.) 4 poles 1500rpm 1,45kW @ 50Hz S3 60% voltage 3x230/400V - 50Hz brake inverter AC Vb=Vm and release lever (type unlocking and automatic spring return) IP56; Cl.F Tropicalized; brake Disc type standard (brake torque 60-70% of max value 38Nm); PTC; flange B5 heaters 1x230Vac painting C5M RAL 7038 | C01-M-0030 |
| 002-0017-C0394<br>002-0017-C0395 | 1+1 | Shoe brake (electro-hydraulic DIN 15435, V. 230/400 - Hz 50, IP.65, isol. classe F, and pulley. | - |
| 007-0010-C0196 | 1 | Brake resistor 63 ohm, 2 kW | - |
| 007-0010-C0197 | 1 | Brake resistor 19 ohm, 12kW | - |
| 011-0008-C2436 | 1 | Position limit switch with short piston and special lever with roller | - |

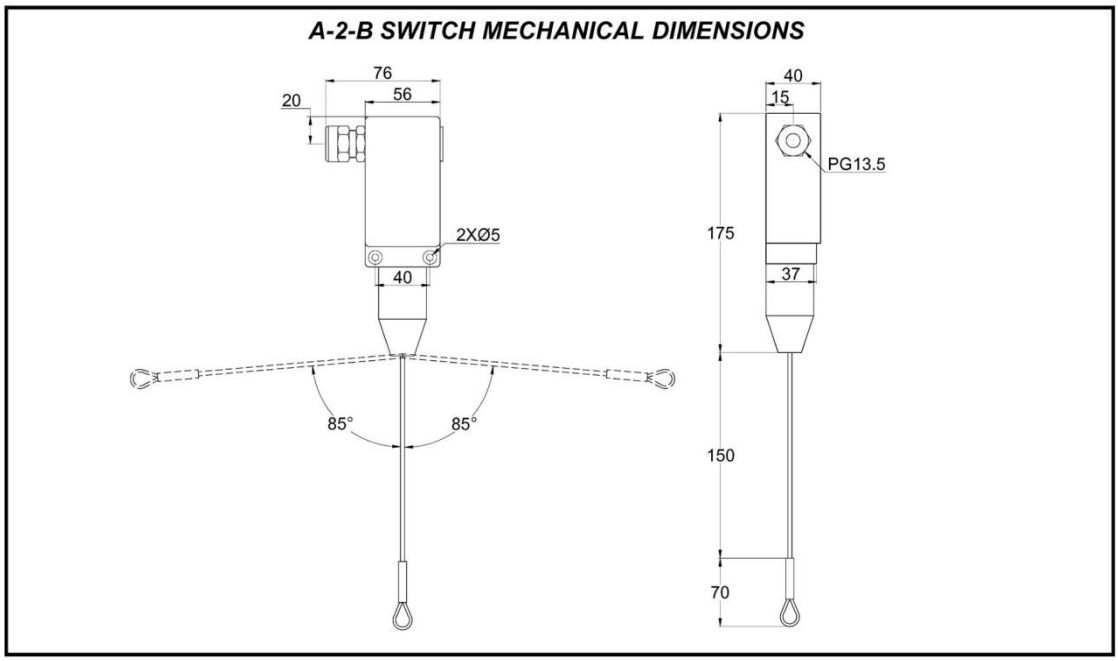
## 29. HOISTING LIMIT SWITCHES

The maximum stroke of the hook is limited by a special encoder. The minimum stroke, however, is obtained via an Anti two block device (see figures below).

The limit switch are supplied assembled and already set

According to crane safety requirements, all parts of this device have been designed in conformity with the rules of the current MACHINE DIRECTIVE STANDARDS.
It has been designed to perform very easy installation on any kind of machine: from the largest and most complex lattice boom cranes to the simplest and smallest hydraulic cranes.
As an option the device can be supplied with a chain and 5 Kg weigh.
No specific care or special tool is required for its installation.
The device uses an actually simple and reliable spring mechanic, including a micro switch with normally closed contacts, as stated by CE Standards.
If the hoist is lifted over its limit, the contact opens and the alarm function is activated.





A second limit switch, on the drum (see example figure below) limits the maximum stroke of the hook by reading the presence of the wire rope on the drum by means a limit switch and its pressing roller. The limit switch are supplied assembled and already set.

See the following page in case it needs to be set again.



# 30. SETTING OF LIMIT SWITCH ON THE DRUM

**⚠WARNING**

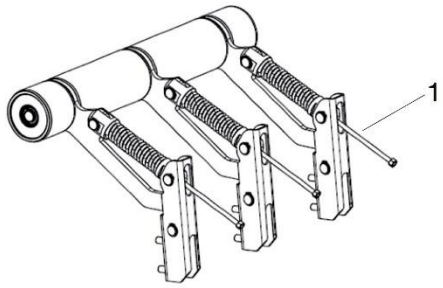
Pay attention to the pressure roller springs: danger of projecting objects and crushing.

The pressure roller is installed on the machine if requested, if not supplied it is demanded to the installer to prevent the rope to go out of the drum flanges causing dangerous situations.

***NOTICE***

Before any rotation of the drum, for example for the installation of the rope, make sure that the pressure roller is at a distance from the drum equal to the diameter of the rope, by adjusting it with the tie rods (1). These must be removed only after having wrapped the first layer of rope on the drum.

Warning: only the first layer, and not the second.




## SETTING OF THE MINIMUM ROPE CAPACITY LIMIT SWITCHES: ELECTRIC AND HYDRAULIC

The minimum rope capacity limit switch is installed on the machine if requested, if not supplied it is demanded to the installer.

This device can be supplied with electric o hydraulic microswitch, and in both cases prior to delivery, the clicking mechanism is pre-set by DANA with the roller touching the drum. The installer shall double check the correct setting any time maintenance is needed or as per first installation when connecting the signal in the final application.

To set the click mechanism proceed as follow:

**1 -** Loosen the two nuts (1)

**2 -** Check that the roller (2) touches the drum

**3 -** Position the screw (3) making sure that the button (4) is activated and there is still a small gap before going in to interference with the microswitch itself

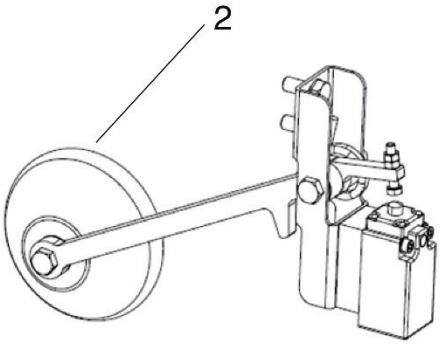
**4 -** Lift the roller several times and drop it to double check the correct positioning, it should keep clicking the button all the times

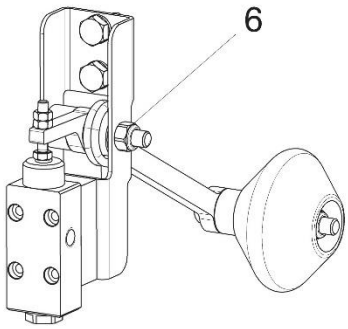
**5 -** Tighten the nuts (1) to the required torque to avoid later unwanted loosening

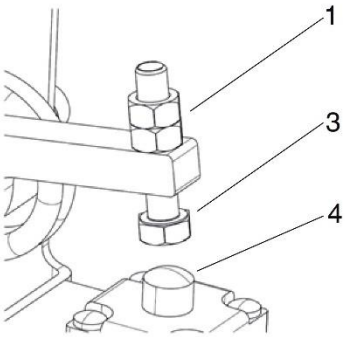
**6 -** Make sure the self-locking nut (6) of the lever pin is set against the support but it does not prevent the lever from freely rotating

**7 -** Replace roller (7) when worn.

# INSTALLATION




**NOTICE**

To avoid full unwinding of the rope from the drum, a minimum of 3 (three) windings shall always remain wound. Limit switches are mandatory for lifting applications but are only fitted if requested, if not supplied it is demanded to the installer.

According to BWE-BWP size, the roller of this device can be mounted on the left or on the right of the lever. When ordered as spare parts, it will be supplied in the standard position. If the roller must be moved to ensure the minimum windings requirement to the other side of the lever, make sure to follow the steps below:

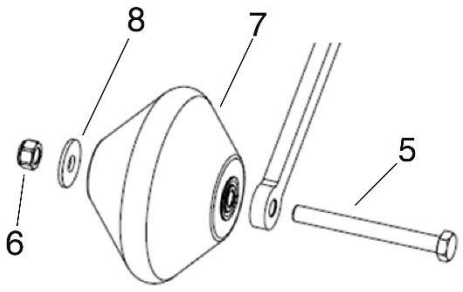
**1 -** Loosen the screw (5) and nut (6)

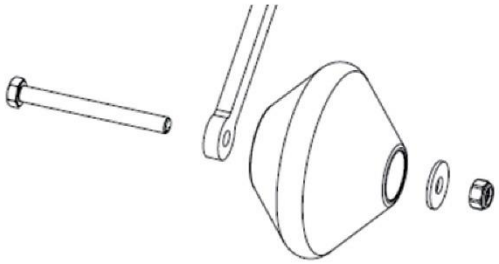
**2 -** Switch the position of the roller (7) and its internal component

**3 -** Pay attention to not lose washer (8)

**4 -** Re assembly all these parts on the other side of the lever

**5 -** Tighten screw (5) and nut (6) to the required torque

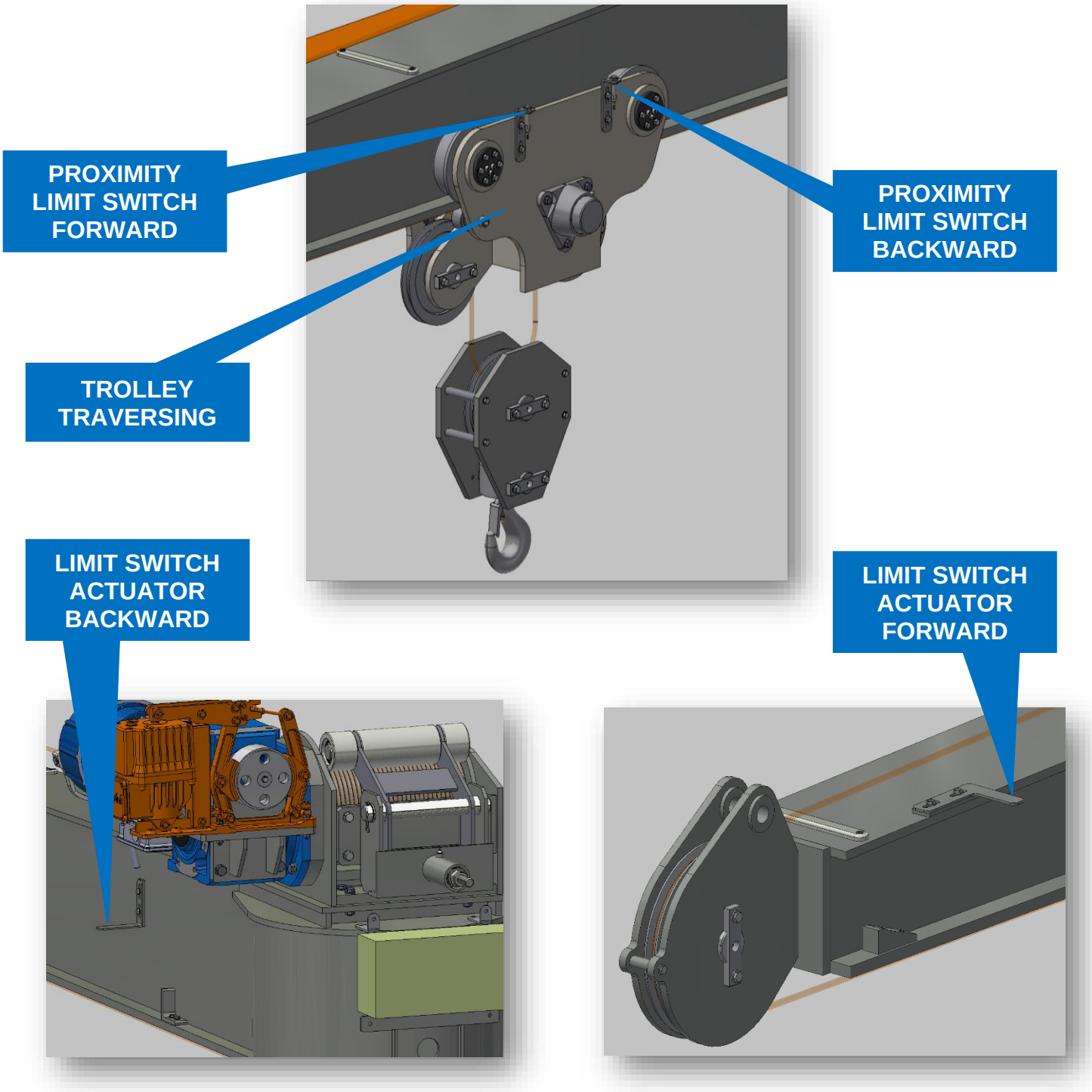


## 31. TROLLEY TRAVERSING LIMIT SWITCH

Two proximity limit switches are fitted on the traversing trolley and by means their actuators they prevent (electrically) the trolley from exceeding its stroke (forward and backward).

See picture below.



## 32. OVERLOAD DEVICE SETUP

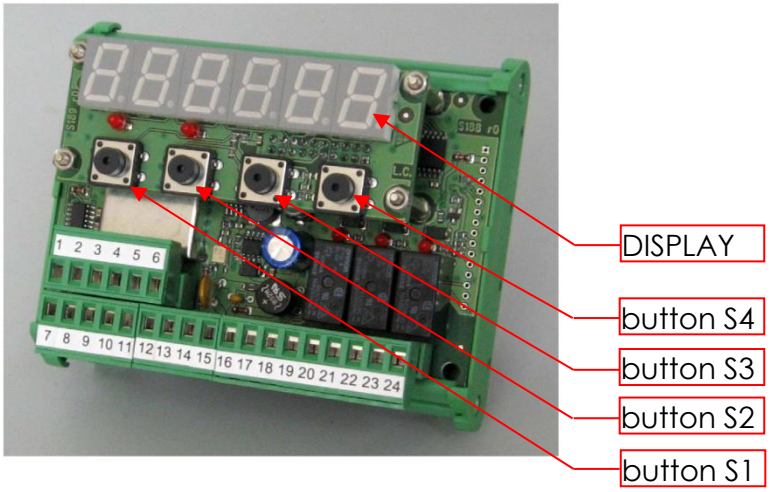



Fig. 1 Electronic card LC 200 front view

**IMPORTANT:** This procedure has to be done **only** :

- at first mounting or
- after load cell replacing
- after electronic card replacing

1. Switch on the current,
2. Press contemporarily buttons **S2** and **S4**: "**CONST**" appears on the display
3. Press button **S4,** on the display appears "**TARAT**"
4. Press button **S4**, on the display appears "**PASSwd**"
5. Press **S4**: on the display appears "**00000**", and the first zero on the left of the display is blinking
6. Insert the password: **2792**; to insert the numbers:
   - Press **S1** – to increase from 0 to 9,
   - Press **S2** – to decrease from 9 to 0,
   - Press **S3** – to select the next number
7. Press **S4** to confirm inserted password: "**CAPAC**" appears on the display
8. Press button **S4**,
9. Set the value in "Kg" of the **OVERLOAD**; nominal value **+ 25%** (by means of the buttons S1, S2, S3 as above described) and press the button **S4**
10. Press button **S3:** "**TARAT**" appears on the display
11. Press **S1** or **S2** until "**DIVIS**" appears on the display
12. Press button **S4**
13. Set the value "**10**" (by means of the buttons S1, S2, S3 as above described) and press button **S4**
14. Press button **S3**: "**DIVIS**" appears on the display
15. Press **S1** or **S2** until "**CONST**" appears on the display
16. Press button **S4**
17. Press **S1** or **S2** until "**PARAM**" appears on the display
18. Press button **S4**

19. Press **S1** or **S2** until "**FILTER**" appears on the display
20. Press button **S4**
21. Set the value "**6**" " (by means of the buttons S1, S2, S3 as above described) and press the button **S4**
22. Press button **S3**: "**FILTER**" appears on the display
23. Press **S1** or **S2** until "**STABIL**" appears on the display
24. Press button **S4**
25. Set the value "**1**" (by means of the buttons S1, S2, S3 as above described)and press the button **S4**
26. Press button **S3**: "**STABIL**" appears on the display
27. Press button **S3:** "**PARAM**" appears on the display
28. Press **S1** or **S2** until "**CALIBR**" appears on the display
29. Press button **S4**
30. As now we have to set the ZERO value, be sure that the HOOK IS EMPTY (no load applied)
31. Hold pressed the button **S3** until the actual weight on the display becomes "**0**"
32. On the display start blinking and switching from "**0**" to "**CAL**"
33. Now we have to set the device with a KNOWN LOAD; this load has:
    - to be bigger than the half of the rated capacity of the crane
    - to be smaller or equal to the rated capacity of the crane
34. Lift the known load and Press **S1**
35. By means of the buttons S1, S2, S3 as above described, set the value of the known load (in "**Kg**") and press the button **S4** to confirm the relevant value
36. The display start blinking and switching from "**CAL**" to the "**new value**"
37. Press the button **S4**
38. Press the button **S3** until "**STORE**" appears on the display; after some seconds on the display appears the value of the load on the hook
39. Press contemporarily buttons **S1** and **S4:** "**SET1**" appears on the display
40. Press the button **S4**
41. Now we must set the value in "**Kg**" of the load at which the crane lifting has to be stopped (it could be included from +5% to +10%, according to the wishes of the Register)
42. Press the button **S4**
43. Press the button **S3** until "**STORE**" appears on the display; after some seconds on the display appears the value of the load on the hook (the actual value, not the overload)

**IMPORTANT:**

IF DURING THE SETUP THE CURRENT IS SWITCHED OFF ALL DATA NOT "STORED" WILL NOT BE SAVED, AND THE WHOLE PROCEDURE MUST BE REPEATED

# 33. AUDIBLE AND VISIBLE ALARM – ITEM C01-CHB-0014

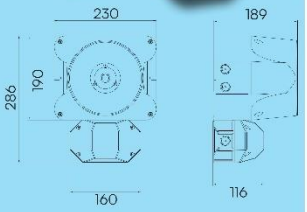
ELECTRA

## SE 120 LED
## SE 120 PRO LED



SE 120 LED
2.20 kg

SE 120 LED 100-240V AC
2.40 kg




IP69K

120 dB max

LED

Corpo / Body / Corps

SE 120 LED è una sirena elettronica con output fino a 120dB e luce LED, progettata per applicazioni industriali in cui siano richieste robustezza ed elevate prestazioni.
Disponibile nel colore grigio o rosso, in diverse tensioni e molteplici funzioni. Il modulo NFC integrato e la speciale app MySirena rendono la connessione, la configurazione e la diagnostica del dispositivo molto semplici. Collegando SE 120 PRO LED a un PC, è possibile scaricare e configurare messaggi personalizzati, in modo da programmare completamente la sirena e la luce in base alle proprie esigenze.

### TENSIONE OPERATIVA
12-24V AC / 12-60V DC, 100-240V AC (AC: 50/60 Hz)

### CARATTERISTICHE GENERALI
Temperatura di funzionamento: -40° +60°C
Grado di protezione: IP66-IP69K
Resistenza agli impatti: IK08
Servizio continuo



### CARATTERISTICHE MECCANICHE
Per le caratteristiche meccaniche vedere SE 120 (pagina 24) e EL-7L (pagina 69).

### CARATTERISTICHE ACUSTICHE
Multisuono: 64 suoni selezionabili e regolazione del volume (8 livelli).
Collegando la versione SE 120 PRO LED ad un PC, è possibile caricare e configurare messaggi personalizzati.

### CARATTERISTICHE LUMINOSE
7 LED ad elevata luminosità che producono diversi effetti luminosi: luce fissa, singolo flash (FPM: 1F 95), doppio flash (CPM: 2F 80), triplo flash (CPM: 3F 67), strobo (FPM: 1F 300) con possibilità di personalizzare il numero di flash/min. tramite l'app

### CERTIFICAZIONI / CERTIFICATIONS

CONFORME DIRETTIVA RED
RED COMPLIANT DEVICE
DISPOSITIF CONFORME À LA DIRECTIVE RED

| | | | |
|---|---|---|---|
| LED - CD max | 24V | 580 |

**SE 120 LED LT**

**SE 120 LT**

| V DC | 12 | 24 | - | - | 48 | 60 |
|---|---|---|---|---|---|---|
| V AC | - | - | 12 | 24 | - | - |
| mA | 500 | 900 | 750 | 1400 | 1300 | 1400 |

**EL-7L MULTI**

| V DC | 12 | 24 | - | - | 48 | 60 |
|---|---|---|---|---|---|---|
| V AC | - | - | 12 | 24 | - | - |
| mA | 1800 | 700 | 2200 | 900 | 350 | 300 |

**SE 120 LED HT**

| | SE 120 HT | EL-7L |
|---|---|---|
| 100V AC | 450 mA | 250 mA |
| 240V AC | 350 mA | 140 mA |

SE 120 LED is an electronic alarm sounder with LED light up to 120dB output, designed for industrial applications where robustness and high performance are required. Available in gray or red color, different voltages and multiple functions. The built-in NFC module and special MySirena app make connection, configuration and diagnostics of the device very easy. By connecting SE 120 PRO LED to a PC, customized messages can be downloaded and configured, so the siren and the light can be fully programmed to meet your needs.

### VOLTAGES
12-24V AC / 12-60V DC, 100-240V AC (AC: 50/60 Hz)

### GENERAL FEATURES
Operating temperature: -40° +60°C
IP rating: IP66 IP69K
Impact Protection: IK08
Continuous operation

### MECHANICAL FEATURES
See SE 120 (page 24) and EL-7L (page 69).

### ACOUSTIC FEATURES
Multisound: 64 selectable sounds and volume adjustment (8 levels). By connecting the SE 120 PRO LED version to a PC, customized messages can be uploaded and configured.

### OPTICAL FEATURES
7 very bright LEDs producing different light effects: steady light, single flash (FPM: 1F 95), double flash (CPM: 2F 80), triple flash (CPM: 3F 67), strobe (FPM: 1F 300), with the possibility to customize the number of flash/min via MySirena App.

SE 120 LED est une sirène électronique avec feu LED et une puissance jusqu'à 120dB, conçue pour les applications industrielles où la résistance et les hautes performances sont nécessaires.
Performante et durable, elle est disponible en différentes versions de tension, de fonctionnalité et de couleur pour permettre une plus grande polyvalence et adaptabilité à chaque application. Grâce au module NFC intégré et à l'application MySirena dédiée, elle est simple à connecter, configurer et diagnostiquer. En connectant la version SE 120 PRO LED à un PC, on peut télécharger et configurer des messages personnalisés, ce qui permet de configurer entièrement la sirène et le feu selon vos besoins.

### TENSION D'UTILISATION
12/24V AC / 12-60V DC, 100-240V AC (AC : 50/60 Hz)

### CARACTÉRISTIQUES GÉNÉRALES
Température de fonctionnement : -40° +60°C
Degré de protection : IP66 - IP69K
Résistance aux chocs : IK08
Service continu

### CARACTÉRISTIQUES MÉCANIQUES
Voir SE 120 (page 24) et EL-7L (page 69).

### CARACTÉRISTIQUES ACOUSTIQUES
Multi sons : 64 tonalités sélectionnables et réglage du volume (8 niveaux). En connectant la sirène SE 120 PRO LED à un PC, il est possible de télécharger et configurer des messages personnalisés.

### CARACTÉRISTIQUES OPTIQUES
7 LED à haute luminosité produisant différents effets lumineux : lumière fixe, simple éclat (FPM : 1F 95), double éclat (CPM : 2F 80), triple éclat (CPM : 3F 67), stroboscopique (FPM : 1F 300), avec la possibilité de personnaliser le nombre de flash/min par l'application MySirena.

**SE 120 LED**

| | | |
|---|---|---|
| 12/24V AC / 12-60V DC | 22710 | 22711 |
| 100-240V AC | 22718 | 22719 |
| 12/24V AC / 12-60V DC | 22714 | 22715 |
| 100-240V AC | 22722 | 22723 |

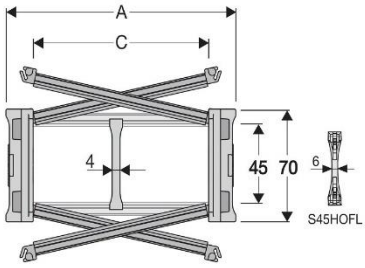
**SE 120 PRO LED**

| | | |
|---|---|---|
| 12/24V AC / 12-60V DC | 22712 | 22713 |
| 100-240V AC | 22720 | 22721 |
| 12/24V AC / 12-60V DC | 22716 | 22717 |
| 100-240V AC | 22724 | 22725 |

## 34. CABLE CHAIN

# H45SC
## Nylon cable chain with opening frames

**Inner height (D) 45 mm**
Sideband construction with quickly removable pin. Frames openable from either side on both inner and outer radius. As standard the chain comes with frames every second link, on request with frames every link. Vertical and horizontal modular separator system is available.




| Separator | |
|---|---|
| -Unassembled | Part.no S45CF3 |
| -Assembled* | Part.no S45CF3MCI |
| -Assembled** | Part.no S45CF3MCE |
| **Strong-hold Separator** *for C > 250 mm* | |
| -Unassembled | Part.no S45HOFL |
| -Assembled | Part.no S45HOFL |
| **Pin** | |
| | Part.no PNH45RS |

** for chain opening outer radius*
*** for chain opening inner radius*

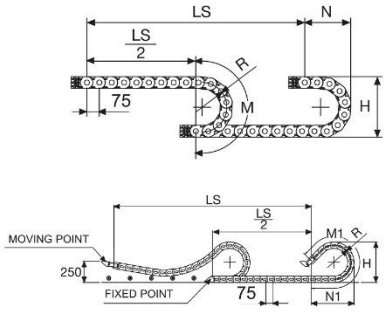
| Technical Characteristics when self-supporting | |
|---|---|
| Speed | 8 m/s |
| Acceleration | 40 m/s² |

*For higher requirements please consult our technical dept.*

***For sliding applications, characteristics techniques may vary depending on the frequency, added weight and work environment.***

| A | B | C | D | R | Weight/m | Chain |
|---|---|---|---|---|---|---|
| mm | mm | mm | mm | mm | kg | Part Number |
| 113 | 70 | 75 | 45 | 075-100-125-150-175-200-250-300 | 2,29 | **H45SC075** □□□ * |
| 138 | 70 | 100 | 45 | 075-100-125-150-175-200-250-300 | 2,37 | **H45SC100** □□□ * |
| 163 | 70 | 125 | 45 | 075-100-125-150-175-200-250-300 | 2,44 | **H45SC125** □□□ * |
| 188 | 70 | 150 | 45 | 075-100-125-150-175-200-250-300 | 2,52 | **H45SC150** □□□ * |
| 213 | 70 | 175 | 45 | 075-100-125-150-175-200-250-300 | 2,60 | **H45SC175** □□□ * |
| 238 | 70 | 200 | 45 | 075-100-125-150-175-200-250-300 | 2,67 | **H45SC200** □□□ * |
| 263 | 70 | 225 | 45 | 075-100-125-150-175-200-250-300 | 2,75 | **H45SC225** □□□ * |
| 288 | 70 | 250 | 45 | 075-100-125-150-175-200-250-300 | 2,83 | **H45SC250** □□□ * |
| 313 | 70 | 275 | 45 | 075-100-125-150-175-200-250-300 | 2,91 | **H45SC275** □□□ * |
| 338 | 70 | 300 | 45 | 075-100-125-150-175-200-250-300 | 2,99 | **H45SC300** □□□ * |
| 388 | 70 | 350 | 45 | 075-100-125-150-175-200-250-300 | 3,14 | **H45SC350** □□□ * |
| 438 | 70 | 400 | 45 | 075-100-125-150-175-200-250-300 | 3,30 | **H45SC400** □□□ * |

**Complete the code by inserting the value of the radius (R): Ex. H45SC100 ☐☐☐*
*Chain equipped with nylon frame every picth: complete the code by inserting the letter D. Ex. H45SC100250 ☐*




Length of chain (L)
Half travel distance $(\frac{LS}{2})$
plus length of curve (M) or (M1)

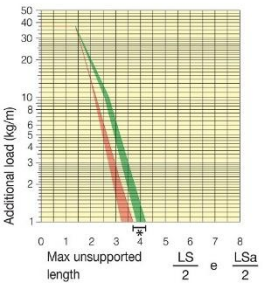
**$L = \frac{LS}{2}$ + M or M1**

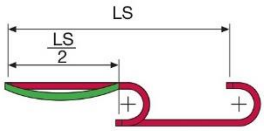
| R | H | N | M | N1 | M1 |
|---|---|---|---|---|---|
| mm | mm | mm | mm | mm | mm |
| 075 | 220 | 185 | 390 | 265 | 540 |
| 100 | 270 | 210 | 465 | 275 | 595 |
| 125 | 320 | 235 | 545 | 395 | 870 |
| 150 | 370 | 260 | 625 | 515 | 1150 |
| 175 | 420 | 285 | 700 | 635 | 1430 |
| 200 | 470 | 310 | 780 | 750 | 1705 |
| 250 | 570 | 360 | 940 | 990 | 2265 |
| 300 | 670 | 410 | 1095 | 1225 | 2820 |



## Self-Supporting Capacity Diagram

The maximum length of the self-supporting capacity or in admissible sagging in relationship to the weight of the cables and hoses contained per linear metre.




***If the chain is in the ADMISSIBLE SAGGING area** (between GREEN and RED area) version with **frames on every link** is necessary.

The area in the diagram considers the difference of weight between various widths.

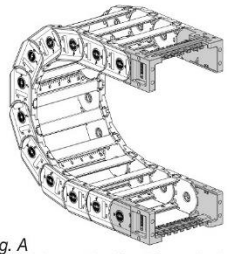
Red for self-supporting chain, green for chain in admissible sagging.

For applications with ($\frac{LS}{2}$) and weights not included in the diagram of self-supporting capacity, verify the possible use of support rollers (see page 30).

## End Brackets

The end brackets set allows the two ends of the chain to be attached to the equipment. Set complete with tiewrap clamps available on request.

### Nylon Type



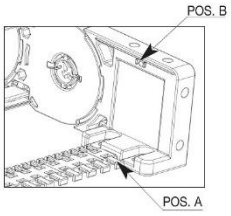
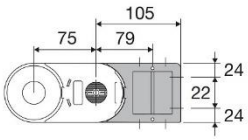
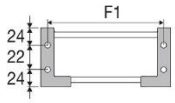
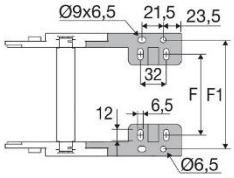



*Fig. A*
*The chain can be fixed frontally, inner and outer radius (Fig A)*




| Chain Type | F mm |
|---|---|
| H45SC075 | 91 |
| H45SC100 | 116 |
| H45SC125 | 141 |
| H45SC150 | 166 |
| H45SC175 | 191 |
| H45SC200 | 216 |
| H45SC225 | 241 |
| H45SC250 | 266 |
| H45SC275 | 291 |
| H45SC300 | 316 |
| H45SC350 | 366 |
| H45SC400 | 416 |

| Chain Type | F mm |
|---|---|
| H45SC075 | 55,5 |
| H45SC100 | 80,5 |
| H45SC125 | 105,5 |
| H45SC150 | 130,5 |
| H45SC175 | 155,5 |
| H45SC200 | 180,5 |
| H45SC225 | 205,5 |
| H45SC250 | 230,5 |
| H45SC275 | 255,5 |
| H45SC300 | 280,5 |
| H45SC350 | 330,5 |
| H45SC400 | 380,5 |

### Nylon Type Part Numbers

**Complete Set Assembled**

| Chain Type | End Brackets set |
|---|---|
| H45SC... | **ANH45SC□□□KM□**** |

**Complete Set Unassembled**

| Chain Type | End Brackets set |
|---|---|
| H45SC... | **ANH45SC□□□K** |

*** 1=Pos.1; 2=Pos.2; 3=Pos.3*

### Tiewrap Clamp

**Complete Set Assembled**

| Chain Type | Tiewrap Clamp set |
|---|---|
| Pos. A | **SFCTH45□□□*KMA** |
| Pos. B | **SFCTH45□□□*KM** |

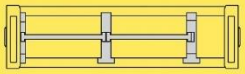
**Complete Set Unassembled**

| Mounting Position | Tiewrap Clamp set |
|---|---|
| Pos. A | **SFCTH45□□□*KA** |
| Pos. B | **SFCTH45□□□*K** |

** Inner Width C*

# H45SC

**Nylon cable chain with opening frames**

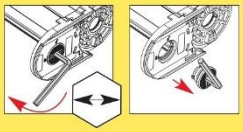


*Separation System page. 196*

*How to open the frame*



*How to release the pin junction*





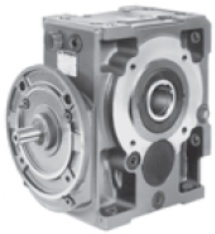

*Suitable to long travel distance in frame every pitch version.*

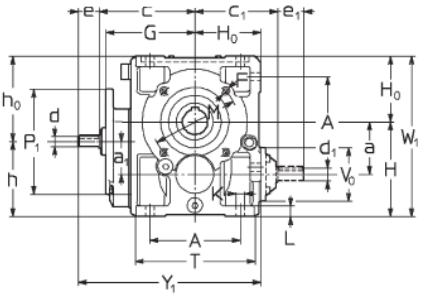
*For further informations please consult Brevetti Stendalto's Technical Office*

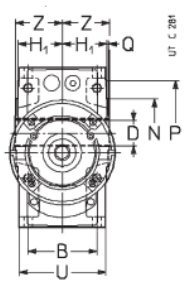
# 35. TROLLEY TRAVERSING GEARBOX

Designs, dimensions, mounting positions and oil quantities

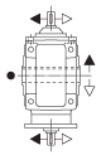
**R ICI 50 ... 200**






**Design** (direction of rotation)



U03D

● Position of the reference groove (see ch. 20) for verification of radial load.

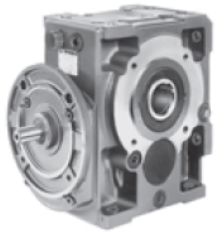
| Grand. Size | a | $a_1$ | A | B | c | $c_1$ | D Ø H7 | d Ø | e | $Y_1$ | d Ø | e | $Y_1$ | $d_1$ Ø | $e_1$ | $d_1$ Ø | $e_1$ | F | G | H | $H_0$ | $H_1$ | h | $h_0$ | K Ø | L | M Ø | N Ø h6 | P Ø | $P_1$ | Q | T | U | $V_0$ Ø | $W_1$ | Z | Massa Mass kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | $i_N \leq 80$ | | | $i_N \geq 100$ | | | $i_N \leq 40$ 4) | | $i_N \geq 50$ 5) | | 1) | | h11 | h11 | h12 | h11 | h11 | | | | | | | | | | | | | |
| **50** | 50 | 40 | 86 | 75 | 107 | 94 | 24 | 11 | 23 | 197 | – | – | – | 16 | 30 | 14 | 30 | M6 | 98 | 100 | 67 | 49 | 90 | 77 | 9,5 | 12 | 85 | 70 | 105 | 140[3] | 2,5 | 120 | 95 | 78 | 167 | 53 | 11 |
| **63** | 63 | 50 | 102 | 90 | 127 | 108 | 30 | 14 | 30 | 237 | 14 | 30 | 237 | 16 | 30 | 14 | 30 | M8 | 118 | 125 | 80 | 58,5 | 112 | 93 | 11,5 | 14 | 100 | 80 | 120 | 160[3] | 3 | 143 | 114 | 78 | 205 | 63 | 17 |
| **64** | 63 | 50 | 102 | 90 | 127 | 108 | 32 | 14 | 30 | 237 | 14 | 30 | 237 | 16 | 30 | 14 | 30 | M8 | 118 | 125 | 80 | 58,5 | 112 | 93 | 11,5 | 14 | 100 | 80 | 120 | 160[3] | 3 | 143 | 114 | 78 | 205 | 63 | 17 |
| **80** | 80 | 50 | 132 | 106 | 147 | 131 | 38 | 14 | 30 | 277 | 14 | 30 | 277 | 19 | 40 | 16 | 30 | M10 | 138 | 150 | 100 | 69,5 | 120 | 130 | 14 | 17 | 130 | 110 | 160 | 160[3] | 3,5 | 180 | 135 | 86 | 250 | 75 | 28 |
| **81** | 80 | 50 | 132 | 106 | 147 | 131 | 40 | 14 | 30 | 277 | 14 | 30 | 277 | 19 | 40 | 16 | 30 | M10 | 138 | 150 | 100 | 69,5 | 120 | 130 | 14 | 17 | 130 | 110 | 160 | 160 | 3,5 | 180 | 135 | 86 | 250 | 75 | 28 |
| **100** | 100 | 63 | 172 | 131 | 181 | 157 | 48 | 19 | 40 | 346 | 16 | 30 | 336 | 24 | 50 | 19 | 40 | M12 | 170 | 180 | 125 | 84,5 | 143 | 162 | 16 | 20 | 165 | 130 | 200 | 200 | 3,5 | 228 | 165 | 104 | 305 | 90 | 50 |
| **125** | 125 | 80 | 212 | 162 | 216 | 188 | 60 | 24 | 50 | 416 | 19 | 40 | 406 | 28 | 60 | 24 | 50 | 2) | 205 | 225 | 150 | 103,5 | 180 | 195 | 18 | 23 | 215 | 180 | 250 | 200 | 4 | 274 | 201 | 122 | 375 | 110 | 88 |
| **140** | 140 | 80 | 212 | 162 | 216 | 188 | 70 | 24 | 50 | 416 | 19 | 40 | 406 | 28 | 60 | 24 | 50 | 2) | 205 | 240 | 150 | 103,5 | 180 | 210 | 18 | 23 | 265 | 230 | 300 | 200 | 4 | 274 | 201 | 122 | 390 | 125 | 102 |
| **160** | 160 | 100 | 252 | 201 | 258 | 226 | 80 | 28 | 60 | 498 | 24 | 50 | 488 | 38 | 80 | 32 | 80 | 2) | 247 | 280 | 180 | 128,5 | 220 | 240 | 22 | 28 | 265 | 230 | 300 | 250 | 4 | 328 | 249 | 155 | 460 | 136 | 164 |
| **180** | 180 | 100 | 252 | 201 | 258 | 226 | 90 | 28 | 60 | 498 | 24 | 50 | 488 | 38 | 80 | 32 | 80 | 2) | 247 | 300 | 180 | 128,5 | 220 | 260 | 22 | 28 | 300 | 250 | 350 | 250 | 5 | 328 | 249 | 155 | 480 | 150 | 188 |
| **200** | 200 | 125 | 320 | 250 | 318 | 282 | 100 | 32 | 80 | 623 | 32 | 80 | 623 | 48 | 110 | 38 | 80 | 2) | 305 | 355 | 225 | 158 | 280 | 300 | 27 | 34 | 350 | 300 | 400 | 300 | 5 | 410 | 307 | 190 | 580 | 167 | 296 |

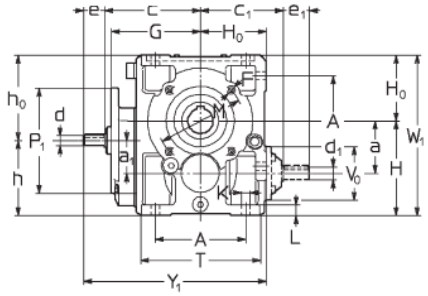
| Item | Description | Code | Off |
|---|---|---|---|
| - | Orthogonal type gearbox type cat. G MR ICI 80 UO3A - 24x200 - 52 Form B3 - Flange B5 (F1) painting cycle 2I (C5 M) white RAL 7038 without motor | 002-0027-C1433 | 1 |

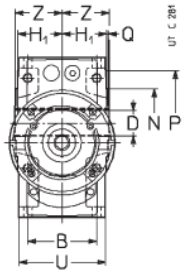
# 36. HOISTING GEARBOX

Designs, dimensions, mounting positions and oil quantities

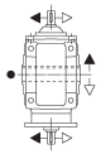
**R ICI 50 ... 200**






**Design** (direction of rotation)



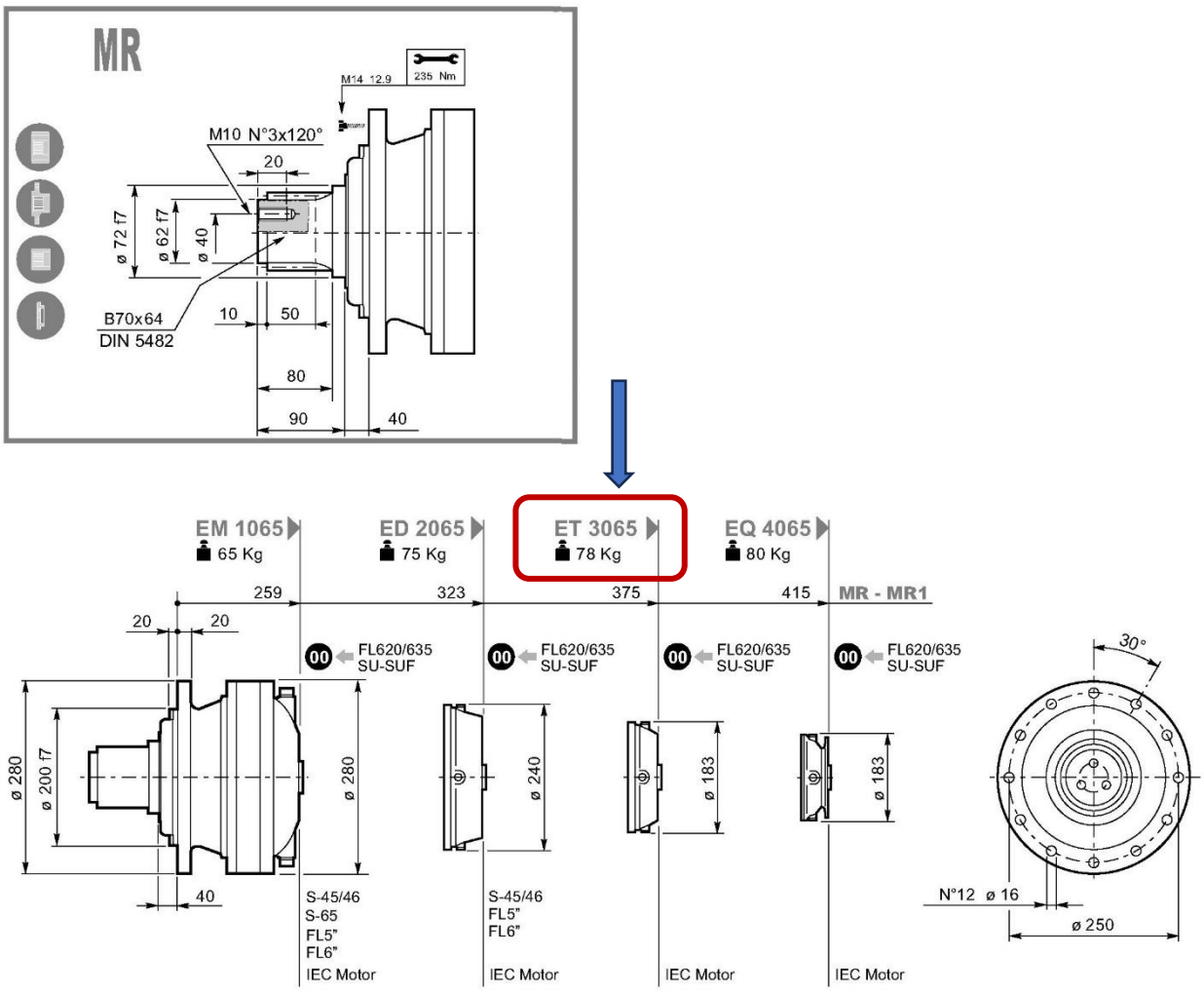
UO3D

● Position of the reference groove (see ch. 20) for verification of radial load.

| Grand. Size | a | $a_1$ | A | B | c | $c_1$ | D Ø H7 | d Ø | e | $Y_1$ | d Ø | e | $Y_1$ | $d_1$ Ø | $e_1$ | $d_1$ Ø | $e_1$ | F | G | H h11 | $H_0$ h11 | $H_1$ h12 | h h11 | $h_0$ h11 | K Ø | L | M Ø | N Ø h6 | P Ø | $P_1$ | Q | T | U | $V_0$ Ø | $W_1$ | Z | Massa Mass kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | $i_N \leq 80$ | | | $i_N \geq 100$ | | 4) $i_N \leq 40$ | | 5) $i_N \geq 50$ | | 1) | | | | | | | | | | | | | | | | | | | | |
| **50** | 50 | 40 | 86 | 75 | 107 | 94 | 24 | 11 | 23 | 197 | – | – | – | 16 | 30 | 14 | 30 | M6 | 98 | 100 | 67 | 49 | 90 | 77 | 9,5 | 12 | 85 | 70 | 105 | 140[3] | 2,5 | 120 | 95 | 78 | 167 | 53 | 11 |
| **63** | 63 | 50 | 102 | 90 | 127 | 108 | 30 | 14 | 30 | 237 | 14 | 30 | 237 | 16 | 30 | 14 | 30 | M8 | 118 | 125 | 80 | 58,5 | 112 | 93 | 11,5 | 14 | 100 | 80 | 120 | 160[3] | 3 | 143 | 114 | 78 | 205 | 63 | 17 |
| **64** | 63 | 50 | 102 | 90 | 127 | 108 | 32 | 14 | 30 | 237 | 14 | 30 | 237 | 16 | 30 | 14 | 30 | M8 | 118 | 125 | 80 | 58,5 | 112 | 93 | 11,5 | 14 | 100 | 80 | 120 | 160[3] | 3 | 143 | 114 | 78 | 205 | 63 | 17 |
| **80** | 80 | 50 | 132 | 106 | 147 | 131 | 38 | 14 | 30 | 277 | 14 | 30 | 277 | 19 | 40 | 16 | 30 | M10 | 138 | 150 | 100 | 69,5 | 120 | 130 | 14 | 17 | 130 | 110 | 160 | 160[3] | 3,5 | 180 | 135 | 86 | 250 | 75 | 28 |
| **81** | 80 | 50 | 132 | 106 | 147 | 131 | 40 | 14 | 30 | 277 | 14 | 30 | 277 | 19 | 40 | 16 | 30 | M10 | 138 | 150 | 100 | 69,5 | 120 | 130 | 14 | 17 | 130 | 110 | 160 | 160[3] | 3,5 | 180 | 135 | 86 | 250 | 75 | 28 |
| **100** | 100 | 63 | 172 | 131 | 181 | 157 | 48 | 19 | 40 | 346 | 16 | 30 | 336 | 24 | 50 | 19 | 40 | M12 | 170 | 180 | 125 | 84,5 | 143 | 162 | 16 | 20 | 165 | 130 | 200 | 200 | 3,5 | 228 | 165 | 104 | 305 | 90 | 50 |
| **125** | 125 | 80 | 212 | 162 | 216 | 188 | 60 | 24 | 50 | 416 | 19 | 40 | 406 | 28 | 60 | 24 | 50 | 2) | 205 | 225 | 150 | 103,5 | 180 | 195 | 18 | 22 | 215 | 180 | 250 | 200 | 4 | 274 | 201 | 122 | 375 | 110 | 88 |
| **140** | 140 | 80 | 212 | 162 | 216 | 188 | 70 | 24 | 50 | 416 | 19 | 40 | 406 | 28 | 60 | 24 | 50 | 2) | 205 | 240 | 150 | 103,5 | 180 | 210 | 18 | 23 | 265 | 230 | 300 | 200 | 4 | 274 | 201 | 122 | 390 | 125 | 102 |
| **160** | 160 | 100 | 252 | 201 | 258 | 226 | 80 | 28 | 60 | 498 | 24 | 50 | 488 | 38 | 80 | 32 | 80 | 2) | 247 | 280 | 180 | 128,5 | 220 | 240 | 22 | 28 | 265 | 230 | 300 | 250 | 4 | 328 | 249 | 155 | 460 | 136 | 164 |
| **180** | 180 | 100 | 252 | 201 | 258 | 226 | 90 | 28 | 60 | 498 | 24 | 50 | 488 | 38 | 80 | 32 | 80 | 2) | 247 | 300 | 180 | 128,5 | 220 | 260 | 22 | 28 | 300 | 250 | 350 | 250 | 5 | 328 | 249 | 155 | 480 | 150 | 188 |
| **200** | 200 | 125 | 320 | 250 | 318 | 282 | 100 | 32 | 80 | 623 | 32 | 80 | 623 | 48 | 110 | 38 | 80 | 2) | 305 | 355 | 225 | 158 | 280 | 300 | 27 | 34 | 350 | 300 | 400 | 300 | 5 | 410 | 307 | 190 | 580 | 167 | 296 |

| Item | Description | Code | Off |
|---|---|---|---|
| - | Orthogonal type gearbox type cat. G MR ICI 140 UO3D - 38x300 - 40,6 Form B3 - Flange B5 (F1) Painting cycle 2I (C5 M) white RAL 7038 without motor | 002-0027-C1432 | 1 |

## 37. SLEWING GEARBOX




| Item | Description | Code | Off |
|---|---|---|---|
| - | Planetary gearbox type B2045232 ET3065/MR/208.2/61104600690 V5C5MH RAL 7038- Pinion 3355332000K EM1065/Z11M10/../A32 + RDF Flange for motor size IEC100-112 | 002-0027-C1431 | 1 |

# 38. GEARBOXES LUBRICATION

## General

The gear pairs are oil-bath lubricated, the bearings are either oil bathed or splashed or lubricated «for life» with grease. For some mounting positions with continuous duty at high speed, an expansion tank is foreseen: consult us. Gear reducers are supplied filled with PAO synthetic oil having viscosity 320 cSt (at 40° C).Consider the lubrication interval stated in the table for all re-lubrication operations, emptying the gear reducers from the exhausted oil, executing a wash with clean oil of the same type to be used also for the re-filling of the gear reducer up to level.

| OIL TEMPERATURE (°C) | OIL-INTERVAL (h) | |
|---|---|---|
| | Synthetic oil | Mineral oil |
| ≤ 65 | 12500 | 5600 |
| 65 ÷ 80 | 9000 | 2800 |
| 80 ÷ 95 | 6300 | 1400 |

Oil-change intervals assume pollution-free surroundings. When heavy overloads are present, halve the values. Independently from running times, change the oil every 2 ÷ 4 years (every 1 ÷ 2 years, for mineral oil).The main lubricant manufacturers as well as the ISO viscosity grade to be used are stated in the following tables. Use only lubricants with EP (extreme pressure) additives.

Never mix different makes of synthetic oil; if oil-change involves switching to a type different from that used hitherto, then give the gear reducer a through clean-out. Polyglycol basis synthetic lubricants must not be mixed with other type's lubricants (mineral and PAO lubricants). Before their use is not recommended.

## Bearings with independent lubrication, motor bearings

Usually the bearings are automatically and continuously lubricated (oil-bathed or splashed) with the same lubricant of gear reducer. However for certain gear reducer in vertical mounting position V1, V3 and horizontal mounting position B51, B52 the upper bearings have independent lubrication, with special grease for «long life» lubrication in absence of external pollution; this is valid also for motor bearings (excluding some cases where a re-lubrication device is foreseen).

## Commissioning

Carry out an overall check, making particularly sure that the gear reducer is filled with lubricant up to level and mounted according to the mounting position stated on name plate. For the first commissioning, before starting with a normal running cycle, it is advisable to run the gear reducer without load in order to verify if it correctly runs. In this circumstance, cause of the elimination of potential residual air, an oil filling up to level could be necessary. Where Y-Δ starting is being used, input voltage must match the motor lower voltage (Δ connection).For asynchronous three-phase motor, if the direction of rotation is not as desired, invert two phases at the terminals.

# 39. GEARBOXES MAINTENANCE

## General

At machine rest, verify at regular intervals (more or less frequently according to environment and use):
a) all external surfaces are clean and air passages to the gear reducer or gear-motor are free, in order that cooling remains fully effective;
b) oil level and deterioration degree (check with cold gear reducer at rest);
c) correct fastening screws tightening.
During operation, check periodically:
– noise level;
– vibrations;
– sealings;
etc.

## Attention!

After a running period, gear reducer is subject to a light internal overpressure which may cause burning liquid discharge. Therefore, before loosening whichever (filler plug, included) plug wait until gear reducer has become cold and open it carefully; if not possible, take the necessary protection measures against burning due to warm oil contact. In all cases, always proceed with great care. Maximum oil temperatures indicated in lubrication table do not represent a hindrance to the gear reducer regular running. During oil change operation, after unscrewing also the filler plug in order to facilitate oil draining:
– wash the inside part of gear reducer housing using the same oil type suitable for the running (stated on lubrication nameplate); the oil used for this wash can be applied for further washings after proper filtering by 25 µm of filtration standard.
– clean, using a compressed air stream, all magnetic plugs, taking care to assemble them again in their original position;
– fill in the gear reducer with new oil up to level, using only oil of the same type and viscosity as per lubrication nameplate.
Replace the seal rings in case of dismounting or of periodical check; in this case, the new ring must be positioned so that the new ring does not work on the same sliding race of previous ring.

## Seal rings

Duration depends on several factors such as dragging speed, temperature, ambient conditions, etc.; as a rough guide it can vary from 1 600 ÷ 12 500 h.

## Motor mounting or replacement

Since gear-motors are realized with standardized, motor mounting and replacement in case of failure is extremely easy. simply observe the following instructions:
– be sure that the mating surfaces are machined under accuracy rating (iec 60072-1, unel 13501-69; din 42955);
– clean surfaces to be fitted thoroughly;
– check and, if necessary, lower the parallel key so as to leave a clearance of 0,1 □ 0,2 mm between its top and the bottom of the keyway of the hole. if shaft keyway is without shoulder, lock the key with a pin.
– lubricate surfaces to be fitted against fretting corrosion.
– insert the motor down to shoulder on gear-motor flange; this operation can be facilitated vertically positioning the gear-motor with motor flange mounted upwards;
– check that motor centering is in the relevant gear-motor flange seat;
– tighten the motor fastening screws to gear reducer flange in order to achieve the tightening torque as per following table:

| Bolt - d (ø) | Tigthtening torque - Nm cl.8.8 |
|---|---|
| M8 | 25 |
| M10 | 56 |
| M12 | 85 |
| M14 | 135 |
| M16 | 205 |

# 40. ELECTRIC MOTORS BRAKE ASSEMBLY – SIZES 90-100-132

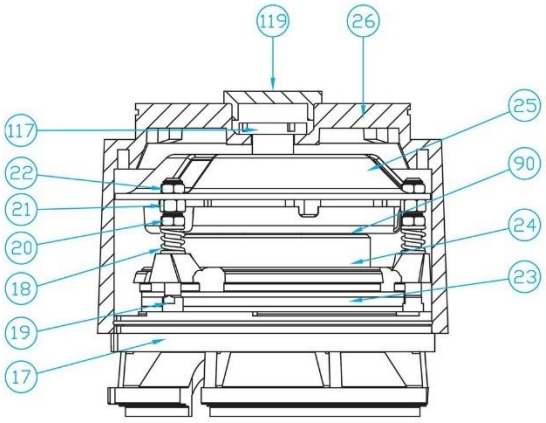
## BAH Series 80÷315

BA brake motors are supplied as standard as BAH series starting from the frame size 225 up to 315 mm and on request starting from the frame size 80 up to 200. In the technical data tables the BAH series motors are proposed in the BAHX version for continuous duty with efficiency class IE2 / IE3 (compliant with EU regulation 2019/1781), alternatively they can be supplied in the BAH 'Enhanced Power' version only for intermittent service (S3 60%).

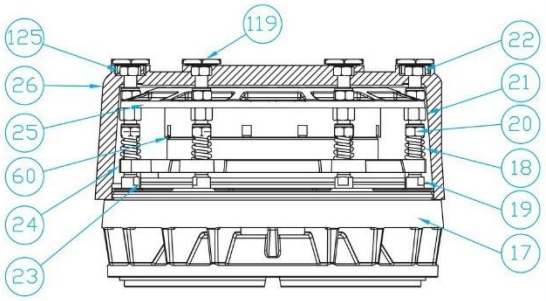
The BAH serie-motors have the same characteristics of the BA-BAX serie-motors. The difference essentially consists in the casing of the brake assembly designed to give greater strenght and protection against the entry of dust and liquids (IP degree). The BAH serie-motors are supplied as standard with IP55 protection degree and, on request, with IP56-65-66 protection degree.

**17** - Brake Friction surface
**18** - Spring
**19** - Brake Adjuster
**20** - Brake Torque Adjuster Locknut
**21** - Air Gap Adjusting Nut
**22** - Brake Coil Locknut
**23** - Brake disc
**24** - Brake Moving Element
**25** - Brake coil
**26** - Brake Cover (BAH)
**60** - Air Gap
**117** - Brake Cover Fixing Screw (BAH 80÷112)
**119** - Brake Cover Closing Cap BAH
**125** - Brake Cover Fixing Nut (BAH 132÷315)

## Brake assembly BAH 80÷112

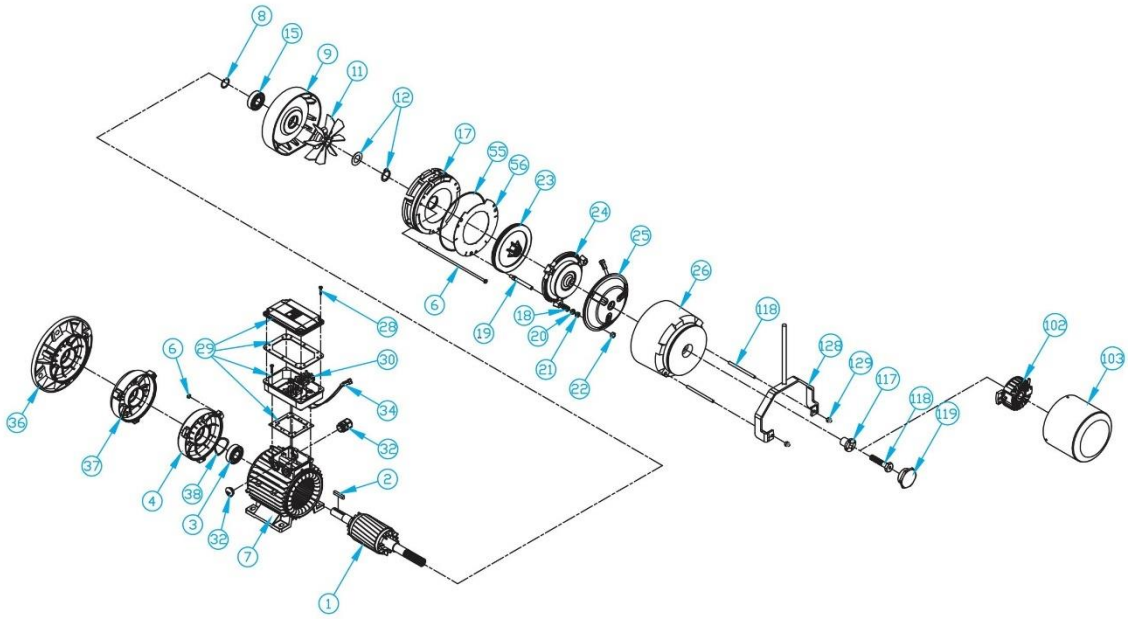



## Brake assembly BAH 132÷315



# 41. ELECTRIC MOTORS SPARE PARTS LIST – SIZES 90-100

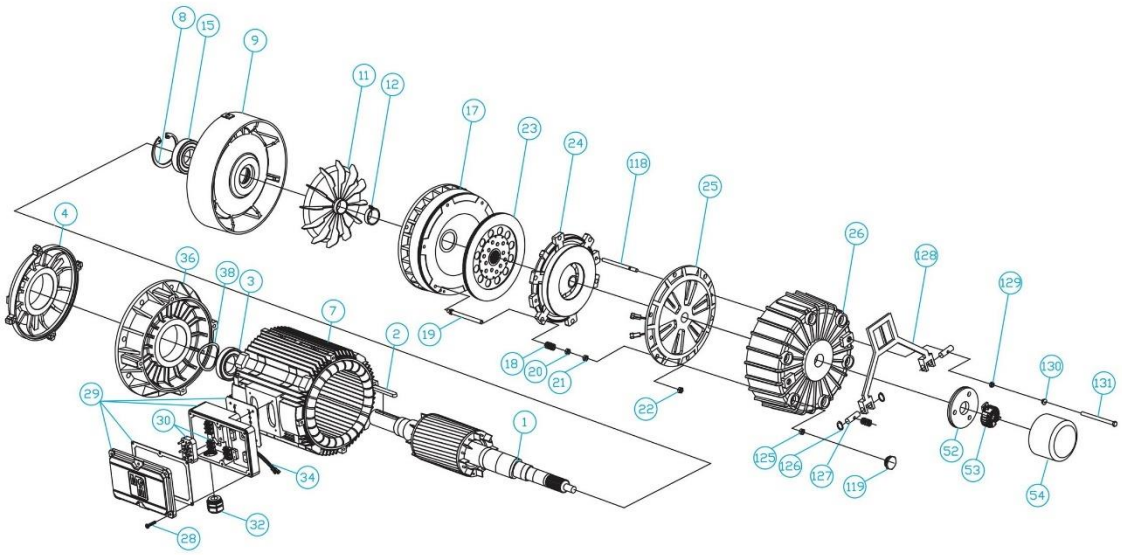
BAH-BAHX 80-112 series



| | | | |
|---|---|---|---|
| 1 | Rotor | 25 | Brake coil |
| 2 | Key | 26 | Brake cover (BAH) |
| 3 | Front bearing | 28 | Hexagonal rear nut |
| 4 | Front cover (B3) | 29 | Terminal board box screws |
| 6 | Tie rod assembly | 30 | Terminal board box (single or double) |
| 7 | Frame | 32 | Terminal board |
| 8 | Circlip | 34 | Cable gland |
| 9 | Rear cover | 36 | Terminal box/brake coil connection |
| 11 | Fan | 37 | Flange cover (B5) |
| 12 | Fan assembly | 38 | Flange cover (B14) |
| 15 | Rear bearing | 49 | Elastic washer |
| 17 | Rear cover (brake surface) | 55 | Brake assembly O-Ring |
| 18 | Spring | 56 | Inox plate |
| 19 | Brake adjuster | 102 | Encoder (BAHE, BAHXE) |
| 20 | Braking torque adjusting locknut | 103 | Encoder cover (BAHE, BAHXE) |
| 21 | Air gas adjusting nut | 117 | BAH brake cover fixing cap |
| 22 | Locknut | 118 | BAH Brake release screw |
| 23 | Brake disc | 119 | BAH brake cover screw cap |
| 24 | Brake moving element | | |

# 42. ELECTRIC MOTOR SPARE PARTS LIST – SIZES 132






| | | | |
|---|---|---|---|
| 1 | Rotor Shaft | 28 | Terminal board box screws (6 units) |
| 2 | Key | 29 | Terminal board box |
| 3 | Front bearing | 30 | Terminal board |
| 4 | Endshield Drive End | 32 | Cable gland |
| 7 | Frame | 34 | Terminal box/brake coil connection |
| 8 | Circlip | 36 | Flange cover (B5) |
| 9 | Rear cover | 38 | Elastic washer |
| 11 | Fan | 52 | Encoder fixing plate (BAHE, BAHXE) |
| 12 | Rear cover seal | 53 | Encoder (BAHE, BAHXE) |
| 15 | Rear bearing | 54 | Encoder protective cover (BAHE, BAHXE) |
| 17 | Brake friction surface | 118 | Unlocking type hand brake release screw (2 units) |
| 18 | Spring (6 units) | 119 | Brake Adjuster Plug (6 units) |
| 19 | Brake adjuster (6 units) | 125 | Brake Cover Locknut |
| 20 | Brake torque adjuster locknut (6 units) | 126 | Hinge for unlocking type brake release circlip (optional) |
| 21 | Air gap adjusting nut (6 units) | 127 | Hinge for unlocking type brake release (optional) |
| 22 | Brake Coil Locknut (6 units) | 128 | Unlocking type hand brake release lever (optional) |
| 23 | Brake disc | 129 | Unlocking type hand brake release locknut (optional) |
| 24 | Brake moving element | 130 | Brake release plug |
| 25 | Brake coil | 131 | Locking type brake release screw (2 units) |
| 26 | Cast Iron Brake Cover | 132 | Brake hand release locking screws |

## 43. ATTACHMENTS LIST

| ITEM | TITLE | CODE | N° of sheets |
|---|---|---|---|
| - | SLEWING GEARBOX PARTS LIST | 002-0027-C1431 | 15 |
| - | HOISTING GEARBOX PARTS LIST | 002-0027-C1432 | 1 |
| - | TRAVERSING GEARBOX PARTS LIST | 002-0027-C1433 | 1 |
| - | SHOE BRAKE – INSTALLATION AND MAINTENANCE MANUAL | 002-0017-C0396 | 40 |

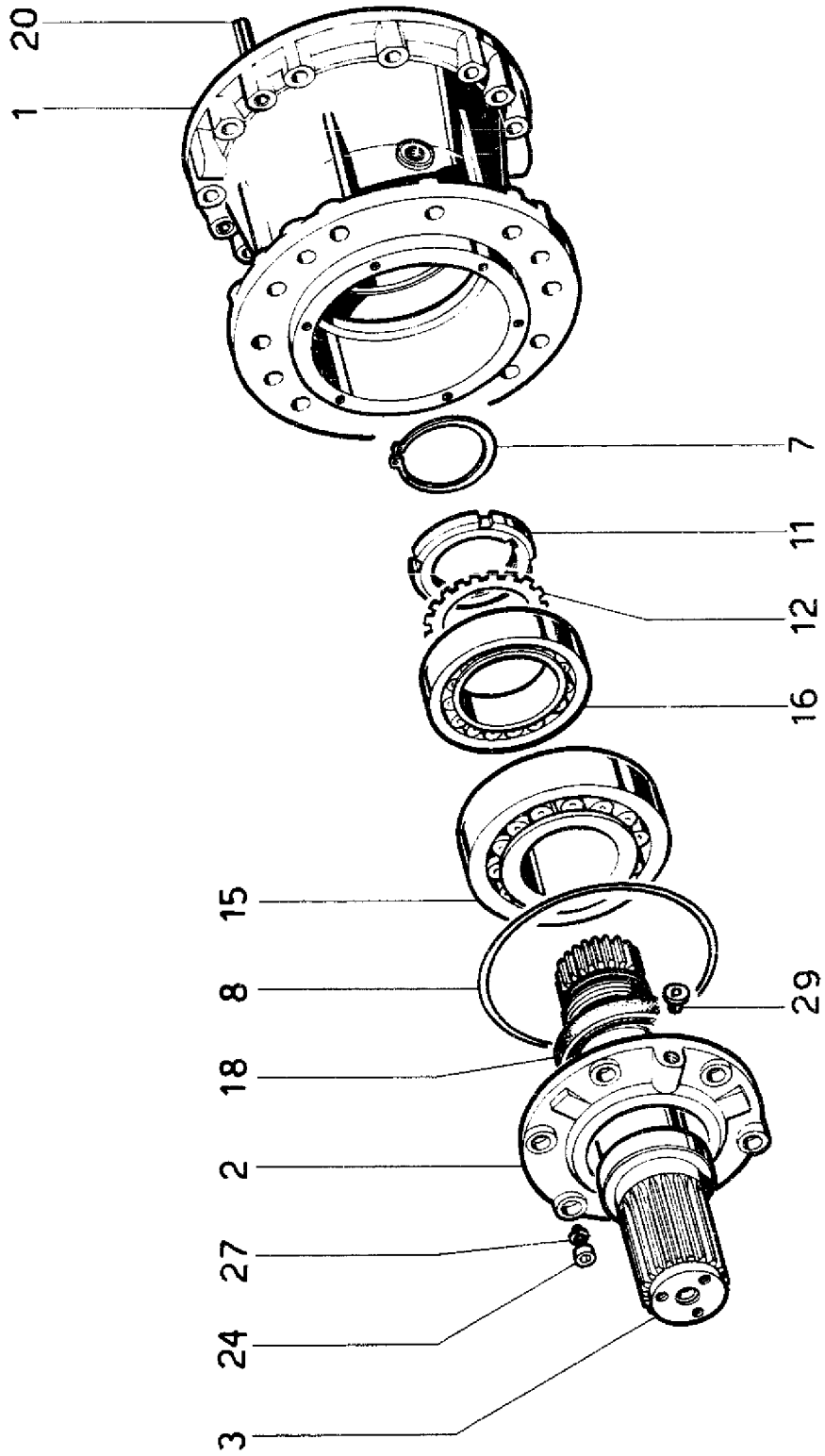


REMAZEL
ENGINEERING

**REMAZEL ENGINEERING S.P.A.**
Via Portici Manarini 41/A, 24060 Chiuduno (BG), Italy

info@remazel.com
www.remazel.com

Remazel Engineering




| Mod. | | | Mod. Date | Modified by | Checked by |
|---|---|---|---|---|---|
| Drawn by: A.Neroni | Checked by: W.Bacchelli | Date: 10.07.17 | SET11D60002V2 | | |

# COMPONENT PART LIST

**Num:** ***DBT11D60002V2***

**Date:** ***10.07.2017***

Description: **OUTPUT SUPPORT**
Business Code: **EM1065/MR/../065**
Discriminating: **(Senza Tappi)**

| Pos. | Code | Description | Qty. | Notes |
|---|---|---|---|---|
| 1 | 35206614200 | SUPPORT<br>EM1065/MR/../065 | 1 | |
| 2 | 35417424000 | COVER<br>EM1065/../../IF178 | 1 | |
| 3 | 31113730600 | SHAFT<br>EM1065/B32/../B32 | 1 | |
| 7 | 43107000000 | SEEGER CIRCLIP<br>DIN 471-A 70 | 1 | |
| 8 | 41234100000 | O-RING<br>129,77x3,53 NBR 70Sh | 1 | |
| 11 | 47101600000 | LOCK NUT<br>KM15 DIN981 | 1 | |
| 12 | 37211346400 | TAB WASHER<br>EM1065/17T/72/2,5 | 1 | |
| 15 | 42214100000 | BEARING<br>33215 DIN720 | 1 | |
| 16 | 42213900000 | BEARING<br>30215 DIN720 | 1 | |
| 18 | 41133500000 | OIL SEAL<br>DIN3760 AS 85x110x12 NBR | 1 | |
| 20 | 43843040100 | PIN<br>Spirol 12x60 | 4 | |
| 24 | 46107800000 | SCREW<br>ISO4017 M8x25 8.8 | 6 | |
| 27 | 46701000101 | WASHER<br>ISO 7092 8,4x14x1,6 St-HV300 | 6 | |
| 29 | 9010776 | PLUG<br>G1/8 DIN908 Magn.Inc_O-Ring_Lanthane | 1 | |

**Exploded view:** SET11D60002V2

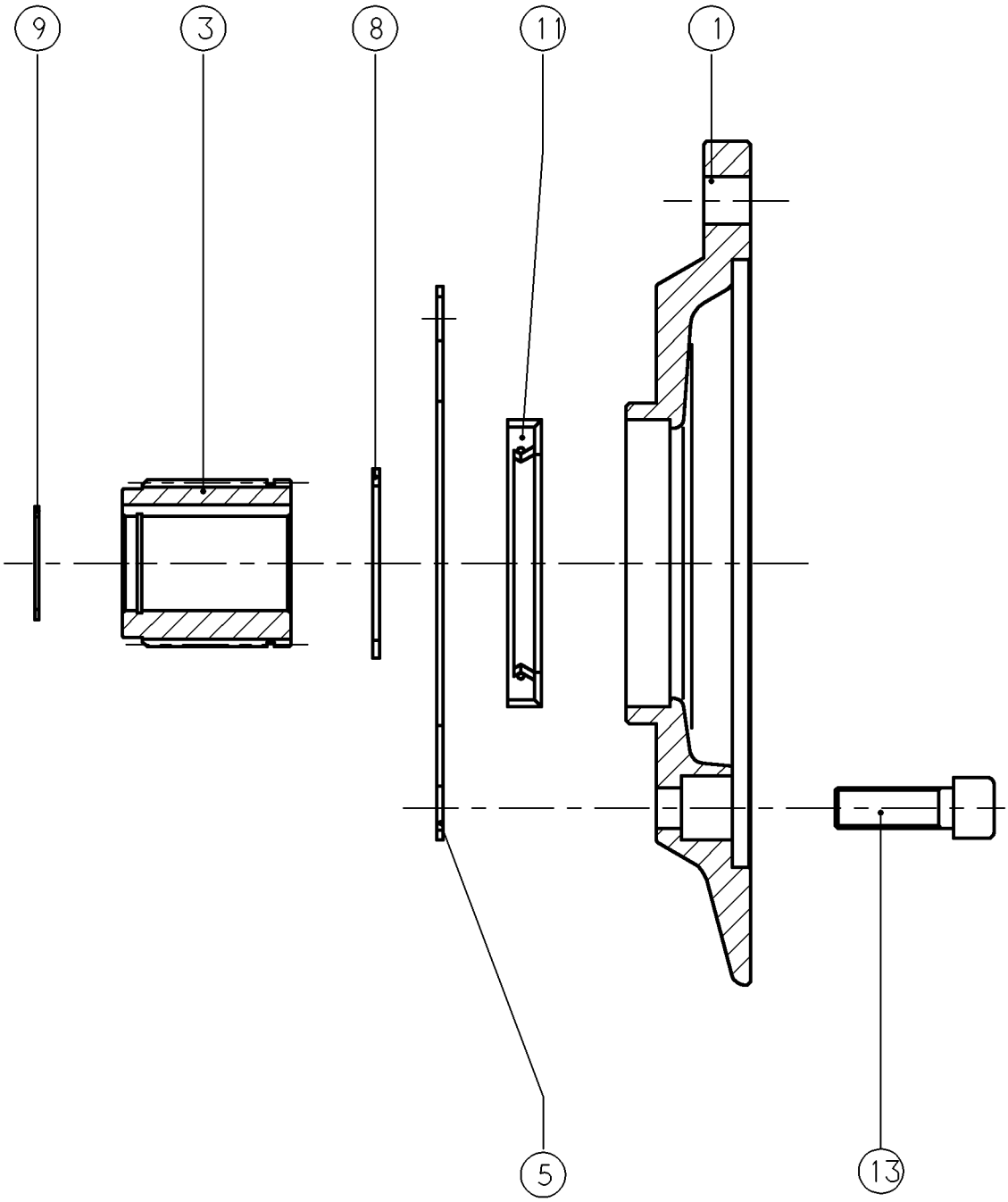
**Notes:**

| Mod. | Description Modifications | Date Mod. |
|---|---|---|
| | | |

ESPLOSO FLANGIATURA
Exploded view adaptor set – Vue eclatee adaptation
Anbauteile einzeldarstellung – Despiece adaptation

61104600690

| Disegnato da: Progettazioni G.G il : 06/05/94 | Controllato da: Incerti il : 06/05/94 |
|---|---|




| Mod. | Descrizione modifica | Data | Es./Ct. | Sostituisce il: |
|---|---|---|---|---|
| | | | | |

Brevini

# COMPONENT PART LIST

**Num:** ***DB61104600690***

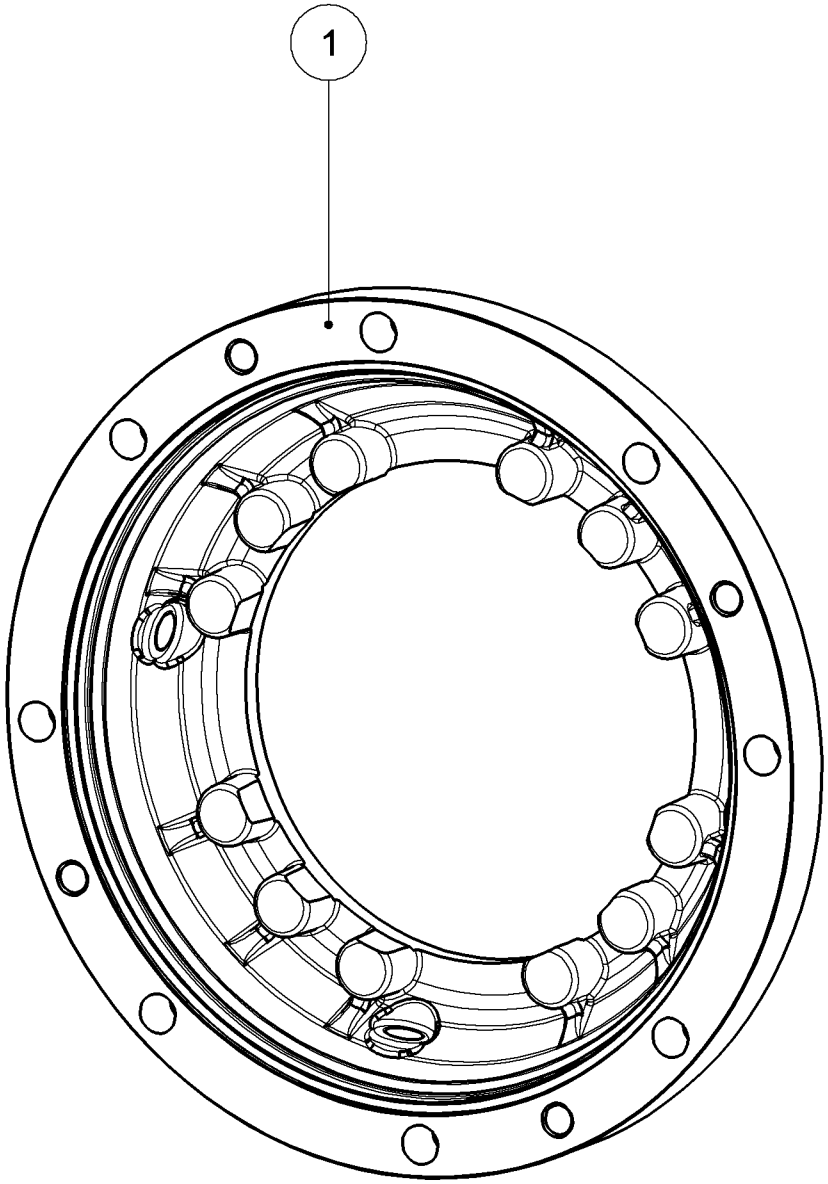
**Date:** ***03.03.2016***

Description: **UNIVERSAL ADAPTOR**
Business Code: **UNI611.0/B24X00 (X=28)**
Discriminating:

| Pos. | Code | Description | Qty. | Notes |
|---|---|---|---|---|
| 001 | 30104624000 | FLANGE<br>UNI/IF145/../To4 | 1 | (X=28) |
| 003 | 30506940100 | COUPLING<br>B24/../D28i | 1 | |
| 005 | 36602249000 | GASKET<br>UNI/IF145/../To6 | 1 | |
| 008 | 43105500000 | CIRCLIP.<br>Est.50 UNI7435-75 | 1 | |
| 009 | 43202700000 | CIRCLIP.<br>Int.28 UNI7437-75 | 1 | |
| 011 | 41127900000 | OIL SEAL<br>BA60x85x10 | 1 | |
| 013 | 46213600000 | SCREW<br>ISO4762 M12x25 8.8 | 6 | |

**Exploded view:** SE61104600690

**Notes:**




OFF-HIGHWAY DRIVE AND MOTION TECHNOLOGIES
REGGIO EMILIA

DANA

| Mod. | | | Mod. Date | Modified by | Checked by |
|---|---|---|---|---|---|
| A | ELIM.POS.9 (ERANO N.4 SPINE 43839640100)<br>DEL.POS.9 (WERE N.4 PINS 43839640100) | | 30.04.21 | GAGLIANI M. | S.C. |
| Drawn by: | Checked by: | Date: | SE1001396 | | |
| S.CAMPARI | B.LOMBARDI | 19.06.02 | | | |

# COMPONENT PART LIST

**Num:** ***DB1002057***

**Date:** ***30.04.2021***

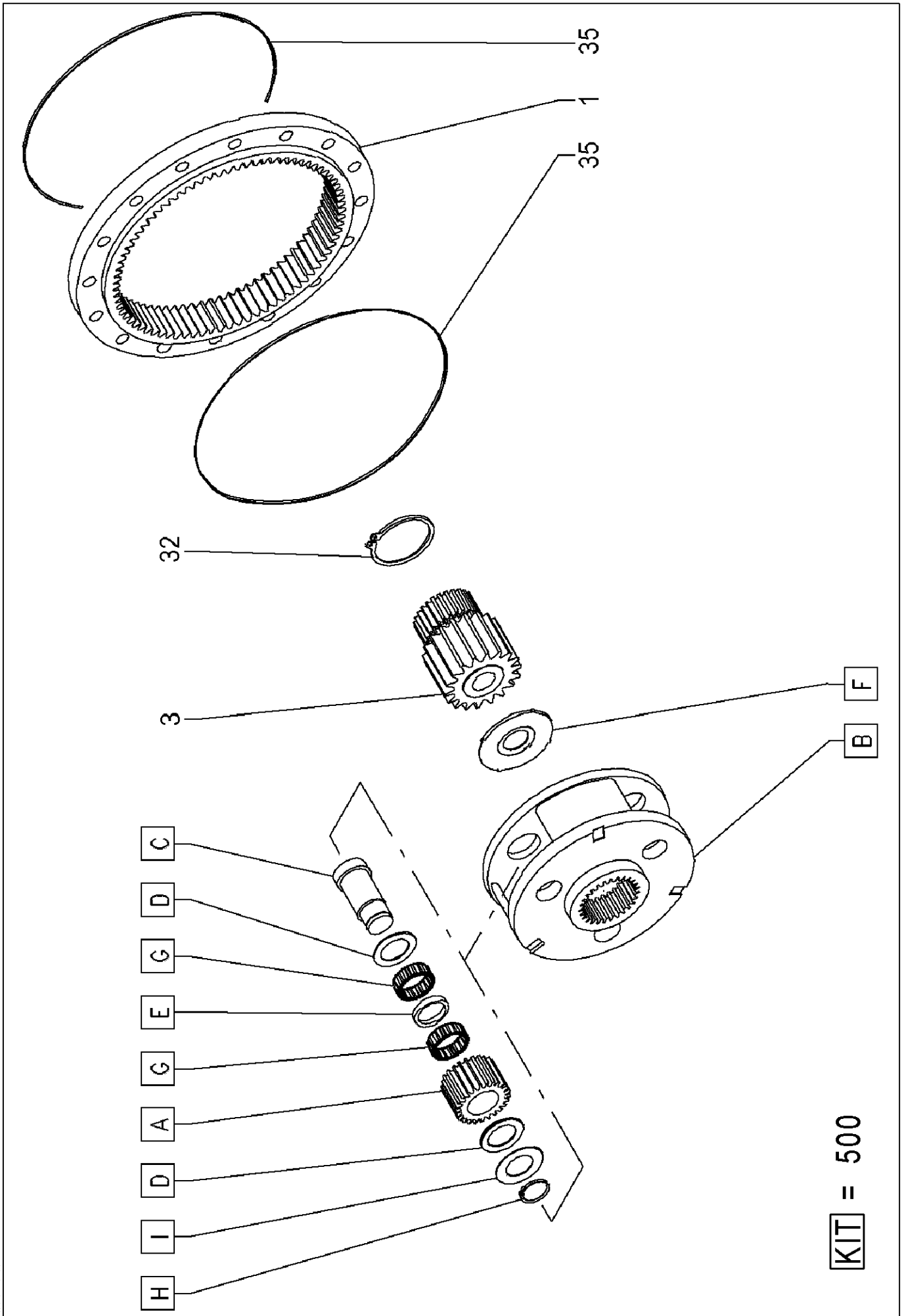
Description: **INTERMEDIATE FLANGE**
Business Code: **EM1065/065/../020**

| Pos. | Code | Description | Qty. | Notes |
|---|---|---|---|---|
| 001 | 34203624000 | INTERMEDIATE FLANGE<br>EM1065/065/../020 | 1 | |

**Exploded view:** SE1001396

**Notes:**

| Mod. | Description Modifications | Date Mod. |
|---|---|---|
| A | ELIM.POS.9 ERA 43839640100.<br>DEL.POS.9 WAS 43839640100. | 30.4.21_MG |

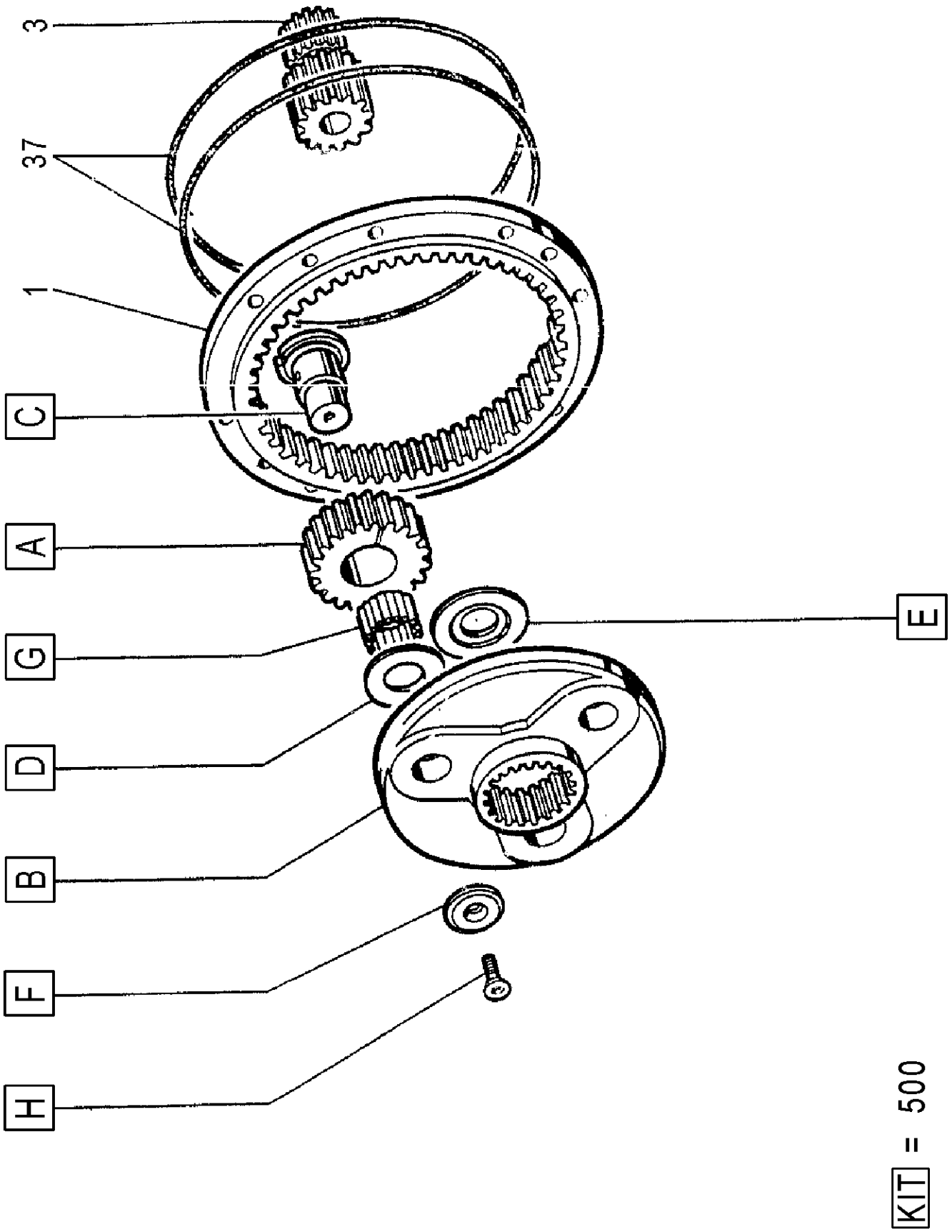



| Mod. | | Mod. Data | Modificato da | Controllato da |
|---|---|---|---|---|
| A | Variata rappresentaz. grafica ralla posizione "D" (PM373) | 05.11.03 | A.N. | Fiumanò |

| DISEGNATO/DRAWN BY: | CONTROLLATO/CHECKED BY: | DATA/DATE: | |
|---|---|---|---|
| S.Campari | R.Incerti | 26.11.02 | SE111D6220007 |

Description: **REDUCTION STAGE**
Business Code: **EM1065/FEc/5/GC27**
Discriminating:

| Pos | Code | Denomination | Q.ty | Notes |
|---|---|---|---|---|
| 001 | **32001921100** | RING-GEAR<br>EM1065/10F/..Z60M3,5 | **1** | |
| 003 | **32733530300** | SUN PINION<br>EM1065/Z15M3,5/5/B27 | **1** | |
| 032 | **43106100000** | CIRCLIP<br>Est.57 UNI7435-75 | **1** | |
| 035 | **41221700000** | O-RING<br>2-175 228x2,62 | **2** | |
| 500 | **211D625000N** | REDUCTION STAGE EM1065/FEc/5/SGC | **1** | |
| | | | | |
| | **Exploded View** | SE111D6220007 | | |




| Mod. | | Data mod. | Modificato | Controllato |
|---|---|---|---|---|
| DISEGNATO: S.Campari | CONTROLLATO: R.Incerti | DATA: 26.11.02 | SE111B8210107 | |

# COMPONENT PART LIST

**Num:** ***DB111B8270107/B***

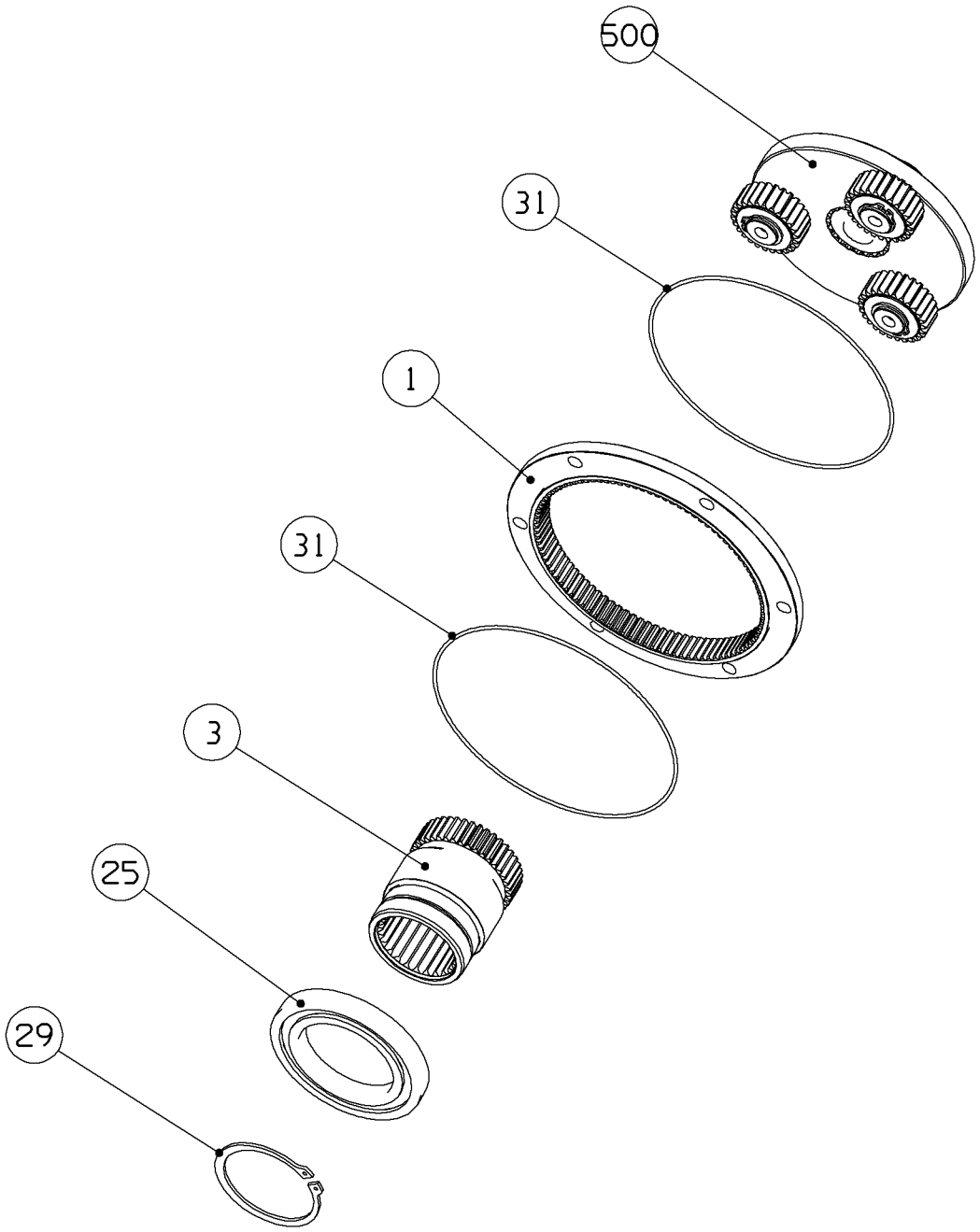
**Date:** ***10.04.2014***

Description: **REDUCTION STAGE**
Business Code: **EM1020/FEC/6/GC20**
Discriminating:

| Pos. | Code | Description | Qty. | Notes |
|---|---|---|---|---|
| 001 | 32001021100 | RING-GEAR<br>EM1020/8F/../Z75M2,5 | 1 | |
| 003 | 32730430300 | SUN PINION<br>EM1020/Z15M2,5/6/B20 | 1 | |
| 037 | 41220900000 | O-RING<br>2-170 196,52x2,62 | 2 | |
| 500 | 211B8270000 | REDUCTION STAGE EM1020/FEc/6/SGC | 1 | |

**Exploded view:** SE111B8210107

**Notes:**




| Mod. | | | Mod. Data | Modificato da | Controllato da |
|---|---|---|---|---|---|
| B | Ripristinata numerazione | | 08/07/14 | G.Mariech | Bacchelli |
| DISEGNATO/DRAWN BY: | CONTROLLATO/CHECKED BY: | DATA/DATE: | SE111B4220001 | | |
| G Mariech | Fiumano' | 24/06/14 | | | |

# COMPONENT PART LIST

**Num:** ***DB111B4300001***

**Date:** ***13.05.2016***

Description: **REDUCTION STAGE**
Business Code: **EM1010/FEc/6,94/00**
Discriminating:

| Pos. | Code | Description | Qty. | Notes |
|---|---|---|---|---|
| 001 | 32000538300 | RING-GEAR<br>EM1010/6F/../Z95M1,5 | 1 | |
| 003 | 32603241900 | SUN PINION<br>EM1010/Z16M1,5/6,94/A24 | 1 | |
| 025 | 42119300000 | BEARING<br>16012 DIN625 | 1 | |
| 029 | 43106300000 | CIRCLIP<br>Est.60 UNI7435-75 | 1 | |
| 031 | 36610340000 | O-RING<br>EM1010/150/2/NB | 2 | |
| 500 | 211B4300000 | REDUCTION STAGE EM1010/FEc/6,94/SGC | 1 | |

**Exploded view:** SE111B4220001

**Notes:**

| Mod. | Description Modifications | Date Mod. |
|---|---|---|
| | | |

Description: **SCREW SET**
Business Code:
Discriminating: **VR10x60UNI5737-8.8**

| Pos | Code | Denomination | Q.ty | Notes |
|---|---|---|---|---|
| 001 | **46111000000** | SCREW<br>M10x60 UNI5737-65-8.8 | **1** | |
| 002 | **46701100101** | WASHER<br>10,5x18x2 UNI6592-93-HV300 | **1** | |

Description: **SCREW SET**
Business Code:
Discriminating: **VDR12x90UNI5931-8.8**

| Pos | Code | Denomination | Q.ty | Notes |
|---|---|---|---|---|
| 001 | **46214800000** | SCREW<br>M12x90 UNI5931-67-8.8 | **1** | |
| 002 | **46600900100** | NUT<br>M12 UNI5588-65-10 | **1** | |
| 003 | **46701200101** | WASHER<br>13x20x2,5 UNI6592-93-HV300 | **2** | |

# COMPONENT PART LIST

**Num:** ***DB1002492/A***

**Date:** ***08.04.2014***

Description: **SCREW SET**
Business Code: **VR8x45UNI5931-10.9**
Discriminating:

| Pos. | Code | Description | Qty. | Notes |
|---|---|---|---|---|
| 001 | 46208200600 | SCREW<br>M8x45 UNI5931-67-10.9 | 1 | |
| 002 | 46701000101 | WASHER<br>8,4x14x1,6 UNI6592-93-HV300 | 1 | |

**Notes:**

| | | | |
|---|---|---|---|
| DATA DATE | 17/07/02 | MR ICI 140 U03D U03Dsin | DIS. DWG 2697 |
| DISEGN. DRAFTMAN | | Rossi Habasit Group | REV. DIS. DWG REV. D |
| | | | DATA REV. REV. DATE 01/03/2021 |

**IMPORTANTE IMPORTANT**

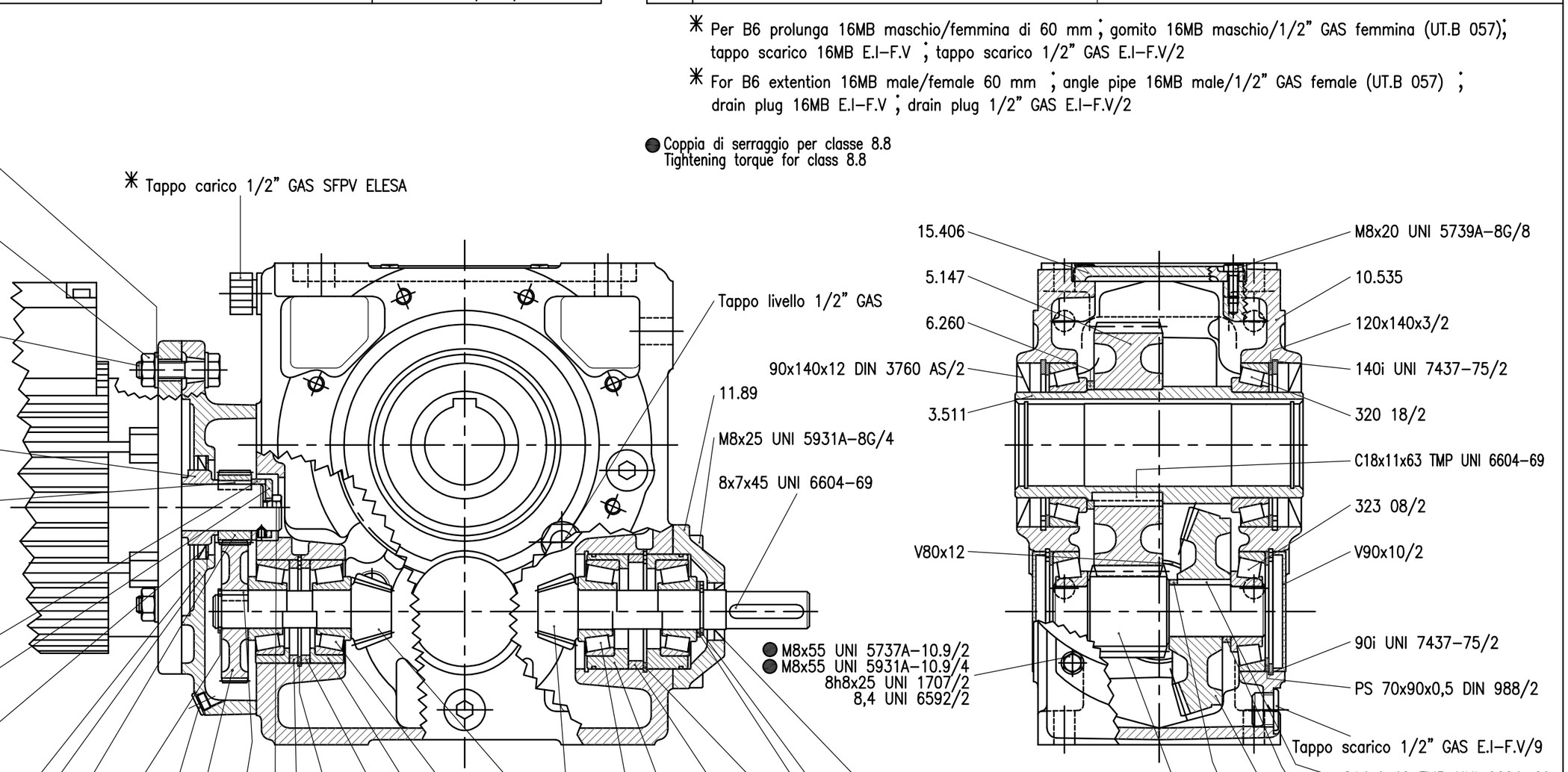
- Il valore dopo la barra indica la quantità maggiore di 1.
- La disposizione dei tappi dipende dalla forma costruttiva.
- Per la richiesta di pezzi di ricambio indicare sempre la realativa designazione, il tipo di riduttore, il numero della tavola e il rapporto di trasmissione.

- Value given after the bar states quantity when it is more than 1.
- The plug arrangement depends on the mounting position.
- When ordering spare parts always state their designation, gear reducer type, this drawing number and transmission ratio.

✳ Per B6 prolunga 16MB maschio/femmina di 60 mm ; gomito 16MB maschio/1/2" GAS femmina (UT.B 057); tappo scarico 16MB E.I–F.V ; tappo scarico 1/2" GAS E.I–F.V/2

✳ For B6 extention 16MB male/female 60 mm ; angle pipe 16MB male/1/2" GAS female (UT.B 057) ; drain plug 16MB E.I–F.V ; drain plug 1/2" GAS E.I–F.V/2

● Coppia di serraggio per classe 8.8
Tightening torque for class 8.8



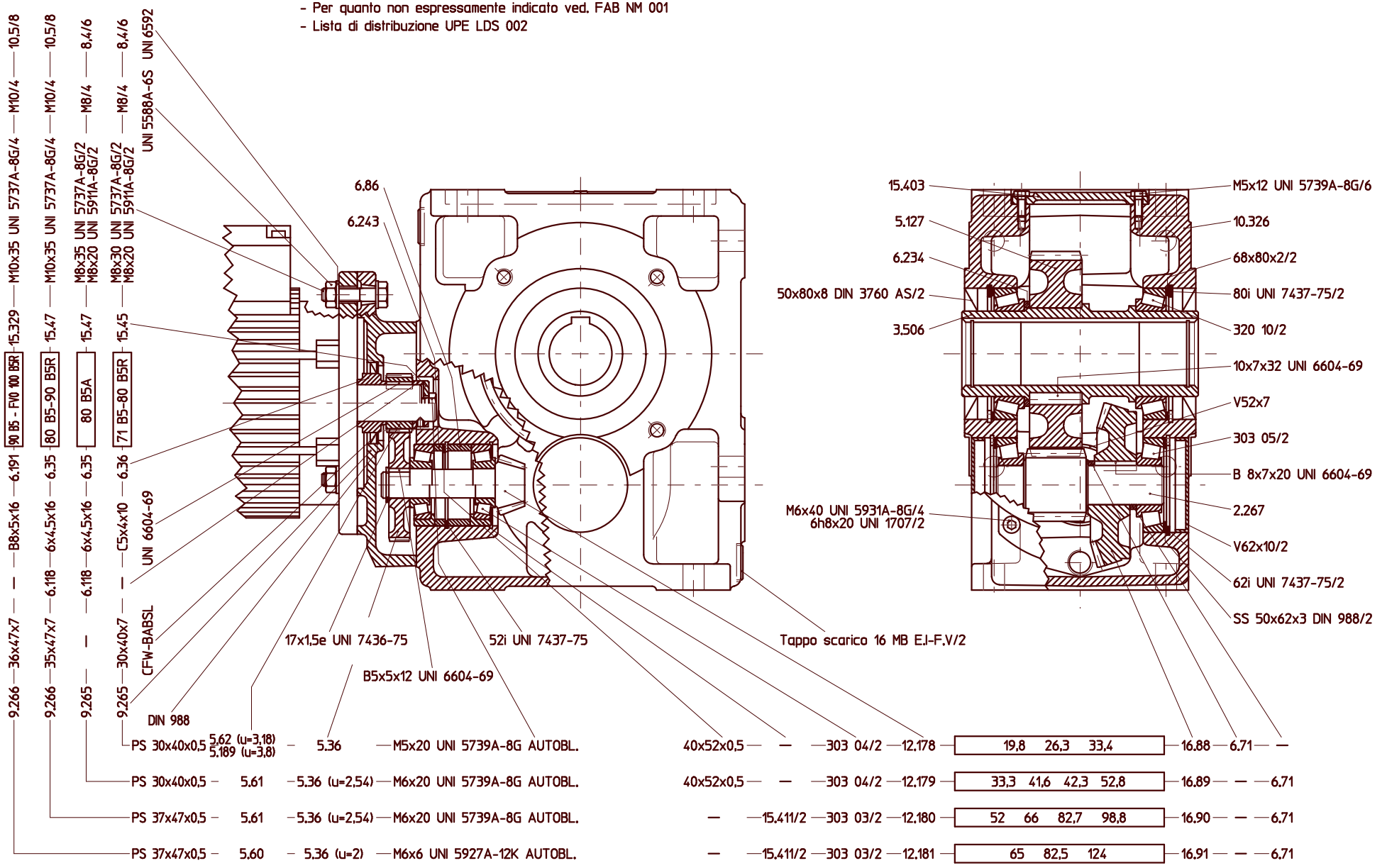

| | | |

| | | |
|---|---|---|
| DATA / DATE 22/06/95 | MV MR ICI 80 U03A U03Asin | DIS. / DWG 1786 |
| DISEGN. / DRAFTMAN | Rossi S.p.A MODENA - ITALY<br>a company of the Habasit Group | REV. DIS. / DWG REV. F<br>DATA REV. / REV. DATE 01/01/08 |

IMPORTANTE / IMPORTANT

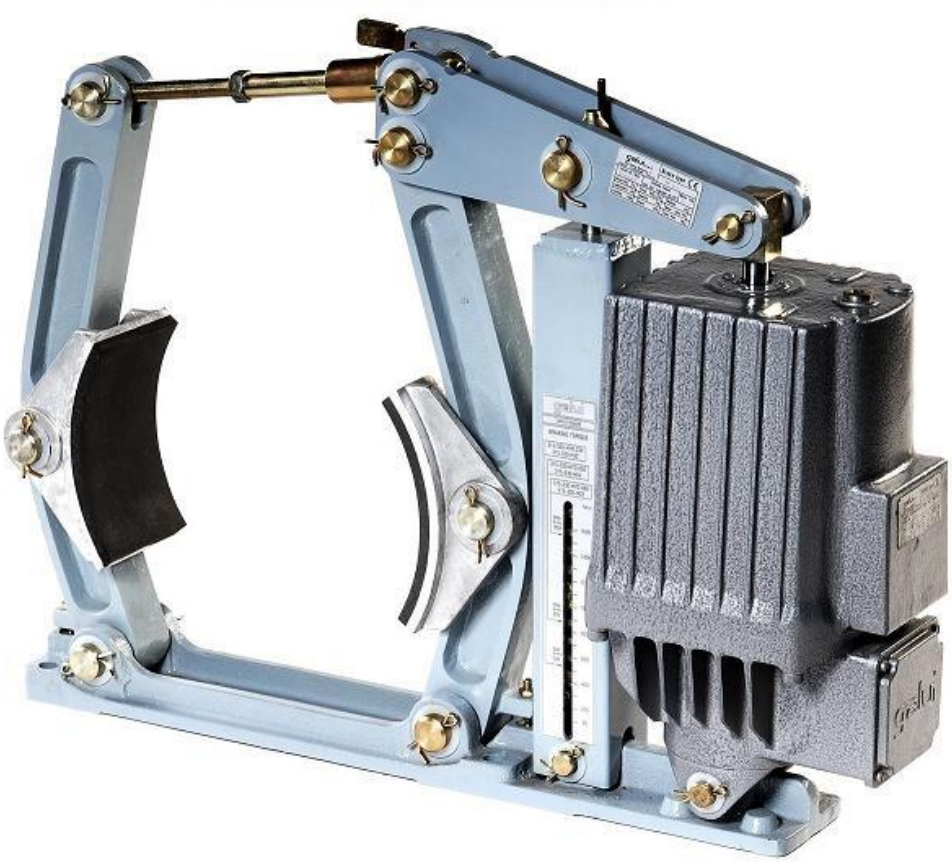
- Il valore dopo la barra indica la quantità maggiore di 1.
  Value given after the bar states quantity when it is more than 1.
- Per la richiesta di pezzi di ricambio indicare sempre la relativa designazione, il tipo di riduttore, il numero della tavola e il rapporto di trasmissione.
  When ordering spare parts always state their designation, gear reducer type, this drawing number and transmission ratio.

- Per quanto non espressamente indicato ved. FAB NM 001
- Lista di distribuzione UPE LDS 002




| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PS 30x40x0,5 | 5,62 (u=3,18)<br>5,189 (u=3,8) | – | 5.36 | M5x20 UNI 5739A-8G AUTOBL. | 40x52x0,5 | — | — | 303 04/2 | 12.178 | 19,8 | 26,3 | 33,4 | 16.88 | 6.71 | — |
| PS 30x40x0,5 | – | 5.61 | 5.36 (u=2,54) | M6x20 UNI 5739A-8G AUTOBL. | 40x52x0,5 | — | — | 303 04/2 | 12.179 | 33,3 | 41,6 | 42,3 | 52,8 | 16.89 | — | 6.71 |
| PS 37x47x0,5 | – | 5.61 | 5.36 (u=2,54) | M6x20 UNI 5739A-8G AUTOBL. | — | — | 15.411/2 | 303 03/2 | 12.180 | 52 | 66 | 82,7 | 98,8 | 16.90 | — | 6.71 |
| PS 37x47x0,5 | – | 5.60 | – 5.36 (u=2) | M6x6 UNI 5927A-12K AUTOBL. | — | — | 15.411/2 | 303 03/2 | 12.181 | 65 | 82,5 | 124 | | 16.91 | — | 6.71 |

# GALVI SHOE BRAKES TYPE NV.HYD
# INSTALLATION AND MAINTENANCE MANUAL



# TABLE OF CONTENTS


| Chapter | Subject | | Page |
|---|---|---|---|
| | | | |
| **01.01** | **Introduction** | | 2 |
| 01.02 | Declaration of incorporation of partly completed machinery as per Machinery Directive 2006/42/EC, Annex II, Point B | | 3 |
| 01.03 | General description of the Product | | 4 |
| 01.04 | Packing and handling of the Product | | 5 |
| 01.05 | Identification and marking of the Product | | 5 |
| 01.06 | Warranty of the Product | | 6 |
| **02.01** | **Installation** | | 7 |
| 02.02 | Electrical connection | | 9 |
| 02.03 | Adjustment of opening strokes and balancing screws | | 13 |
| 02.04 | Adjustment of Braking Torque | | 15 |
| **03.01** | **Optional items** | | 18 |
| 03.02 | Self adjusting device | **NV** | 18 |
| 03.03 | Extra-wide brake shoes | **CL** | 19 |
| 03.04 | Stainless steel pins | **SS** | 20 |
| 03.05 | Lubricators on main pins | **GR** | 20 |
| 03.06 | Open position microswitch | **FIA** | 21 |
| 03.07 | Linings wear microswitch | **FIC** | 22 |
| 03.08 | Manual opening system | **HAN** | 23 |
| 03.09 | Supporting spheres for vertical brake axis | **ORZ** | 25 |
| 03.10 | Protection cover | **COV** | 26 |
| 03.11 | Lowering valve for Thruster | **LO** | 26 |
| 03.12 | Lifting valve for Thruster | **LI** | 27 |
| 03.13 | Foot rotated 90° for Thruster | **90** | 27 |
| 03.14 | VITON seals for Thruster | **VIT** | 28 |
| 03.15 | Heaters for Thruster | **HEA** | 28 |
| 03.16 | Special Voltage for Thruster | **V-Hz** | 28 |
| **04.01** | **Maintenance** | | 29 |
| 04.02 | Replacement of brake Shoes | | 29 |
| 04.03 | Oil change for Thruster | | 31 |
| 04.04 | Replacement of Thruster | | 33 |
| 04.05 | Disassembly and assembly of Thruster | | 34 |
| **05.01** | **Spare Parts** | | 38 |
| **06.01** | **Bill of materials** | | 40 |

# 01.02 - DECLARATION OF INCORPORATION OF PARTLY COMPLETED MACHINERY AS PER MACHINERY DIRECTIVE 2006/42/EC, ANNEX II, POINT B

**Manufacturer**

NEWCOMEN S.r.l.
Via della Betulla, 7
I-20851 Lissone (MB)
ITALY

**Contacts**

Tel. +39 039 480891
Fax +39 039 481289
E-Mail info@galvi.com
Internet www.galvi.com

We hereby declare that the following GALVI partly completed machinery

| Product Description | Product Code |
|---|---|
| Failsafe Shoe Brakes | **NV.HYD**, NV.HYD.IS, NV.HYD.TM, NV.H, NV.H.EX, NV.EM, NV.PN NV.HYD.CA, NV.HYD.IS.CA |
| Positive Shoe Brakes | NV.OL |
| Failsafe-positive Shoe Brakes | NV.HYD/OL |
| Thrusters | **HYD**, H, H.EX, EM, PN, OL |

eventually combined with following Accessories and Spare Parts

| Product Description | Product Code |
|---|---|
| Brakedrums | PD, PL, PA, PAG |
| Couplings | GD, GL, GA |
| Brake Shoes | RF2, RF4, RFA |
| Other | COV, PO, SB, RSH, RSH.EX, RG |

with serial numbers according to delivery notes

are in conformity with the following Standards

DIN 15435 (NV.HYD, NV.HYD.IS, NV.HYD.TM, NV.H, NV.H.EX, NV.EM, NV.PN, NV.OL, NV.HYD/OL, RF2)
DIN 15431 (PD, GD)
AISE 11 (NV.HYD.CA, NV.HYD.IS.CA, PA, PAG, GA, RFA)
Machinery Directive 2006/42/EC, Annex I +
+ 1.1.2, 1.1.3, 1.1.5, 1.1.6, 1.2.1, 1.2.3, 1.2.4.1, 1.2.4.3, 1.3.2, 1.3.4, 1.5.1, 1.5.2, 1.5.8, 1.5.9, 1.6.4,

**must not be put into service until the final machinery into which they are to be incorporated has been declared in conformity with the provisions of Machinery Directive 2006/42/CE.**

We furthermore declare that the relevant technical documentation is compiled in accordance with part B of Annex VII and we undertake to transmit relevant information on the partly completed machinery in response to a reasoned request by the National Authorities.

**This Declaration is invalidated by every modification of the above mentioned GALVI Products.**

Place, date

**Lissone, 11/04/12**

President and Chief Executive Officer

**Tommaso Galbiati**



# 01.03 – GENERAL DESCRIPTION OF THE PRODUCT

The GALVI Shoe Brake type NV.HYD is a safety component which, installed on a rotating Brakedrum, decelerates and stops the Brakedrum through pressure and friction, that is to say through a closing spring, a system of levers, a friction material and an electrohydraulic Thruster whose function is to open the Brake with a lifting Force in contrast with the Force of the Brake's main spring.

The Brake is normally installed between motor and gear box, that is to say on high speed shaft, with Brakedrum always installed on gear box side, which is the load side, so that it can brake a lifted mass or a travelling or a rotating mass.

The Brake is combined with the GALVI flexible Coupling with Brakedrum type GD or GL or, in case the Brake is not installed between motor and gear box, with the Brakedrum type PD or PL.

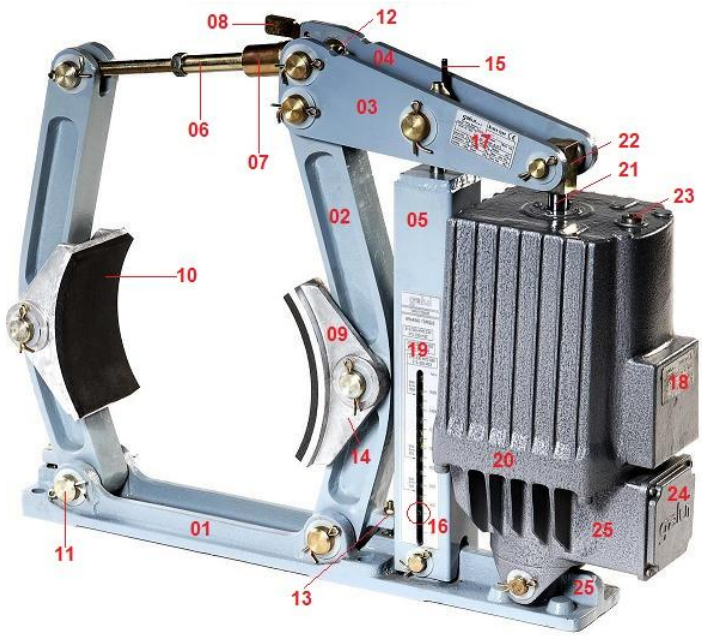
The main dimensional features of the Brake are in conformity with the DIN 15435 Standard, the ones of the Brakedrum are in conformity with DIN 15431 Standard.

The range of Brakes and Brakedrums is available with diameters 160, 200, 250, 315, 400, 500, 630, 710 mm.

The following are the main components of the GALVI Shoe Brake type NV.HYD :

| Pos. | Description |
|---|---|
| 01 | Cast iron base<br>(or steel base for some models ) |
| 02 | Cast iron main levers<br>(or steel levers for some models) |
| 03 | Cast iron left upper lever<br>(or steel lever for some models) |
| 04 | Cast iron right upper lever<br>preset for NV option |
| 05 | Main spring set |
| 06 | Galvanized main tie rod |
| 07 | Optional self adjusting device NV |
| 08 | Fork for self adjusting device NV |
| 09 | Aluminum brake Shoe<br>with anti-wear steel bushes |
| 10 | Asbestos free bonded linings |
| 11 | Galvanized pins secured with split pins and washers (or optional SS pins) |
| 12 | Self lubricating bushes on main pins |
| 13 | Balancing screws |
| 14 | Brake Shoes holding screws |
| 15 | Elastic pin for locking main spring tie rod |
| 16 | Cursor for main spring<br>showing Braking Torque in Nm |
| 17 | Aluminum serial number plate for Brake |
| 18 | Aluminum serial number plate for Thruster |
| 19 | Adhesive Braking Torque plate |
| 20 | Aluminum HYDRO electrohydraulic Thruster, a.c., three phase, IP.65, Class F |
| 21 | Chromed Thruster shaft |
| 22 | Galvanized Thruster push rod |
| 23 | Galvanized Thruster screw cap<br>for oil fill and oil drain |
| 24 | Aluminum Thruster terminal box cover |
| 25 | Polyurethane epoxy antisalt paint |

**Table 1**




**Picture 1**
**Model shown**
**NV.315.HYD.080/06.CD.42.PS.AU.ZN**

## 01.04 – PACKING AND HANDLING OF THE PRODUCT

The GALVI Shoe Brakes are delivered packed in different ways according to the type of shipment and the Customer's need.

Pallets, ISPM 15 cases for sea freight or air freight and containers are normally used in function of the type of delivery.

It is necessary to pay maximum attention during the handling of the Shoe Brakes in order to avoid any kind of damage.

In case of damage of any component of the Brake we recommend to report to info@galvi.com attaching pictures of the damage in order to decide whether to replace the damaged component only or the whole Product.

| | |
|---|---|
| ⚠ | **Never install a Shoe Brake with damaged components. Risk of accident.** |

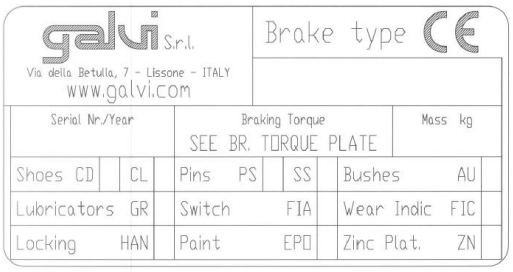
## 01.05 – IDENTIFICATION AND MARKING OF THE PRODUCT

All the GALVI Shoe Brakes have an aluminum serial number plate fixed to the left upper lever (page 4, Table 1, Picture 1); **the serial number plate must never be removed.**

The following data are printed on the serial number plate :

| Description |
|---|
| type and diameter of GALVI Shoe Brake<br>in the "Brake type" cell<br>(N or NV.160, 200, 250, 315, 400, 500, 630, 710) |
| serial number and year of manufacturing<br>in the "Serial Nr./Year" cell |
| mass of the GALVI Shoe Brake<br>in the "Mass kg" cell |
| "X" in the "AU" (self lubricating bushes on main pins) and "ZN" cells (galvanized pins, tie rods, screws and small metallic items) |
| "X" in the "CD" cell<br>(brake Shoes as per DIN 15435 Standard)<br>or<br>in the "CL" cell<br>(extra-wide brake Shoes, 50 % wider than CD Shoes) |
| "X" in the "PS" cell (standard pins)<br>or<br>in the "SS" cell (stainless steel pins) |
| "X" in the "GR", "FIA", "FIC", "HAN" cells<br>if these options are installed |

**Table 2**




**Drawing 1**
**Serial Number Plate for Shoe Brake**




**Picture 2**
**Serial Number Plate for Shoe Brake**

For a complete identification of the GALVI Shoe Brake it is indispensable to read also the data printed on the serial number plate of the relevant HYDRO GALVI Thruster (page 4, Table 1, Picture 1); **the serial number plate must never be removed**.

The serial number plate of the Thruster is fixed to the vertical frontal part of the Thruster and among its data it is necessary to know the following ones :

| Description |
|---|
| Model of HYDRO GALVI Thruster<br>in the "HYDRO type" cell<br>(HYD.023, 024, 030, 031, 050, 051, 080, 081, 121, 201, 301/06 or .../12<br>+ optional codes IS, LO, LI, 90, VIT, HEA if any) |
| Rated Voltage (V) and Frequency (Hz) |

**Table 3**




**Drawing 2**
**Serial Number Plate for Thruster**

## 01.06 – WARRANTY OF THE PRODUCT

All the GALVI Shoe Brakes if not differently agreed have a warranty period of

**12 months from start-up and maximum 18 months from Invoice date.**

The warranty does not cover parts subject to wear.

Any modification of the Product made by the User invalidates totally the warranty.

The use of not genuine Spare Parts invalidates in any case the warranty of the Product, especially the use of not genuine brake Shoes and friction material.

The use of GALVI Shoe Brakes combined with Thrusters different from HYDRO GALVI Thrusters is not suggested and limits the warranty to the GALVI Products only.

Repairs under warranty are made in the Manufacturer's Factories after claim to info@galvi.com writing in any case the serial numbers of Brakes and Thrusters (page 5, Drawing 1, Drawing 2).

The Manufacturer case by case will be free to choose between repairing or replacing the Product.

Products received at the Manufacturer's Factories already disassembled and/or modified will be considered in any case out of warranty and will be eventually repaired or replaced at cost price.

| | |
|---|---|
|  | **Never use not genuine Spare Parts, especially brake Shoes.<br>Loss of warranty.<br>Risk of accident.** |

| | |
|---|---|
|  | **Never modify the Product.<br>Loss of warranty.<br>Risk of accident.** |

# 02.01 – INSTALLATION

Before installing the GALVI Shoe Brake it is necessary to arrange a horizontal anchor plane on which the base of the Brake (page 4, Table 1, Picture 1) can be in contact at least for the length shown in drawings and Catalogue.

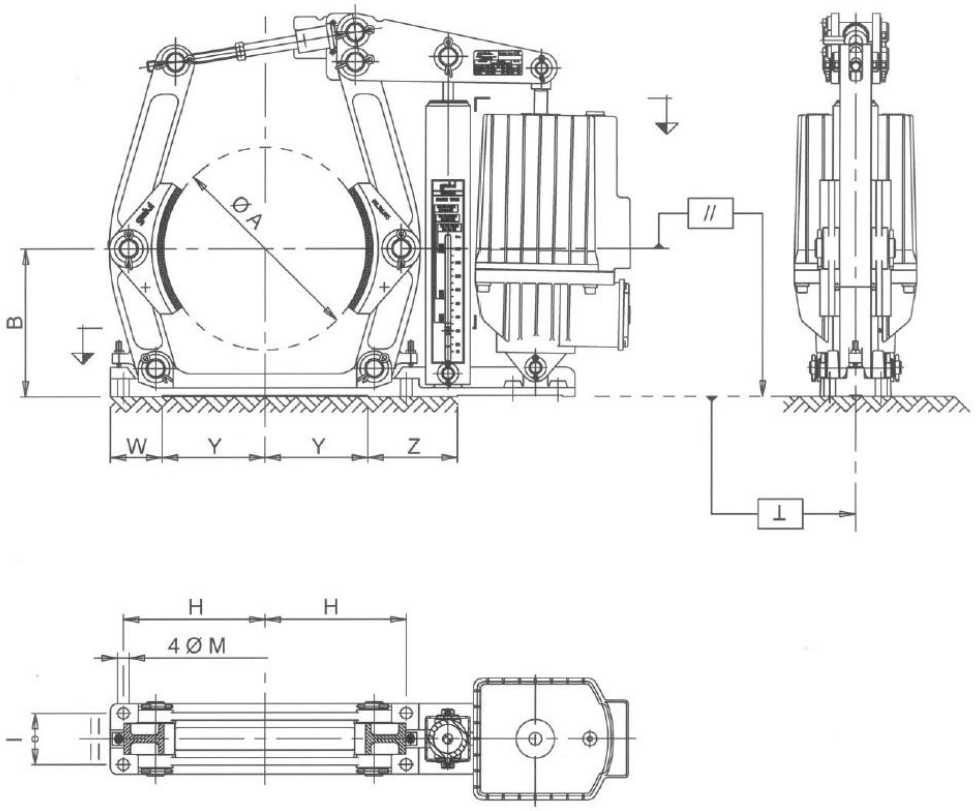
For Brakes with cast iron base it is enough that the portion of base shown with dimensions W, Y, Z is in contact with the anchor base (Drawing 3).

For Brakes with steel base it is instead necessary that the base is totally in contact with the anchor base as per dimensions E, F (Drawing 4).

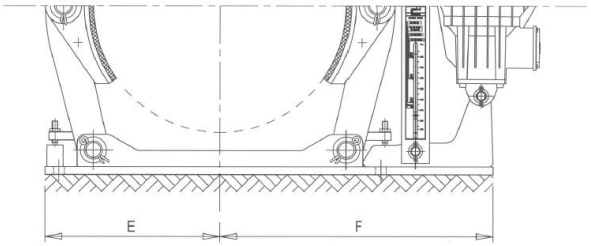
The material of the anchor plane must have a tensile strength ≥ 430 N/mm$^2$.

The anchor plane of the Brake must be parallel to the brake axis and it must be made observing carefully dimensions A, B, H, I, M (Drawing 3).

The four holes for fastening the Brake to the anchor plane must be made observing carefully dimensions H, I, M (Drawing 3) and the perpendicularity between the average main plane of the Brake and the Brakedrum's rotation axis.




**Drawing 3**
**Shoe Brake with cast iron base**
**Model shown NV.315.HYD.080/06.CD.42.PS.AU.ZN**




**Drawing 4**
**Shoe Brake with steel base**
**Model shown NV.630.HYD.301/06.CD.42.SS.AU.ZN**

In the following Table 4 taken from pages 4 and 5 of the GALVI Shoe Brakes Catalogue all the dimension for the whole range are available; specific drawings of every Shoe Brake in 2D (dwg format) and 3D (sldprt and step formats) can be downloaded from the Products page of the website www.galvi.com or can be required to info@galvi.com :

| Freno tipo<br>Brake type<br>Frein type<br>Bremse Typ | Cf [1]<br>(μ=0,42)<br>min-max<br>[N•m] | Ø A | B | C<br>max | D | E | F | G<br>max | H | I | L | Ø M | N | O<br>max | P<br>max | R<br>min | S | T<br>(CD) | T [2]<br>(CL) | W | Y | V | Z | Massa [3]<br>Mass [3]<br>Masse [3]<br>Masse [3]<br>[kg] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N(NV).160.HYD.023/05[2] | 25 - 250 | 160 | 130 | 383 | 480 | 140 | 340 | 530 | 120 | 55 | 100 | 12 | 20 | 132 | 398 | 84 | 5 | 55 | 85 | 55 | 85 | 160 | 92 | 23 |
| N(NV).160.HYD.024/05[2] | 25 - 250 | 160 | 130 | 383 | 480 | 140 | 340 | 530 | 120 | 55 | 100 | 12 | 20 | 132 | 398 | 84 | 5 | 55 | 85 | 55 | 85 | 160 | 92 | 22 |
| N(NV).200.HYD.023/05 | 29 - 310 | 200 | 160 | 402 | 538 | 170 | 368 | 588 | 145 | 55 | 100 | 14 | 23 | 161 | 427 | 106 | 4 | 70 | 105 | 65 | 105 | 160 | 100 | 27 |
| N(NV).200.HYD.024/05 | 29 - 310 | 200 | 160 | 402 | 538 | 170 | 368 | 588 | 145 | 55 | 100 | 14 | 23 | 161 | 427 | 106 | 4 | 70 | 105 | 65 | 105 | 160 | 100 | 26 |
| N(NV).200.HYD.030/05 | 29 - 400 | 200 | 160 | 467 | 538 | 170 | 368 | 588 | 145 | 55 | 100 | 14 | 23 | 161 | 427 | 106 | 4 | 70 | 105 | 65 | 105 | 160 | 100 | 31 |
| N(NV).200.HYD.031/05 | 29 - 400 | 200 | 160 | 467 | 538 | 170 | 368 | 588 | 145 | 55 | 100 | 14 | 23 | 161 | 427 | 106 | 4 | 70 | 105 | 65 | 105 | 160 | 100 | 29 |
| N(NV).250.HYD.023/05 | 43 - 330 | 250 | 190 | 481 | 615 | 200 | 415 | 671 | 180 | 65 | 100 | 18 | 25 | 197 | 474 | 127 | 3 | 90 | 135 | 76 | 124 | 160 | 114 | 35 |
| N(NV).250.HYD.024/05 | 43 - 330 | 250 | 190 | 481 | 615 | 200 | 415 | 671 | 180 | 65 | 100 | 18 | 25 | 197 | 474 | 127 | 3 | 90 | 135 | 76 | 124 | 160 | 114 | 34 |
| N(NV).250.HYD.030/05 | 43 - 440 | 250 | 190 | 481 | 615 | 200 | 415 | 670 | 180 | 65 | 100 | 18 | 25 | 197 | 473 | 127 | 3 | 90 | 135 | 76 | 124 | 160 | 114 | 39 |
| N(NV).250.HYD.031/05 | 43 - 440 | 250 | 190 | 481 | 615 | 200 | 415 | 670 | 180 | 65 | 100 | 18 | 25 | 197 | 473 | 127 | 3 | 90 | 135 | 76 | 124 | 160 | 114 | 37 |
| N(NV).250.HYD.050/06 | 43 - 720 | 250 | 190 | 552 | 615 | 200 | 415 | 699 | 180 | 65 | 100 | 18 | 25 | 197 | 502 | 127 | 3 | 90 | 135 | 76 | 124 | 190 | 114 | 51 |
| N(NV).250.HYD.051/06 | 43 - 720 | 250 | 190 | 552 | 615 | 200 | 415 | 684 | 180 | 65 | 100 | 18 | 25 | 197 | 487 | 127 | 3 | 90 | 135 | 76 | 124 | 190 | 114 | 44 |
| N(NV).315.HYD.030/05 | 95 - 520 | 315 | 230 | 595 | 722 | 240 | 482 | 784 | 220 | 80 | 110 | 18 | 28 | 244 | 540 | 153 | 1,5 | 110 | 165 | 80 | 160 | 160 | 140 | 60 |
| N(NV).315.HYD.031/05 | 95 - 520 | 315 | 230 | 595 | 722 | 240 | 482 | 784 | 220 | 80 | 110 | 18 | 28 | 244 | 540 | 153 | 1,5 | 110 | 165 | 80 | 160 | 160 | 140 | 58 |
| N(NV).315.HYD.050/06 | 95 - 870 | 315 | 230 | 595 | 722 | 240 | 482 | 812 | 220 | 80 | 110 | 18 | 28 | 244 | 568 | 153 | 1,5 | 110 | 165 | 80 | 160 | 190 | 140 | 70 |
| N(NV).315.HYD.051/06 | 95 - 870 | 315 | 230 | 595 | 722 | 240 | 482 | 797 | 220 | 80 | 110 | 18 | 28 | 244 | 553 | 153 | 1,5 | 110 | 165 | 80 | 160 | 190 | 140 | 63 |
| N(NV).315.HYD.080/06 | 95 - 1550 | 315 | 230 | 595 | 722 | 240 | 482 | 812 | 220 | 80 | 110 | 18 | 28 | 244 | 568 | 153 | 1,5 | 110 | 165 | 80 | 160 | 190 | 140 | 71 |
| N(NV).315.HYD.081/06 | 95 - 1550 | 315 | 230 | 595 | 722 | 240 | 482 | 797 | 220 | 80 | 110 | 18 | 28 | 244 | 553 | 153 | 1,5 | 110 | 165 | 80 | 160 | 190 | 140 | 64 |
| N(NV).400.HYD.050/06 | 250 - 860 | 400 | 280 | 731 | 850 | 295 | 555 | 939 | 270 | 100 | 140 | 22 | 33 | 297 | 642 | 188 | 3 | 140 | 210 | 100 | 195 | 190 | 155 | 95 |
| N(NV).400.HYD.051/06 | 250 - 860 | 400 | 280 | 731 | 850 | 295 | 555 | 924 | 270 | 100 | 140 | 22 | 33 | 297 | 627 | 188 | 3 | 140 | 210 | 100 | 195 | 190 | 155 | 88 |
| N(NV).400.HYD.080/06 | 250 - 1620 | 400 | 280 | 731 | 850 | 295 | 555 | 939 | 270 | 100 | 140 | 22 | 33 | 297 | 642 | 188 | 3 | 140 | 210 | 100 | 195 | 190 | 155 | 96 |
| N(NV).400.HYD.081/06 | 250 - 1620 | 400 | 280 | 731 | 850 | 295 | 555 | 924 | 270 | 100 | 140 | 22 | 33 | 297 | 627 | 188 | 3 | 140 | 210 | 100 | 195 | 190 | 155 | 89 |
| N(NV).400.HYD.121/06 | 250 - 2670 | 400 | 280 | 772 | 850 | 295 | 555 | 938 | 270 | 100 | 140 | 22 | 33 | 297 | 641 | 188 | 3 | 140 | 210 | 100 | 195 | 240 | 155 | 117 |
| N(NV).500.HYD.080/06 | 350 - 1600 | 500 | 340 | 811 | 1037 | 360 | 677 | 1081 | 325 | 130 | 180 | 22 | 35 | 362 | 719 | 236 | 3 | 180 | 270 | 115 | 245 | 190 | 185 | 150 |
| N(NV).500.HYD.081/06 | 350 - 1600 | 500 | 340 | 811 | 1037 | 360 | 677 | 1066 | 325 | 130 | 180 | 22 | 35 | 362 | 704 | 236 | 3 | 180 | 270 | 115 | 245 | 190 | 185 | 143 |
| N(NV).500.HYD.121/06 | 350 - 2910 | 500 | 340 | 811 | 1037 | 360 | 677 | 1080 | 325 | 130 | 180 | 22 | 35 | 362 | 718 | 236 | 3 | 180 | 270 | 115 | 245 | 240 | 185 | 161 |
| N(NV).500.HYD.201/06 | 350 - 5220 | 500 | 340 | 811 | 1037 | 360 | 677 | 1080 | 325 | 130 | 180 | 22 | 35 | 362 | 718 | 236 | 3 | 180 | 270 | 115 | 245 | 240 | 185 | 161 |
| N(NV).630.HYD.121/06 | 1200 - 3700 | 630 | 420 | 974 | 1114 | 435 | 679 | 1249 | 400 | 170 | 220 | 27 | 20 | 437 | 812 | 287 | 5 | 225 | 335 | - | - | 240 | - | 242 |
| N(NV).630.HYD.201/06 | 1200 - 5900 | 630 | 420 | 974 | 1114 | 435 | 679 | 1249 | 400 | 170 | 220 | 27 | 20 | 437 | 812 | 287 | 5 | 225 | 335 | - | - | 240 | - | 242 |
| N(NV).630.HYD.301/06 | 1200 - 7900 | 630 | 420 | 974 | 1114 | 435 | 679 | 1249 | 400 | 170 | 220 | 27 | 20 | 437 | 812 | 287 | 5 | 225 | 335 | - | - | 240 | - | 243 |
| N(NV).710.HYD.121/06 | 660 - 3620 | 710 | 470 | 1091 | 1286 | 480 | 806 | 1361 | 450 | 190 | 250 | 27 | 20 | 492 | 869 | 323 | 5 | 255 | 380 | - | - | 240 | - | 307 |
| N(NV).710.HYD.201/06 | 870 - 5800 | 710 | 470 | 1091 | 1286 | 480 | 806 | 1361 | 450 | 190 | 250 | 27 | 20 | 492 | 869 | 323 | 5 | 255 | 380 | - | - | 240 | - | 307 |
| N(NV).710.HYD.301/06 | 1250 - 8700 | 710 | 470 | 1091 | 1286 | 480 | 806 | 1361 | 450 | 190 | 250 | 27 | 20 | 492 | 869 | 323 | 5 | 255 | 380 | - | - | 240 | - | 308 |

**Table 4**

Once the horizontal anchor plane as per dimensions A, B, H, I, M of Table 4 is ready, it is possible to proceed with the installation of the GALVI Shoe Brake.

The GALVI Shoe Brakes are supplied ready for installation, with Thrusters complete with oil and with main spring not compressed (page 4, Table 1, Picture 1).

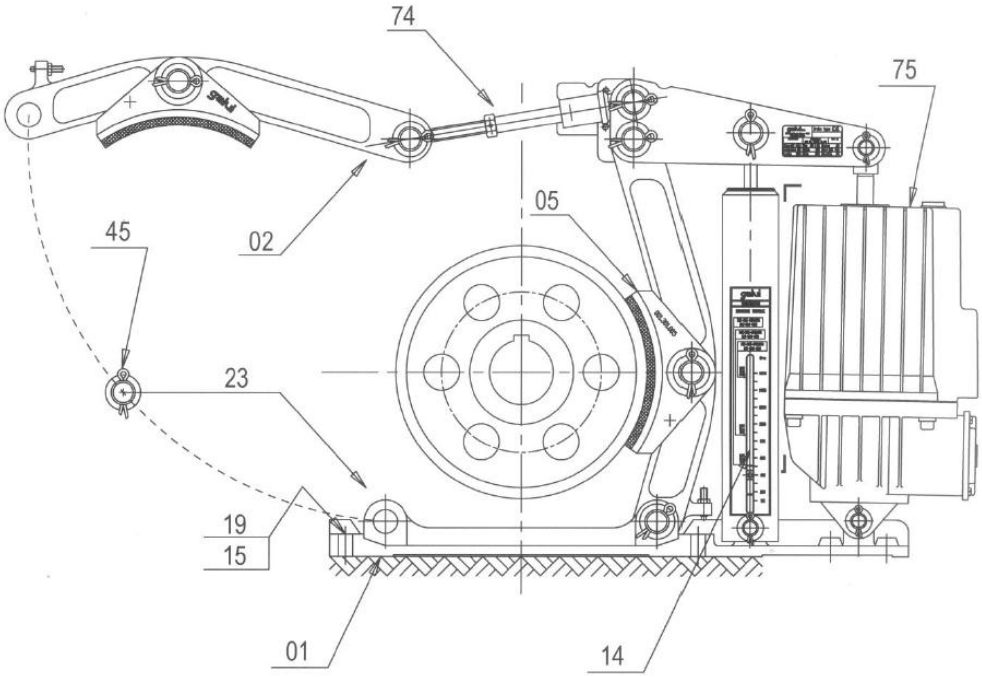
With reference to the Bill of Materials at page 40 of this document and following Drawing 5, it is necessary to remove the lower pin item 23 from the external main lever item 02 after removing its two split pins item 45 or its seegers in case the Brake has optional lubricators on main pins (GR).

Once pin item 23 has been removed, external main lever item 02 can be lifted and rotated on its upper pin tied up to the upper tie rod item 06 for "N" Brakes without self adjusting device or upper tie rod item 74 for "NV" Brakes with self adjusting device.

In this way the internal brake Shoe item 05 can be put in contact with the brakedrum and the base item 01 can be put under the brakedrum and it can be screwed to the anchor plane.

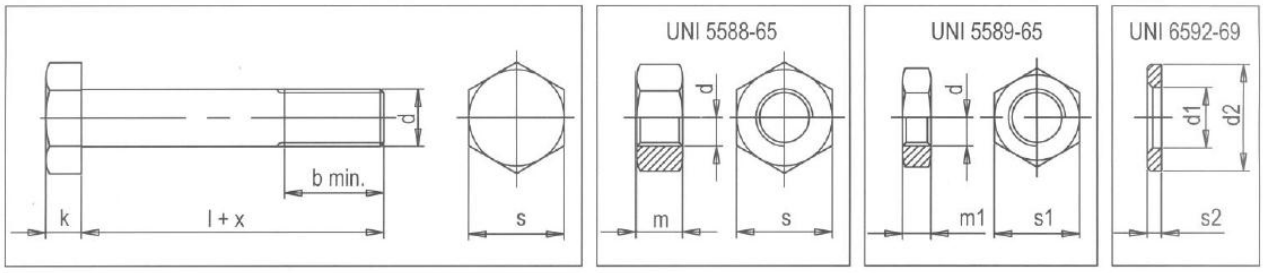
During this operation it is important not to lose disc item 19 and balancing spring item 15.

The base item 01 must be screwed to the anchor plane with four screws in the holes of the same base and in the holes of the face as per dimensions H, I, M (page 7, Drawing 3).




**Drawing 5**
**Model shown NV.315.HYD.080/06.CD.42.PS.AU.ZN**

The features of the screws and nuts necessary for the fastening of the Brake are shown in the following Drawing 6 and Table 5 :




**Drawing 6**

| Dia. Brake mm | Q.ty screws & nuts | Tightening Torque Nm | d | b min | d1 | d2 | k | l | m | m1 | s | s1 | s2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **160** | 4 | 50 | M10 | 26 | 10,5 | 21 | 6,4 | 28 | 8 | 6 | 16 | 16 | 2 |
| **200** | 4 | 85 | M12 | 30 | 13 | 24 | 7,5 | 33 | 10 | 7 | 18 | 18 | 2,5 |
| **250** | 4 | 210 | M16 | 38 | 17 | 30 | 10 | 41 | 13 | 8 | 24 | 24 | 3 |
| **315** | 4 | 210 | M16 | 38 | 17 | 30 | 10 | 41 | 13 | 8 | 24 | 24 | 3 |
| **400** | 4 | 410 | M20 | 46 | 21 | 37 | 12,5 | 50 | 16 | 9 | 30 | 30 | 3 |
| **500** | 4 | 410 | M20 | 46 | 21 | 37 | 12,5 | 50 | 16 | 9 | 30 | 30 | 3 |
| **630** | 4 | 711 | M24 | 54 | 25 | 44 | 15 | 55 | 21,5 | 12 | 36 | 36 | 4 |
| **710** | 4 | 711 | M24 | 54 | 25 | 44 | 15 | 55 | 21,5 | 12 | 36 | 36 | 4 |
| **Use screws with resistance class ≥ 8.8 and nuts with resistance class ≥ 6S** | | | | | | | | | | | | | |

**Table 5**

Once the Shoe Brake is screwed to the anchor base with four screws as per Drawing 6 and Table 5, it is possible to fasten again the lower part of the main lever item 02 (opposite to Thruster item 75) to the base item 01 (Drawing 5).

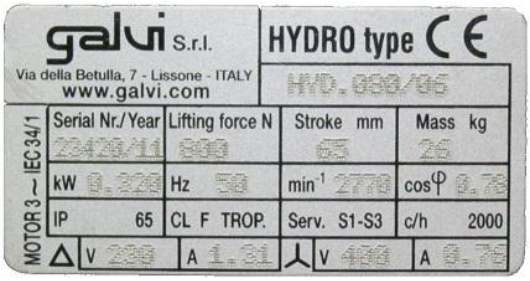
The lower part of the main lever item 02 opposite to Thruster item 75 must be put back in its original position in the Shoe Brake's base item 01, the lower pin item 23 must be put back in its original position with its two split pins item 45 or with its two seegers in case the Brake has optional lubricators on main pins (GR).

# 02.02 – ELECTRICAL CONNECTION

After installation of the GALVI Shoe Brake it is necessary to proceed with the electrical connection of the HYDRO GALVI Thruster.

The HYDRO GALVI Thrusters are available for any rated Voltage both Hz 50 and Hz 60, they have three phase electric motor, IP.65, insulation Class F, which can rotate in both directions.

As per following Picture 3, the main data of the electric motor of the Thruster are printed on the serial number plate placed on the frontal vertical part of the Thruster (page 4, Picture 1; page 5, Drawing 2).




**Picture 3**
**Serial Number Plate for Thruster**

The following are the main data of the electric motors of the HYDRO GALVI Thrusters for the most common rated Voltages **Hz 50** :

| Thruster | kW | Volt Δ | A Δ | Volt Y | A Y | rpm | Cos. Φ | Hz |
|---|---|---|---|---|---|---|---|---|
| **023 – 024** | 0,16 | 220 | 0.69 | 380 | 0,40 | 2689 | 0,85 | 50 |
| **030 – 031** | 0,20 | 220 | 0.85 | 380 | 0,49 | 2752 | 0,82 | 50 |
| **050 – 051** | 0,21 | 220 | 1.00 | 380 | 0,58 | 2802 | 0,84 | 50 |
| **080 – 081** | 0,32 | 220 | 1.31 | 380 | 0,76 | 2695 | 0,84 | 50 |
| **121** | 0,32 | 220 | 1.64 | 380 | 0,95 | 2733 | 0,84 | 50 |
| **201** | 0,45 | 220 | 1.87 | 380 | 1,08 | 2723 | 0,88 | 50 |
| **301** | 0,56 | 220 | 2.30 | 380 | 1,40 | 2703 | 0,91 | 50 |

**Table 6**
**Thrusters V. 220/380 – Hz 50**

| Thruster | kW | Volt Δ | A Δ | Volt Y | A Y | rpm | Cos. Φ | Hz |
|---|---|---|---|---|---|---|---|---|
| **023 – 024** | 0,16 | 290 | 0.52 | 500 | 0,30 | 2757 | 0,78 | 50 |
| **030 – 031** | 0,20 | 290 | 0.64 | 500 | 0,37 | 2767 | 0,79 | 50 |
| **050 – 051** | 0,21 | 290 | 0.75 | 500 | 0,44 | 2802 | 0,84 | 50 |
| **080 – 081** | 0,32 | 290 | 0.99 | 500 | 0,58 | 2695 | 0,84 | 50 |
| **121** | 0,32 | 290 | 1.24 | 500 | 0,72 | 2676 | 0,84 | 50 |
| **201** | 0,45 | 290 | 1.41 | 500 | 0,82 | 2666 | 0,88 | 50 |
| **301** | 0,56 | 290 | 1.73 | 500 | 1,07 | 2646 | 0,87 | 50 |

**Table 9**
**Thrusters V. 290/500 – Hz 50**

| Thruster | kW | Volt Δ | A Δ | Volt Y | A Y | rpm | Cos. Φ | Hz |
|---|---|---|---|---|---|---|---|---|
| **023 – 024** | 0,16 | 230 | 0.69 | 400 | 0,40 | 2716 | 0,81 | 50 |
| **030 – 031** | 0,20 | 230 | 0.85 | 400 | 0,49 | 2752 | 0,82 | 50 |
| **050 – 051** | 0,21 | 230 | 1.00 | 400 | 0,58 | 2830 | 0,80 | 50 |
| **080 – 081** | 0,32 | 230 | 1.31 | 400 | 0,76 | 2722 | 0,80 | 50 |
| **121** | 0,32 | 230 | 1.64 | 400 | 0,95 | 2761 | 0,80 | 50 |
| **201** | 0,45 | 230 | 1.87 | 400 | 1,08 | 2750 | 0,84 | 50 |
| **301** | 0,56 | 230 | 2.30 | 400 | 1,40 | 2730 | 0,86 | 50 |

**Table 7**
**Thrusters V. 230/400 – Hz 50**

| Thruster | kW | Volt Δ | A Δ | Volt Y | A Y | rpm | Cos. Φ | Hz |
|---|---|---|---|---|---|---|---|---|
| **023 – 024** | 0,16 | 305 | 0.52 | 525 | 0,30 | 2716 | 0,81 | 50 |
| **030 – 031** | 0,20 | 305 | 0.64 | 525 | 0,37 | 2780 | 0,78 | 50 |
| **050 – 051** | 0,21 | 305 | 0.75 | 525 | 0,44 | 2830 | 0,80 | 50 |
| **080 – 081** | 0,32 | 305 | 0.99 | 525 | 0,58 | 2722 | 0,80 | 50 |
| **121** | 0,32 | 305 | 1.24 | 525 | 0,72 | 2761 | 0,80 | 50 |
| **201** | 0,45 | 305 | 1.41 | 525 | 0,82 | 2750 | 0,84 | 50 |
| **301** | 0,56 | 305 | 1.73 | 525 | 1,07 | 2730 | 0,86 | 50 |

**Table 10**
**Thrusters V. 305/525 – Hz 50**

| Thruster | kW | Volt Δ | A Δ | Volt Y | A Y | rpm | Cos. Φ | Hz |
|---|---|---|---|---|---|---|---|---|
| **023 – 024** | 0,16 | 240 | 0.69 | 415 | 0,40 | 2727 | 0,78 | 50 |
| **030 – 031** | 0,20 | 240 | 0.85 | 415 | 0,49 | 2791 | 0,75 | 50 |
| **050 – 051** | 0,21 | 240 | 1.00 | 415 | 0,58 | 2841 | 0,77 | 50 |
| **080 – 081** | 0,32 | 240 | 1.31 | 415 | 0,76 | 2733 | 0,77 | 50 |
| **121** | 0,32 | 240 | 1.64 | 415 | 0,95 | 2772 | 0,77 | 50 |
| **201** | 0,45 | 240 | 1.87 | 415 | 1,08 | 2761 | 0,81 | 50 |
| **301** | 0,56 | 240 | 2.30 | 415 | 1,40 | 2741 | 0,83 | 50 |

**Table 8**
**Thrusters V. 240/415 – Hz 50**

| Thruster | kW | Volt Δ | A Δ | Volt Y | A Y | rpm | Cos. Φ | Hz |
|---|---|---|---|---|---|---|---|---|
| **023 – 024** | 0,16 | 380 | 0.40 | 660 | 0,23 | 2716 | 0,81 | 50 |
| **030 – 031** | 0,20 | 380 | 0.49 | 660 | 0,28 | 2780 | 0,78 | 50 |
| **050 – 051** | 0,21 | 380 | 0.58 | 660 | 0,33 | 2830 | 0,80 | 50 |
| **080 – 081** | 0,32 | 380 | 0.76 | 660 | 0,44 | 2722 | 0,80 | 50 |
| **121** | 0,32 | 380 | 0.95 | 660 | 0,55 | 2761 | 0,80 | 50 |
| **201** | 0,45 | 380 | 1.08 | 660 | 0,62 | 2750 | 0,84 | 50 |
| **301** | 0,56 | 380 | 1.40 | 660 | 0,81 | 2730 | 0,86 | 50 |

**Table 11**
**Thrusters V. 380/660 – Hz 50**

The following are the main data of the electric motors of the HYDRO GALVI Thrusters for the most common rated Voltages **Hz 60** :

| Thruster | kW | Volt Δ | A Δ | Volt Y | A Y | rpm | Cos. Φ | Hz |
|---|---|---|---|---|---|---|---|---|
| **023 – 024** | 0,16 | 220 | 0.69 | 380 | 0,40 | 3335 | 0,80 | 60 |
| **030 – 031** | 0,20 | 220 | 0.85 | 380 | 0,49 | 3366 | 0,80 | 60 |
| **050 – 051** | 0,21 | 220 | 1.00 | 380 | 0,58 | 3461 | 0,78 | 60 |
| **080 – 081** | 0,32 | 220 | 1.31 | 380 | 0,76 | 3368 | 0,78 | 60 |
| **121** | 0,32 | 220 | 1.64 | 380 | 0,95 | 3313 | 0,84 | 60 |
| **201** | 0,45 | 220 | 1.87 | 380 | 1,08 | 3299 | 0,87 | 60 |
| **301** | 0,56 | 220 | 2.30 | 380 | 1,40 | 3272 | 0,88 | 60 |

**Table 12**
**Thrusters V. 220/380 – Hz 60**

| Thruster | kW | Volt Δ | A Δ | Volt Y | A Y | rpm | Cos. Φ | Hz |
|---|---|---|---|---|---|---|---|---|
| **023 – 024** | 0,16 | 265 | 0,60 | 460 | 0,35 | 3369 | 0,77 | 60 |
| **030 – 031** | 0,20 | 265 | 0,74 | 460 | 0,43 | 3390 | 0,75 | 60 |
| **050 – 051** | 0,21 | 265 | 0,87 | 460 | 0,50 | 3501 | 0,77 | 60 |
| **080 – 081** | 0,32 | 265 | 1,14 | 460 | 0,66 | 3367 | 0,77 | 60 |
| **121** | 0,32 | 265 | 1,42 | 460 | 0,83 | 3352 | 0,77 | 60 |
| **201** | 0,45 | 265 | 1,62 | 460 | 0,94 | 3339 | 0,81 | 60 |
| **301** | 0,56 | 265 | 2,00 | 460 | 1,22 | 3315 | 0,83 | 60 |

**Table 15**
**Thrusters V. 265/460 – Hz 60**

| Thruster | kW | Volt Δ | A Δ | Volt Y | A Y | rpm | Cos. Φ | Hz |
|---|---|---|---|---|---|---|---|---|
| **023 – 024** | 0,16 | 230 | 0.69 | 400 | 0,40 | 3369 | 0,76 | 60 |
| **030 – 031** | 0,20 | 230 | 0.85 | 400 | 0,49 | 3400 | 0,76 | 60 |
| **050 – 051** | 0,21 | 230 | 1.00 | 400 | 0,58 | 3496 | 0,74 | 60 |
| **080 – 081** | 0,32 | 230 | 1.31 | 400 | 0,76 | 3402 | 0,74 | 60 |
| **121** | 0,32 | 230 | 1.64 | 400 | 0,95 | 3346 | 0,80 | 60 |
| **201** | 0,45 | 230 | 1.87 | 400 | 1,08 | 3332 | 0,83 | 60 |
| **301** | 0,56 | 230 | 2.30 | 400 | 1,40 | 3305 | 0,84 | 60 |

**Table 13**
**Thrusters V. 230/400 – Hz 60**

| Thruster | kW | Volt Δ | A Δ | Volt Y | A Y | rpm | Cos. Φ | Hz |
|---|---|---|---|---|---|---|---|---|
| **023 – 024** | 0,16 | 280 | 0,60 | 480 | 0,35 | 3386 | 0,74 | 60 |
| **030 – 031** | 0,20 | 280 | 0,74 | 480 | 0,43 | 3417 | 0,72 | 60 |
| **050 – 051** | 0,21 | 280 | 0,87 | 480 | 0,50 | 3513 | 0,74 | 60 |
| **080 – 081** | 0,32 | 280 | 1,14 | 480 | 0,66 | 3419 | 0,74 | 60 |
| **121** | 0,32 | 280 | 1,42 | 480 | 0,83 | 3363 | 0,74 | 60 |
| **201** | 0,45 | 280 | 1,62 | 480 | 0,94 | 3349 | 0,78 | 60 |
| **301** | 0,56 | 265 | 2,00 | 460 | 1,22 | 3322 | 0,80 | 60 |

**Table 16**
**Thrusters V. 280/480 – Hz 60**

| Thruster | kW | Volt Δ | A Δ | Volt Y | A Y | rpm | Cos. Φ | Hz |
|---|---|---|---|---|---|---|---|---|
| **023 – 024** | 0,16 | 255 | 0.60 | 440 | 0,35 | 3369 | 0,79 | 60 |
| **030 – 031** | 0,20 | 255 | 0.74 | 440 | 0,43 | 3400 | 0,79 | 60 |
| **050 – 051** | 0,21 | 255 | 0.87 | 440 | 0,50 | 3496 | 0,77 | 60 |
| **080 – 081** | 0,32 | 255 | 1.14 | 440 | 0,66 | 3402 | 0,77 | 60 |
| **121** | 0,32 | 255 | 1.42 | 440 | 0,83 | 3346 | 0,84 | 60 |
| **201** | 0,45 | 255 | 1.62 | 440 | 0,94 | 3332 | 0,87 | 60 |
| **301** | 0,56 | 255 | 2.00 | 440 | 1,22 | 3305 | 0,88 | 60 |

**Table 14**
**Thrusters V. 255/440 – Hz 60**

| Thruster | kW | Volt Δ | A Δ | Volt Y | A Y | rpm | Cos. Φ | Hz |
|---|---|---|---|---|---|---|---|---|
| **023 – 024** | 0,16 | 330 | 0,48 | 575 | 0,28 | 3369 | 0,76 | 60 |
| **030 – 031** | 0,20 | 330 | 0,59 | 575 | 0,34 | 3400 | 0,76 | 60 |
| **050 – 051** | 0,21 | 330 | 0,70 | 575 | 0,40 | 496 | 0,74 | 60 |
| **080 – 081** | 0,32 | 330 | 0,91 | 575 | 0,53 | 3402 | 0,74 | 60 |
| **121** | 0,32 | 330 | 1,14 | 575 | 0,66 | 3346 | 0,80 | 60 |
| **201** | 0,45 | 330 | 1,30 | 575 | 0,75 | 3332 | 0,83 | 60 |
| **301** | 0,56 | 330 | 1,60 | 575 | 0,97 | 3305 | 0,84 | 60 |

**Table 17**
**Thrusters V. 330/575 – Hz 60**

On request it will be possible to supply also the electrical data of Thrusters electric motors for rated Voltages different from the listed ones.

**In no case a Thruster for Hz 50 can be used at Hz 60, also if rated Voltage is the same, because the Thruster's impeller for Hz 50 is different from the Thruster's impeller for Hz 60.**

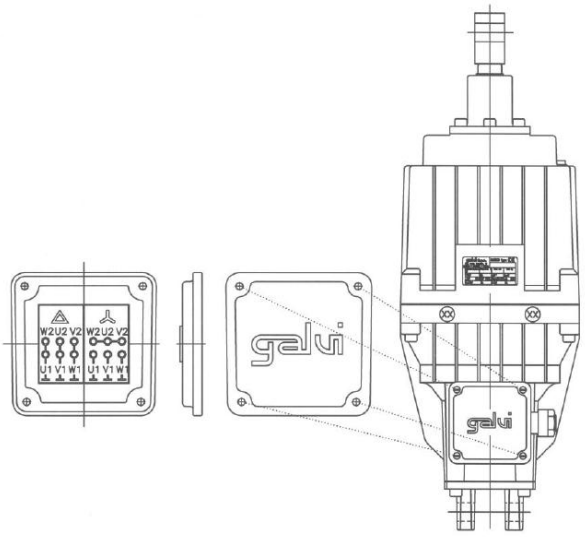
| | |
|---|---|
|  | **Never use a Thruster for Hz 50 at Hz 60.**<br>**Never use a Thruster for Hz 60 at Hz 50.**<br>**Risk of accident.** |

For the cables connection it is necessary to remove the terminal box cover of the Thruster by unscrewing its four screws, and to remove the cable gland of the Thruster (Table 18, Picture 4).

| Pos. | Description |
|---|---|
| 01 | Terminal box cover of Thruster |
| 02 | Screws for terminal box cover of Thruster |
| 03 | Cable gland of Thruster |
| 04 | Motor housing |

**Table 18**

The wiring instructions are printed on the internal part of the terminal box cover, wiring can be of delta type or star type. (Drawing 7, Picture 5).



**Drawing 7**




**Picture 4**
**Model shown HYD.301/06**

The HYDRO GALVI Thrusters if not differently required are star connected.

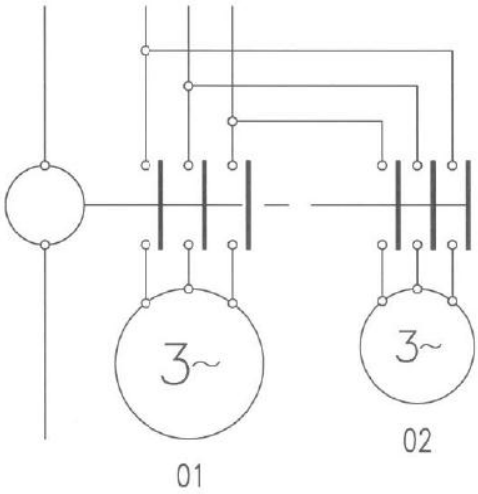
The Thruster motor must be connected to the main motor of the machine as per following suggested wiring diagram (Table 19, Drawing 8).




**Picture 5**

| Pos. | Description |
|---|---|
| 01 | Main motor |
| 02 | Thruster motor |

**Table 19**



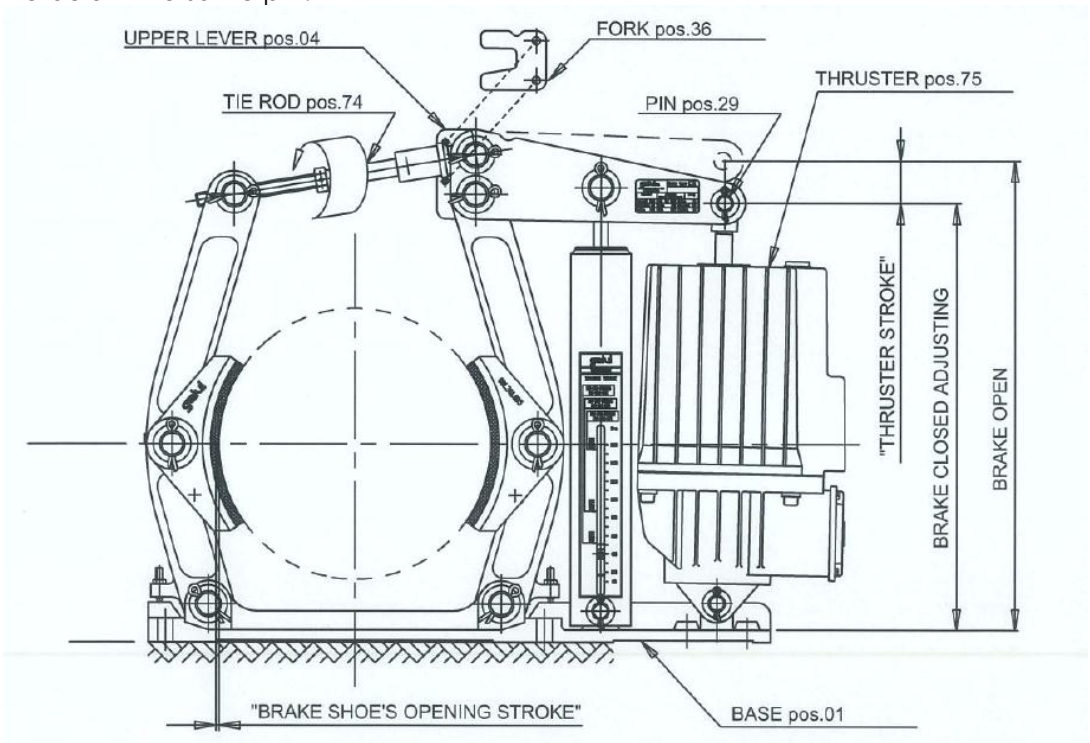

**Drawing 8**
**Suggested wiring diagram**

## 02.03 - ADJUSTMENT OF OPENING STROKES & BALANCING SCREWS

After installation of the GALVI Shoe Brake and electrical connection of the HYDRO GALVI Thruster it is necessary to proceed with the adjustment of the opening strokes of brake Shoes and Thruster.

With Shoe Brake in closed position, in "NV" version with self adjusting device, it is necessary to remove temporarily fork item 36 from self adjusting device for rotating the upper tie rod item 74 until the Thruster item 75 is totally open, without forcing beyond the normal opening stroke (Drawing 9).

With Brake in open position it is necessary to measure the distance between the axis of pin item 29 and plane below the same pin.




**Drawing 9**
**Model shown NV.315.HYD.080/06.CD.42.PS.AU.ZN**

Rotate back in opposite direction the upper tie rod item 74 until pin item 29 is lowered in a measure equal to the "Thruster stroke" as per following Table 20, that is to say the opening stroke of the Brake at Thruster axis.

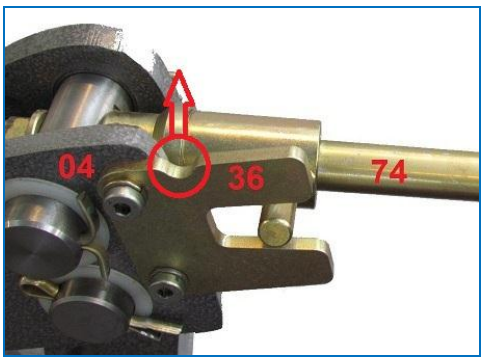
| Brake diameter | 160 mm not DIN Standard | 200 mm | 250 mm | 315 mm | 400 mm | 500 mm | 630 mm | 710 mm |
|---|---|---|---|---|---|---|---|---|
| **Thruster stroke** | 30 mm | 30 mm | 38 mm | 38 mm | 42 mm | 48 mm | 50 mm | 35 mm |

**Table 20**

After this operation **the fork item 36 of the self adjusting device must be screwed again to the upper lever item 04, always paying attention to install it again with reference mark A upwards** (Table 21, Picture 6).

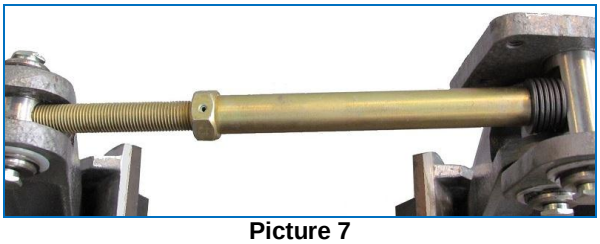
| Pos. | Description |
|---|---|
| **04** | Upper right lever |
| **36** | Fork |
| **74** | Upper tie rod |
| **A** | Reference mark for fork 36 |

**Table 21**




**Picture 6**

In Shoe Brakes in "N" version without self adjusting device there is no fork item 36 and the adjusting procedure with the upper tie rod is the same as per "NV" Shoe Brakes (Picture 7).



**Picture 7**

Adjusting the opening stroke of the Thruster the brake Shoes will have an opening stroke equal to the "brake Shoe stroke" as per following Table 22 and DIN Standard 15435, where the "brake Shoe stroke" is the gap between each lining and the brakedrum :

| **Brake diameter** | **160 mm** not DIN Standard | **200 mm** | **250 mm** | **315 mm** | **400 mm** | **500 mm** | **630 mm** | **710 mm** |
|---|---|---|---|---|---|---|---|---|
| **Brake Shoe stroke** | 0,80 mm | 1,00 mm | 1,25 mm | 1,25 mm | 1,60 mm | 1,60 mm | 2,00 mm | 2,00 mm |

**Table 22**

In Shoe Brakes in "NV" version with self adjusting device the brake Shoes opening stroke remains constant also during the linings wear, so that also the Braking Torque remains constant.

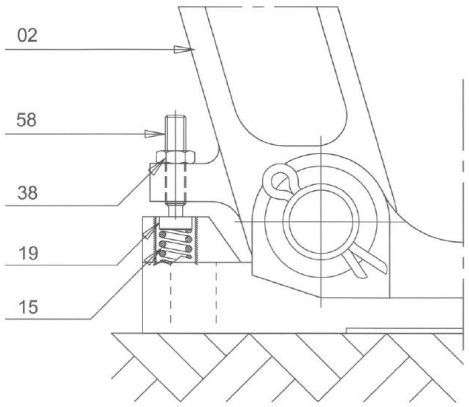
In Shoe Brakes in "N" version without self adjusting device the opening stroke of the brake Shoes increases during linings wear, so that there is a progressive loss of Braking Torque during the use of the Brake, for such reason it is necessary to screw periodically the upper tie rod of the Brake for resetting the correct opening stroke of the brake Shoes.

After adjusting the opening strokes of the brake Shoes and of the Thruster it is necessary to proceed with the adjustment of the balancing screws item 58 of the main levers item 02 of the GALVI Shoe Brake (Drawing 10, Picture 8).

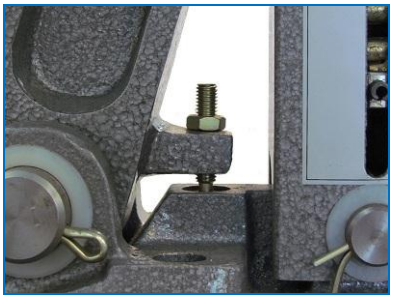
The function of this adjustment if to have an equal opening of the main levers.

It is necessary to open the GALVI Shoe Brake and to keep it in open position using the lifting Force of the HYDRO GALVI Thruster.

During this phase the balancing screws item 58 at the base of the main levers item 02 must be conveniently screwed or unscrewed until main levers item 02 can open equally.




**Drawing 10**



**Picture 8**

Once this last operation is completed and nuts item 38 are fastened on balancing screws item 58 the GALVI Shoe Brake is ready for working and for the adjustment of the Braking Torque.

## 02.04 – ADJUSTMENT OF THE BRAKING TORQUE

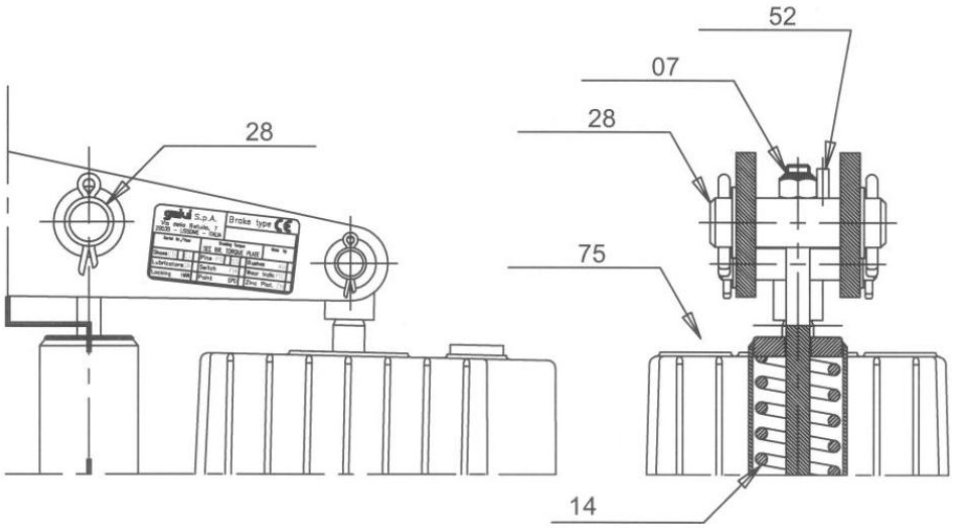
After installation, electrical connection and adjustment of opening strokes and balancing screws of the Brake it is necessary to proceed with the adjustment of the Braking Torque.

This operation must be made with HYDRO GALVI Thruster item 75 in closed position, that is to say with brake Shoes item 05 in contact with the brakedrum (page 9, Drawing 5).

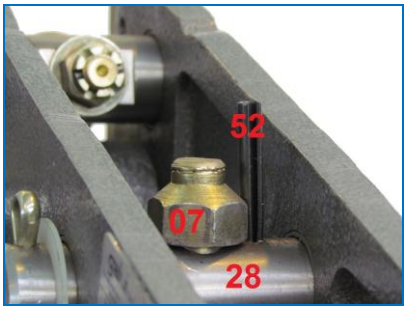
The adjustment of the Braking Torque is substantially made compressing the Brake's main spring item 14 by screwing the nut at the top of the main spring's tie rod item 07 (Drawing 11).

For rotating this nut it is necessary to remove temporarily the elastic pin item 52 from its hole in pin item 28 above the main spring set (Picture 9).

It is necessary to keep the elastic pin item 52 and to put it back in its original position at the end of the operation in order to avoid the rotation of the above mentioned nut.

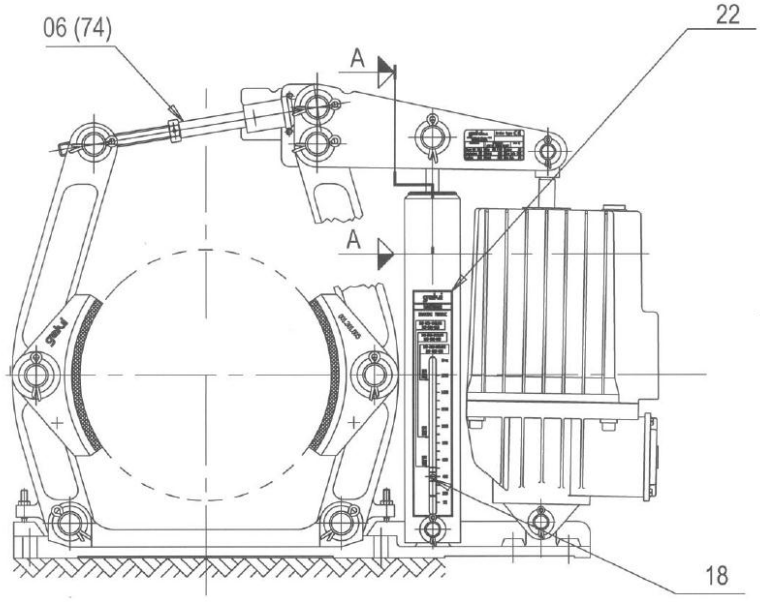



**Drawing 11**

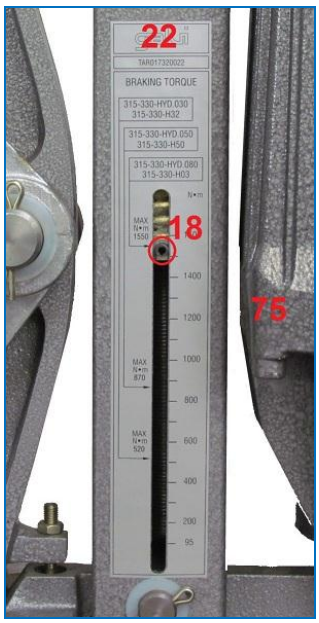



**Picture 9**

Screw the nut of tie rod item 07 until the pointer (that is to say the elastic pin item 18) in the slit of the main spring set reaches the estimated value of Braking Torque expressed in Nm on the Braking Torque plate item 22 (Drawing 12, Picture 10).




**Drawing 12**
**Model shown NV.315.HYD.080/06.CD.42.PS.AU.ZN**



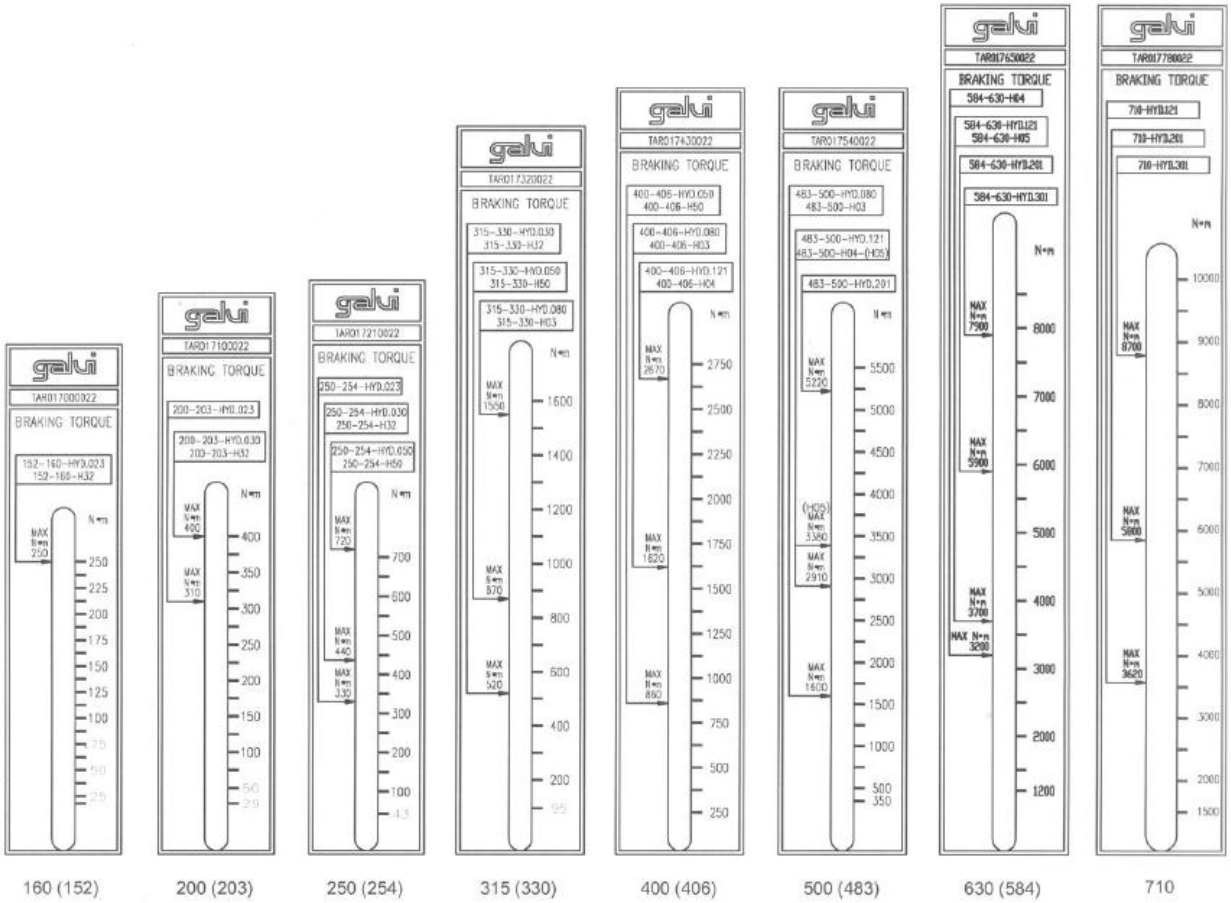

**Picture 10**

As per following Drawing 13, the GALVI Shoe Brakes' Braking Torque plate item 22 shows for each diameter of Brake more than one maximum Braking Torque to which the Brake can be set in function of the model of HYDRO GALVI Thruster item 75.

More precisely, the Braking Torque plate item 22 shows two different maximum Braking Torques for Brake dia. 160 mm and three different maximum Braking Torques for Brakes from dia. 200 mm to dia. 710 mm included.

As an example, a GALVI Shoe Brake type NV.315… can be set up to a maximum Braking Torque of 520 Nm with HYDRO GALVI Thruster type HYD.030/05 or up to a maximum Braking Torque of 1550 Nm with HYDRO GALVI Thruster type HYD.080/06, as shown also at page 8 in Table 4.

The following Drawing 13 shows the eight Braking Torque plates item 22 for GALVI Shoe Brakes from dia. 160 mm to dia. 710 mm :




**Drawing 13**

**It is always necessary to know which model of HYDRO Thruster is installed for knowing which maximum Braking Torque each Brake can be set to.**

| | |
|---|---|
|  | **Never set the Braking Torque beyond the maximum limit shown in the Braking Torque plate in function of the installed Thruster. Risk of malfunctioning.** |

If the Shoe Brake has been selected by the Manufacturer, its Braking Torque is always written in the "Btt" line of the calculations report for the Brake's selection, selection which can be made by filling the data sheets in the Inquiries page of the website www.galvi.com .

If the Shoe Brake hasn't been selected by the Manufacturer and if the User doesn't know which Braking Torque is necessary, it is suggested to initially set the Brake to its maximum Braking Torque and then eventually decrease the Braking Torque in function of the results of the first test brakings, until optimal braking time and braking space are reached, after an adequate running in of the linings and of the brakedrums which must be perfectly clean.

**Once the GALVI Shoe Brake has been set to a satisfactory Braking Torque it is necessary to put the elastic pin item 52 back in its hole in pin item 28 above the main spring set in order to avoid accidental unscrewing of the nut of tie rod item 07 with possible loss of Braking Torque.**

In GALVI Shoe Brakes in "NV" version with self adjusting device the Braking Torque remains constant during the linings wear.

In GALVI Shoe Brakes in "N" version without self adjusting device the Braking Torque decreases progressively during linings wear and during increase of brake Shoes opening stroke, for such reason it is necessary to screw periodically the upper tie rod of the Brake for resetting the correct opening stroke of the brake Shoes.

A correct selection of the Shoe Brake is at the base of a lasting and reliable installation, the Manufacturer for such reason is available to make without obligation and free of charge the selection of GALVI Brakes supplying calculations report, it is therefore suggested to let the Manufacturer select the Brake.

## 03.01 – OPTIONAL ITEMS

The GALVI Shoe Brakes with HYDRO GALVI Thrusters can be supplied with optional items as per following Table 23 :

| Description | Code |
|---|---|
| Self adjusting device | **NV** |
| Extra-wide brake Shoes, 1,5 times wider than the DIN 15435 Standard brake Shoes | **CL** |
| Stainless steel pins | **SS** |
| Lubricators on main pins | **GR** |
| Open position microswitch | **FIA** |
| Linings wear microswitch | **FIC** |
| Manual opening system | **HAN** |
| Supporting spheres for vertical brake axis | **ORZ** |
| Protection cover | **COV** |
| Lowering valve for Thruster | **LO** |
| Lifting valve for Thruster | **LI** |
| Foot rotated 90° for Thruster | **90** |
| VITON seals for Thruster | **VIT** |
| Heaters for Thruster | **HEA** |
| Special Voltage for Thruster | **V-Hz** |

**Table 23**

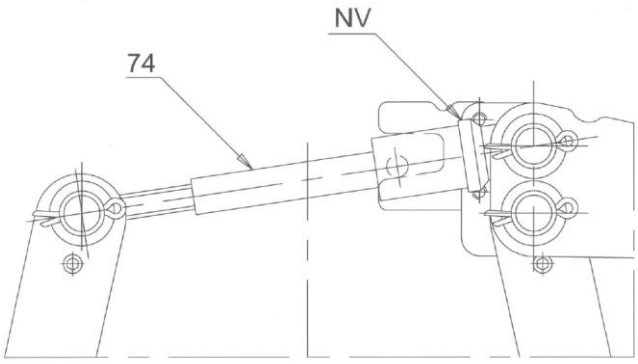
## 03.02 – SELF ADJUSTING DEVICE (NV)

The GALVI Shoe Brakes with self adjusting device have "NV" code instead of "N" code typical of standard Shoe Brakes.

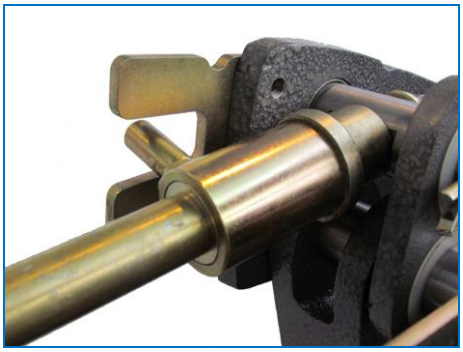
The self adjusting device is now installed on all GALVI Brakes and it is considered indispensable for all the hoist drive Brakes and for heavy duty Brakes.

In Shoe Brakes in "NV" version the self adjusting device automatically adjusts the Brake with repeated and minimum rotations of the upper tie rod during the progressive linings wear, so that the Braking Torque and the opening stroke of the brake Shoes remain constant.

The self adjusting device is substantially a unidirectional needle bearing installed on the upper tie rod which works also through its pin and its fork (Drawing 14, Picture 11).




**Drawing 14**



**Picture 11**
**Self adjusting device (NV)**

# 03.03 – BRAKE SHOES 1,5 TIMES WIDER THAN DIN 15435 STANDARD BRAKE SHOES (CL)

The GALVI Shoe Brakes with brake Shoes item 05 1,5 times wider than DIN 15435 Standard brake Shoes have "CL" code instead of "CD" code typical of standard brake Shoes.

The brake Shoes item 05 1,5 times wider than DIN 15435 Standard brake Shoes are an option suggested by the Manufacturer for all the heavy duty GALVI Shoe Brakes.

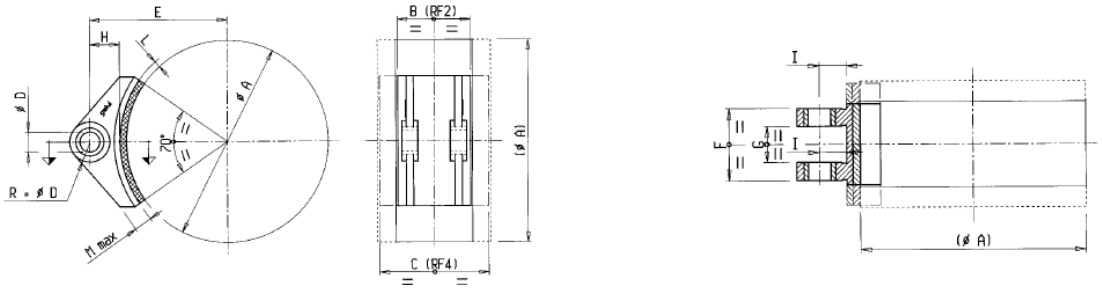
In case the Manufacturer has made the technical selection of the GALVI Shoe Brake it is possible that the brake Shoes item 05 1,5 times wider than DIN 15435 Standard brakes Shoes are indispensable for the service required by the Customer.

The brake Shoes item 05 1,5 times wider than DIN 15435 Standard brakes Shoes allow a better dissipation of thermal energy and a better use of the lining.

The brake Shoes item 05 1,5 times wider than DIN 15435 Standard brakes Shoes must be used with Brakedrums or Couplings with Brakedrums 1,5 times wider than the DIN 15431 Standard Brakedrums respectively named "PL" and "GL" in the GALVI range.

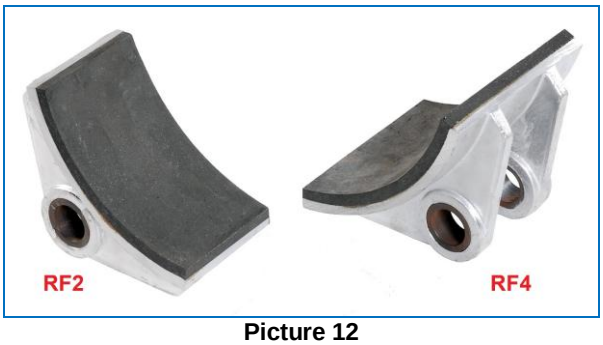
The DIN 15435 Standard brake Shoes item 05 are named "RF2" while the brakes Shoes 1,5 times wider than the DIN 15435 Standard brake Shoes are named "RF4".

All the brake Shoes "RF2" and "RF4" are listed in the following Table 24 taken from pages 36 and 37 of the GALVI Shoe Brakes Catalogue :




| Ceppo freno tipo<br>Brake Shoe type<br>Sabots de frein type<br>Bremsbacke Durchm. Typ | | Ø A | B<br>RF2 | C (1)<br>RF4 | Ø D<br>D10 | E | F<br>0<br>- 0,2 | G<br>+ 0,2<br>0 | H | I | L | M<br>max | Massa (2)<br>Mass (2)<br>Masse (2)<br>Masse (2)<br>[kg] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | Ceppo DIN<br>DIN Shoe<br>Sabot DIN<br>Backe DIN | Ceppo largo (1)<br>Extra-wide Shoe (1)<br>Sabot large (1)<br>Breite Backe (1) |
| CD | CL (1) | | | | | | | | | | | | RF2 | RF4 |
| RF2.160(1) | RF4.160(1) | 160 | 55 | 85 | 16 | 115 | 52 | 28 | 29 | 23 | 6 | 13 | 0,31 | 0,77 |
| RF2.200 | RF4.200(1) | 200 | 70 | 105 | 20 | 140 | 65 | 35 | 32 | 24 | 8 | 17 | 0,60 | 0,76 |
| RF2.250 | RF4.250(1) | 250 | 90 | 135 | 25 | 170 | 80 | 40 | 37 | 29 | 8 | 22 | 0,99 | 1,24 |
| RF2.315 | RF4.315(1) | 315 | 110 | 165 | 30 | 212 | 100 | 50 | 44,5 | 34,5 | 10 | 25 | 1,83 | 2,34 |
| RF2.400 | RF4.400(1) | 400 | 140 | 210 | 35 | 260 | 125 | 62 | 50 | 40 | 10 | 30 | 3,06 | 3,88 |
| RF2.500 | RF4.500(1) | 500 | 180 | 270 | 40 | 320 | 160 | 80 | 58 | 46 | 12 | 33 | 5,30 | 6,90 |
| RF2.630 | RF4.630(1) | 630 | 225 | 335 | 45 | 390 | 200 | 100 | 63 | 51 | 12 | 38 | 17,5 | 22,0 |
| RF2.710 | RF4.710(1) | 710 | 255 | 380 | 50 | 440 | 224 | 112 | 70 | 56 | 15 | 40 | 24,5 | 33,5 |

**Table 24**



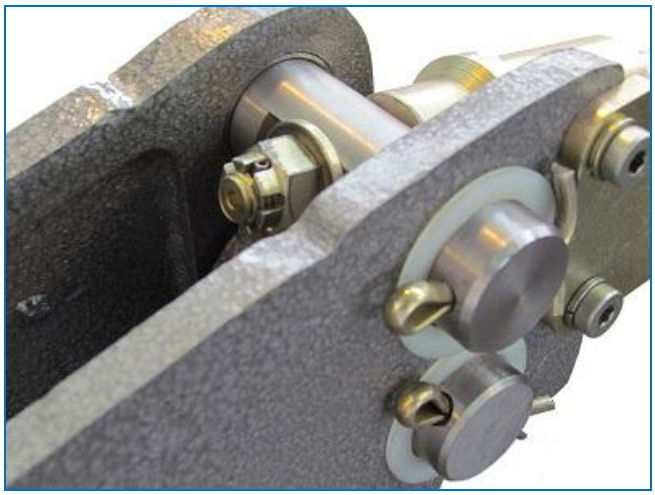

**Picture 12**
**Standard brake Shoes "RF2" and 1,5 times wider brake Shoes "RF4"**

## 03.04 - STAINLESS STEEL PINS (SS)

The GALVI Shoe Brakes with stainless steel pins have "SS" code instead of "PS" code typical of standard pins.

The stainless steel pins are an option suggested by the Manufacturer for all the GALVI Shoe Brakes installed outdoors or in salty and humid environments.

The stainless steel pins are made in AISI 420 HARDENED AND TEMPERED (Picture 13).



**Picture 13**
**Stainless steel pins "SS"**

## 03.05 – LUBRICATORS ON MAIN PINS (GR)

The GALVI Shoe Brakes with lubricators on main pins have "GR" code.

The lubricators on main pins are an option suggested by the Manufacturer for all the GALVI Shoe Brakes installed outdoors or in salty and humid environments.

The lubricators on main pins are available only combined with the optional stainless steel pins (SS).

The pins with lubricators are secured with seegers instead of split pins and washers used for securing the standard pins (PS) and the stainless steel pins (SS) (Picture 14).

The lubrication with lubricators on main pins is made with injection of grease (as an example grease EXXON Beacon 2) with specific guns for lubricators Tecalemit UNI 7662.



**Picture 14**
**Lubricators on main pins "GR"**

## 03.06 – OPEN POSITION MICROSWITCH (FIA)

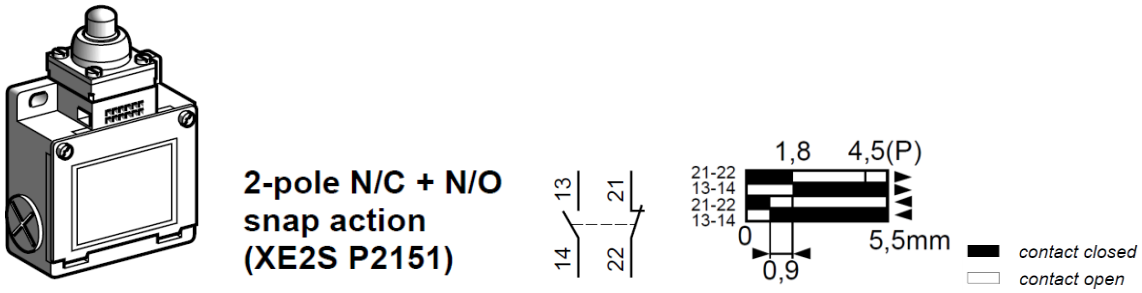
The GALVI Shoe Brakes with open position microswitch have "FIA" code.

The open position microswitch is an option suggested by the Manufacturer for avoiding the accidental start of the machine's main motor before the GALVI Shoe Brake is completely open.

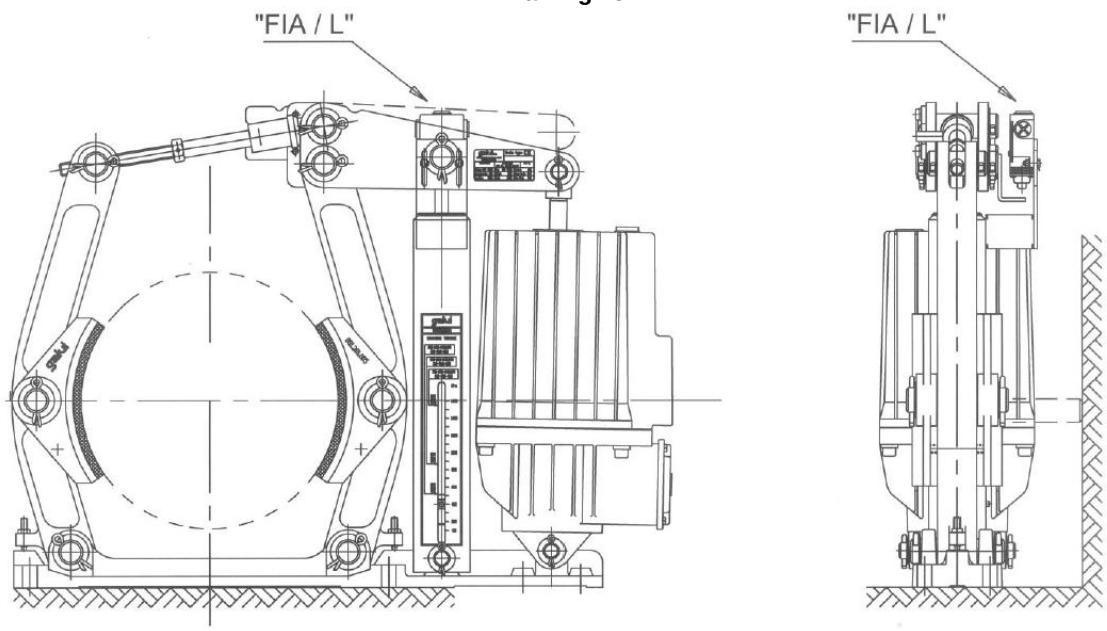
The option can be installed on left side ("FIA/L", Drawing 16) or on right side ("FIA/R"), in any case always opposite to eventual "HAN" option's side.

The microswitch normally used is Telemecanique brand, type XCK.M110 (Drawing 15, Picture 15), preset for cable gland Pg.11 (cable gland normally not included); on request it is possible to supply the microswitch model XCK.M110.H20 preset for cable gland M20 x 1,5 mm.

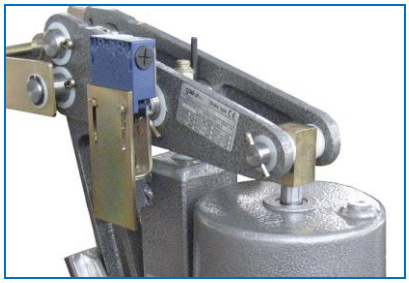
On request it is possible to supply also the cable gland, both Pg.11 and M20 x 1,5 mm, both in nylon and in stainless steel (Picture 16).




**Drawing 15**




**Drawing 16**
**Model shown NV.315.HYD.080/06.CD.42.PS.AU.ZN.FIA/L**



**Picture 15**
**Open position microswitch "FIA/L"**



**Picture 16**
**Nylon and stainless steel cable glands Pg.11 and M20**

## 03.07 – LININGS WEAR MICROSWITCH (FIC)

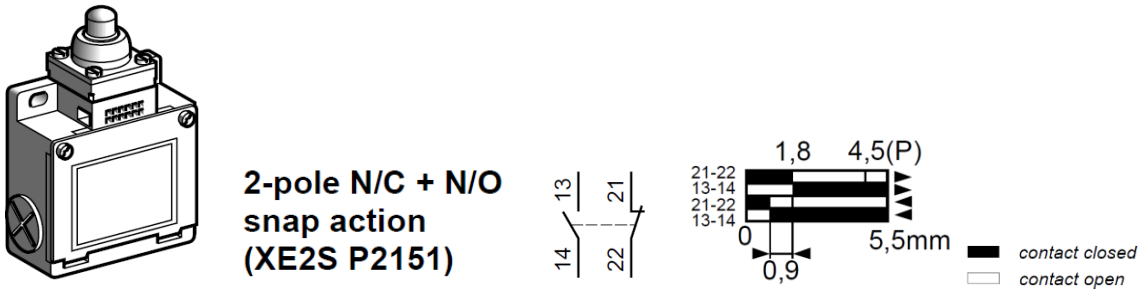
The GALVI Shoe Brakes with linings wear microswitch have "FIC" code.

The linings wear microswitch is an option suggested by the Manufacturer for detecting and signalling the linings wear.

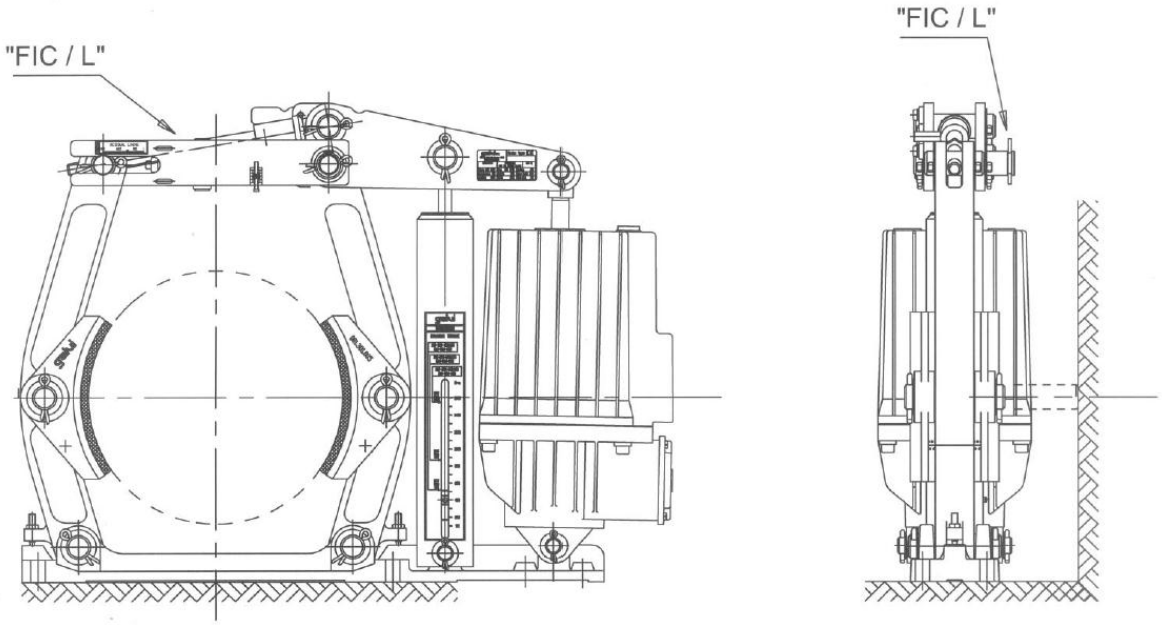
The option can be installed on left side ("FIC/L", Drawing 18) or on right side ("FIC/R").

The microswitch normally used is Telemecanique brand, type XCK.M110 (Drawing 17, Picture 17), preset for cable gland Pg.11 (cable gland normally not included); on request it is possible to supply the microswitch model XCK.M110.H20 preset for cable gland M20 x 1,5 mm.

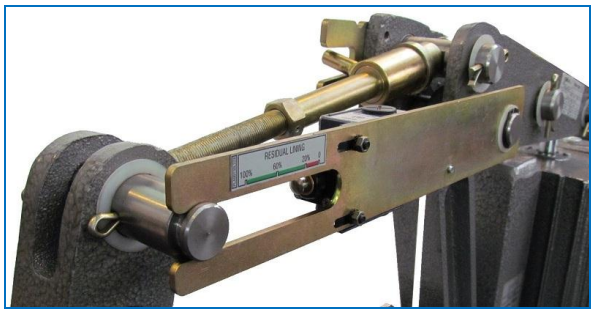
On request it is possible to supply also the cable gland, both Pg.11 and M20 x 1,5 mm, both in nylon and in stainless steel (Picture 18).




**Drawing 17**




**Drawing 18**
**Model shown NV.315.HYD.080/06.CD.42.PS.AU.ZN.FIC/L**



**Picture 17**
**Linings wear microswitch "FIC/L"**



**Picture 18**
**Nylon and stainless steel cable glands Pg.11 and M20**

# 03.08 – MANUAL OPENING SYSTEM (HAN)

The GALVI Shoe Brakes with manual opening system have "HAN" code.

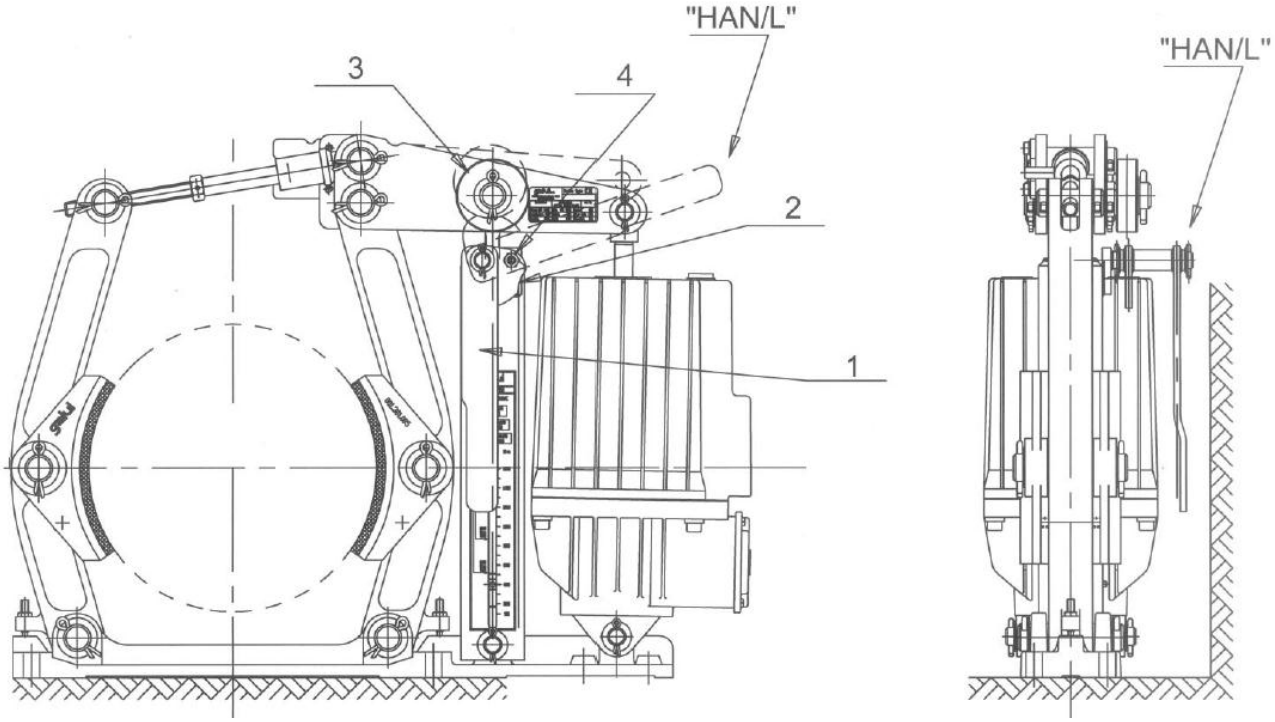
The manual opening system is an option suggested by the Manufacturer for facilitating maintenance and/or for some special installations which require the possibility to open the Brake manually and eventually to lock it in open position, as it happens with Brakes for boom rotation for port cranes.

The system is made with a lever with eccentric cam which, held and lifted, working on a wheel allows to open the GALVI Shoe Brake and to eventually lock it in open position.

The system is designed for being automatically disengaged going back to closed position as soon as the Thruster starts working opening electrically the Brake.

For closing the Brake it is necessary to put the lever back in vertical position.

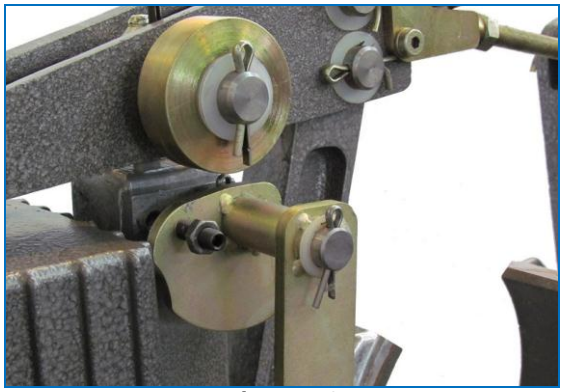
The option can be installed on left side ("HAN/L", Drawing 19) or on right side ("HAN/R").




**Drawing 19**
**Model shown NV.315.HYD.080/06.CD.42.PS.AU.ZN.HAN/L**

| Pos. | Description |
|---|---|
| 01 | Lever |
| 02 | Eccentric cam |
| 03 | Wheel |
| 04 | Setscrew |

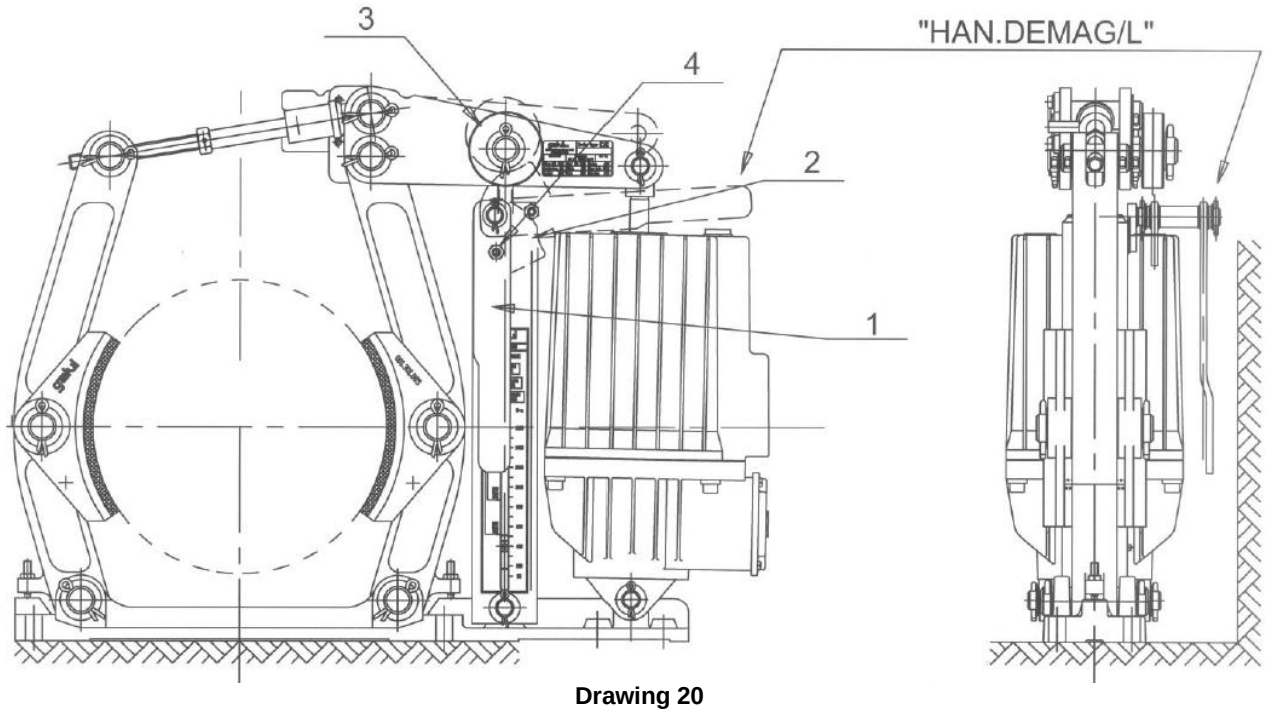
**Table 25**



**Picture 19**
**Manual opening system "HAN/R"**

On specification of Customer Demag Cranes & Components GmbH the manual opening system is made also in special version which, unlike the standard version, doesn't allow to lock the Brake in open position, in this special version the option is named "HAN.DEMAG".

The option also in this version can be installed on left side ("HAN.DEMAG/L", Drawing 20) or on right side ("HAN.DEMAG/R", Picture 20).




**Drawing 20**
**Model shown NV.315.HYD.080/06.CD.42.PS.AU.ZN.HAN.DEMAG/L**

| Pos. | Description |
|---|---|
| 01 | HAN.Demag lever |
| 02 | Eccentric cam HAN.Demag |
| 03 | Wheel |
| 04 | Setscrew HAN.Demag with spring |

**Table 26**



**Picture 20**
**Manual opening system "HAN.DEMAG/R"**

## 03.09 – SUPPORTING SPHERES FOR VERTICAL BRAKE AXIS (ORZ)

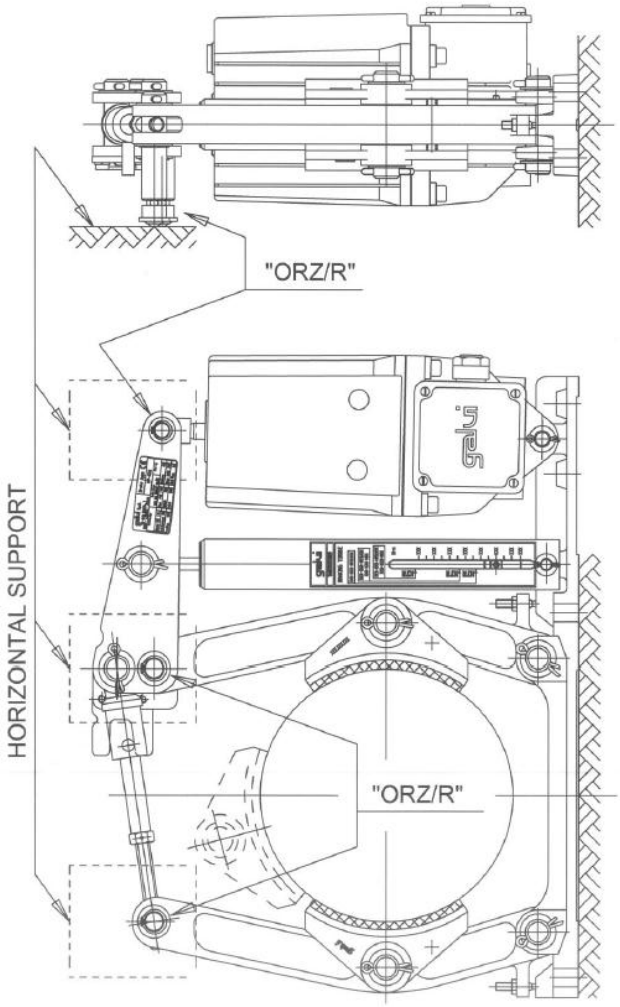
The GALVI Shoe Brakes with supporting spheres for vertical brake axis have "ORZ" code.

The supporting spheres for vertical brake axis are an option considered by the Manufacturer as indispensable for all the GALVI Shoe Brakes installed in horizontal position, that is to say with vertical brake axis.

These spheres support the GALVI Shoe Brake with vertical brake axis rolling on a horizontal support preset under the Brake.

In all the cases in which the Brake is installed in horizontal position, that is to say with vertical brake axis, it is indispensable to add the following "90" option to the "ORZ" option, that is to say it is indispensable for the HYDRO GALVI Thruster to have the foot rotated of 90 degrees so that the frontal part of the Thruster is facing upwards (Drawing 21).

The GALVI Shoe Brakes with "ORZ" option cannot be supplied with HYDRO GALVI Thrusters model HYD.024/05, 031/05, 081/06, 051/06 because these Thrusters are not available with option "90".



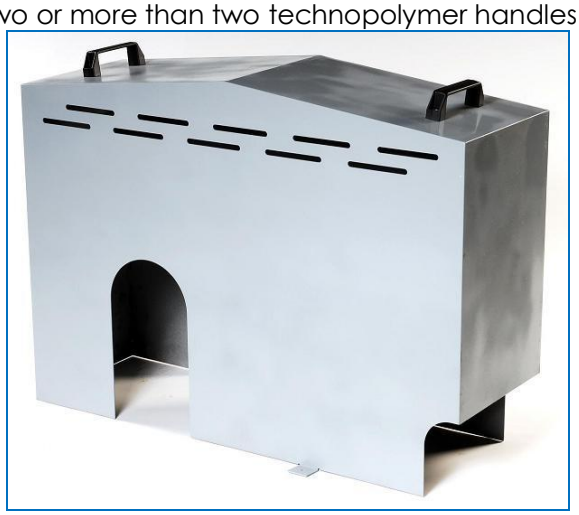

**Drawing 21**
**Model shown NV.315.HYD.080/06.90.CD.42.PS.AU.ZN.ORZ/R**

## 03.10 – PROTECTION COVER (COV)

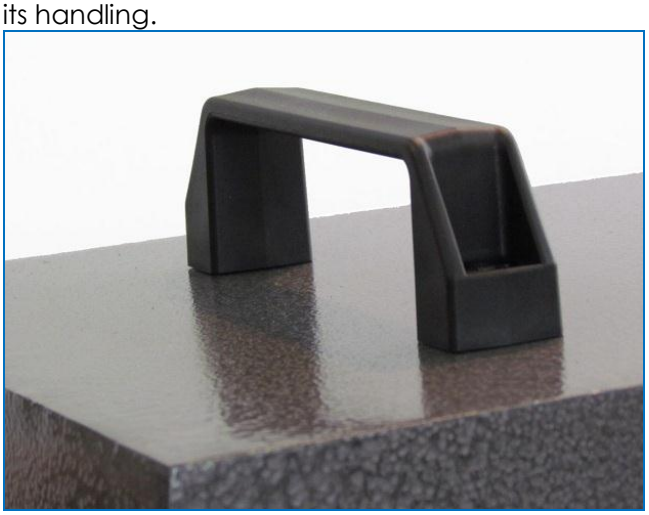
The protection cover is an option identified with "COV" code.

The protection cover is an option considered by the Manufacturer as sometimes suggested and sometimes indispensable for all the GALVI Shoe Brakes installed outdoors.

The protection cover is made of laser cut steel and in function of the diameter of Shoe Brakes it has two or more than two technopolymer handles for its handling.



**Picture 21**
**Protection cover "COV"**



**Picture 22**
**Technopolymer handle for cover "COV"**

## 03.11 – LOWERING VALVE FOR THRUSTER (LO)

The HYDRO GALVI Thrusters, excluding models HYD.024/05, 031/05, 051/06, 081/06, can be supplied with optional lowering valve identified with "LO" code.

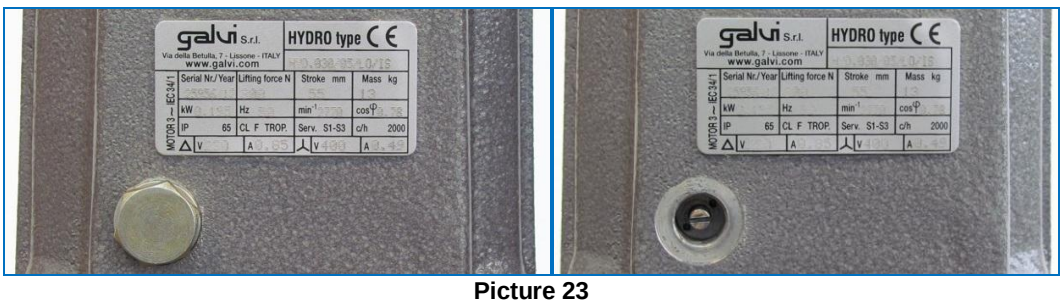
The lowering valve is an option considered by the Manufacturer as indispensable for all the GALVI Shoe Brakes whose application requires adjustment of closing time, with effects on braking time and braking space.

Normally this option is common on Brakes for horizontal movements (cranes' bridge travelling, cranes' trolley traversing, belt conveyors drives), while it shouldn't be installed on Brakes for vertical movements (hoist drives).

Externally the lowering valve can be used screwing its tie rod on the frontal part of the Thruster (protected by a screw cap) and increasing the normal closing time of Thruster and Brake.

The average closing time of a GALVI Shoe Brake with standard Thruster is 0,3 seconds, using the lowering valve this closing time can be increased up to maximum 15 times the standard average time, on the other hand the presence of the "LO" valve normally increases slightly the minimum closing time of the Brake.

The "LO" option is considered by the Manufacturer as not compatible with Thrusters installed in horizontal position, because its effectiveness is reduced on Shoe Brakes installed on vertical brake axis.




**Picture 23**
**Lowering valve for Thruster "LO"**

## 03.12 – LIFTING VALVE FOR THRUSTER (LI)

The HYDRO GALVI Thrusters, excluding models HYD.024/05, 031/05, 051/06, 081/06, can be supplied with optional lifting valve identified with "LI" code.

The lifting valve is an option suggested by the Manufacturer for all the GALVI Shoe Brakes whose application requires adjustment of the opening time.

Externally the lifting valve can be used screwing its tie rod on the frontal part of the Thruster (protected by a screw cap) and increasing the normal opening time of Thruster and Brake.

The average opening time of a GALVI Shoe Brake with standard Thruster is 0,3 seconds, using the lifting valve this opening time can be increased up to maximum 15 times the standard average time, on the other hand the presence of the "LI" valve normally increases slightly the minimum opening time of the Brake.

The "LI" option is considered by the Manufacturer as not compatible with Thrusters installed in horizontal position, because its effectiveness is reduced on Shoe Brakes installed on vertical brake axis.




**Picture 24**
**Lifting valve for Thruster "LI"**

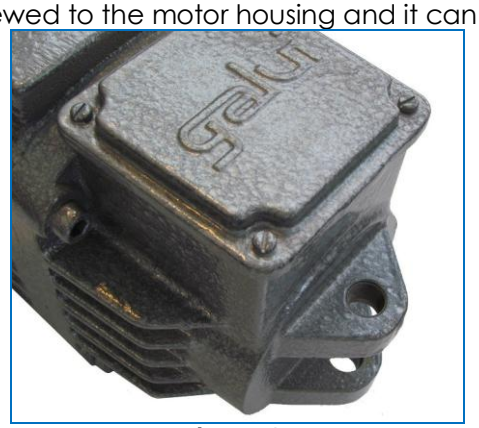
## 03.13 – FOOT ROTATED 90° FOR THRUSTER (90)

The HYDRO GALVI Thrusters, excluding models HYD.024/05, 031/05, 051/06, 081/06, can be supplied with foot rotated of 90° identified with "90" code.

The foot rotated of 90° is an option considered by the Manufacturer as indispensable for all the GALVI Shoe Brakes installed in horizontal position, that is to say installed with vertical brake axis and with "ORZ" option.

The function of "90" option is to position upwards the frontal part of the Thruster in cases where the Thruster is installed in horizontal position.

In Thrusters model HYD.023/05, 030/05, 050/06, 080/06 the "90" option is made with a special casting of the motor housing of the Thruster, while in models HYD.121/06(12), 201/06(12), 301/06(12) the foot is screwed to the motor housing and it can be easily rotated by the User if necessary.



**Picture 25**
**Foot rotated 90° for Thrusters 023,030,050,080 "90"**



**Picture 26**
**Foot rotatable 90° for Thrusters 121,201,301**

## 03.14 – VITON SEALS FOR THRUSTER (VIT)

The HYDRO GALVI Thrusters, excluding models HYD.024/05, 031/05, 051/06, 081/06, can be supplied with VITON seals identified with "VIT" code.

The VITON seals are an option considered by the Manufacturer as indispensable for all the GALVI Shoe Brakes installed at ambient temperature higher than +70 °C.

In function of the ambient temperature it could be necessary to use also a special oil for the Thruster besides the "VIT" option.

## 03.15 – HEATERS FOR THRUSTER (HEA)

The HYDRO GALVI Thrusters can be supplied with heaters identified with "HEA" code.

The heaters are an option considered by the Manufacturer as indispensable for all the GALVI Shoe Brakes installed at ambient temperature lower than -20 °C and in any case suggested for all the GALVI Shoe Brakes installed at ambient temperature lower than 0 °C.

In function of the ambient temperature it could be necessary to use also a special oil for the Thruster besides the "HEA" option.

## 03.16 – SPECIAL VOLTAGE FOR THRUSTER (V-Hz)

The HYDRO GALVI Thrusters are available for any rated Voltage both Hz 50 and Hz 60, they have three phase electric motor, IP.65, insulation Class F, which can rotate in both directions.

The data of the most common rated Voltages both Hz 50 and Hz 60 are listed in chapter 02.02 of this document.

**In no case a Thruster for Hz 50 can be used at Hz 60, also if rated Voltage is the same, because the Thruster's impeller for Hz 50 is different from the Thruster's impeller for Hz 60.**

| | |
|---|---|
|  | **Never use a Thruster for Hz 50 at Hz 60.**<br>**Never use a Thruster for Hz 60 at Hz 50.**<br>**Risk of accident.** |

## 04.01 - MAINTENANCE

As it is fundamental to install correctly the GALVI Shoe Brake following the instructions of this document, it is equally important to follow scrupulously the following maintenance instructions.

A periodical and correct maintenance will ensure the best and correct functioning of the GALVI Shoe Brake, increasing its lifetime and ensuring safety.

For a correct and timely maintenance of the GALVI Shoe Brakes it is indispensable to have a stock of the following GALVI Genuine Spare Parts, in absence of these Spare Parts the User is exposed to risk of machine stop, production stop and possible damage of the Brake and its brakedrum.

| | |
|---|---|
| ⚠ | **Never operate without strategic spare parts. Risk of machine stop.** |

## 04.02 – REPLACEMENT OF BRAKE SHOES

All the brake Shoes item 05 of the GALVI Shoe Brakes are made of aluminum with anti-wear steel bushes and have asbestosfree bonded linings of exclusive GALVI formula and with a special substrate for maximizing the bonding (Table 27, Picture 27).

The lining is subject to wear in function of the type of service of the GALVI Shoe Brakes and also in function of the type of environment where the Brake is installed.

It is in any case indispensable to check periodically the wear level of the linings in order to replace the brake Shoes item 05 before the lining is totally worn.

The total wear of the linings must be avoided for avoiding the direct contact between the brakedrum and the aluminum casting of the brake Shoe with possible consequent damages and possible total loss of friction and Braking Torque.

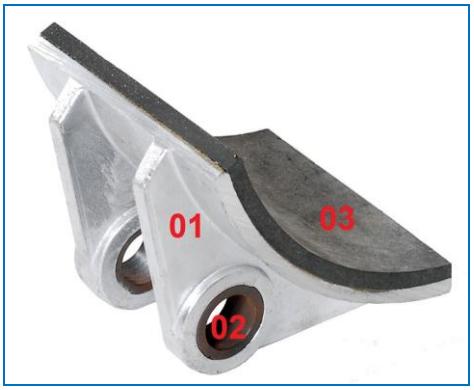
| | |
|---|---|
| ⚠ | **Never wear totally the linings of the brake Shoes. Risk of accident. Inspect periodically the brake Shoes.** |

The brake Shoes item 05, both in DIN 15435 Standard version (CD) named "RF2" and in extra-wide version (CL) named "RF4", can be easily replaced without disassembling the GALVI Shoe Brake.

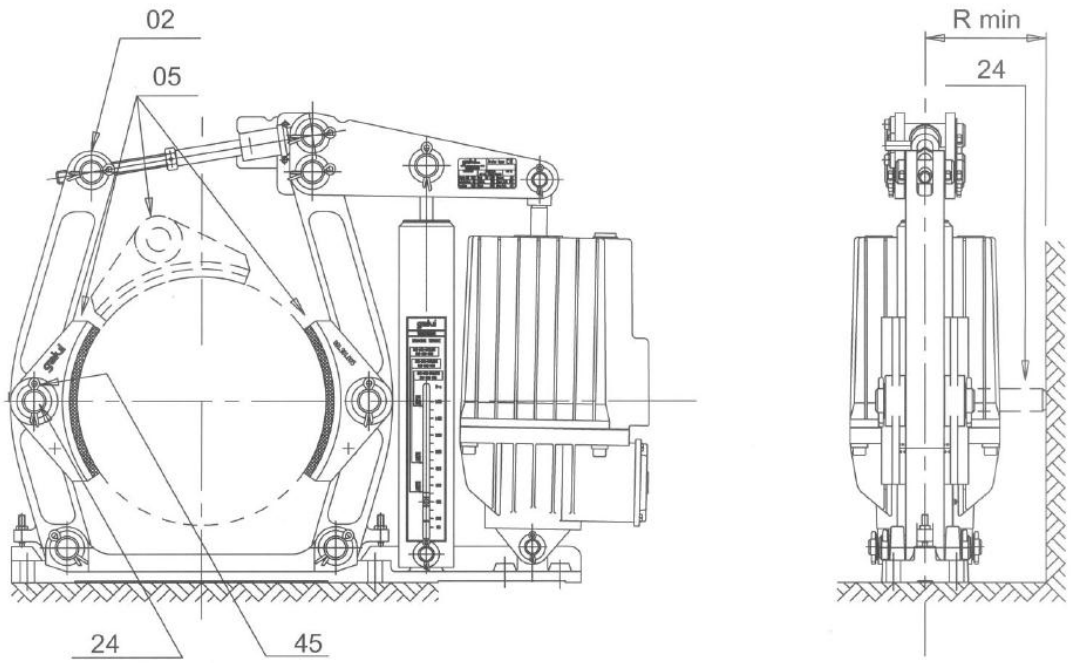
For replacing the brake Shoes item 05 it is in fact necessary to open the Brake, also using "HAN" option if installed, to remove the two split pins item 45 from their pin item 24 or the two seegers if the Brake has optional lubricators on main pins (GR), to remove pin item 24 in order to release the brake Shoes from the main levers item 02 and to rotate them upwards sliding them on the brakedrum (Drawing 22).

| Pos. | Description |
|---|---|
| 01 | Aluminum brake Shoe |
| 02 | Anti-wear steel bushes |
| 03 | Asbestosfree bonded linings, with substrate for bonding |

**Table 27**




**Picture 27**
**Genuine GALVI brake Shoe "RF2" or "RF4"**




**Drawing 22**
**Model shown NV.315.HYD.080/06.CD.42.PS.AU.ZN**

The "$R_{min}$" dimension in above Drawing 22 and in Table 4 at page 9 of this document, table taken from pages 4 and 5 of the GALVI Shoe Brakes Catalogue, shows the minimum distance between the vertical axis of the GALVI Shoe Brake and eventual lateral obstacle for removing towards the same obstacle the pin item 24 which fastens the brake Shoe item 05 to the main lever item 02.

The brake Shoes item 05 with worn lining can be replaced with identical new brake Shoes or they can be regenerated, that is to say they can be sent to the Manufacturer who will remove the worn lining and will bond the new lining.

The linings of the GALVI brake Shoes are never riveted because this fixing technique is worse and outdated by thermal bonding.

**Riveting the brake Shoes, that is to say fixing any lining with metallic rivets and making holes in the brake Shoes, is strongly unwary, as there is risk of possible disjunction of the lining during the braking phase.**

We strongly do not recommend the regeneration of the brake Shoes made by the User because this procedure changes friction material and fixing technique of the friction material.

**We recommend to use only genuine GALVI brake Shoes with genuine linings**.

The use of not genuine brake Shoes and of not genuine friction material invalidates the Declaration of chapter 01.02 and the Product warranty terms of chapter 01.06 of this document.

| | |
|---|---|
| ⚠ | **Never use not genuine Spare Parts, especially brake Shoes. Loss of warranty. Risk of accident.** |

| | |
|---|---|
| ⚠ | **Never modify the Product. Loss of warranty. Risk of accident.** |

## 04.03 – OIL CHANGE FOR THRUSTER

All the HYDRO GALVI Thrusters are supplied complete with oil and ready for operation.

If not differently required, the following type of hydraulic oil is used for ambient temperature included between -20 °C and +55 °C :

**HLP32, DIN 51525**
for Thrusters model HYD.023/05, 024/05, 030/05, 031/05, 050/06, 051/06, 081/06

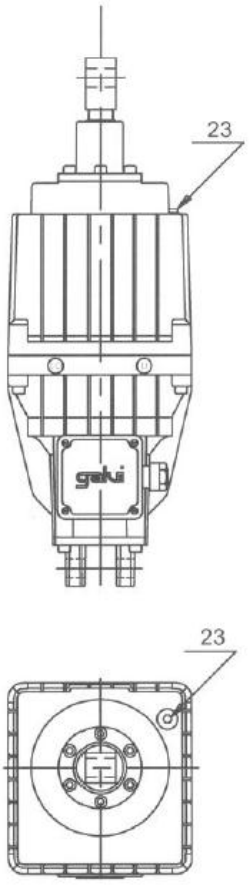
**HL10, DIN 51524, part. 1**
for Thrusters model HYD.121/06(12), 201/06(12), 301/06(12)

**The HYDRO GALVI Thrusters can work also with water-glycol fluid** instead of hydraulic oil; the Manufacturer has made successful tests with fluid Agip Arnica 104/FR, a non-flammable biodegradable hydraulic fluid made of solution of propylene-glycol and additive-treated water with anti-corrosive products.

**The hydraulic oil of the HYDRO GALVI Thrusters must be replaced at least every twelve months.**

**The water-glycol fluid of the HYDRO GALVI Thrusters must be replaced at least every six months.**

Every HYDRO GALVI Thruster has a screw cap item 23 for oil fill and oil drain (Drawing 23, Picture 28).




**Drawing 23**
**Model shown HYD.201/06**



**Picture 28**
**Screw cap for Thruster's oil fill and oil drain**

After unscrewing cap item 23 proceed with emptying totally the Thruster with repeated overturnings.

After emptying totally the Thruster, proceed with oil fill through the hole of cap item 23 as per data of following Table 28, where level is measured from the base of cap item 23 :

| Thruster | Oil quantity liters | Oil level mm |
|---|---|---|
| **HYD.023/05** | 1,75 | 17 |
| **HYD.024/05** | 1,45 | 17 |
| **HYD.030/05** | 2,70 | 20 |
| **HYD.031/05** | 1,90 | 20 |
| **HYD.050/06** | 5,15 | 22 |
| **HYD.051/06** | 3,75 | 22 |
| **HYD.080/06** | 5,15 | 22 |
| **HYD.081/06** | 3,75 | 22 |
| **HYD.121/06-201/06-301/06** | 7,80 | 28 |
| **HYD.121/12-201/12-301/12** | 7,70 | 28 |
| **Table 28** | | |

A too low oil level can cause a loss of lifting Force of the Thruster with consequent difficult or missed opening of the Brakes.

A too high oil level can cause expulsion of oil in excess through the shaft of the Thruster.

For applications with particularly heavy duties, that is to say with Thruster working continuously, it is possible that a different oil level is required, normally slightly lower compared to the standard level as per Table 28.

After completing the operation the cap item 23 must be screwed with a tightening Torque of 25 Nm.

In case the Thruster has options like internal springs (IS, option not available for NV.HYD Brakes of this document) and/or lowering valve (LO) and lifting valve (LI), the quantity of oil inside the Thruster is smaller compared to the quantity shown in Table 28, more precisely it would be necessary to remove the quantity shown in the following Table 29 and Table 30 from the standard quantity shown in Table 28 :

| Thruster with internal springs "IS" | Reduction oil quantity liters |
|---|---|
| **HYD.023/05.IS** | 0,025 |
| **HYD.024/05.IS** | 0,025 |
| **HYD.030/05.IS** | 0,045 |
| **HYD.031/05.IS** | 0,045 |
| **HYD.050/06.IS** | 0,100 |
| **HYD.051/06.IS** | 0,100 |
| **HYD.080/06.IS** | 0,190 |
| **HYD.081/06.IS** | 0,190 |
| **HYD.121/06.IS** | 0,250 |
| **HYD.201/06.IS** | 0,400 |
| **HYD.301/06.IS** | 0,650 |
| **Table 29** | |

| Thruster with valve/s LO/LI | Reduction oil quantity liters |
|---|---|
| **HYD.023/05.LO** | 0,080 |
| **HYD.030/05.LO** | 0,085 |
| **HYD.050/06.LO** | 0,160 |
| **HYD.080/06.LO** | 0,160 |
| **HYD.121/06.LO-201/06.LO-301/06.LO** | 0,220 |
| **HYD.121/12.LO-201/12.LO-301/12.LO** | 0,220 |
| **Table 30** | |

## 04.04 – REPLACEMENT OF THRUSTER

In case it is necessary to replace the HYDRO GALVI Thruster item 75 it is necessary first of all to disconnect it from the power line after putting the machine in total safety conditions.

It is also necessary to note the Braking Torque the GALVI Shoe Brake is set to, because for replacing the Thruster item 75 it is necessary to set to zero the Braking Torque of the Brake.

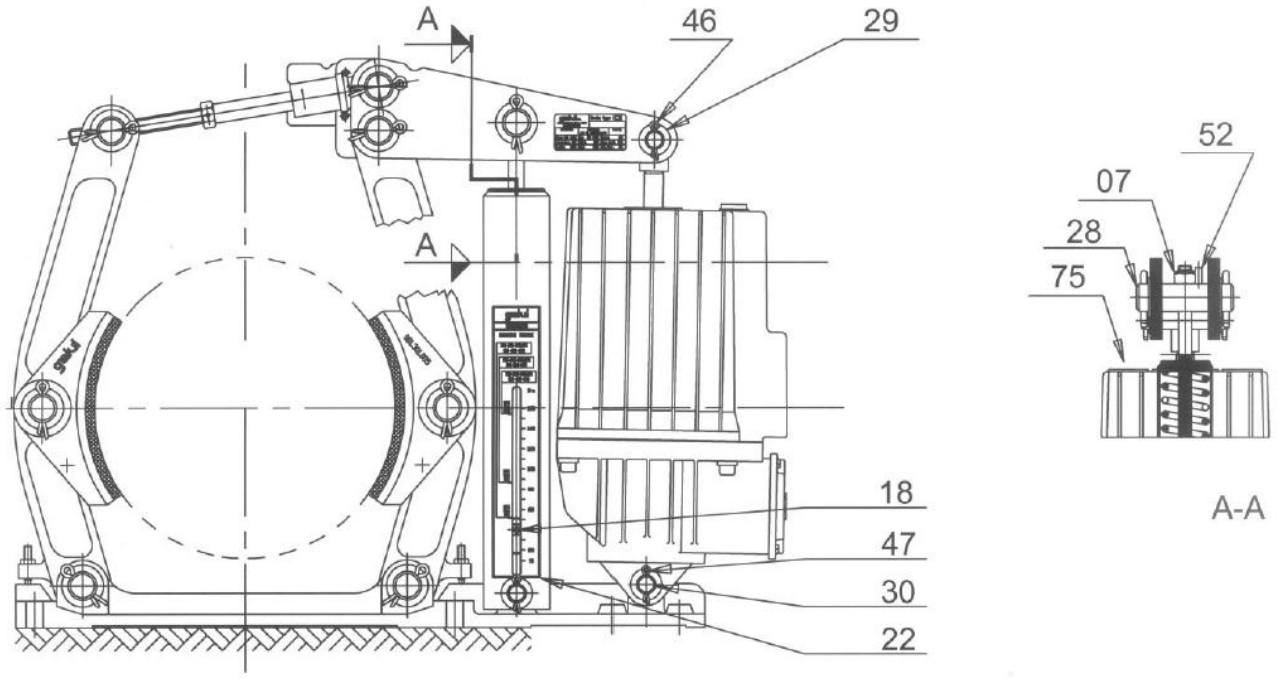
Remove temporarily the elastic pin item 52 from its hole in pin item 28 above the main spring set then rotate counterclockwise the nut at the top of the main spring tie rod item 07 until the pointer (elastic pin item 18) in the slit of the main spring set reaches the minimum Braking Torque value (Drawing 24).

It is necessary to keep elastic pin item 52 because at the end of the operation it will have the important function to prevent the rotation of the nut of tie rod item 07.

Remove the four split pins items 46 and 47 of Thruster's upper pin item 29 and lower pin item 30, remove the two same pins and release the Thruster from the Brake.

Once the Thruster item 75 has been replaced with a new HYDRO GALVI Thruster of same model, insert again upper pin item 29 and lower pin item 30, insert again their four split pins items 46 and 47 and connect again to the power line.

Once the GALVI Shoe Brake's Braking Torque has been reset to the same value noted before replacing the Thruster item 75 following the instructions of this document, it is necessary to put the elastic pin item 52 back in its hole in pin item 28 above the main spring set in order to avoid the accidental rotation of the nut of tie rod item 07 with consequent possible loss of Braking Torque.




**Drawing 24**
**Model shown NV.315.HYD.080/06.CD.42.PS.AU.ZN**

## 04.05 – DISASSEMBLY AND ASSEMBLY OF THE THRUSTER

**The HYDRO GALVI Thruster doesn't need maintenance apart from the oil change suggested every twelve months or the water-glycol fluid change suggested every six months.**

The HYDRO GALVI Thruster must not be disassembled unless it is necessary to repair it and when possible it is always suggested to let the Manufacturer repair it in order to make any operation in a workmanlike manner and with final test.

The eventual disassembly and assembly of the Thruster made by the User invalidates the warranty of the Thruster itself.

**In case for any reason the HYDRO GALVI Thruster has been disassembled it is in any case necessary to comply with the following instructions for reassembling the Thruster.**

The disassembly of HYDRO GALVI Thrusters model 023, 030, 050, 080 (Picture 29) and 121, 201, 301 (Picture 30) requires necessarily to remove and replace gasket item 36 between the two aluminum castings the body of the Thruster is made of, then anyone who wants to disassemble and reassemble must have a new spare gasket item 36.

Thrusters model 024, 031, 051, 081 (Picture 31) are instead without gasket item 36.



**Picture 29**
**Thruster 023, 030, 050, 080**



**Picture 30**
**Thruster 121, 201, 301**



**Picture 31**
**Thruster 024, 031, 051, 081**

Before joining the lower half of the Thruster, called motor housing, to the upper half, called reservoir, it is necessary to clean perfectly the surfaces of the two castings which come into contact.

Then it is necessary to check the clearance between the two castings putting them together, initially without gasket item 36, by means of screws item 69 and tightening them with a tightening Torque of 5 Nm (Drawing 25).

A correct clearance in this initial phase is included between 0,5 and 0,75 mm (Drawing 25).

Once this check has been made it is necessary to separate temporarily the motor housing from the reservoir for preparing their definitive union with sealant and gasket item 36.

On both contact surfaces strew a strip 3-4 mm wide of liquid gasketing (the Manufacturer uses and suggests Loxeal type 58-31) code KKSEAL5831.

Strew uniformly the sealant on both contact surfaces, putting the sealant also around the four holes.

Insert the two pins item 83 in their holes in the reservoir, then position gasket item 36 placing it on the two pins item 83 (Drawing 25).

Join motor housing and reservoir, checking that the two pins item 83 go adequately in their holes.

Insert the four screws item 69 after putting three drops of threadlocker on their threads (the Manufacturer uses and suggests Loxeal type 54-03) code KKSEAL5403, tightening them partially just for joining the two castings.

Then tighten them definitively in three phases with procedure and tightening Torque as per following Table :

| Thruster | First phase Sequence and tightening Torque | Second phase Sequence and tightening Torque | Third phase Sequence and tightening Torque |
|---|---|---|---|
| **023-024-030-031** | Screws 1, 3, 2, 4<br>10 Nm | Screws 4, 2, 3, 1<br>17 Nm | Screws 2, 4, 1, 3<br>25 Nm |
| **050-051-080-081** | Screws 1, 3, 2, 4<br>12 Nm | Screws 4, 2, 3, 1<br>20 Nm | Screws 2, 4, 1, 3<br>30 Nm |
| **121-201-301** | Screws 1, 3, 2, 4<br>20 Nm | Screws 4, 2, 3, 1<br>35 Nm | Screws 2, 4, 1, 3<br>50 Nm |

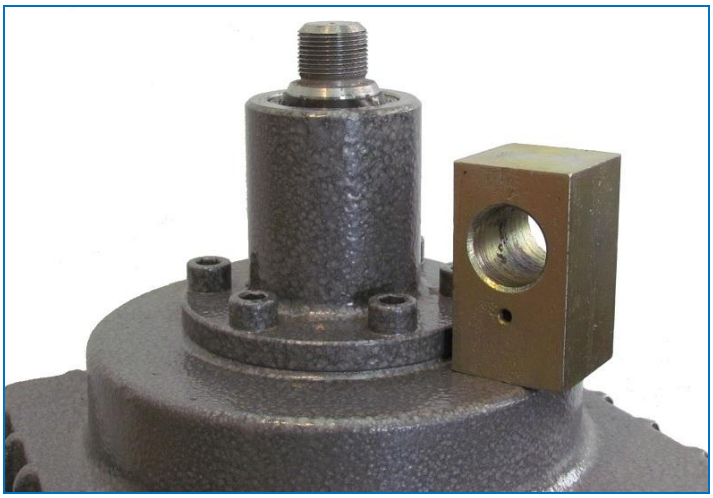
**Table 31**

75 minutes after completing this operation it is possible to proceed with oil filling of the HYDRO GALVI Thruster following the instructions of this document.

It is extremely important to manage correctly also the push rod of the Thruster, being it the component of connection of the Thruster with the Brake; this component should never be unscrewed from the shaft of the Thruster, should it be unscrewed and removed from the shaft during disassembly or in any other circumstance it would be indispensable to rescrew it again to the shaft fixing it with the specific screw properly positioned in order not to damage the thread of the shaft (Picture 32, Picture 33).

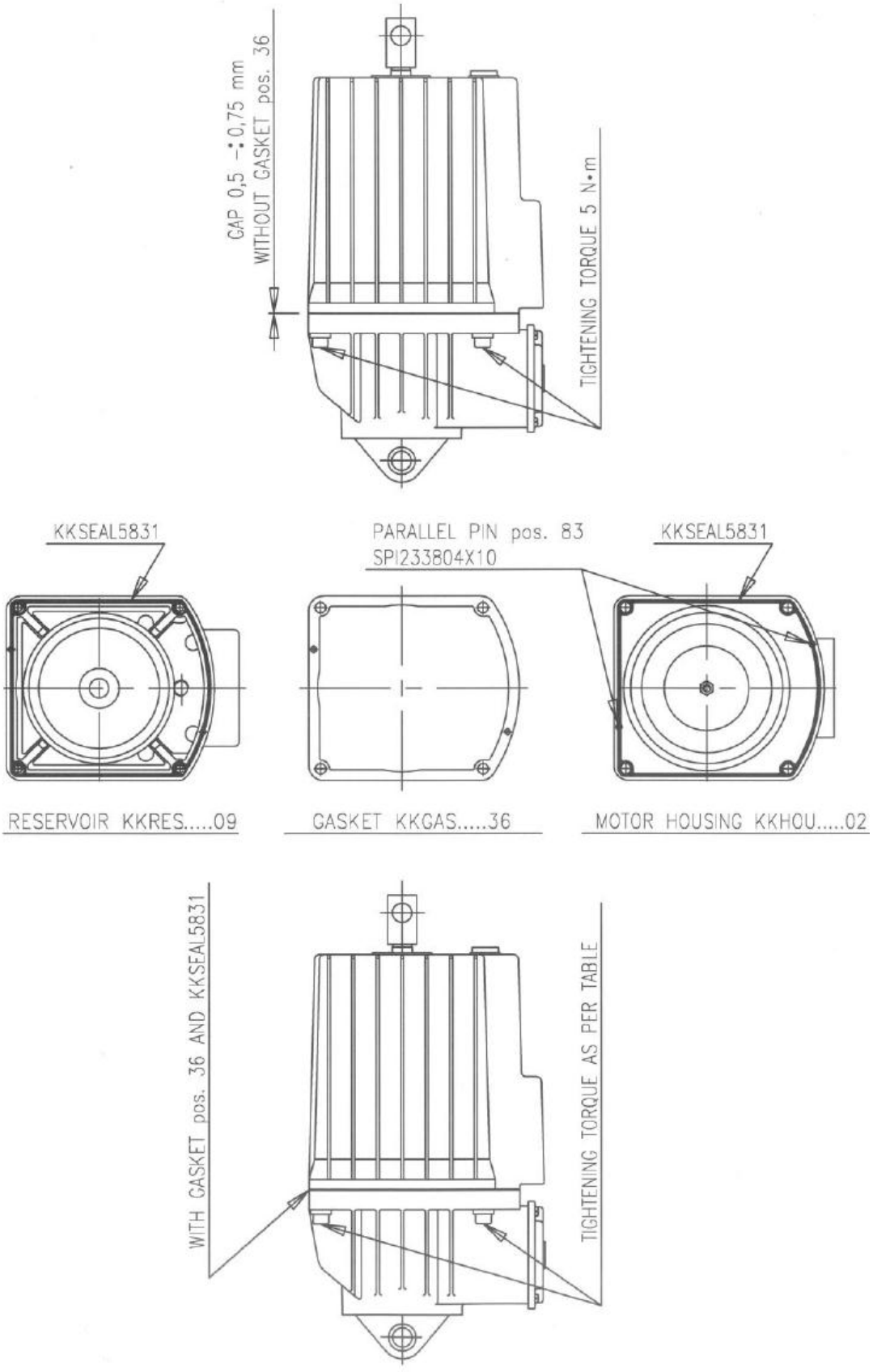


**Picture 32**
**Thruster's shaft complete with push rod**

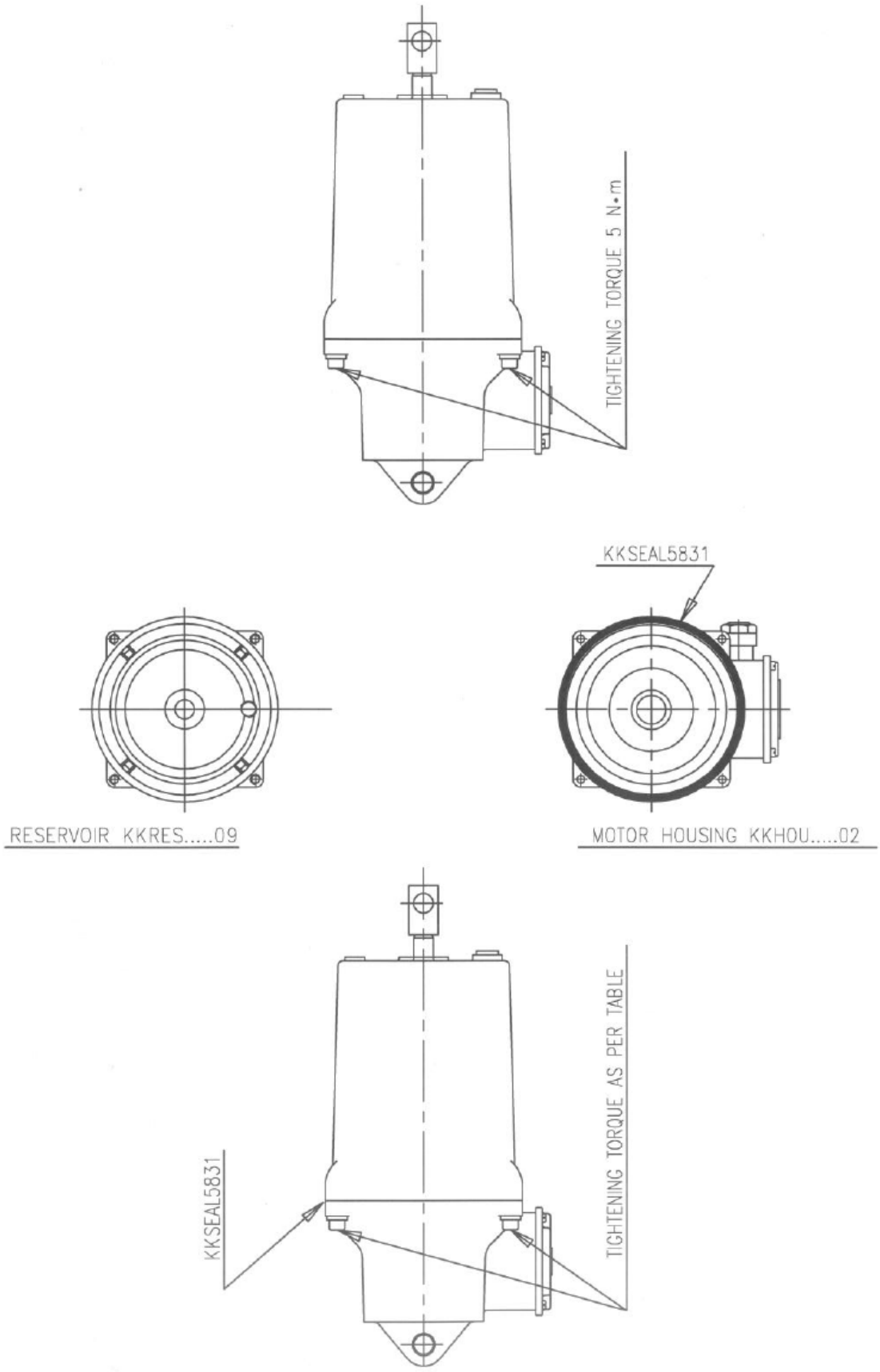


**Picture 33**
**Thruster's shaft without push rod**

| | |
|---|---|
| ⚠ | **Never unscrew the push rod of the Thruster. If unscrewed, be sure to rescrew and fix the push rod of the Thruster. Risk of accident.** |




**Drawing 25**
**Instructions valid for models HYD.023/05, 030/05, 050/06, 080/06, 121/06(12), 201/06(12), 301/06(12)**




**Drawing 26**
**Instructions valid for models HYD.024/05, 031/05, 051/06, 081/06**

# 05.01 – SPARE PARTS

For an adequate maintenance of the GALVI Shoe Brakes it is indispensable to have always the strategic Genuine GALVI Spare Parts as per following Table 32 :

| Strategic Spare Part 1 | Strategic Spare Part 2 | Strategic Spare Part 3 |
|---|---|---|
| nr. 4 brake Shoes RF2.XXX or RF4.XXX | nr. 1 Thruster HYD.XXX/XX | nr. 1 upper Tie rod RIP002XXX100 |
|  |  |  |

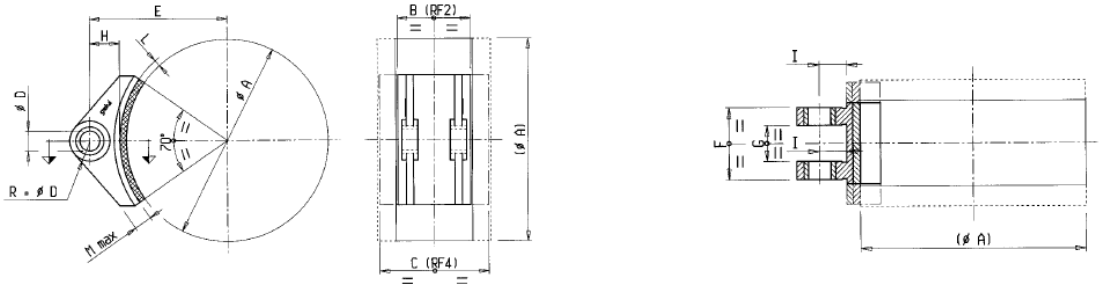
**Table 32**

The User who works without the strategic Spare Parts is exposed to risk of machine stop.

The User who uses not genuine Spare Parts, especially brake Shoes and their friction material, is exposed to risk of malfunctioning and, modifying substantially the Product, invalidates totally the warranty of the Product itself.

| | |
|---|---|
| ⚠ | **Never use not genuine Spare Parts, especially brake Shoes.<br>Loss of warranty.<br>Risk of accident.** |

All the brake Shoes type "RF2" and "RF4" are listed in the following Table 33 taken from pages 36 and 37 of the GALVI Shoe Brakes Catalogue :

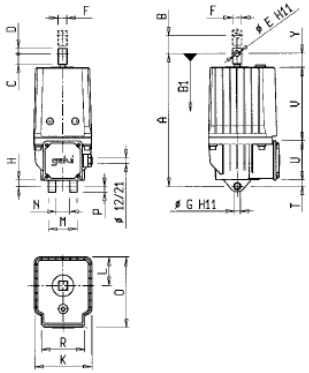



| Ceppo freno tipo<br>Brake Shoe type<br>Sabots de frein type<br>Bremsbacke Durchm. Typ | | Ø A | B<br>RF2 | C [1]<br>RF4 | Ø D<br>D10 | E | F<br>0<br>- 0,2 | G<br>+ 0,2<br>0 | H | I | L | M<br>max | Massa [2]<br>Mass [2]<br>Masse [2]<br>Masse [2]<br>[kg] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD | CL [1] | | | | | | | | | | | | Ceppo DIN<br>DIN Shoe<br>Sabot DIN<br>Backe DIN<br>RF2 | Ceppo largo [1]<br>Extra-wide Shoe [1]<br>Sabot large [1]<br>Breite Backe [1]<br>RF4 |
| RF2.160[1] | RF4.160[1] | 160 | 55 | 85 | 16 | 115 | 52 | 28 | 29 | 23 | 6 | 13 | 0,31 | 0,77 |
| RF2.200 | RF4.200[1] | 200 | 70 | 105 | 20 | 140 | 65 | 35 | 32 | 24 | 8 | 17 | 0,60 | 0,76 |
| RF2.250 | RF4.250[1] | 250 | 90 | 135 | 25 | 170 | 80 | 40 | 37 | 29 | 8 | 22 | 0,99 | 1,24 |
| RF2.315 | RF4.315[1] | 315 | 110 | 165 | 30 | 212 | 100 | 50 | 44,5 | 34,5 | 10 | 25 | 1,83 | 2,34 |
| RF2.400 | RF4.400[1] | 400 | 140 | 210 | 35 | 260 | 125 | 62 | 50 | 40 | 10 | 30 | 3,06 | 3,88 |
| RF2.500 | RF4.500[1] | 500 | 180 | 270 | 40 | 320 | 160 | 80 | 58 | 46 | 12 | 33 | 5,30 | 6,90 |
| RF2.630 | RF4.630[1] | 630 | 225 | 335 | 45 | 390 | 200 | 100 | 63 | 51 | 12 | 38 | 17,5 | 22,0 |
| RF2.710 | RF4.710[1] | 710 | 255 | 380 | 50 | 440 | 224 | 112 | 70 | 56 | 15 | 40 | 24,5 | 33,5 |

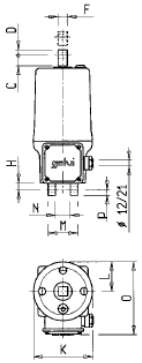
**Table 33**

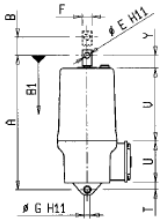
All the short stroke HYDRO GALVI Thrusters are listed in the following Table 34 taken from pages 30 and 31 of the GALVI Shoe Brakes Catalogue :

023-030-050-080

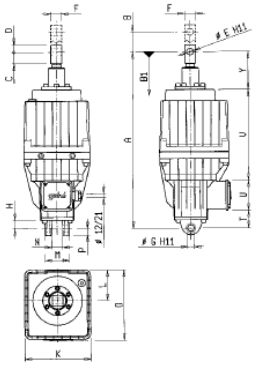


024-031-051-081





121-201-301



| HYDRO tipo<br>HYDRO type<br>HYDRO type<br>HYDRO Typ | Spinta a<br>Lifting Force at<br>Poussée à<br>Druck bei<br>+ 20 °C<br>[N] | Corsa<br>Stroke<br>Course<br>Hub<br>[mm] | Forza Molla Interna opzionale<br>Optional Internal Spring Force<br>Force Ressort Interne optionnel<br>Kraft Opt. Innenfeder (IS)<br>[N] | Potenza a<br>Power at<br>Puissance à<br>Leistung bei<br>+ 20 °C<br>[W] | Corrente a<br>Current at<br>Courant à<br>Strom bei<br>+ 20 °C<br>V. 400 - Hz 50<br>[A] | Numero max cicli orari con temperatura ambiente<br>Max cycles per hour with ambient temperature of<br>Nombre max cycles horaires avec température ambiante<br>Max. Schaltzyklenanzahl bei Raumtemperatur<br>+ 50 °C<br>[n°] | Max temperatura ambiente per servizio continuo<br>Max ambient temperature for continuous operation<br>Température ambiante max pour service continu<br>Max Raumtemperatur für Dauerbetrieb<br>[°C] | Massa<br>(compreso olio)<br>Mass<br>(oil included)<br>Masse<br>(huile incluse)<br>Masse (inkl. Öl)<br>[kg] |
|---|---|---|---|---|---|---|---|---|
| HYD.023/05 | 220 | 50 | 140 - 235 | 160 | 0,40 | 2000 | 50 | 11 |
| HYD.024/05 | 220 | 50 | 140 - 235 | 160 | 0,40 | 2000 | 50 | 10 |
| HYD.030/05 | 300 | 50+5 | 230 - 300 | 195 | 0,49 | 2000 | 50 | 15 |
| HYD.031/05 | 300 | 50+5 | 230 - 300 | 195 | 0,49 | 2000 | 50 | 13 |
| HYD.050/06 | 500 | 60+5 | 375 - 550 | 210 | 0,58 | 2000 | 50 | 25 |
| HYD.051/06 | 500 | 60+5 | 375 - 550 | 210 | 0,58 | 2000 | 50 | 18 |
| HYD.080/06 | 800 | 60+5 | 570 - 820 | 320 | 0,76 | 2000 | 50 | 26 |
| HYD.081/06 | 800 | 60+5 | 570 - 820 | 320 | 0,76 | 2000 | 50 | 19 |
| HYD.121/06 | 1250 | 60+10 | 900 - 1290 | 320 | 0,95 | 2000 | 50 | 43 |
| HYD.201/06 | 2000 | 60+10 | 1460 - 2010 | 450 | 1,08 | 2000 | 50 | 43 |
| HYD.301/06 | 3000 | 60+10 | 2060 - 2920 | 560 | 1,30 | 1500 | 50 | 44 |

| | HYDRO 023/05 | HYDRO 024/05 | HYDRO 030/05 | HYDRO 031/05 | HYDRO 050/06 | HYDRO 051/06 | HYDRO 080/06 | HYDRO 081/06 | HYDRO 121/06 201/06 301/06 |
|---|---|---|---|---|---|---|---|---|---|
| A | 286 | 286 | 370 | 370 | 435 | 435 | 450 | 450 | 645 |
| B | 50 | 50 | 50 | 50 | 60 | 60 | 60 | 60 | 60 |
| B1 | - | - | 5 | 5 | 5 | 5 | 5 | 5 | 10 |
| C | 23 | 23 | 28,5 | 28,5 | 32,5 | 32,5 | 32,5 | 32,5 | 42 |
| D | 12 | 12 | 15 | 15 | 18 | 18 | 18 | 18 | 26 |
| Ø E H11 | 12,05 | 12,05 | 16,05 | 16,05 | 20,05 | 20,05 | 20,05 | 20,05 | 25,05 |
| F | 20 | 20 | 25 | 25 | 30 | 30 | 30 | 30 | 40 |
| Ø G H11 | 16,05 | 16,05 | 16,05 | 16,05 | 20,05 | 20,05 | 20,05 | 20,05 | 25,05 |
| H | 18 | 18 | 18 | 18 | 23 | 23 | 23 | 23 | 31 |
| K | 160 | 160 | 160 | 160 | 190 | 190 | 190 | 190 | 240 |
| L | 80 | 80 | 80 | 80 | 95 | 95 | 95 | 95 | 112 |
| M | 80 | 80 | 80 | 80 | 120 | 120 | 120 | 120 | 90 |
| N | 40 | 40 | 40 | 40 | 60 | 60 | 60 | 60 | 40 |
| O | 198 | 198 | 198 | 198 | 241 | 226 | 241 | 226 | 258 |
| P | 16 | 16 | 16 | 16 | 22 | 22 | 22 | 22 | 24 |
| R | 112 | - | 112 | - | 120 | - | 120 | - | - |
| T | 17 | 21 | 17 | 21 | 29 | 29 | 29 | 29 | 65 |
| U | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |
| V | 133,5 | 129,5 | 206 | 203 | 255 | 256 | 255 | 256 | 334 |
| Y | 25,5 | 25,5 | 37 | 36 | 41 | 40 | 56 | 55 | 136 |

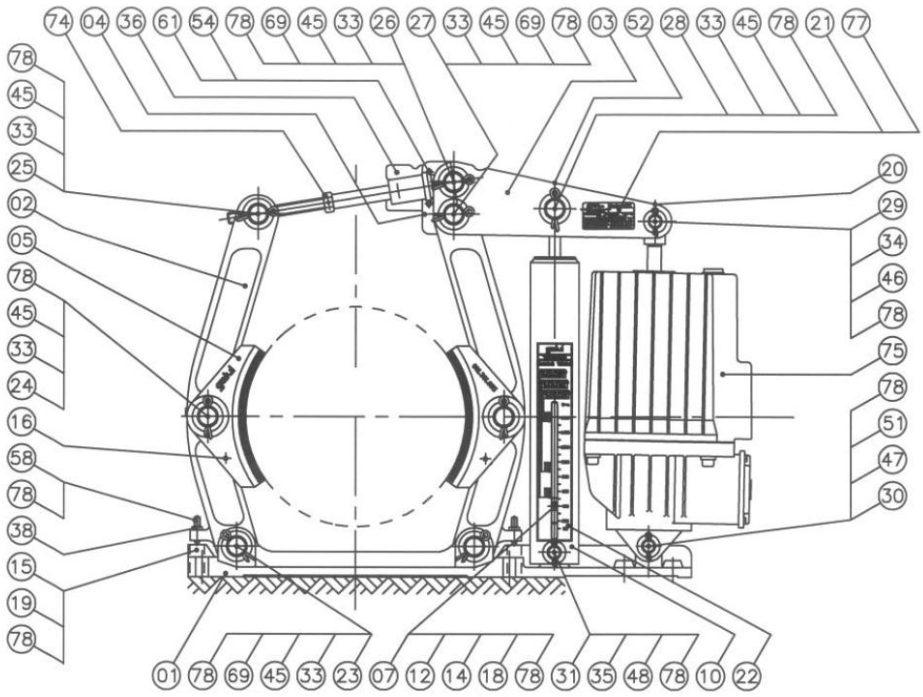
**Table 34**

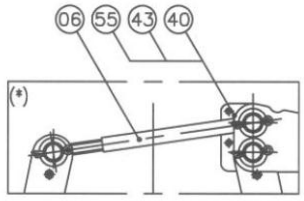
The Manufacturer suggests to use always and only HYDRO GALVI Thrusters.

The Manufacturer is not liable for eventual malfunctioning caused by the use of Thrusters which are not HYDRO GALVI Thrusters.

# 06.01 – BILL OF MATERIALS

The following is a numbered list of the main components of the GALVI Shoe Brakes.




(*) = VALID ONLY FOR "N" VERSION

| POS. | CODE | ITEMS | Q.TY | POS. | CODE | ITEMS | Q.TY |
|---|---|---|---|---|---|---|---|
| 01 | BAS001XXX001 | BASE | NR 1 | 31 | PER001XXX031 | PIN | NR 1 |
| 02 | LEV001XXX002 | MAIN LEVER | NR 2 | 33 | ROS001XXX033 | SPECIAL WASHER | NR 18 |
| 03 | LEV001XXX003 | UPPER LEVER | NR 2 | 34 | ROS001XXX034 | SPECIAL WASHER | NR 2 |
| 04 | LEV002XXX004 | UPPER LEVER NV | NR 1 | 35 | ROS001XXX035 | SPECIAL WASHER | NR 2 |
| 05 | RFX.XXX | BRAKE SHOE | NR 2 | 36 ** | FOR001XXX036 | FORK | NR 1 |
| 06 * | TIR001XXX006 | TIE ROD | NR 1 | 38 | DAD5589MXX-6 | NUT | NR 2 |
| 07 | TIR001XXX007 | TIE ROD | NR 1 | 40 * | DAD5593MXX-6 | NUT | NR 1 |
| 10 | CON001XXX010 | SPRING FENDER | NR 1 | 43 * | MODXXXXXXXXX | DISC SPRING | NR 12 |
| 12 | FON001XXX012 | BOTTOM | NR 1 | 45 | COF36UXXXXX | SPLIT PIN | NR 16 |
| 14 | MOL017XXX014 | MAIN SPRING | NR 1 | 46 | COF36UXXXXX | SPLIT PIN | NR 2 |
| 15 | MOL017XXX015 | SPRING | NR 2 | 47 | COF36UXXXXX | SPLIT PIN | NR 2 |
| 16 | MOL0XXXXX016 | HOLDER SPRING | NR 2 | 48 | COF36UXXXXX | SPLIT PIN | NR 2 |
| 18 | SPI6873XXXXX | ELASTIC PIN | NR 1 | 51 | ROS001XXX033 | SPECIAL WASHER | NR 4 |
| 19 | DIS001XXX019 | DISC | NR 2 | 52 | SPI6873XXXXX | ELASTIC PIN | NR 1 |
| 20 | ROSXXXXXX020 | WASHER | NR X | 54 ** | ROS1751AXX | ELASTIC WASHER | NR 2 |
| 21 | TAR001XXX021 | SERIAL NUMBER PLATE | NR 1 | 55 * | SPI6873XXXXX | ELASTIC PIN | NR 1 |
| 22 | TAR017XXX022 | BRAKING TORQUE PLATE | NR 1 | 58 | VIT25GXXXXXX | SCREW | NR 2 |
| 23 | PER001XXX023 | PIN | NR 2 | 61 ** | VIT84GXXXXXX | SCREW | NR 2 |
| 24 | PER001XXX024 | PIN | NR 2 | 69 | BOC.KUXXXXXX | SELF LUBRICATING BUSH | NR 8 |
| 25 | PER001XXX025 | PIN | NR 1 | 70 | BOC.KUXXXXXX | SELF LUBRICATING BUSH | NR 2 |
| 26 | PER001XXX026 | PIN | NR 1 | 74 ** | RIP002XXX100 | AUTOMATIC WEAR ADJUSTING DEVICE | NR 1 |
| 27 | PER001XXX027 | PIN | NR 1 | 75 | HYDXXXXXX | HYDRO GALVI THRUSTER | NR 1 |
| 28 | PER001XXX028 | PIN | NR 1 | 77 | VARBOS.5242C | BOSTIK | – |
| 29 | PER001XXX029 | PIN | NR 1 | 78 | VARGRA.BEA2 | GREASE | – |
| 30 | PER0XXXXX030 | PIN | NR 1 | | – | – | – |

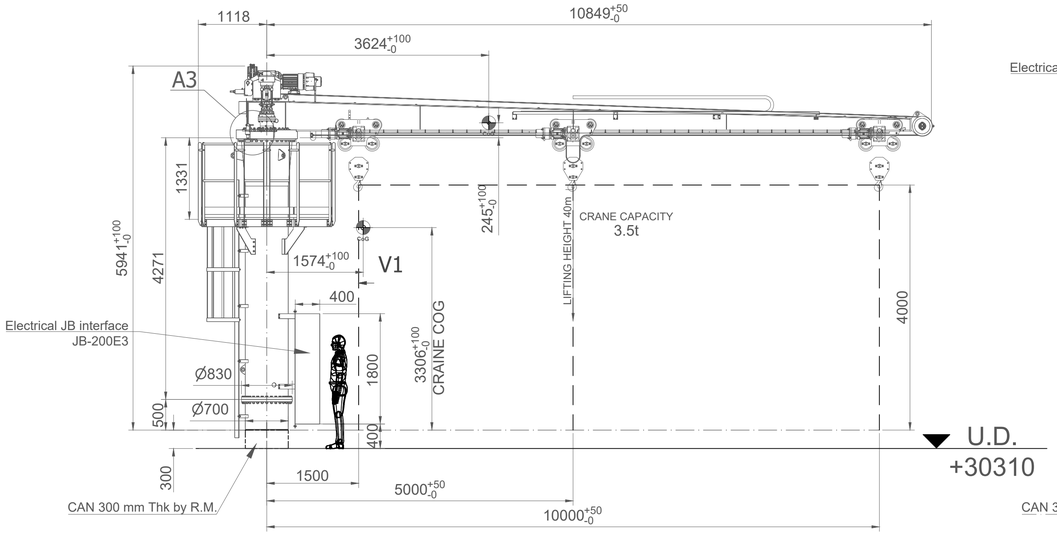
* = VALID ONLY "N" VERSION

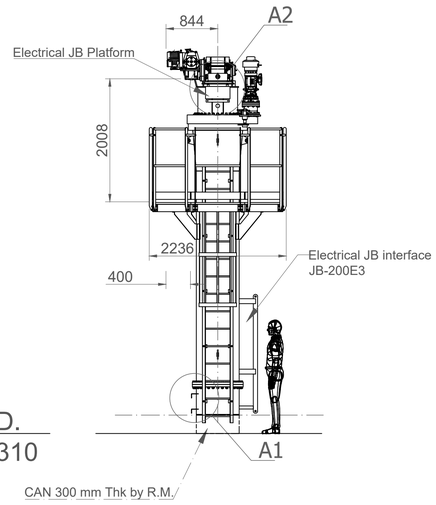
** = VALIDO ONLY FOR "NV" VERSION

N.B. The letters "X" which appears in the code numbers replaces any other letter or number mentioned only in the specific lists

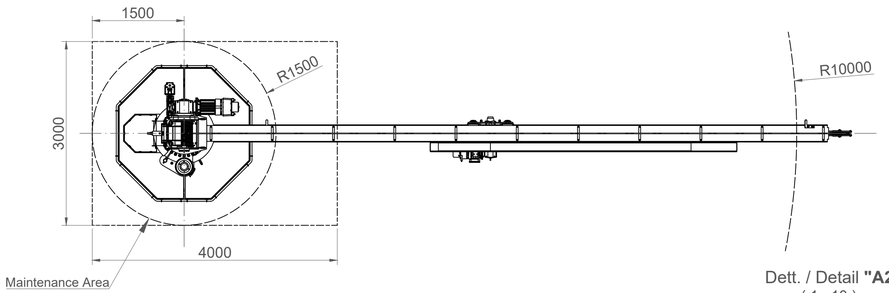
**Drawing 27**
**Model shown NV.315.HYD.080/06.CD.42.PS.AU.ZN**

DRAWING NO. 1724001010-MAC-DA-00009 REV. 3

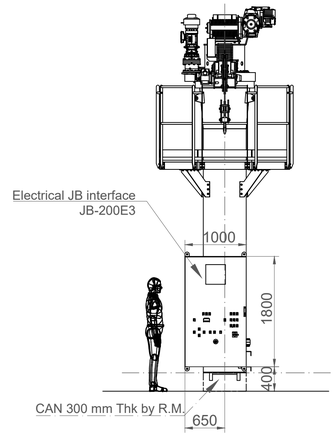


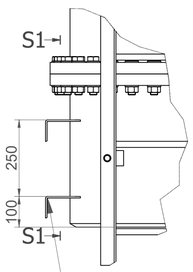

Vista da / View from **"V1"**
( 1 : 50 )




Dett. / Detail **"A2"**
( 1 : 10 )

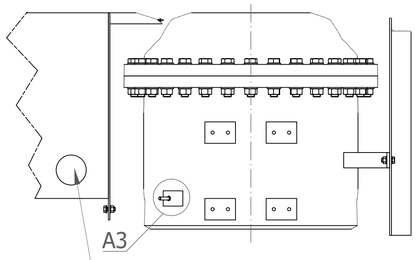



Dett. / Detail **"A1"**
( 1 : 10 )

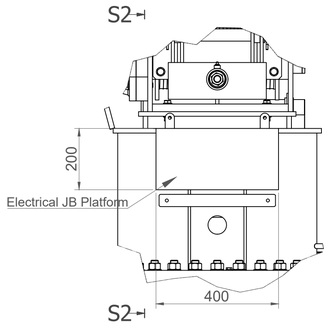



**WELDED "L" PROFILE**
**For supports cable ladder**

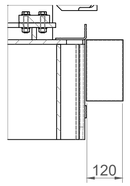
Sez. / Sec. **"S1-S1"**
( 1 : 10 )



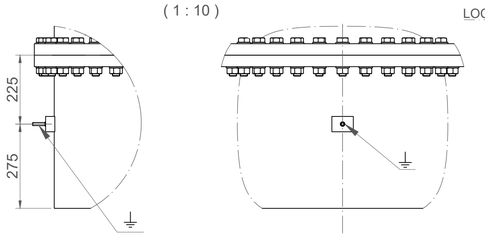

**EL. CABLE IN**
**For cable by R.M.**




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

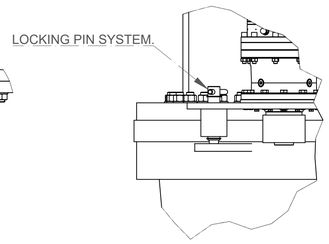


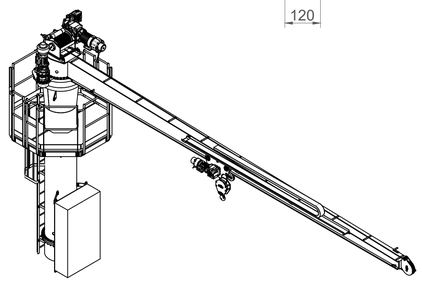

Dett. / Detail **"A3"**
( 1 : 10 )




**EARTING POINT**
**Threaded stud, ∅16mm, L.30mm, material S355J2+N**

Dett. / Detail **"A3"**
( 1 : 10 )



| | | | | |
|---|---|---|---|---|
| 3 | Travelling Trolley Assembly | S 355 J2+N UNI EN 10025 | 1 | 256,01 kg |
| 2 | Boom Assembly | S 355 J2+N UNI EN 10025 | 1 | 2542,26 kg |
| 1 | Fixed Column Ass. | S 355 J2+N UNI EN 10025 | 1 | 1241 kg |
| EL. | Description Eng | MATERIAL | Q.TY | WEIGHT |

| | |
|---|---|
| ***Material :*** | ***Painting Color :*** |
| **S355 J2+N** | **RAL Code: 7038.** |

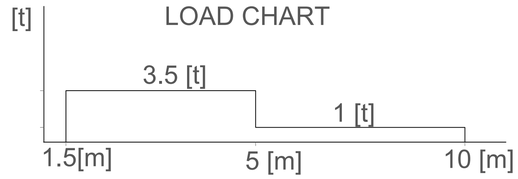
## Load at deck interface

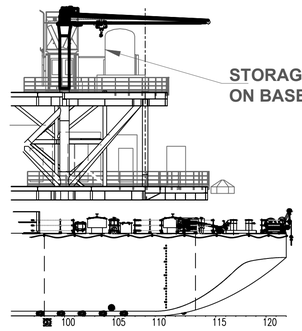
| MAX FORCE ON DECK | |
|---|---|
| $F_{Vmax}$ | -120[kN] |
| $F_{Rmax}$ | 15[kN] |
| $M_{Zmax}$ | ±45[kNm] |
| $M_{Rmax}$ | 520[kNm] |

Forces on the table are calculated with 3.5[t]x5[m] outreach.
Forces to be applied at deck level in center of adapter.
DAF= 1.7 (Outboard Lift in Offshore)
Contingency Factor=1.05 (included)
$F_{Vmax}$: vertical load on deck.
$F_{Rmax}$: max radial load on deck in any direction (plane x-y)
$M_{Zmax}$: max Torsion moment in z direction.
$M_{Rmax}$: max tilting moment (perp. to the boom line)

## Test load:

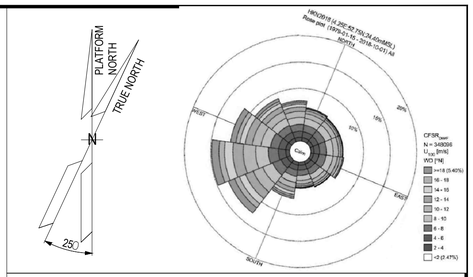
5.6[t]x5[m] - 1.6[t]x10[m]
in according to DNV-ST-0378 rules




**STORAGE POSITION**
**ON BASE LOAD POWER HUB**

| Description | Q.ty | Notes |
|---|---|---|
| CRANE TYPE | | PLATFORM CRANE OFF-SHORE |
| LIFTING CAPACITY | 3.5[t] 1.5-5[m]<br>1[t] 1.5-10[m] | STEEL ROPE HOIST WINCH |
| HOOK STROKE | 40[m] | Electric driven by gearbox<br>Brake on the El. Motor |
| LIFTING SPEED | 3.75/15[m/min] | Variable speed motor |
| Hoist winch stroke (radial movement) | 1.5-10[m] | Eletric driven rack - pinion system |
| RADIAL SPEED | 2-8[m/min] | |
| PRELIMINARY WEIGHT | 6000[kg] | |
| ROTATIONAL MOVEMENT | 0-180° | By electric Motor Geqarbox Pinion on slewing bearing |
| ROTATIONAL SPEED | 0.25/0.5[rpm] | Variable speed motor |
| WORKING TEMPERATURE | -9/45[°C] | |
| HAZAEDOUS AREA: | | SAFE AREA |
| PERSONEL LIFT | | NO |
| POWER SUPPLY | 400[v]/3Ph/50[hZ] (3Ph+N) | |
| TOTAL POWER ABS. | 20[kW] | |




NOTES

LEGEND

HOLDS

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

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 3 | 20/09/24 | R.S. | M.P. | A.T. | ACCEPTED FOR CONSTRUCTION |
| 2 | 21/08/24 | R.S. | M.P. | A.T. | ACCEPTED FOR CONSTRUCTION |
| 1 | 03/07/24 | R.S. | M.P. | A.T. | ACCEPTED FOR CONSTRUCTION |
| 0 | 18/06/24 | R.S. | M.P. | A.T. | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

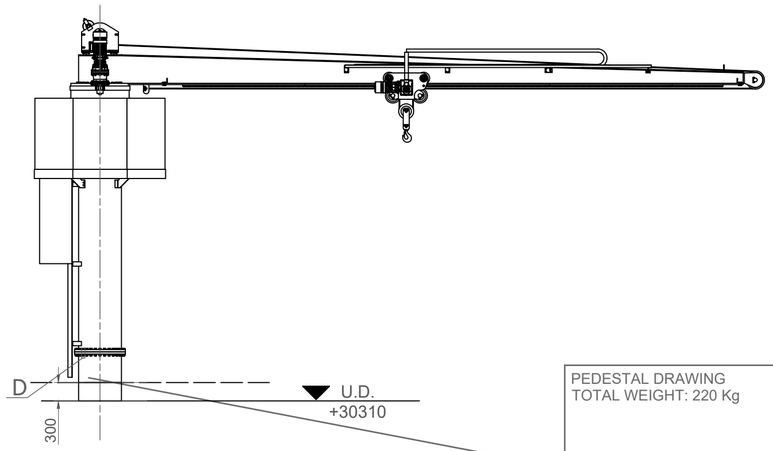
TITLE : 123A90A – Base Load Power Hub Platform
CRANE GENERAL ARRANGEMENT DRAWINGS
DAVIT CRANE

| CONTRACT NO./TITLE | CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | SCALE | 1:50 |
|---|---|---|---|---|
| DRAWN R.S. | CHECKED M.P. | APPROVED A.T. | DATE | 18/06/24 |
| A1 | DRAWING NO. 1724001010-MAC-DA-00009 | | SHEET 001 | REV. 3 |

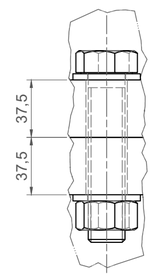
File Name : 1724001010-MAC-DA-00009

DRAWING NO. 1724001010-MAC-DA-00010

REV. 1

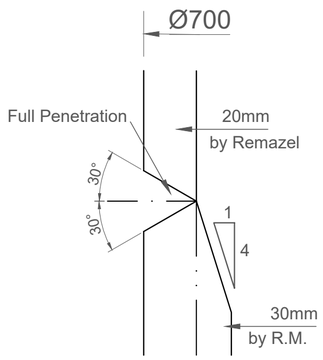



Dett. / Detail **"D"**
( 1 : 2 )

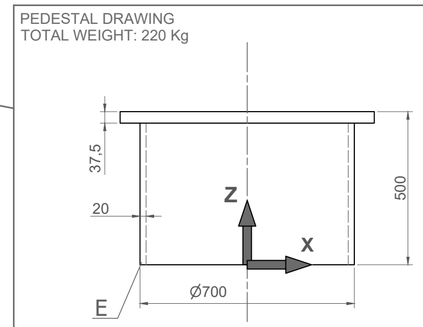


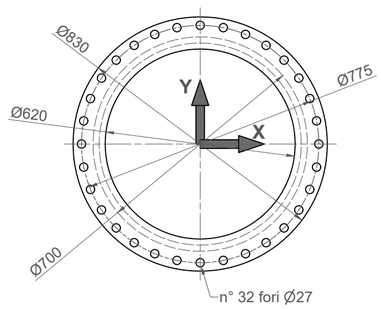

-n° 32 screws M24 - class 10.9

Dett. / Detail **"E"**




PEDESTAL DRAWING
TOTAL WEIGHT: 220 Kg

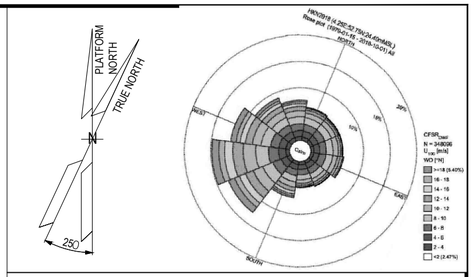



## Load at deck interface

| MAX FORCE ON DECK | |
|---|---|
| $F_{Vmax}$ | -120[kN] |
| $F_{Rmax}$ | 15[kN] |
| $M_{Zmax}$ | ±45[kNm] |
| $M_{Rmax}$ | 520[kNm] |

Forces on the table are calculated with 3.5[t]x5[m] outreach.
Forces to be applied at deck level in center of adapter.
DAF= 1.7 (Outboard Lift in Offshore)
Contingency Factor=1.05 (included)
$F_{Vmax}$: vertical load on deck.
$F_{Rmax}$: max radial load on deck in any direction (plane x-y)
$M_{Zmax}$: max Torsion moment in z direction.
$M_{Rmax}$: max tilting moment (perp. to the boom line)




NOTES

LEGEND

HOLDS

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Phone : +39-035-68.64.14 - Fax : +39-035-68.78.23
e-mail : info@remazel.com / website : www.remazel.com

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 1 | 03/07/24 | R.S. | M.P. | A.T. | ACCEPTED FOR CONSTRUCTION |
| 0 | 18/06/24 | R.S. | M.P. | A.T. | ISSUE FOR REVIEW (IFR) |

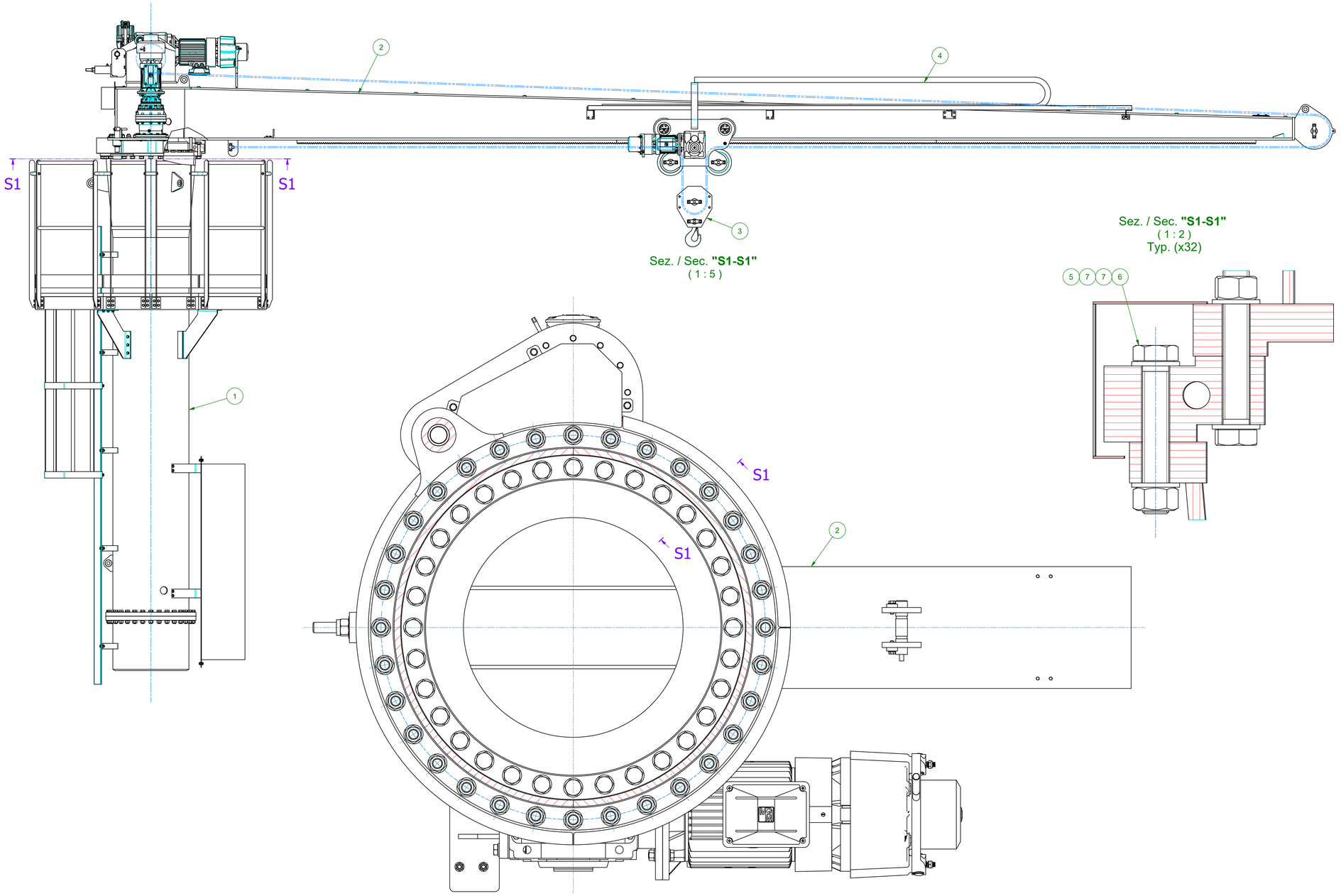
CROSSWIND

ROSETTI MARINO

TITLE : 123A90A – Base Load Power Hub Platform
PEDESTAL ADAPTOR CRANE GENERAL ARRANGEMENT DRAWINGS
DAVIT CRANE

| CONTRACT NO./TITLE | CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | SCALE 1:50 |
|---|---|---|---|
| DRAWN R.S. | CHECKED M.P. | APPROVED A.T. | DATE 18/06/24 |
| A1 | DRAWING NO. 1724001010-MAC-DA-00010 | SHEET 001 | REV. 1 |

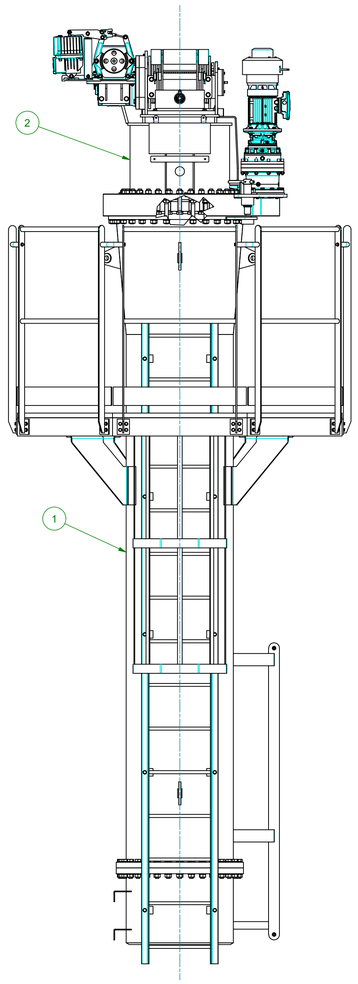
File Name : 1724001010-MAC-DA-00010

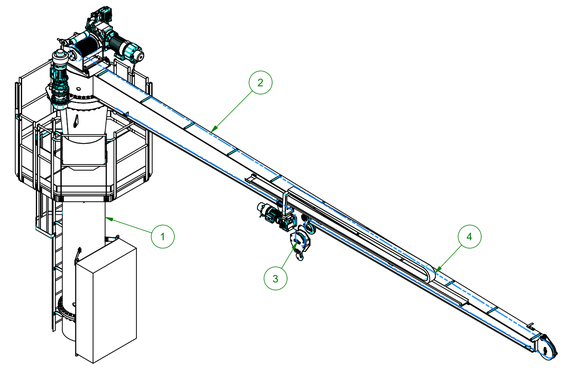


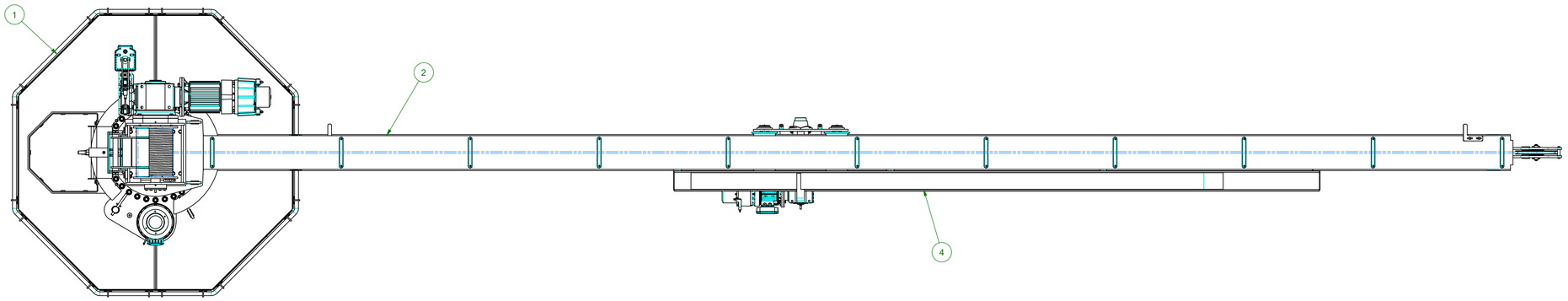

Sez. / Sec. **"S1-S1"**
( 1 : 5 )

Sez. / Sec. **"S1-S1"**
( 1 : 2 )
Typ. (x32)



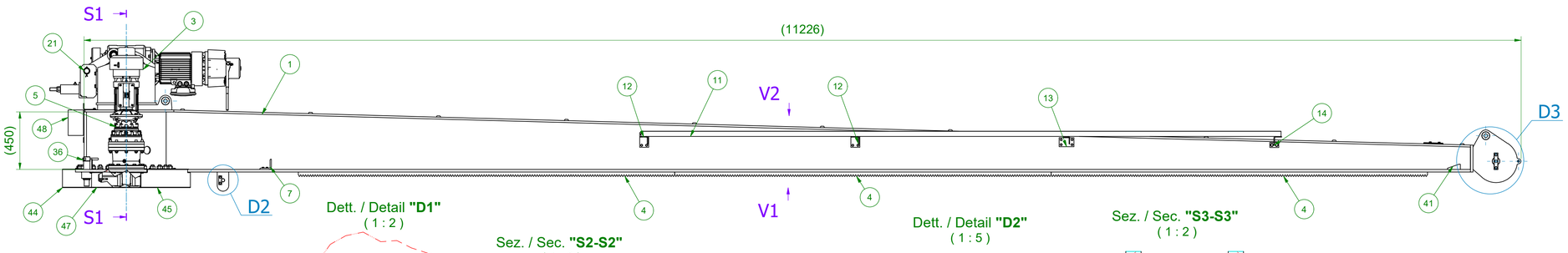

| EL. | PART NUMBER | DESCRIPTION ENG | Q.TY | WEIGHT |
|---|---|---|---|---|
| 7 | 004-0023-C0523 | Plain washer | 64 | 0 kg |
| 6 | 004-0175-C0215 | Hex head screw fully threaded | 32 | 0,6 kg |
| 5 | DA CODIFICARE | Hexagonal nut | 32 | 0,1 kg |
| 4 | R-000347885 | Cable Tray | 1 | 0 kg |
| 1 | C09-0001-A0006 | Fixed Column Ass. | 1 | 2722,9 kg |
| 3 | C09-0001-A0005 | Travelling Trolley Assembly | 1 | 298,5 kg |
| 2 | C09-0001-A0003 | Boom Assembly | 1 | 2567,6 kg |

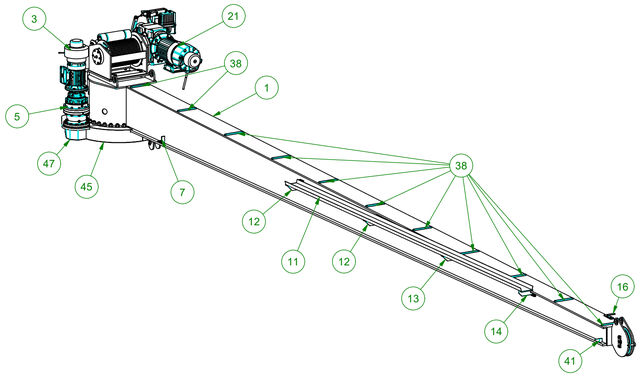
| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| A | 01/10/2024 | Prima emissione / First issued | riccardo.sobani | Sobani R. | De Fazio F. | – |

REMAZEL ENGINEERING
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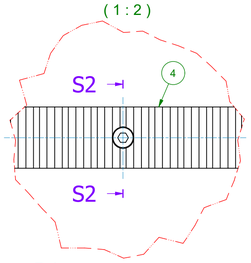
Project / Equipment : **C09-0001**
Weight : N/A
Title : Assieme Meccanico / Mechanical Assembly
Scale : 1 : 50
Sheet : 2 of 2
**A1**
Drawing State: **Work in Progress** / ***FOR CONSTRUCTION***
Q.C.L. : C3
Drawing N° : C09-0001-A0002
Revision : A

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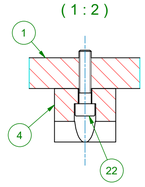


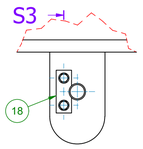
Dett. / Detail **"D1"**
( 1 : 2 )



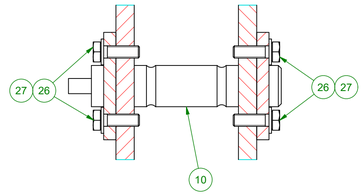

Sez. / Sec. **"S2-S2"**
( 1 : 2 )

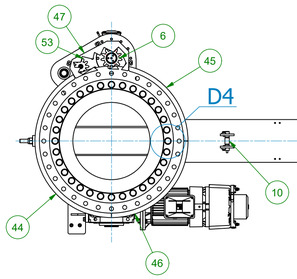


Dett. / Detail **"D2"**
( 1 : 5 )

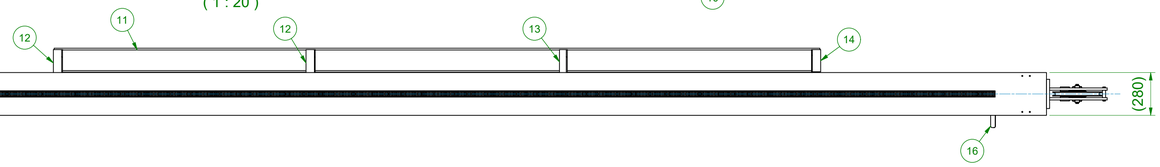



Sez. / Sec. **"S3-S3"**
( 1 : 2 )

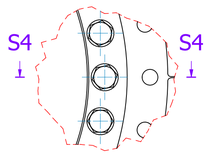


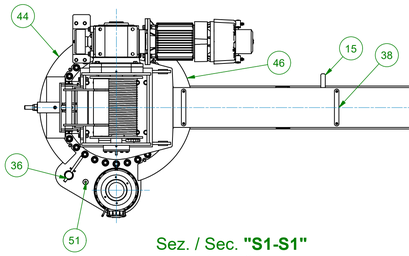



Vista da / View from **"V1"**
( 1 : 20 )

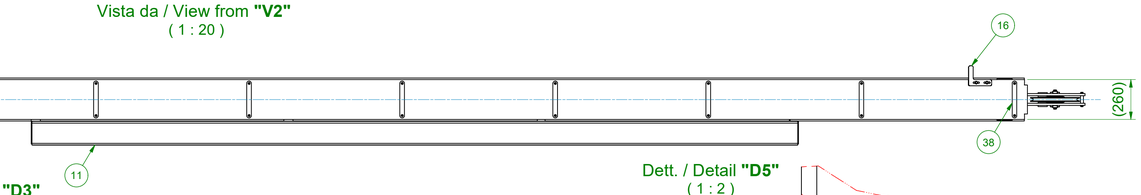



Dett. / Detail **"D4"**
( 1 : 5 )

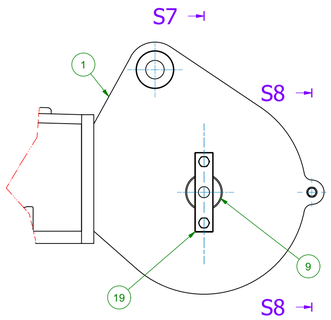


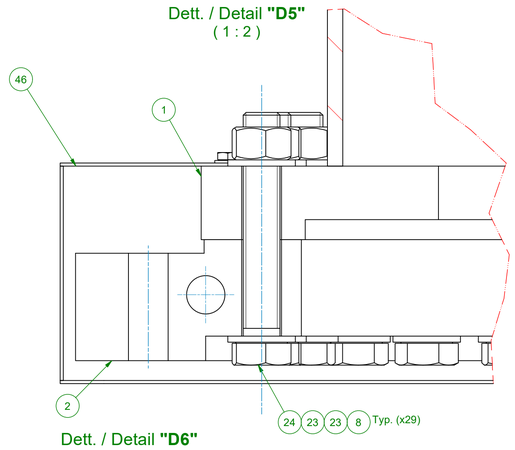
Vista da / View from **"V2"**
( 1 : 20 )



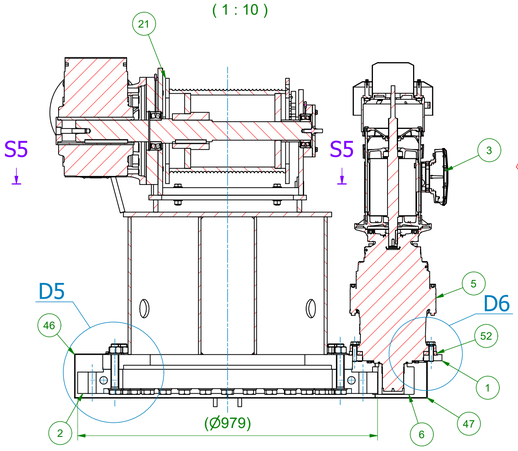

Dett. / Detail **"D3"**
( 1 : 5 )



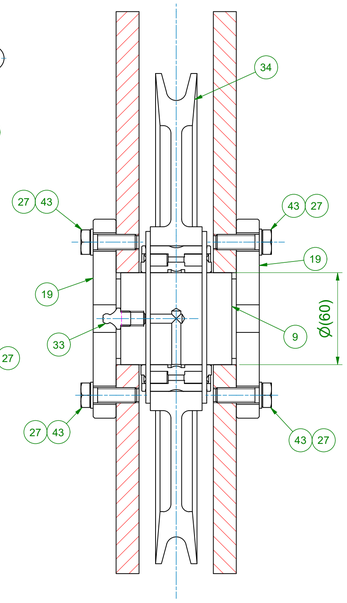

Dett. / Detail **"D5"**
( 1 : 2 )



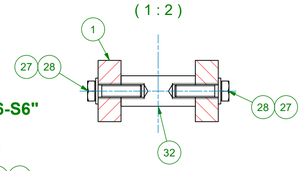

Sez. / Sec. **"S1-S1"**
( 1 : 10 )



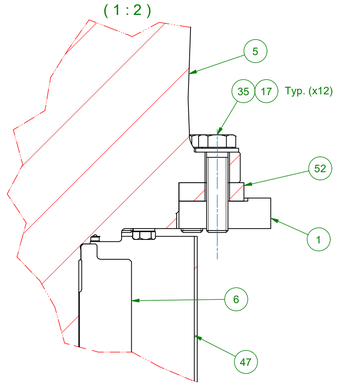

Sez. / Sec. **"S7-S7"**
( 1 : 2 )



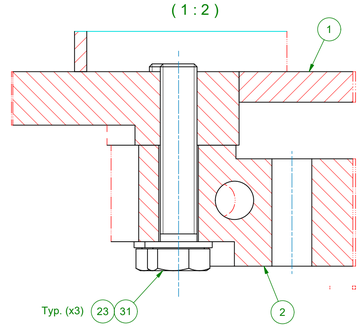

Sez. / Sec. **"S8-S8"**
( 1 : 2 )



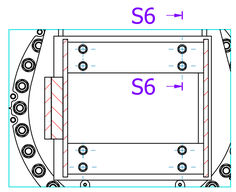
Dett. / Detail **"D6"**
( 1 : 2 )



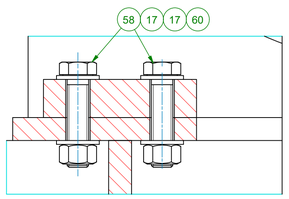

Sez. / Sec. **"S4-S4"**
( 1 : 2 )




Sez. / Sec. **"S5-S5"**
( 1 : 10 )




Sez. / Sec. **"S6-S6"**
( 1 : 2 )
Typ. (x4)



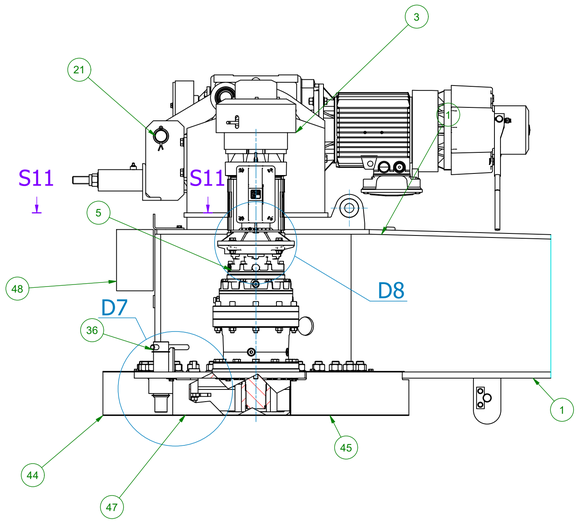
| | | | | |
|---|---|---|---|---|
| 60 | 004-0147-C0021 | Hexagonal nut | 8 | 0 kg |
| 59 | 004-0147-C0002 | Hexagonal nut | 4 | 0 kg |
| 58 | 004-0149-C0138 | Hex head screw fully threaded | 8 | 0,1 kg |
| 57 | 004-0011-C0040 | Hex head screw fully threaded | 3 | 0 kg |
| 56 | 004-0011-C0012 | Hex head screw fully threaded | 11 | 0 kg |
| 55 | 004-0021-C0007 | Hexagonal nut | 1 | 0 kg |
| 54 | 004-0023-C0598 | Plain washer | 1 | 0 kg |
| 53 | C09-0001-P0089 | Rotation Slewing encoder pinion M9 Z10 | 1 | 0,5 kg |
| 52 | C09-0001-P0086 | Rotation motor centering disc | 1 | 2,8 kg |
| 51 | C09-0001-P0083 | Rotation Encoder Shaft | 1 | 0,4 kg |
| 50 | 006-0005-C0283 | Flanged Cylindrical Bushing | 1 | 0 kg |
| 49 | C09-0001-P0081 | Fix El. Jb Platform | 2 | 0,2 kg |
| 48 | C09-0001-P0035 | El. Box on Platform | 1 | 4,7 kg |
| 47 | C09-0001-P0073 | Cover Gearbox 4 | 1 | 2,2 kg |
| 46 | C09-0001-P0072 | Cover Gearbox 3 | 1 | 3,1 kg |
| 45 | C09-0001-P0039 | Cover Bearing 2 | 1 | 2,5 kg |
| 44 | C09-0001-P0031 | Cover Bearing | 1 | 5,3 kg |
| 43 | 004-0011-C0001 | Hex head screw fully threaded | 4 | 0 kg |
| 42 | 004-0012-C0015 | Hex socket head cap screw | 2 | 0 kg |
| 41 | C09-0001-P0070 | Wheel Block | 2 | 0,7 kg |
| 40 | 004-0012-C0006 | Hex socket cilindrical head screw | 2 | 0 kg |
| 39 | 004-0043-C0006 | Hex socket cilindrical head screw | 22 | 0 kg |
| 38 | C09-0001-P0069 | Rope protection | 11 | 0,1 kg |
| 37 | 006-0005-C0104 | Cylindrical Bushing | 2 | 0,1 kg |
| 36 | C09-0001-A0014 | Locking pin assembly | 1 | 3,6 kg |
| 35 | 004-0175-C0120 | Hex head screw fully threaded | 12 | 0,1 kg |
| 34 | C09-0001-A0013 | Pulley Assembly Øc285 -rope Ø11 | 1 | 8,6 kg |
| 33 | 004-0035-C0029 | Greaser | 1 | 0 kg |
| 32 | C09-0001-P0065 | Boom Anti-Skid | 1 | 0,1 kg |
| 31 | 004-0175-C0213 | Hex head screw fully threaded | 3 | 0,6 kg |
| 30 | 004-0023-C0498 | Plain washer | 8 | 0 kg |
| 29 | 004-0011-C0060 | Hex head screw fully threaded | 2 | 0 kg |
| 28 | 004-0011-C0046 | Hex head screw fully threaded | 18 | 0 kg |
| 27 | 004-0023-C0049 | Plain washer | 44 | 0 kg |
| 26 | 004-0011-C0013 | Hex head screw fully threaded | 8 | 0 kg |
| 25 | 004-0023-C0083 | Plain washer | 2 | 0 kg |
| 24 | 004-0175-C0216 | Hex head screw fully threaded | 29 | 0,7 kg |
| 23 | 004-0023-C0523 | Plain washer | 61 | 0 kg |
| 22 | 004-0012-C0048 | Hex socket head cap screw | 39 | 0 kg |
| 21 | C09-0001-A0004 | Winch Assembly | 1 | 540,5 kg |
| 20 | 004-0149-C0008 | Hex head screw fully threaded | 4 | 0,1 kg |
| 19 | C09-0001-P0033 | Anti-rotation plate | 2 | 0,4 kg |
| 18 | C09-0001-P0032 | Anti-rotation plate to load cell | 2 | 0,1 kg |
| 17 | 004-0023-C0630 | Plain washer | 28 | 0 kg |
| 16 | C09-0001-P0027 | Fixed buffer for limiter | 1 | 0,2 kg |
| 15 | C09-0001-P0026 | Fixed buffer for limiter | 1 | 0,2 kg |
| 14 | C09-0001-P0025 | Bracket tray 3 | 1 | 1 kg |
| 13 | C09-0001-P0024 | Bracket tray 2 | 1 | 1,3 kg |
| 12 | C09-0001-P0023 | Bracket tray 1 | 2 | 1,5 kg |
| 11 | C09-0001-P0022 | | 1 | 12,7 kg |
| 10 | C09-0001-P0021 | HOISTING LOAD CELL | 1 | 0,6 kg |
| 9 | C09-0001-P0014 | Pulley Axis Ø60 | 1 | 1,8 kg |
| 8 | DA CODIFICARE | Hexagonal nut | 29 | 0,1 kg |
| 7 | C09-0001-P0020 | Trolley Wheel Retainer Plate | 2 | 0,4 kg |
| 6 | R-000347882 | SLEWING PINION M10 Z11 | 1 | 4,8 kg |
| 5 | 002-0027-C1431 | Gearbox for rotation | 1 | 134,3 kg |
| 4 | C09-0001-P0009 | Rack M6 40x35 L.2940 | 3 | 26,2 kg |
| 3 | 007-0006-C1220 | El. Motor for Rotation MGM BAHK2 100 LB4 Enhanced Power (E.P.) | 1 | 36 kg |
| 2 | 006-0006-C0123 | Ball bearing with internal teeth | 1 | 176,5 kg |
| 1 | C09-0001-P0004 | Boom Carpentry | 1 | 1494,5 kg |
| EL. | PART NUMBER | DESCRIPTION ENG | Q.TY | WEIGHT |

| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| A | 30/09/2024 | Prima emissione / First issued | riccardo.sobani | Sobani R. | De Fazio F. | – |

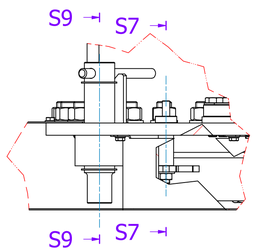
REMAZEL ENGINEERING
Chiuduno (BG) - 24060 - ITALY
Phone : +39-035-68.44.14 - Fax : +39-035-68.78.23
e-mail : info@remazel.com / website : www.remazel.com

Project / Equipment : **C09-0001**
Weight : 2567,6 kg
Title : Assieme Braccio / Boom Assembly
Scale : 1 : 33,3333
Sheet : 4 of 6
A1
Drawing State: **Work in Progress** / ***FOR CONSTRUCTION***
Q.C.L. : C3
Drawing N° : C09-0001-A0003
Revision : A

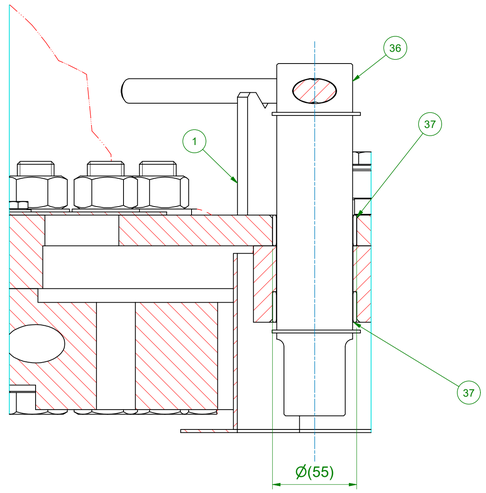
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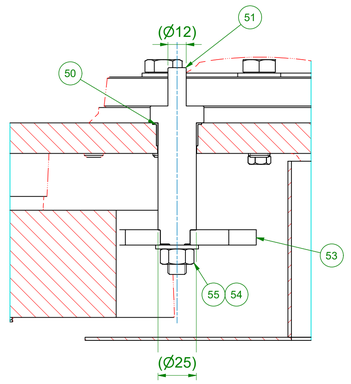

Dett. / Detail **"D7"**
( 1 : 5 )

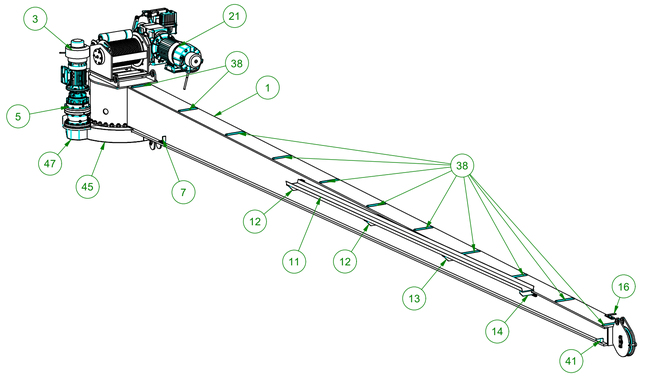



Sez. / Sec. **"S9-S9"**
( 1 : 2 )

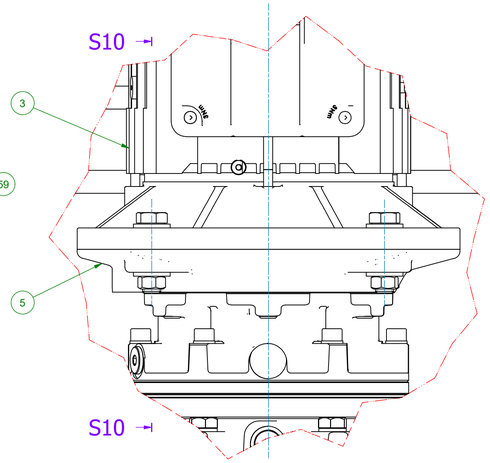



Sez. / Sec. **"S7-S7"**
( 1 : 2 )

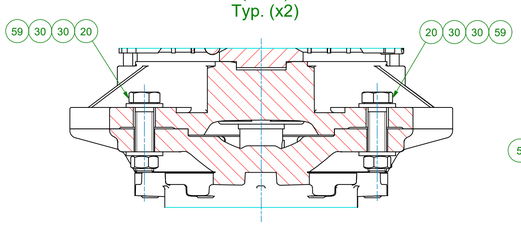


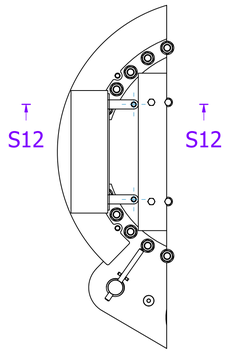

Dett. / Detail **"D8"**
( 1 : 2 )



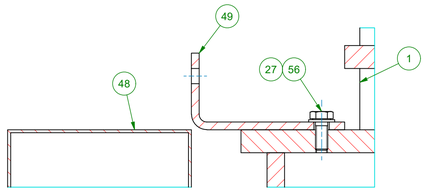

Sez. / Sec. **"S10-S10"**
( 1 : 2 )
Typ. (x2)

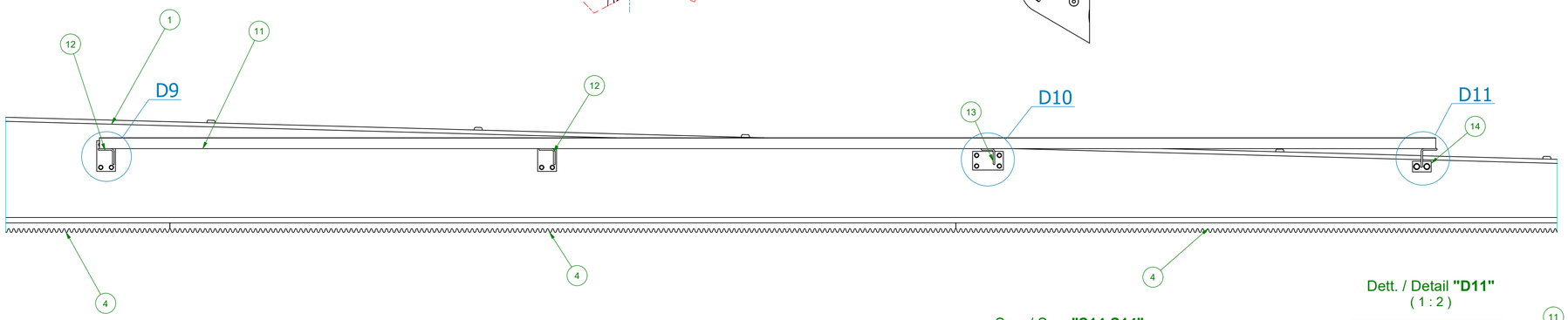



Sez. / Sec. **"S11-S11"**
( 1 : 10 )

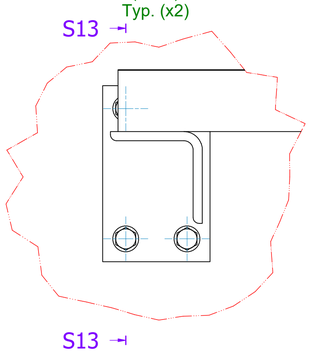



Sez. / Sec. **"S12-S12"**
( 1 : 2 )

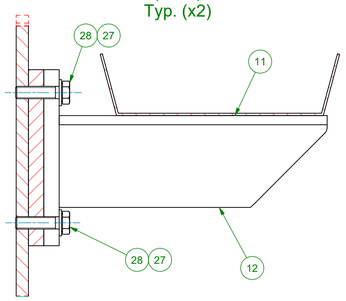


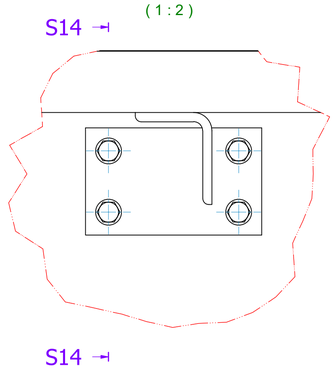

Dett. / Detail **"D9"**
( 1 : 2 )
Typ. (x2)



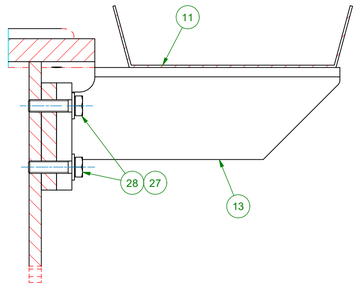

Sez. / Sec. **"S13-S13"**
( 1 : 2 )
Typ. (x2)



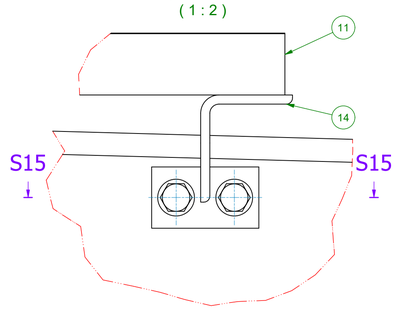

Dett. / Detail **"D10"**
( 1 : 2 )



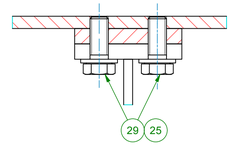

Sez. / Sec. **"S14-S14"**
( 1 : 2 )
Typ. (x2)




Dett. / Detail **"D11"**
( 1 : 2 )




Sez. / Sec. **"S15-S15"**
( 1 : 2 )



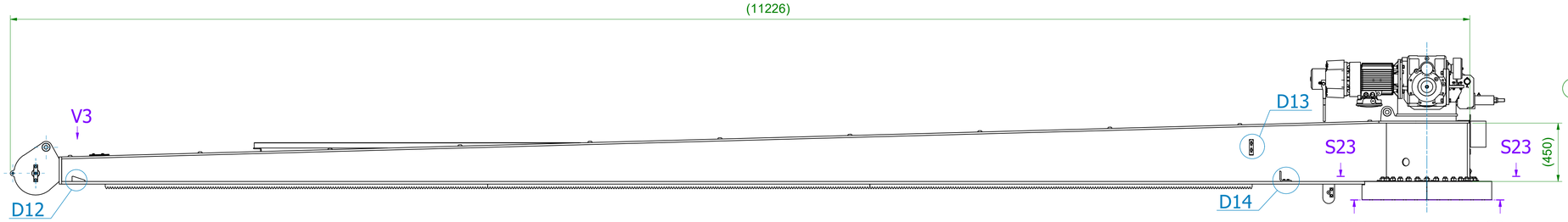

| | | | | |
|---|---|---|---|---|
| 60 | 004-0147-C0021 | Hexagonal nut | 8 | 0 kg |
| 59 | 004-0147-C0002 | Hexagonal nut | 4 | 0 kg |
| 58 | 004-0149-C0138 | Hex head screw fully threaded | 8 | 0,1 kg |
| 57 | 004-0011-C0040 | Hex head screw fully threaded | 3 | 0 kg |
| 56 | 004-0011-C0012 | Hex head screw fully threaded | 11 | 0 kg |
| 55 | 004-0021-C0007 | Hexagonal nut | 1 | 0 kg |
| 54 | 004-0023-C0598 | Plain washer | 1 | 0 kg |
| 53 | C09-0001-P0089 | Rotation Slewing encoder pinion M9 Z10 | 1 | 0,5 kg |
| 52 | C09-0001-P0086 | Rotation motor centering disc | 1 | 2,8 kg |
| 51 | C09-0001-P0083 | Rotation Encoder Shaft | 1 | 0,4 kg |
| 50 | 006-0005-C0283 | Flanged Cylindrical Bushing | 1 | 0 kg |
| 49 | C09-0001-P0081 | Fix El. Jb Platform | 2 | 0,2 kg |
| 48 | C09-0001-P0035 | El. Box on Platform | 1 | 4,7 kg |
| 47 | C09-0001-P0073 | Cover Gearbox 4 | 1 | 2,2 kg |
| 46 | C09-0001-P0072 | Cover Gearbox 3 | 1 | 3,1 kg |
| 45 | C09-0001-P0039 | Cover Bearing 2 | 1 | 2,5 kg |
| 44 | C09-0001-P0031 | Cover Bearing | 1 | 5,3 kg |
| 43 | 004-0011-C0001 | Hex head screw fully threaded | 4 | 0 kg |
| 42 | 004-0012-C0015 | Hex socket head cap screw | 2 | 0 kg |
| 41 | C09-0001-P0070 | Wheel Block | 2 | 0,7 kg |
| 40 | 004-0012-C0006 | Hex socket cilindrical head screw | 2 | 0 kg |
| 39 | 004-0043-C0006 | Hex socket cilindrical head screw | 22 | 0 kg |
| 38 | C09-0001-P0069 | Rope protection | 11 | 0,1 kg |
| 37 | 006-0005-C0104 | Cylindrical Bushing | 2 | 0,1 kg |
| 36 | C09-0001-A0014 | Locking pin assembly | 1 | 3,6 kg |
| 35 | 004-0175-C0120 | Hex head screw fully threaded | 12 | 0,1 kg |
| 34 | C09-0001-A0013 | Pulley Assembly Øc285 -rope Ø11 | 1 | 8,6 kg |
| 33 | 004-0035-C0029 | Greaser | 1 | 0 kg |
| 32 | C09-0001-P0065 | Boom Anti-Skid | 1 | 0,1 kg |
| 31 | 004-0175-C0213 | Hex head screw fully threaded | 3 | 0,6 kg |
| 30 | 004-0023-C0488 | Plain washer | 8 | 0 kg |
| 29 | 004-0011-C0060 | Hex head screw fully threaded | 2 | 0 kg |
| 28 | 004-0011-C0046 | Hex head screw fully threaded | 18 | 0 kg |
| 27 | 004-0023-C0049 | Plain washer | 44 | 0 kg |
| 26 | 004-0011-C0013 | Hex head screw fully threaded | 8 | 0 kg |
| 25 | 004-0023-C0083 | Plain washer | 2 | 0 kg |
| 24 | 004-0175-C0216 | Hex head screw fully threaded | 29 | 0,7 kg |
| 23 | 004-0023-C0523 | Plain washer | 61 | 0 kg |
| 22 | 004-0012-C0048 | Hex socket head cap screw | 39 | 0 kg |
| 21 | C09-0001-A0004 | Winch Assembly | 1 | 540,5 kg |
| 20 | 004-0149-C0008 | Hex head screw fully threaded | 4 | 0,1 kg |
| 19 | C09-0001-P0033 | Anti-rotation plate | 2 | 0,4 kg |
| 18 | C09-0001-P0032 | Anti-rotation plate to load cell | 2 | 0,1 kg |
| 17 | 004-0023-C0630 | Plain washer | 28 | 0 kg |
| 16 | C09-0001-P0027 | Fixed buffer for limiter | 1 | 0,2 kg |
| 15 | C09-0001-P0026 | Fixed buffer for limiter | 1 | 0,2 kg |
| 14 | C09-0001-P0025 | Bracket tray 3 | 1 | 1 kg |
| 13 | C09-0001-P0024 | Bracket tray 2 | 1 | 1,3 kg |
| 12 | C09-0001-P0023 | Bracket tray 1 | 2 | 1,5 kg |
| 11 | C09-0001-P0022 | | 1 | 12,7 kg |
| 10 | C09-0001-P0021 | HOISTING LOAD CELL | 1 | 0,6 kg |
| 9 | C09-0001-P0014 | Pulley Axis Ø60 | 1 | 1,8 kg |
| 8 | DA CODIFICARE | Hexagonal nut | 29 | 0,1 kg |
| 7 | C09-0001-P0020 | Trolley Wheel Retainer Plate | 2 | 0,4 kg |
| 6 | R-000347882 | SLEWING PINION M10 Z11 | 1 | 4,8 kg |
| 5 | 002-0027-C1431 | Gearbox for rotation | 1 | 134,3 kg |
| 4 | C09-0001-P0009 | Rack M6 40x35 L.2940 | 3 | 26,2 kg |
| 3 | 007-0006-C1220 | El. Motor for Rotation MGM BAHK2 100 LB4 Enhanced Power (E.P.) | 1 | 36 kg |
| 2 | 006-0006-C0123 | Ball bearing with internal teeth | 1 | 176,5 kg |
| 1 | C09-0001-P0004 | Boom Carpentry | 1 | 1494,5 kg |
| EL. | PART NUMBER | DESCRIPTION ENG | Q.TY | WEIGHT |

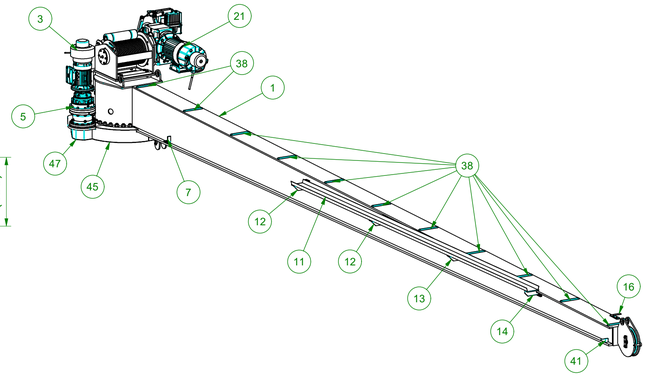
| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| A | 30/09/2024 | Prima emissione / First issued | riccardo.sobani | Sobani R. | De Fazio F. | – |

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

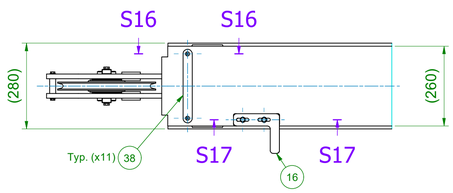
Project / Equipment : **C09-0001**
Weight : 2567,6 kg
Title : Assieme Braccio Boom Assembly
Scale : 1 : 33,3333
Sheet : 5 of 6
A1
Drawing State: **Work in Progress** / **FOR CONSTRUCTION**
Q.C.L. : C3
Drawing N° : C09-0001-A0003
Revision : A

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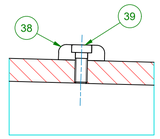


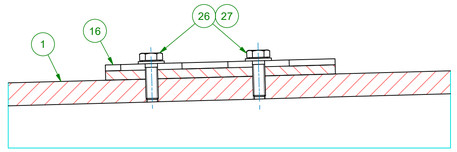

Vista da / View from **"V3"**
( 1 : 10 )



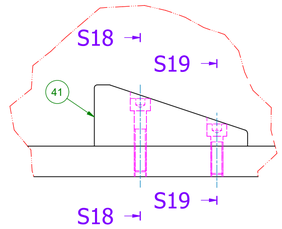

Sez. / Sec. **"S16-S16"**
( 1 : 2 )
Typ. (x2)



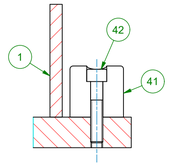

Sez. / Sec. **"S17-S17"**
( 1 : 2 )



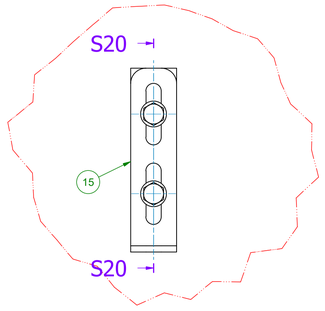

Dett. / Detail **"D12"**
( 1 : 2 )
Typ. (x2)



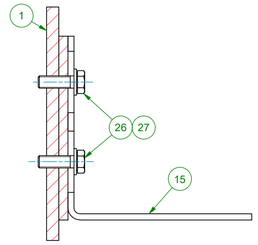

Sez. / Sec. **"S18-S18"**
( 1 : 2 )



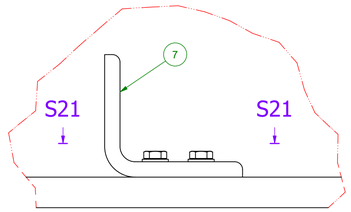

Dett. / Detail **"D13"**
( 1 : 2 )



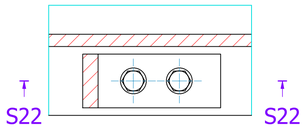

Sez. / Sec. **"S20-S20"**
( 1 : 2 )



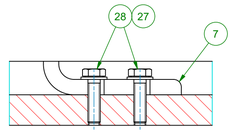

Dett. / Detail **"D14"**
( 1 : 2 )
Typ. (x2)



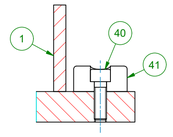

Sez. / Sec. **"S21-S21"**
( 1 : 2 )



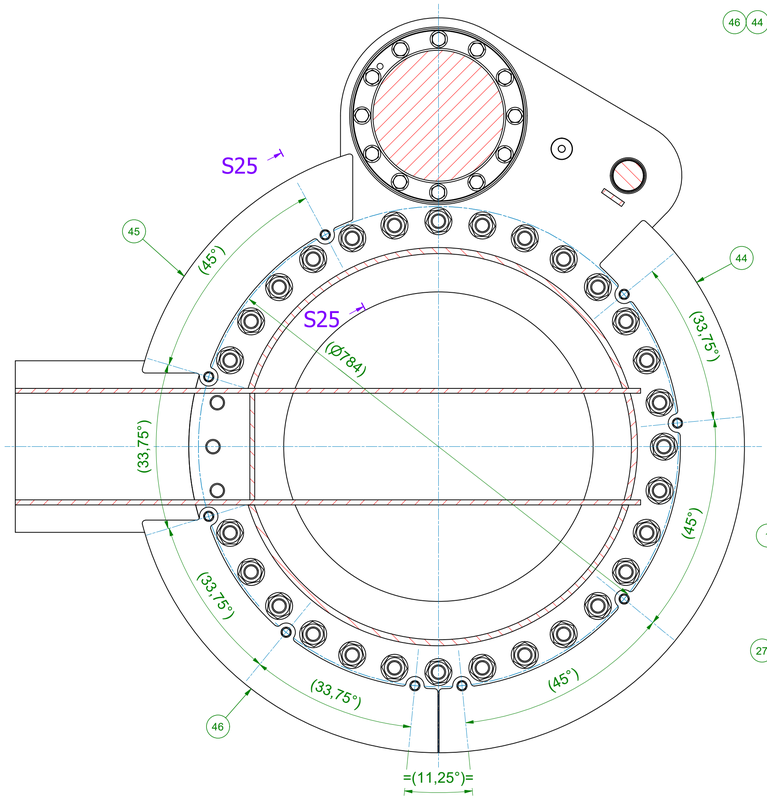

Sez. / Sec. **"S22-S22"**
( 1 : 2 )



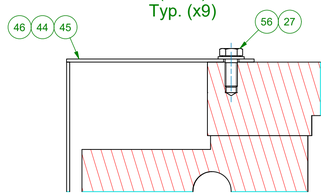

Sez. / Sec. **"S19-S19"**
( 1 : 2 )



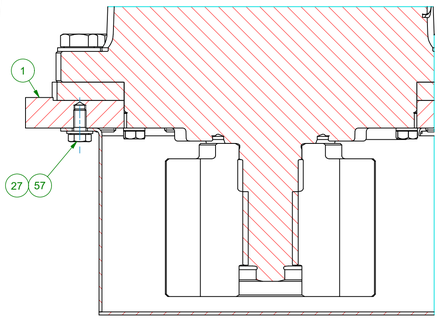

Sez. / Sec. **"S23-S23"**
( 1 : 5 )



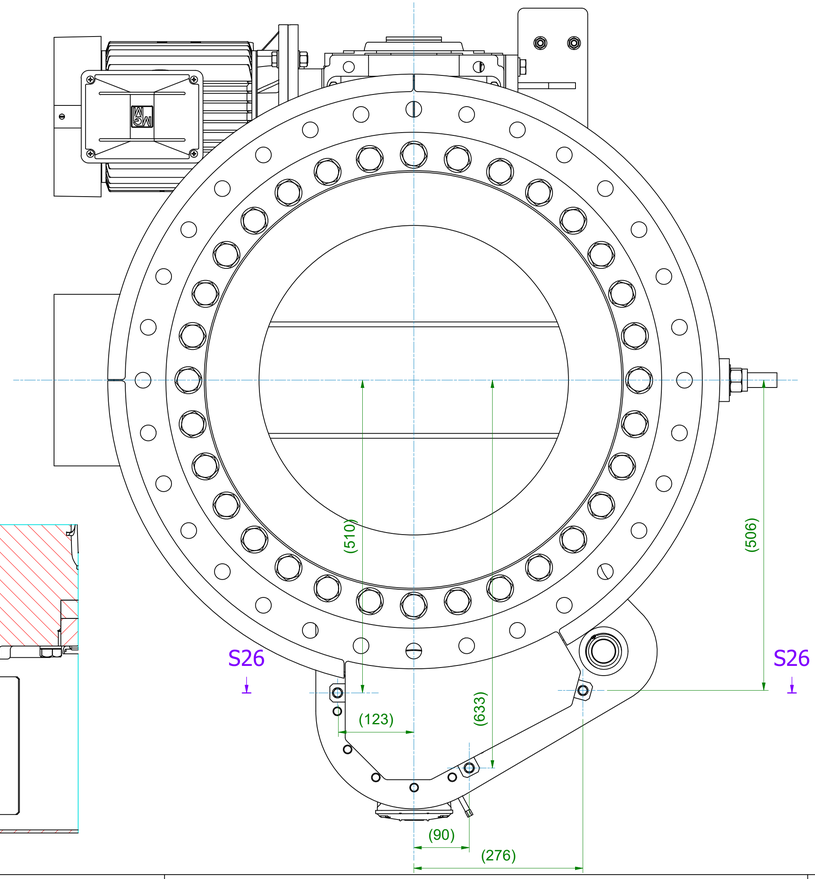

Sez. / Sec. **"S25-S25"**
( 1 : 2 )
Typ. (x9)




Sez. / Sec. **"S26-S26"**
( 1 : 2 )
Typ. (x3)




Sez. / Sec. **"S24-S24"**
( 1 : 5 )



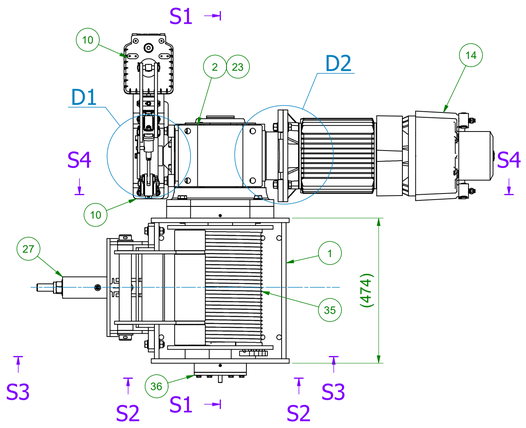

| | | | | |
|---|---|---|---|---|
| 60 | 004-0147-C0021 | Hexagonal nut | 8 | 0 kg |
| 59 | 004-0147-C0002 | Hexagonal nut | 4 | 0 kg |
| 58 | 004-0149-C0138 | Hex head screw fully threaded | 8 | 0,1 kg |
| 57 | 004-0011-C0040 | Hex head screw fully threaded | 3 | 0 kg |
| 56 | 004-0011-C0012 | Hex head screw fully threaded | 11 | 0 kg |
| 55 | 004-0021-C0007 | Hexagonal nut | 1 | 0 kg |
| 54 | 004-0023-C0598 | Plain washer | 1 | 0 kg |
| 53 | C09-0001-P0089 | Rotation Slewing encoder pinion M9 Z10 | 1 | 0,5 kg |
| 52 | C09-0001-P0086 | Rotation motor centering disc | 1 | 2,8 kg |
| 51 | C09-0001-P0083 | Rotation Encoder Shaft | 1 | 0,4 kg |
| 50 | 006-0005-C0283 | Flanged Cylindrical Bushing | 1 | 0 kg |
| 49 | C09-0001-P0081 | Fix El. Jb Platform | 2 | 0,2 kg |
| 48 | C09-0001-P0035 | El. Box on Platform | 1 | 4,7 kg |
| 47 | C09-0001-P0073 | Cover Gearbox 4 | 1 | 2,2 kg |
| 46 | C09-0001-P0072 | Cover Gearbox 3 | 1 | 3,1 kg |
| 45 | C09-0001-P0039 | Cover Bearing 2 | 1 | 2,5 kg |
| 44 | C09-0001-P0031 | Cover Bearing | 1 | 5,3 kg |
| 43 | 004-0011-C0001 | Hex head screw fully threaded | 4 | 0 kg |
| 42 | 004-0012-C0015 | Hex socket head cap screw | 2 | 0 kg |
| 41 | C09-0001-P0070 | Wheel Block | 2 | 0,7 kg |
| 40 | 004-0012-C0006 | Hex socket cilindrical head screw | 2 | 0 kg |
| 39 | 004-0043-C0006 | Hex socket cilindrical head screw | 22 | 0 kg |
| 38 | C09-0001-P0069 | Rope protection | 11 | 0,1 kg |
| 37 | 006-0005-C0104 | Cylindrical Bushing | 2 | 0,1 kg |
| 36 | C09-0001-A0014 | Locking pin assembly | 1 | 3,6 kg |
| 35 | 004-0175-C0120 | Hex head screw fully threaded | 12 | 0,1 kg |
| 34 | C09-0001-A0013 | Pulley Assembly Øc285 -rope Ø11 | 1 | 8,6 kg |
| 33 | 004-0035-C0029 | Greaser | 1 | 0 kg |
| 32 | C09-0001-P0065 | Boom Anti-Skid | 1 | 0,1 kg |
| 31 | 004-0175-C0213 | Hex head screw fully threaded | 3 | 0,6 kg |
| 30 | 004-0023-C0488 | Plain washer | 8 | 0 kg |
| 29 | 004-0011-C0060 | Hex head screw fully threaded | 2 | 0 kg |
| 28 | 004-0011-C0046 | Hex head screw fully threaded | 18 | 0 kg |
| 27 | 004-0023-C0049 | Plain washer | 44 | 0 kg |
| 26 | 004-0011-C0013 | Hex head screw fully threaded | 8 | 0 kg |
| 25 | 004-0023-C0083 | Plain washer | 2 | 0 kg |
| 24 | 004-0175-C0216 | Hex head screw fully threaded | 29 | 0,7 kg |
| 23 | 004-0023-C0523 | Plain washer | 61 | 0 kg |
| 22 | 004-0012-C0048 | Hex socket head cap screw | 39 | 0 kg |
| 21 | C09-0001-A0004 | Winch Assembly | 1 | 540,5 kg |
| 20 | 004-0149-C0008 | Hex head screw fully threaded | 4 | 0,1 kg |
| 19 | C09-0001-P0033 | Anti-rotation plate | 2 | 0,4 kg |
| 18 | C09-0001-P0032 | Anti-rotation plate to load cell | 2 | 0,1 kg |
| 17 | 004-0023-C0630 | Plain washer | 28 | 0 kg |
| 16 | C09-0001-P0027 | Fixed buffer for limiter | 1 | 0,2 kg |
| 15 | C09-0001-P0026 | Fixed buffer for limiter | 1 | 0,2 kg |
| 14 | C09-0001-P0025 | Bracket tray 3 | 1 | 1 kg |
| 13 | C09-0001-P0024 | Bracket tray 2 | 1 | 1,3 kg |
| 12 | C09-0001-P0023 | Bracket tray 1 | 2 | 1,5 kg |
| 11 | C09-0001-P0022 | | 1 | 12,7 kg |
| 10 | C09-0001-P0021 | HOISTING LOAD CELL | 1 | 0,6 kg |
| 9 | C09-0001-P0014 | Pulley Axis Ø60 | 1 | 1,8 kg |
| 8 | DA CODIFICARE | Hexagonal nut | 29 | 0,1 kg |
| 7 | C09-0001-P0020 | Trolley Wheel Retainer Plate | 2 | 0,4 kg |
| 6 | R-000347882 | SLEWING PINION M10 Z11 | 1 | 4,8 kg |
| 5 | 002-0027-C1431 | Gearbox for rotation | 1 | 134,3 kg |
| 4 | C09-0001-P0009 | Rack M6 40x35 L.2940 | 3 | 26,2 kg |
| 3 | 007-0006-C1220 | El. Motor for Rotation MGM BAHK2 100 LB4 Enhanced Power (E.P.) | 1 | 36 kg |
| 2 | 006-0006-C0123 | Ball bearing with internal teeth | 1 | 176,5 kg |
| 1 | C09-0001-P0004 | Boom Carpentry | 1 | 1494,5 kg |
| EL. | PART NUMBER | DESCRIPTION ENG | Q.TY | WEIGHT |

| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| A | 30/09/2024 | Prima emissione / First issued | riccardo.sobani | Sobani R. | De Fazio F. | – |

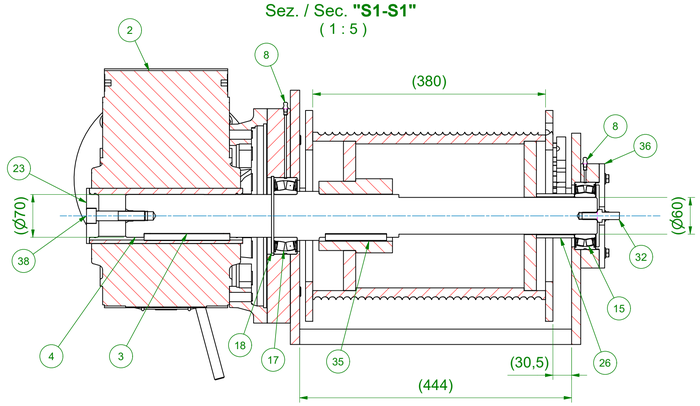
REMAZEL ENGINEERING
Chiuduno (BG) - 24060 - ITALY
Phone : +39-035-68.44.14 - Fax : +39-035-68.78.23
e-mail : info@remazel.com / website : www.remazel.com

Project / Equipment : **C09-0001**
Title : Assieme Braccio / Boom Assembly
Weight : 2567,6 kg
Scale : 1 : 33,3333
Sheet : 6 of 6 **A1**
Drawing State: **Work in Progress** / **FOR CONSTRUCTION**
Q.C.L. : C3
Drawing N° : C09-0001-A0003
Revision : A

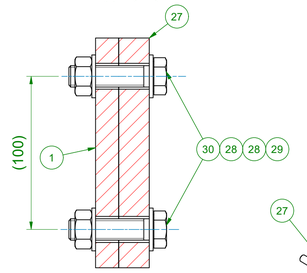
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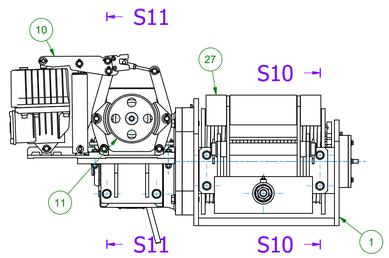


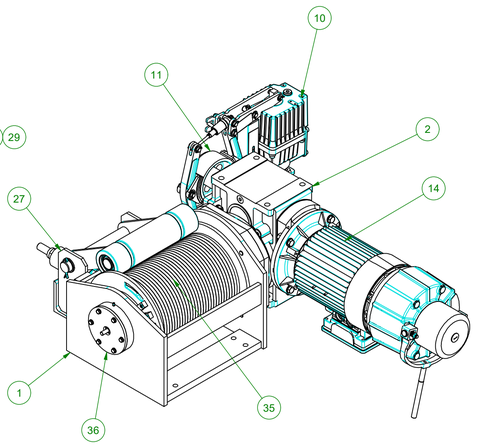

Sez. / Sec. **"S1-S1"**
( 1 : 5 )



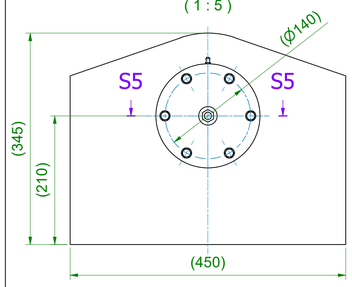

Sez. / Sec. **"S10-S10"**
( 1 : 2 )
Typ. (x2)



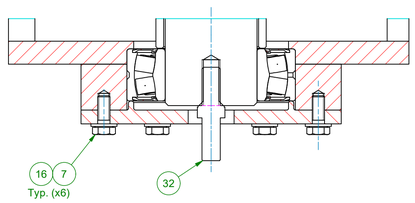



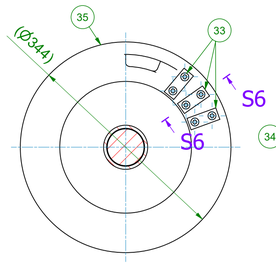
Sez. / Sec. **"S2-S2"**
( 1 : 5 )



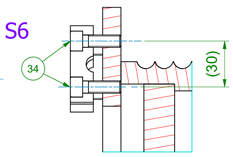

Sez. / Sec. **"S5-S5"**
( 1 : 2 )



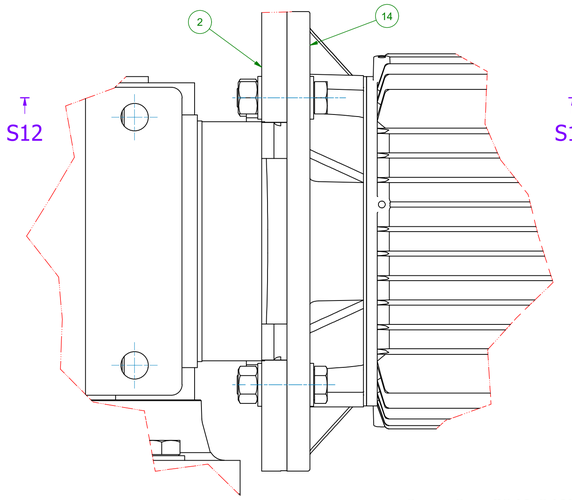

Sez. / Sec. **"S3-S3"**
( 1 : 5 )



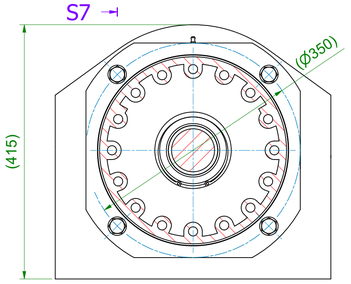

Sez. / Sec. **"S6-S6"**
( 1 : 2 )
Typ. (x3)



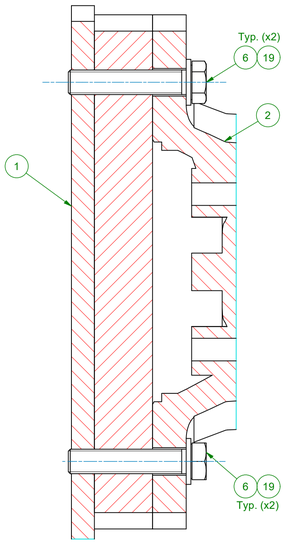

Dett. / Detail **"D2"**
( 1 : 2 )



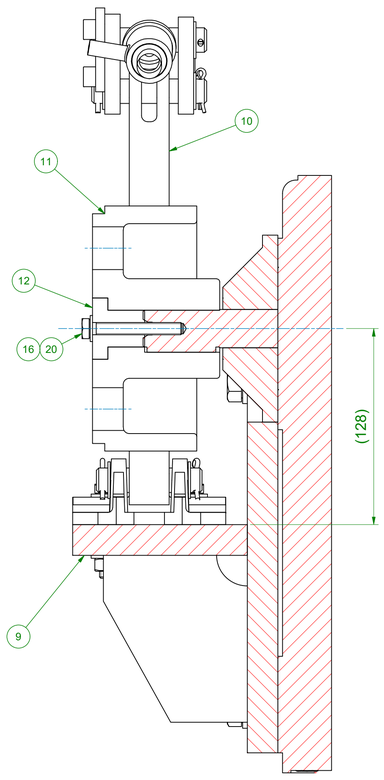

Sez. / Sec. **"S4-S4"**
( 1 : 5 )



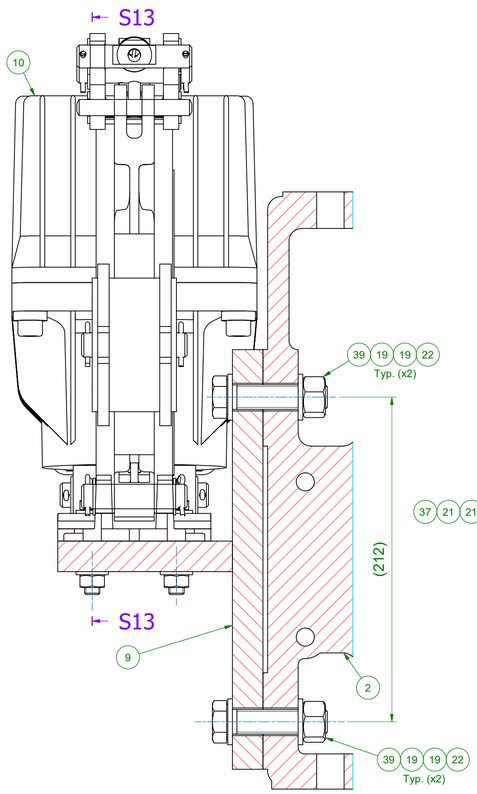

Sez. / Sec. **"S7-S7"**
( 1 : 2 )



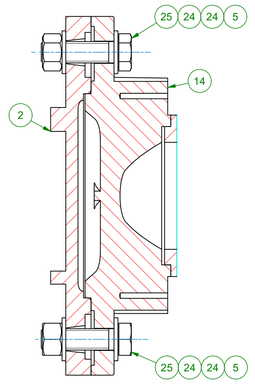

Sez. / Sec. **"S8-S8"**
( 1 : 2 )



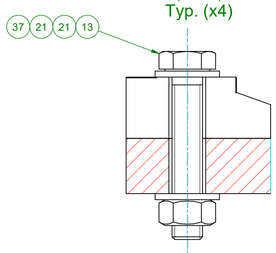

Sez. / Sec. **"S11-S11"**
( 1 : 2 )



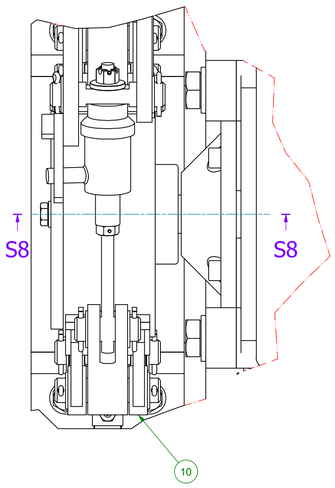

Sez. / Sec. **"S12-S12"**
( 1 : 2 )
Typ. (x2)



Sez. / Sec. **"S13-S13"**
( 1 : 1 )
Typ. (x4)



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



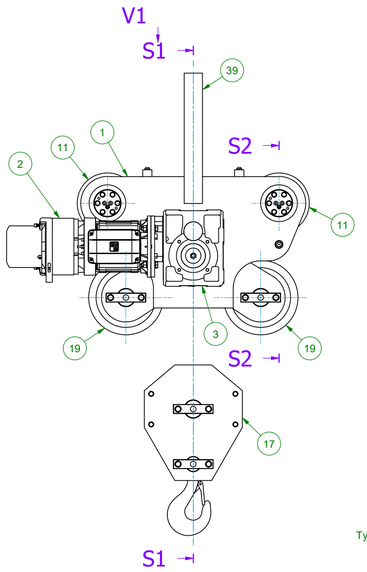

| | | | | |
|---|---|---|---|---|
| 39 | 004-0147-C0001 | Hexagonal nut | 4 | 0 kg |
| 38 | 004-0012-C0117 | Hex socket head cap screw | 1 | 0,2 kg |
| 37 | 004-0147-C0002 | Hexagonal nut | 4 | 0 kg |
| 36 | C09-0001-P0087 | Lateral Cap Winch | 1 | 1,6 kg |
| 35 | C09-0001-P0085 | Winch Box | 1 | 64,1 kg |
| 34 | 004-0012-C0006 | Hex socket cilindrical head screw | 6 | 0 kg |
| 33 | C09-0001-P0003 | Stop rope | 3 | 0,1 kg |
| 32 | C09-0001-P0071 | Encoder winch Axis | 1 | 0,1 kg |
| 31 | 002-0020-C0006 | Key | 1 | 0,2 kg |
| 30 | 004-0011-C0227 | Hex head screw fully threaded | 4 | 0,1 kg |
| 29 | 004-0021-C0014 | Hexagonal nut | 4 | 0 kg |
| 28 | 004-0023-C0598 | Plain washer | 8 | 0 kg |
| 27 | C09-0001-A0012 | Rope presser assembly | 1 | 38,4 kg |
| 26 | C09-0001-P0044 | Winch Spacer | 1 | 0,5 kg |
| 25 | 004-0149-C0136 | Hex head screw fully threaded | 4 | 0,1 kg |
| 24 | 004-0023-C0630 | Plain washer | 8 | 0 kg |
| 23 | C09-0001-P0029 | Cover Gearbox Winch | 1 | 0,6 kg |
| 22 | 004-0149-C0023 | Hex head screw fully threaded | 4 | 0,1 kg |
| 21 | 004-0023-C0489 | Plain washer | 8 | 0 kg |
| 20 | 004-0011-C0218 | Hex head screw fully threaded | 1 | 0 kg |
| 19 | 004-0023-C0486 | Plain washer | 12 | 0 kg |
| 18 | 004-0123-C0034 | Seeger ring for holes | 1 | 0,1 kg |
| 17 | R-000358542 | Spherical roller bearing | 1 | 1,8 kg |
| 16 | 004-0023-C0049 | Plain washer | 7 | 0 kg |
| 15 | R-000358537 | Spherical roller bearing | 1 | 1,3 kg |
| 14 | 007-0006-C1221 | Hoist El.Motor | 1 | 95 kg |
| 13 | 004-0149-C0011 | Hex head screw fully threaded | 4 | 0 kg |
| 12 | C09-0001-P0042 | Cap Brakedrums | 1 | 0,2 kg |
| 11 | C09-0001-P0041 | Machining Brakedrums | 1 | 5,9 kg |
| 10 | R-000354503 | Failsafe Shoe Brake | 1 | 0 kg |
| 9 | C09-0001-P0028 | Brake winch support | 1 | 14,3 kg |
| 8 | 004-0035-C0027 | Greaser | 2 | 0 kg |
| 7 | 004-0011-C0012 | Hex head screw fully threaded | 6 | 0 kg |
| 6 | 004-0175-C0140 | Hex head screw fully threaded | 4 | 0,2 kg |
| 5 | 004-0147-C0021 | Hexagonal nut | 4 | 0 kg |
| 4 | C09-0001-P0040 | Shaft Winch | 1 | 21,3 kg |
| 3 | 002-0020-C0033 | Key | 1 | 0,3 kg |
| 2 | 002-0027-C1432 | Gearbox | 1 | 195,7 kg |
| 1 | C09-0001-P0005 | Chassis Winch Carpentry | 1 | 95,8 kg |
| EL. | PART NUMBER | DESCRIPTION ENG | Q.TY | WEIGHT |

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

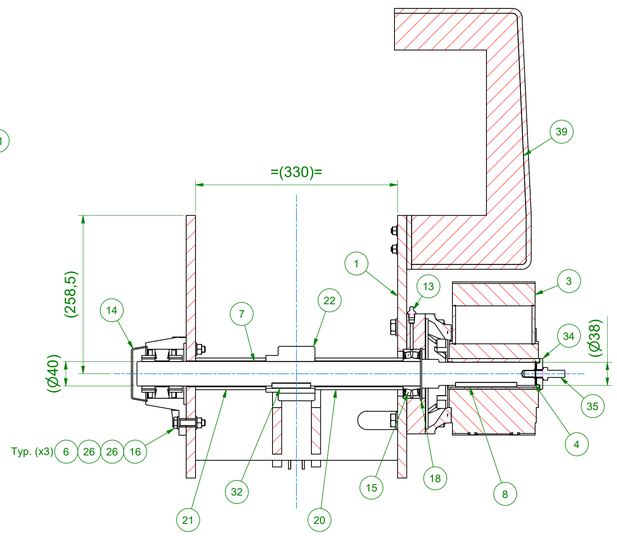
REMAZEL ENGINEERING
Chiuduno (BG) - 24060 - ITALY
Phone : +39-035-68.44.14 - Fax : +39-035-68.78.23
e-mail : info@remazel.com / website : www.remazel.com

Project / Equipment : **C09-0001**
Weight : 540,5 kg
Title : Assieme Winch / Winch Assembly
Scale : 1 : 10
Sheet : 2 of 2 **A1**
Drawing State: **Work in Progress** / ***FOR CONSTRUCTION***
Q.C.L. : C3
Drawing N° : C09-0001-A0004
Revision : A

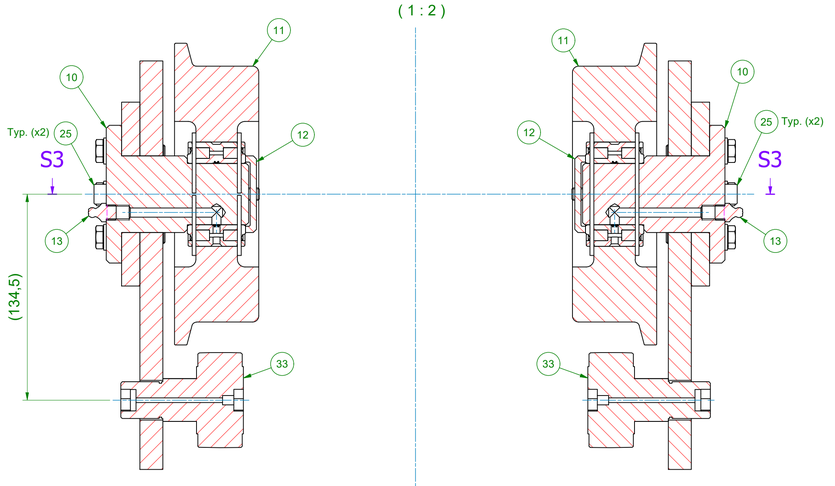
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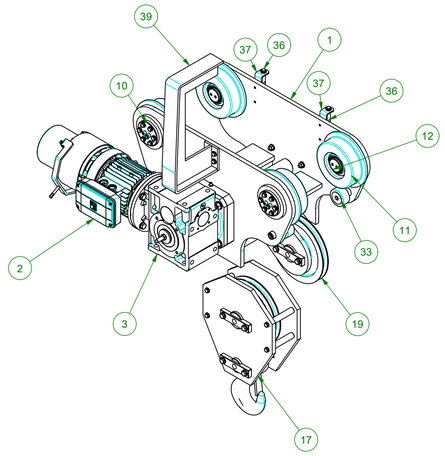


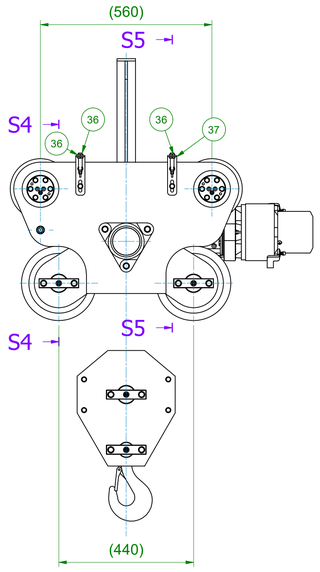

Sez. / Sec. **"S1-S1"**
( 1 : 5 )



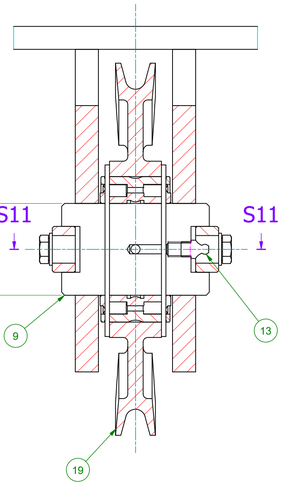

Sez. / Sec. **"S2-S2"**
( 1 : 2 )



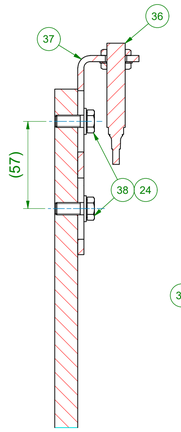



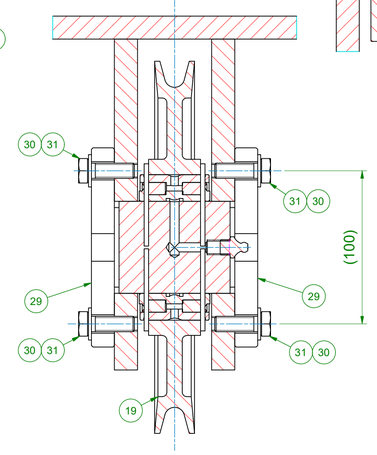

Sez. / Sec. **"S4-S4"**
( 1 : 2 )



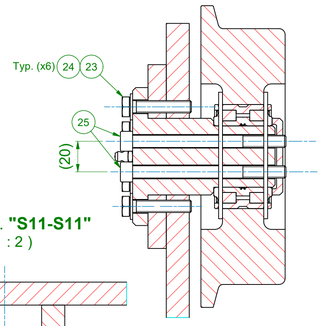

Sez. / Sec. **"S5-S5"**
( 1 : 2 )

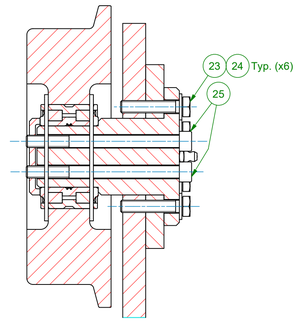



Sez. / Sec. **"S11-S11"**
( 1 : 2 )

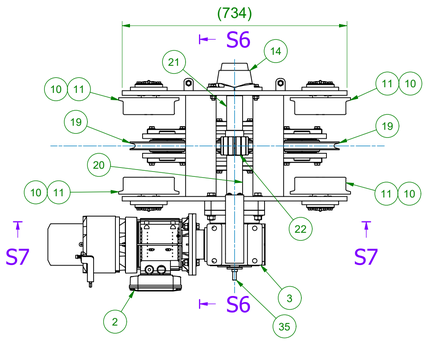



Sez. / Sec. **"S3-S3"**
( 1 : 2 )
Typ. (x2)

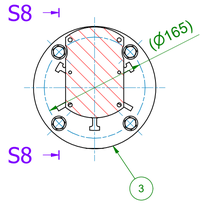


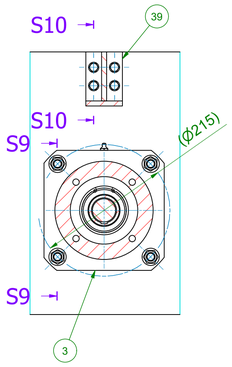

Vista da / View from **"V1"**
( 1 : 10 )



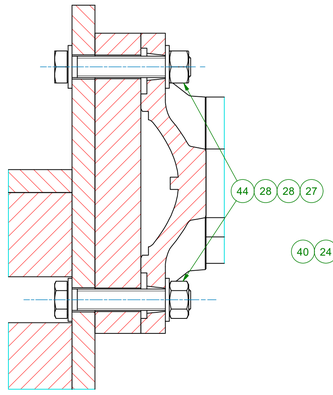

Sez. / Sec. **"S6-S6"**
( 1 : 5 )



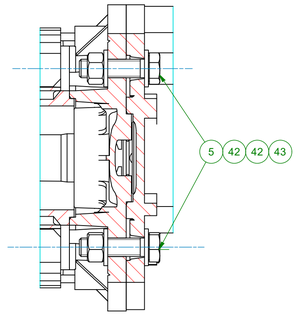

Sez. / Sec. **"S7-S7"**
( 1 : 5 )



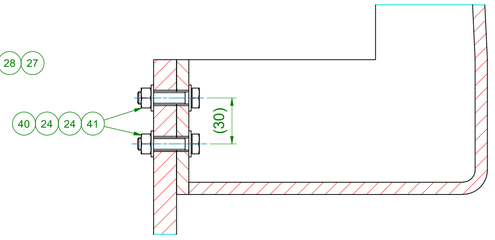

Sez. / Sec. **"S9-S9"**
( 1 : 2 )
Typ. (x2)




Sez. / Sec. **"S8-S8"**
( 1 : 2 )
Typ. (x2)




Sez. / Sec. **"S10-S10"**
( 1 : 2 )
Typ. (x2)




| EL. | PART NUMBER | DESCRIPTION ENG | Q.TY | WEIGHT |
|---|---|---|---|---|
| 44 | 004-0147-C0021 | Hexagonal nut | 4 | 0 kg |
| 43 | 004-0147-C0003 | Hexagonal nut | 4 | 0 kg |
| 42 | 004-0023-C0488 | Plain washer | 8 | 0 kg |
| 41 | 004-0021-C0010 | Hexagonal nut | 4 | 0 kg |
| 40 | 004-0011-C0048 | Hex head screw fully threaded | 4 | 0 kg |
| 39 | C09-0001-P0084 | El. Cable Fix For Trolley | 1 | 6 kg |
| 38 | 004-0011-C0012 | Hex head screw fully threaded | 4 | 0 kg |
| 37 | C09-0001-P0082 | Fixed buffer for limiter | 2 | 0,1 kg |
| 36 | R-000360016 | Inductive Sensors | 2 | 0,1 kg |
| 35 | C09-0001-P0018 | Encoder Axis Trolley | 1 | 0,1 kg |
| 34 | C09-0001-P0019 | Cover Gearbox Trolley | 1 | 0,1 kg |
| 33 | R-000358943 | Cam Followers (stud-type track rollers) | 2 | 0,9 kg |
| 32 | 002-0020-C0129 | Key | 1 | 0,1 kg |
| 31 | 004-0011-C0001 | Hex head screw fully threaded | 8 | 0 kg |
| 30 | 004-0023-C0082 | Plain washer | 8 | 0 kg |
| 29 | C09-0001-P0033 | Anti-rotation plate | 4 | 0,4 kg |
| 28 | 004-0023-C0630 | Plain washer | 8 | 0 kg |
| 27 | 004-0149-C0141 | Hex head screw fully threaded | 4 | 0,1 kg |
| 26 | 004-0023-C0489 | Plain washer | 6 | 0 kg |
| 25 | 004-0012-C0441 | Hex socket head cap screw | 8 | 0 kg |
| 24 | 004-0023-C0049 | Plain washer | 36 | 0 kg |
| 23 | 004-0011-C0023 | Hex head screw fully threaded | 24 | 0 kg |
| 22 | C09-0001-P0050 | Trolley Pinion M=6 Z=13 | 1 | 1,8 kg |
| 21 | C09-0001-P0049 | Spacer Trolley 1 | 1 | 0,7 kg |
| 20 | C09-0001-P0048 | Spacer Trolley 2 | 1 | 0,9 kg |
| 19 | C09-0001-A0011 | Pulley Assembly Øc209 -rope Ø11 | 2 | 5,6 kg |
| 18 | 004-0123-C0048 | Seeger ring for holes | 1 | 0 kg |
| 17 | C09-0001-A0007 | Hook Assembly | 1 | 45,2 kg |
| 16 | 004-0149-C0018 | Hex head screw fully threaded | 3 | 0 kg |
| 15 | R-000353721 | Spherical roller bearing | 1 | 0,6 kg |
| 14 | R-000350882 | Triangular flanged roller bearing unit | 1 | 4,6 kg |
| 13 | 004-0035-C0029 | Greaser | 7 | 0 kg |
| 12 | C09-0001-P0017 | Wheel bearing cover | 4 | 0,1 kg |
| 11 | C09-0001-A0008 | Wheel Assembly Ø 167 | 4 | 8,4 kg |
| 10 | C09-0001-P0016 | Axis for Wheel Ø167 | 4 | 1,4 kg |
| 9 | C09-0001-P0014 | Pulley Axis Ø60 | 2 | 1,8 kg |
| 8 | 002-0020-C0292 | Key | 1 | 0,1 kg |
| 7 | C09-0001-P0013 | Shaft travveling trolley | 1 | 6,5 kg |
| 6 | 004-0147-C0002 | Hexagonal nut | 3 | 0 kg |
| 5 | 004-0149-C0008 | Hex head screw fully threaded | 4 | 0,1 kg |
| 4 | DA CODIFICARE | Seeger ring for holes | 1 | 0 kg |
| 3 | 002-0027-C1433 | Gearbox Rossi Series_G_MR_ICI_80_UO3A_24x200_52_B3__F1 | 1 | 48,8 kg |
| 2 | 007-0006-C1222 | El.Motor Traslation MGM BAHK2 90 SA4 Enhanced Power (E.P.) | 1 | 24 kg |
| 1 | C09-0001-P0006 | Traveling Trolley Carpentry | 1 | 98,2 kg |

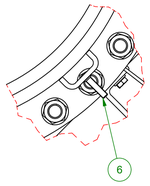
| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| A | | Prima emissione / First issued | riccardo.sobani | Sobani R. | De Fazio F. | – |

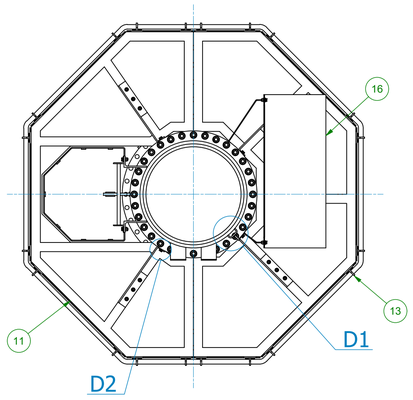
REMAZEL ENGINEERING
Cittadino (BG) - 24060 - ITALY
Phone : +39-035-68.44.14 - Fax : +39-035-68.78.23
e-mail : info@remazel.com / website : www.remazel.com

Project / Equipment : **C09-0001**
Weight : N/A
Title : Assieme Carrello / Travelling Trolley Assembly
Scale : 1 : 10
Sheet : 2 of 2 **A1**
Drawing State: **Work in Progress** / ***FOR CONSTRUCTION***
Q.C.L. : C3
Drawing N° : C09-0001-A0005
Revision : A

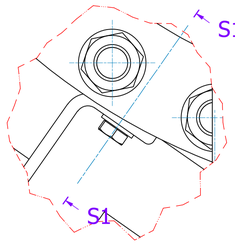
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Dett. / Detail **"D1"**
( 1 : 5 )

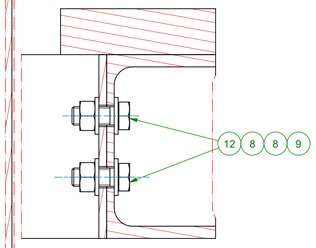


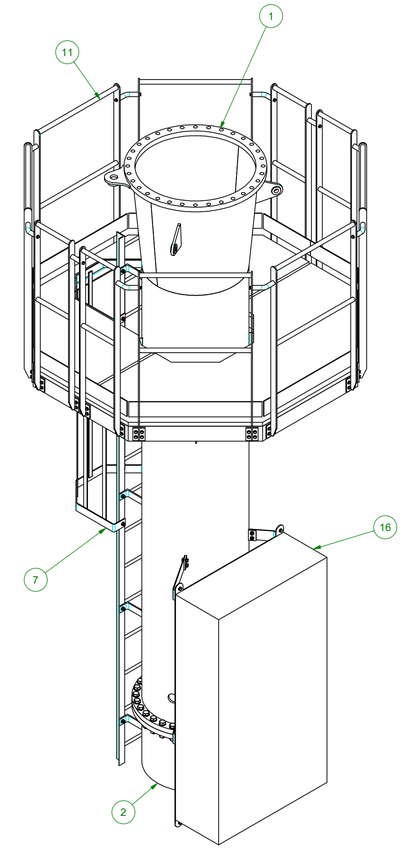



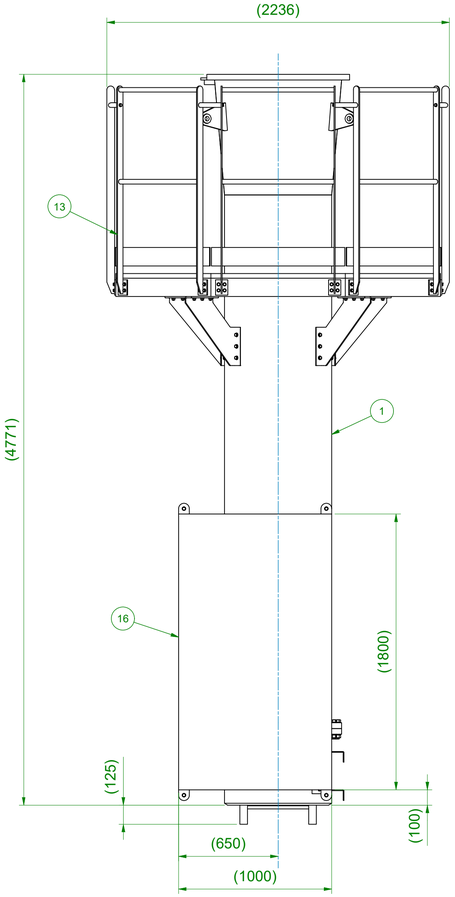

Dett. / Detail **"D2"**
( 1 : 2 )

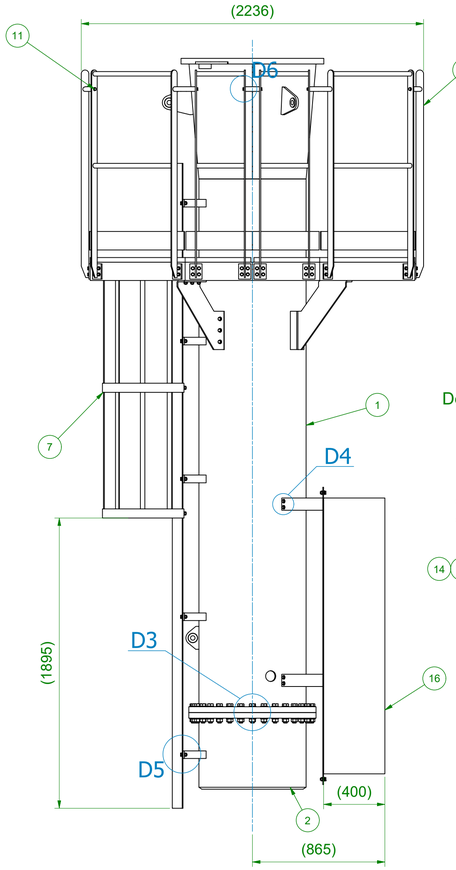



Sez. / Sec. **"S1-S1"**
( 1 : 2 )
Typ. (x4)

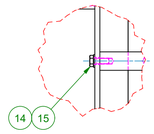


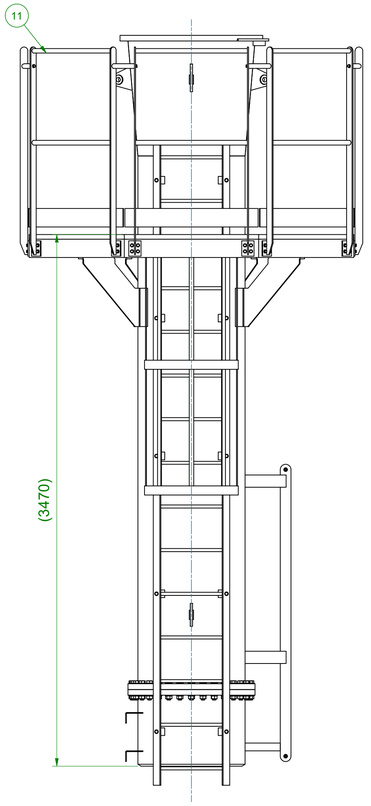



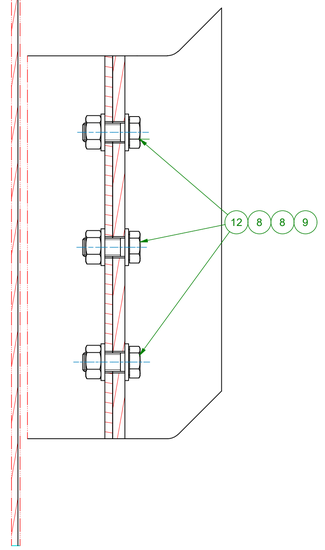



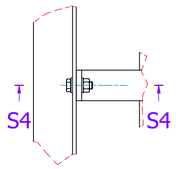

Dett. / Detail **"D6"**
( 1 : 5 )
Typ. (x2)



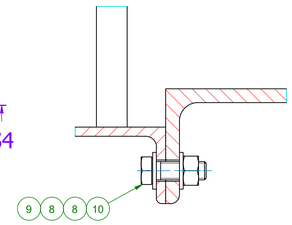



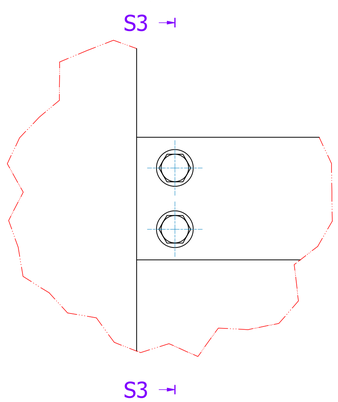

Dett. / Detail **"D5"**
( 1 : 5 )



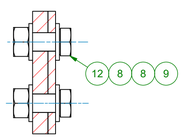

Sez. / Sec. **"S4-S4"**
( 1 : 2 )

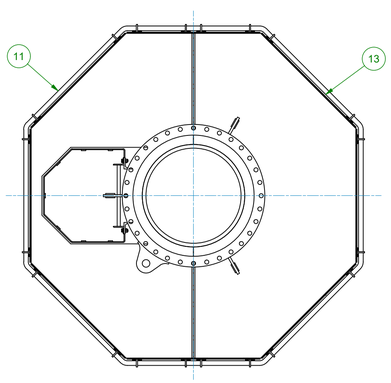



Dett. / Detail **"D4"**
( 1 : 2 )

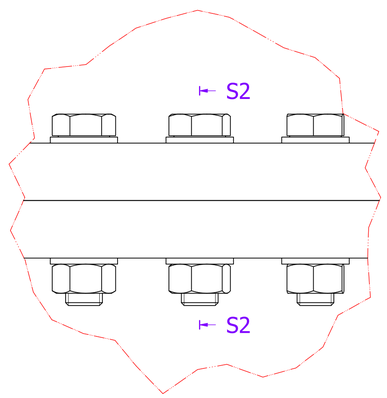



Sez. / Sec. **"S3-S3"**
( 1 : 2 )
Typ. (x4)

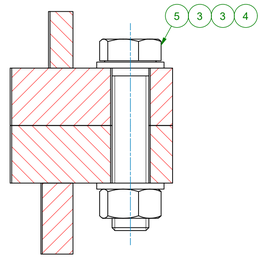



Dett. / Detail **"D3"**
( 1 : 2 )




Sez. / Sec. **"S2-S2"**
( 1 : 2 )
Typ. (x26)



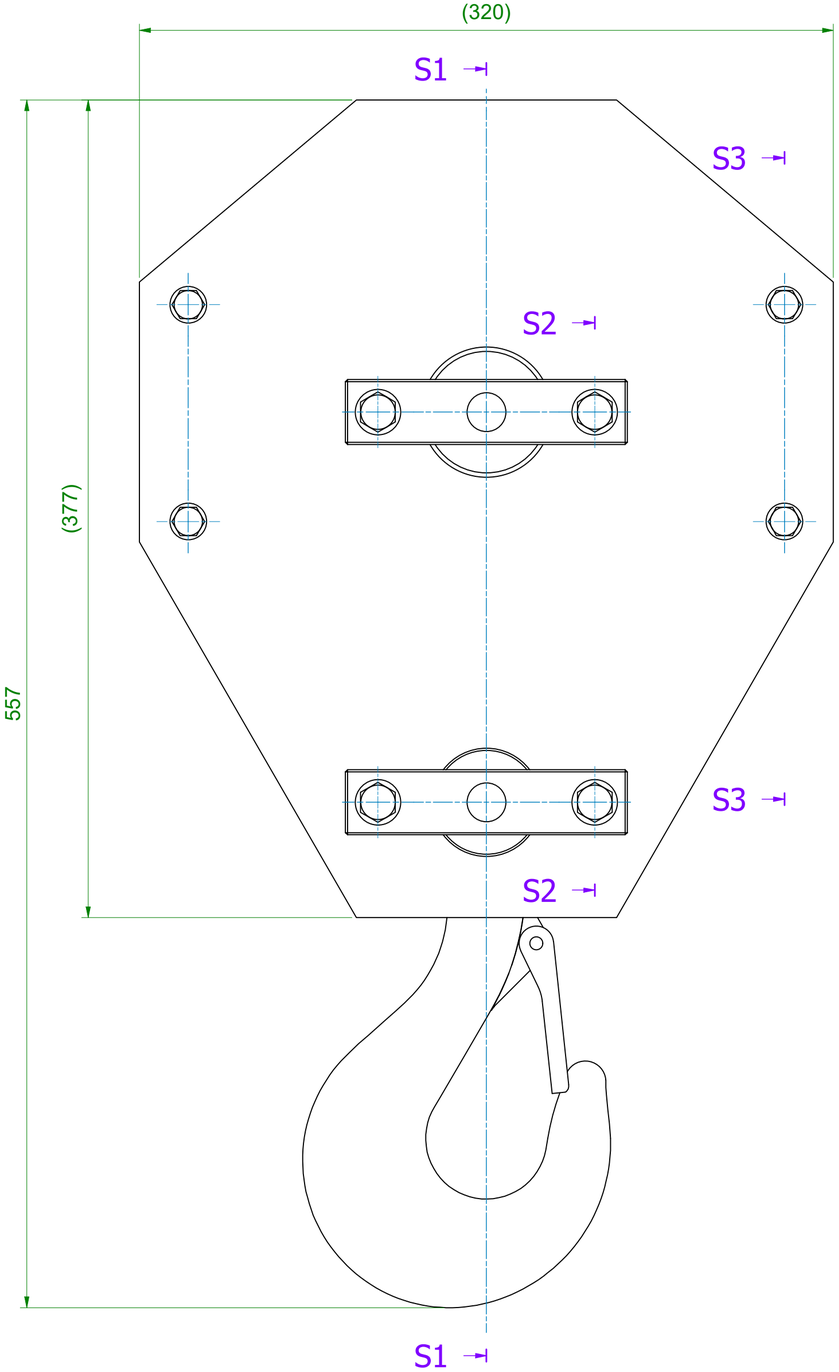

| EL. | PART NUMBER | DESCRIPTION ENG | Q.TY | WEIGHT |
|---|---|---|---|---|
| 16 | C09-0001-A0016 | Eletric JB Assembly | 1 | 88,7 kg |
| 15 | 004-0011-C0008 | Hex head screw fully threaded | 2 | 0 kg |
| 14 | 004-0023-C0082 | Plain washer | 2 | 0 kg |
| 13 | C09-0001-A0015 | Fore Gangway Assembly | 1 | 574,1 kg |
| 12 | 004-0011-C0060 | Hex head screw fully threaded | 54 | 0 kg |
| 11 | C09-0001-A0010 | Aft Gangway Assembly | 1 | 487,4 kg |
| 10 | 004-0011-C0024 | Hex head screw fully threaded | 10 | 0 kg |
| 9 | 004-0021-C0007 | Hexagonal nut | 64 | 0 kg |
| 8 | 004-0023-C0083 | Plain washer | 128 | 0 kg |
| 7 | C09-0001-A0009 | Stair Assembly | 1 | 93,2 kg |
| 6 | 013-0018-C0822 | Nottolino di messa a terra | 1 | 0 kg |
| 5 | 004-0039-C0258 | Hex head screw fully threaded | 32 | 0,5 kg |
| 4 | 004-0110-C0005 | Hexagonal nut | 32 | 0,1 kg |
| 3 | 004-0023-C0112 | Plain washer | 64 | 0 kg |
| 2 | C09-0001-P0001 | Pedestal Carpentry | 1 | 223,2 kg |
| 1 | C09-0001-P0002 | Fixed Column Carpentry | 1 | 1228,9 kg |

| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| A | 27/09/2024 | Prima emissione / First issued | riccardo.sobani | Sobani R. | De Fazio F. | – |

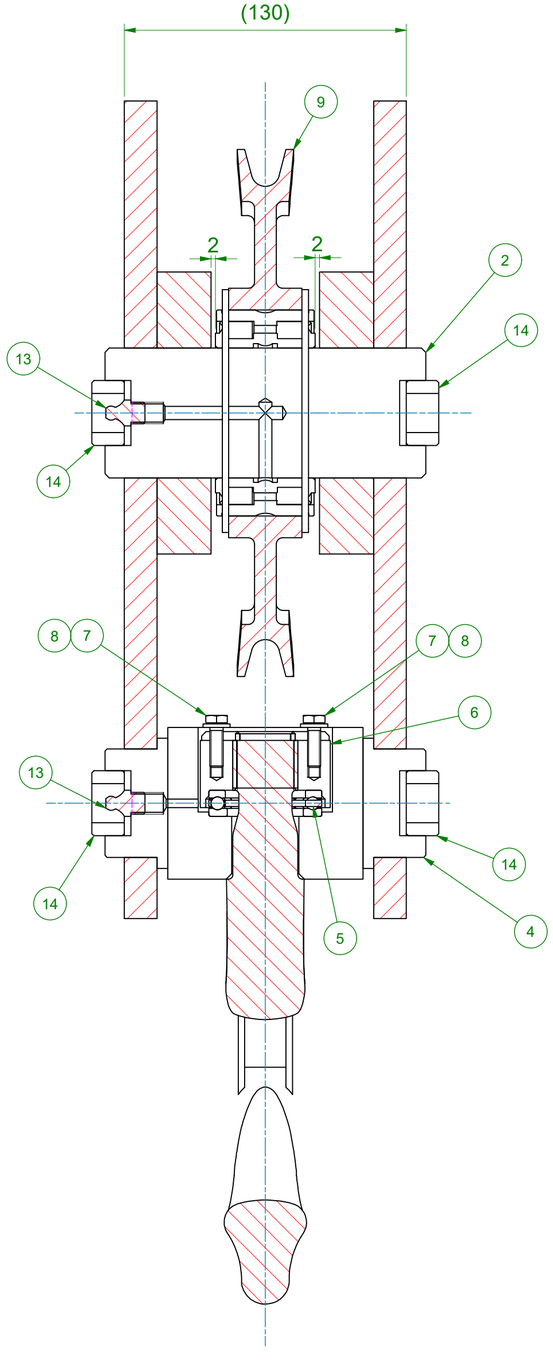
REMAZEL ENGINEERING
Chiuduno (BG) - 24060 - ITALY
Phone : +39-035-68.44.14 - Fax : +39-035-68.78.23
e-mail : info@remazel.com / website : www.remazel.com

Project / Equipment : **C09-0001**
Weight : 2722,9 kg
Title : Assieme Colonna fissa / Fixed Column Ass.
Scale : 1 : 20
Sheet : 2 of 2 **A1**
Drawing State: **Work in Progress** / **FOR CONSTRUCTION**
Q.C.L. : C3
Drawing N° : C09-0001-A0006
Revision : A

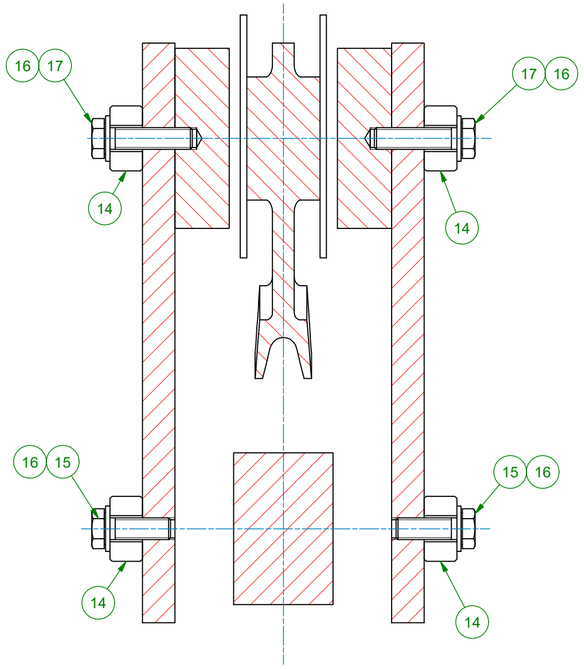
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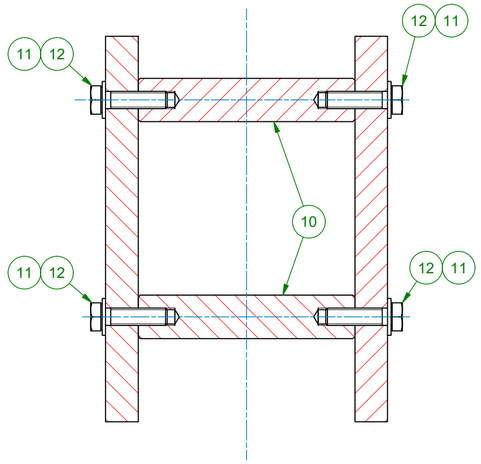

Sez. / Sec. **"S1-S1"**
( 1 : 2 )

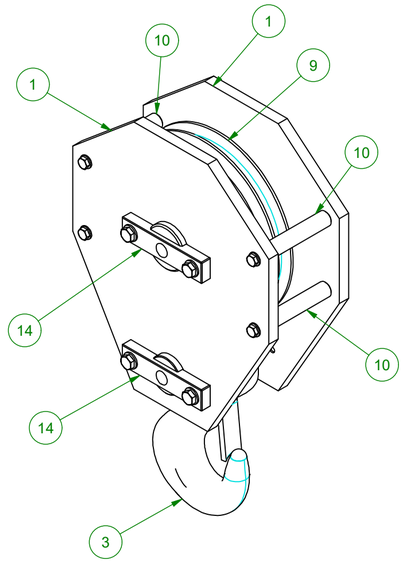



Sez. / Sec. **"S2-S2"**
( 1 : 2 )




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




| EL. | PART NUMBER | DESCRIPTION ENG | Q.TY | WEIGHT |
|---|---|---|---|---|
| 17 | 004-0011-C0003 | Hex head screw fully threaded | 4 | 0 kg |
| 16 | 004-0023-C0082 | Plain washer | 8 | 0 kg |
| 15 | 004-0011-C0001 | Hex head screw fully threaded | 4 | 0 kg |
| 14 | C09-0001-P0033 | Anti-rotation plate | 4 | 0,4 kg |
| 13 | 004-0035-C0029 | Greaser | 2 | 0 kg |
| 12 | 004-0011-C0046 | Hex head screw fully threaded | 8 | 0 kg |
| 11 | 004-0023-C0049 | Plain washer | 8 | 0 kg |
| 10 | C09-0001-P0046 | Hook Anti-Skid | 4 | 0,2 kg |
| 9 | C09-0001-A0011 | Pulley Assembly Øc209 -rope Ø11 | 1 | 5,6 kg |
| 8 | 004-0023-C0433 | Plain washer | 2 | 0 kg |
| 7 | 004-0007-C0015 | Hex head screw fully threaded | 2 | 0 kg |
| 6 | C09-0001-P0047 | Block Roller Bearing Swivels | 1 | 0,5 kg |
| 5 | 002-0027-C1348 | Thrust ball bearing | 1 | 0,1 kg |
| 4 | C09-0001-P0038 | Roller Bearing Swivels | 1 | 4,3 kg |
| 3 | C09-0001-P0036 | Hook 3.5ton | 1 | 3,4 kg |
| 2 | C09-0001-P0037 | Shaft Pulley Hook | 1 | 3 kg |
| 1 | C09-0001-P0011 | Hook Pulley Plate Carpentry | 2 | 12,6 kg |

| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| A | 27/09/2024 | Prima emissione / First issued | riccardo.sobani | Sobani R. | De Fazio F. | – |

QUESTO DISEGNO E' DI PROPRIETA' ESCLUSIVA REMAZEL
A TERMINI DI LEGGE E' VIETATA LA RIPRODUZIONE
ANCHE PARZIALE O LA CESSIONE A TERZI SENZA
AUTORIZZAZIONE SCRITTA DELLA REMAZEL
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without written permission is prohibited

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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 :
45,2 kg

Title :
Assieme Gancio
Hook Assembly

Scale :
1 : 2

Sheet :
2 of 2

**A2**

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

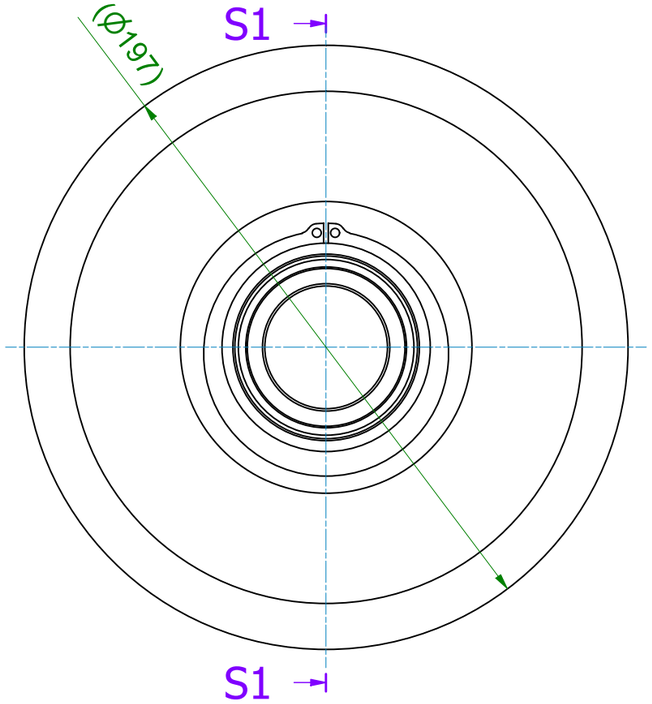
Q.C.L. :
C3

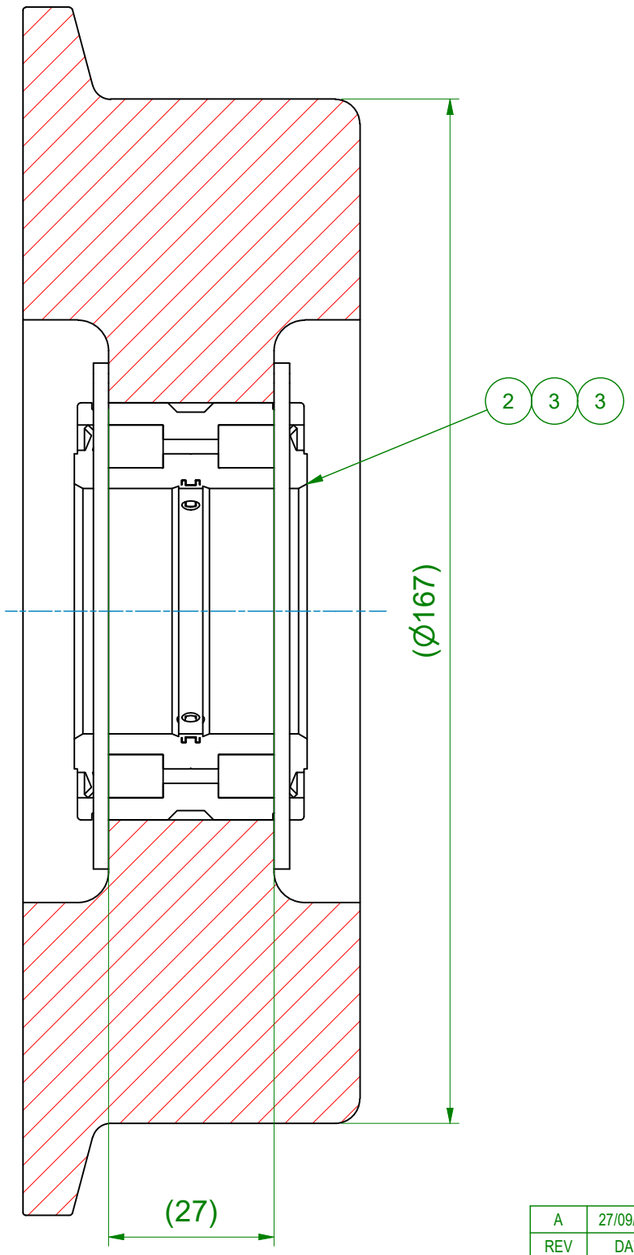
Drawing N° :
C09-0001-A0007

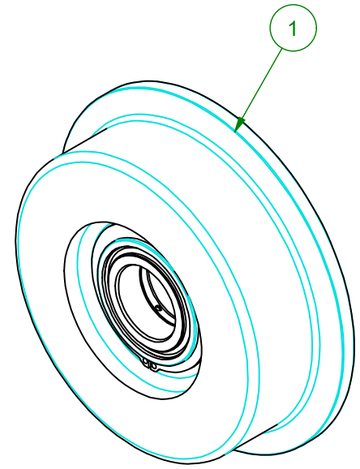
Revision :
A

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




| 3 | 004-0029-C0074 | Seeger ring for shaft | 2 | 0 kg |
|---|---|---|---|---|
| 2 | 006-0003-C0210 | Cylindrical roller bearing | 1 | 0,5 kg |
| 1 | C09-0001-P0015 | Wheel Ø 167 | 1 | 7,8 kg |
| EL. | PART NUMBER | DESCRIPTION ENG | Q.TY | WEIGHT |

| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| A | 27/09/2024 | Prima emissione / First issued | riccardo.sobani | Sobani R. | De Fazio F. | – |

PRODOTTI PRECISIONE PER GIOTTI LINEARI E ANGOLARI NON VOLUTI E NON PRODOTTI DA REMAZEL ENGINEERING
LAVORAZIONI MECCANICHE / MECHANICALS MACHININGS
Lineari-Angolari / Linear-Angular UNI EN 22768/1-1996 - m
Generiche / Geometrical UNI EN 22768/2-1996 - L
CARPENTERIA / WELDING STRUCTURE UNI EN ISO 13920/2000 - A
Lineari-Angolari / Linear-Angular UNI EN ISO 13920/2000 - A
Generiche / Geometrical UNI EN ISO 13920/2000 - E

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

Project / Equipment :
**C09-0001**

Weight :
8,4 kg

Title :
Assieme Ruota Ø167
Wheel Assembly Ø 167

Scale :
1 : 2

Sheet :
2 of 2

**A3**

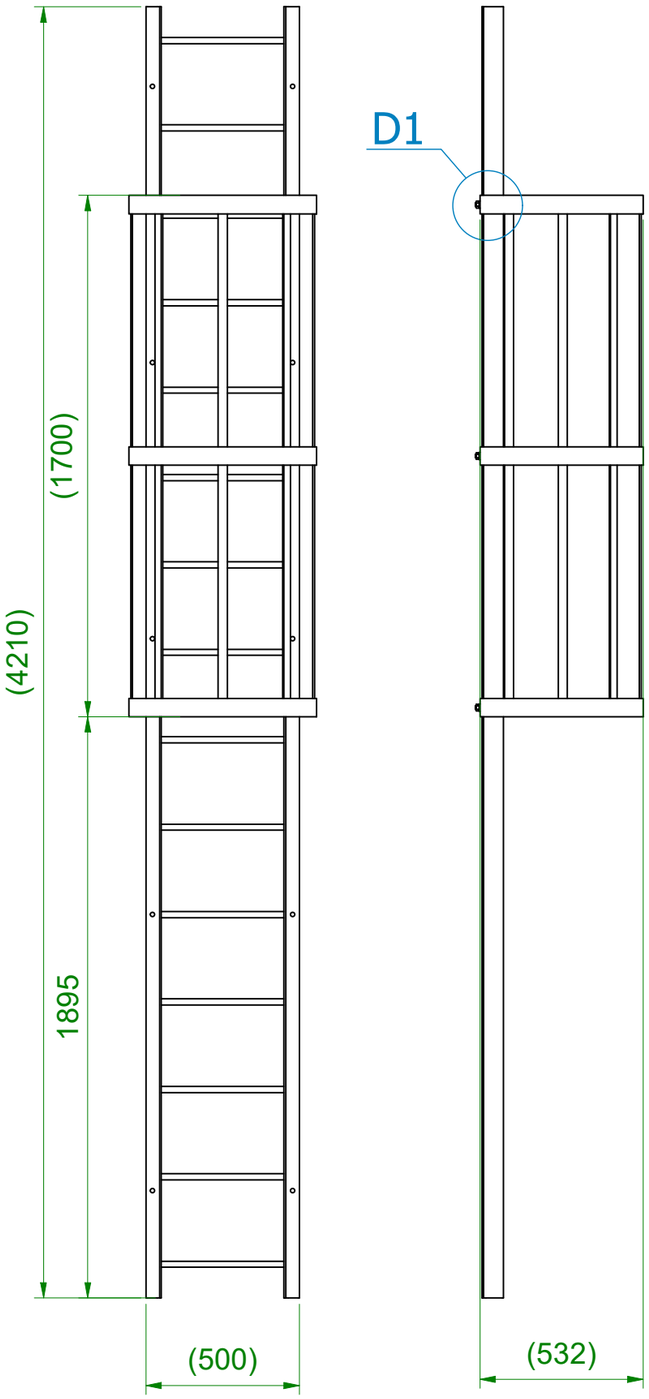
Drawing State:
**Work in Progress**
***FOR CONSTRUCTION***

Q.C.L. :
C3

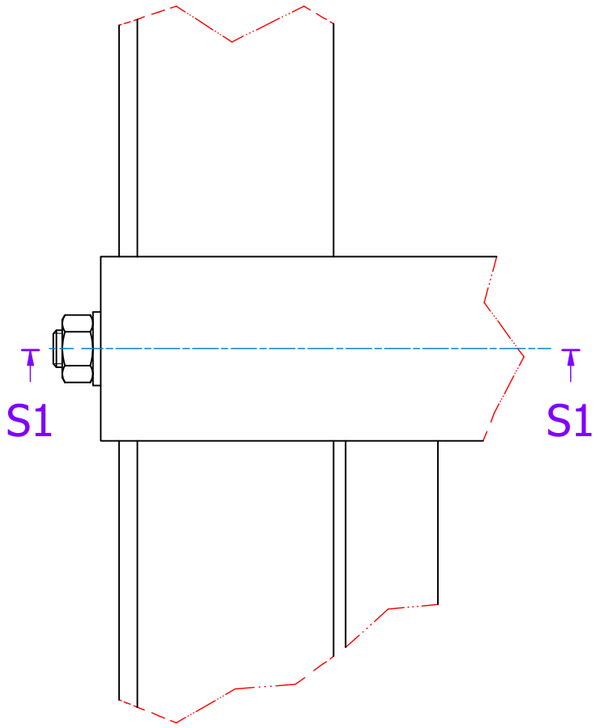
Drawing N° :
C09-0001-A0008

Revision :
A

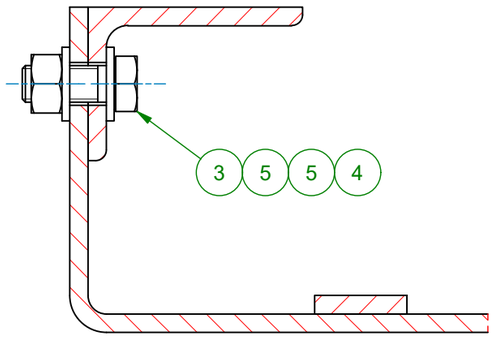
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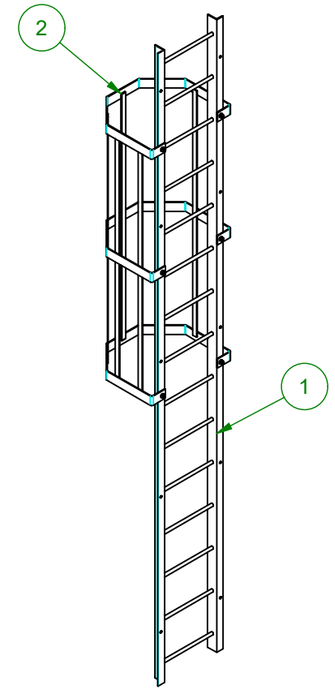



Dett. / Detail **"D1"**
( 1 : 2 )




Sez. / Sec. **"S1-S1"**
( 1 : 2 )
Typ. (x6)




| EL. | PART NUMBER | DESCRIPTION ENG | Q.TY | WEIGHT |
|---|---|---|---|---|
| 5 | 004-0023-C0083 | Plain washer | 12 | 0 kg |
| 4 | 004-0021-C0007 | Hexagonal nut | 6 | 0 kg |
| 3 | 004-0011-C0060 | Hex head screw fully threaded | 6 | 0 kg |
| 2 | C09-0001-P0010 | Cage Ladder Carpentry | 1 | 32,5 kg |
| 1 | C09-0001-P0008 | Stairs | 1 | 60,3 kg |

| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| A | 27/09/2024 | Prima emissione / First issued | riccardo.sobani | Sobani R. | De Fazio F. | – |

GRADO DI PRECISIONE PER QUOTE LINEARI E ANGOLARI NON TOLLERATE
DEGREE OF PRECISION FOR LINEAR AND ANGULAR DIMENSIONS NOT TOLERATED
LAVORAZIONI MECCANICHE / MECHANICALS MACHININGS
Lineari-Angolari / Linear-Angular : UNI EN 22768/1-1996 - m
Geometriche / Geometrical : UNI EN ISO 2768/1-1996 - L
CARPENTERIA / WELDING STRUCTURE
Lineari-Angolari / Linear-Angular : UNI EN ISO 13920:2000 - A
Geometriche / Geometrical : UNI EN ISO 13920:2000 - E

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

Project / Equipment :
**C09-0001**

Weight :
93,2 kg

Title :
Assieme Scala
Stair Assembly

Scale :
1 : 20

Sheet :
2 of 2

**A3**

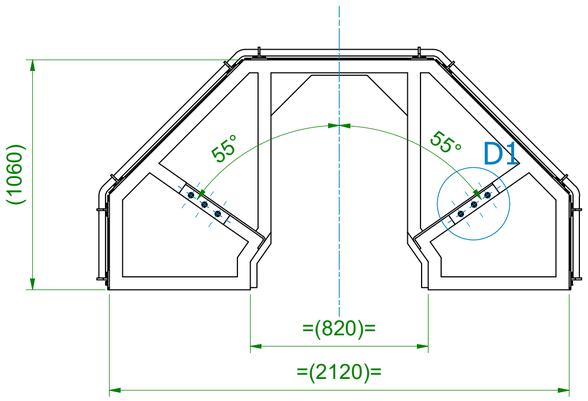
Drawing State:
**Work in Progress**
***FOR CONSTRUCTION***

Q.C.L. :
C3

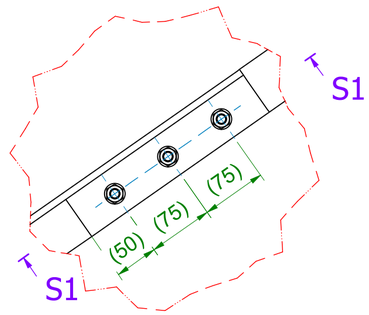
Drawing N° :
C09-0001-A0009

Revision :
A

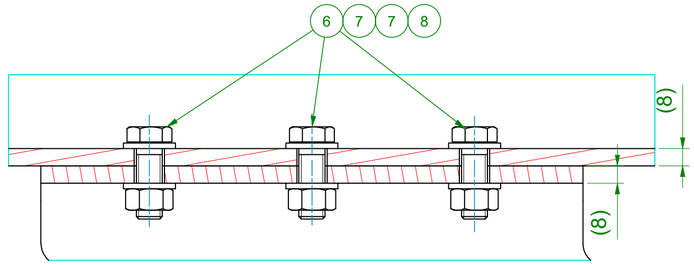
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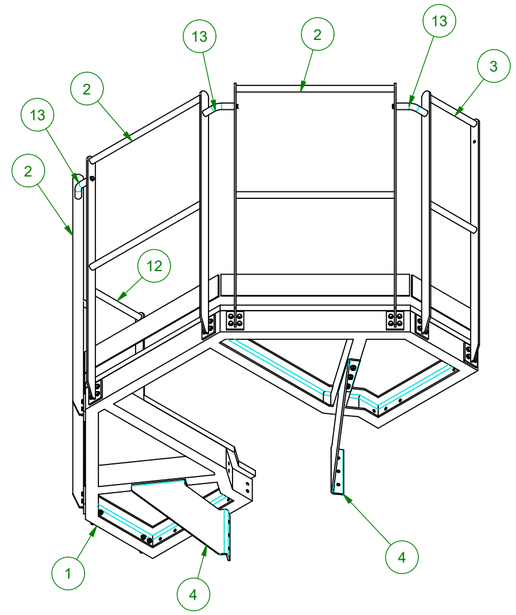


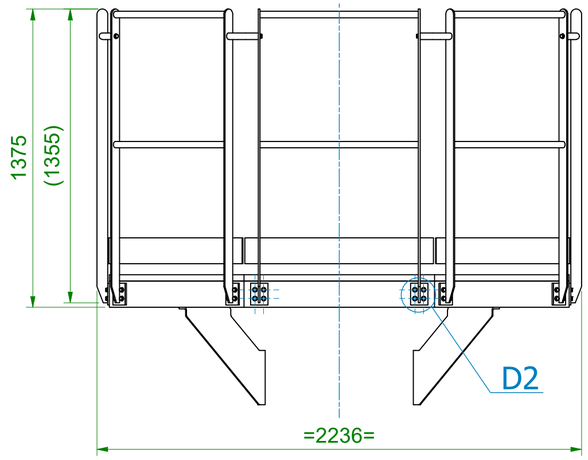

Dett. / Detail **"D1"**
( 1 : 5 )

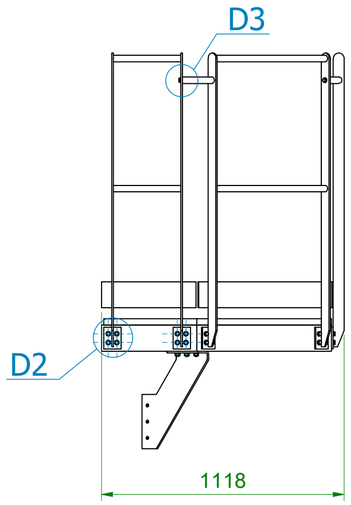



Sez. / Sec. **"S1-S1"**
( 1 : 2 )

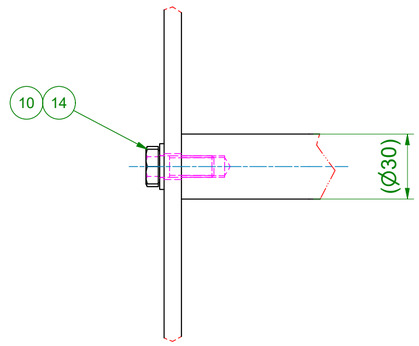


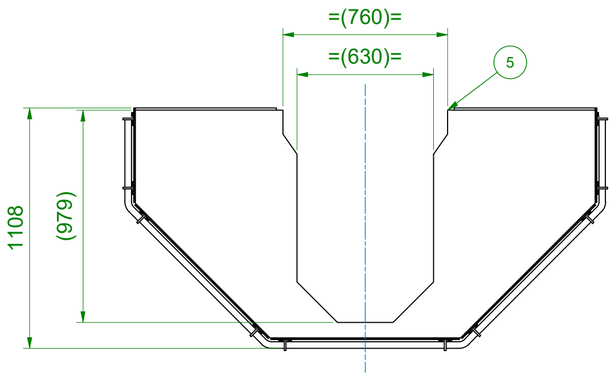



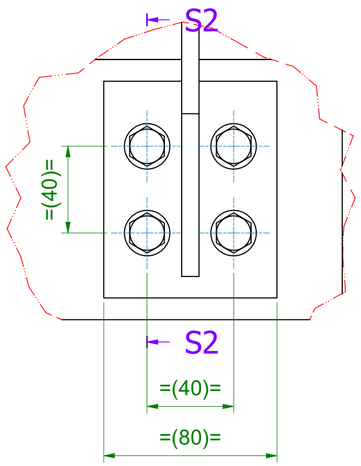

Dett. / Detail **"D3"**
( 1 : 2 )



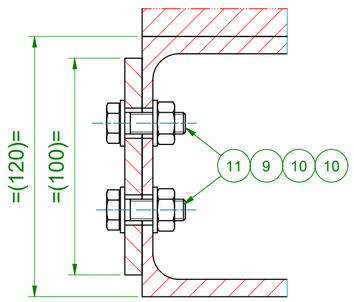

| 14 | 004-0011-C0008 | Hex head screw fully threaded | 8 | 0 kg |
|---|---|---|---|---|
| 13 | C09-0001-P0079 | Handrail Angular Fix | 4 | 0,9 kg |
| 12 | C09-0001-P0078 | Handrail 3 | 1 | 13,2 kg |
| 11 | 004-0011-C0001 | Hex head screw fully threaded | 40 | 0 kg |
| 10 | 004-0023-C0082 | Plain washer | 88 | 0 kg |
| 9 | 004-0021-C0012 | Hexagonal nut | 40 | 0 kg |
| 8 | 004-0021-C0007 | Hexagonal nut | 6 | 0 kg |
| 7 | 004-0023-C0083 | Plain washer | 12 | 0 kg |
| 6 | 004-0011-C0024 | Hex head screw fully threaded | 6 | 0 kg |
| 5 | C09-0001-P0077 | Floor Gangway | 1 | 292 kg |
| 4 | C09-0001-P0076 | Fix Gangway | 2 | 7,1 kg |
| 3 | C09-0001-P0075 | Handrail 2 | 1 | 13,2 kg |
| 2 | C09-0001-P0074 | Handrail 1 | 3 | 17,9 kg |
| 1 | C09-0001-P0007 | Aft Octagonal Gangway | 1 | 94,9 kg |
| EL. | PART NUMBER | DESCRIPTION ENG | Q.TY | WEIGHT |




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




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




| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| A | 27/09/2024 | 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 :
487,4 kg

Title :
Assieme Passerrella Posteriore
Aft Gangway Assembly

Scale :
1 : 20

Sheet :
2 of 2

**A2**

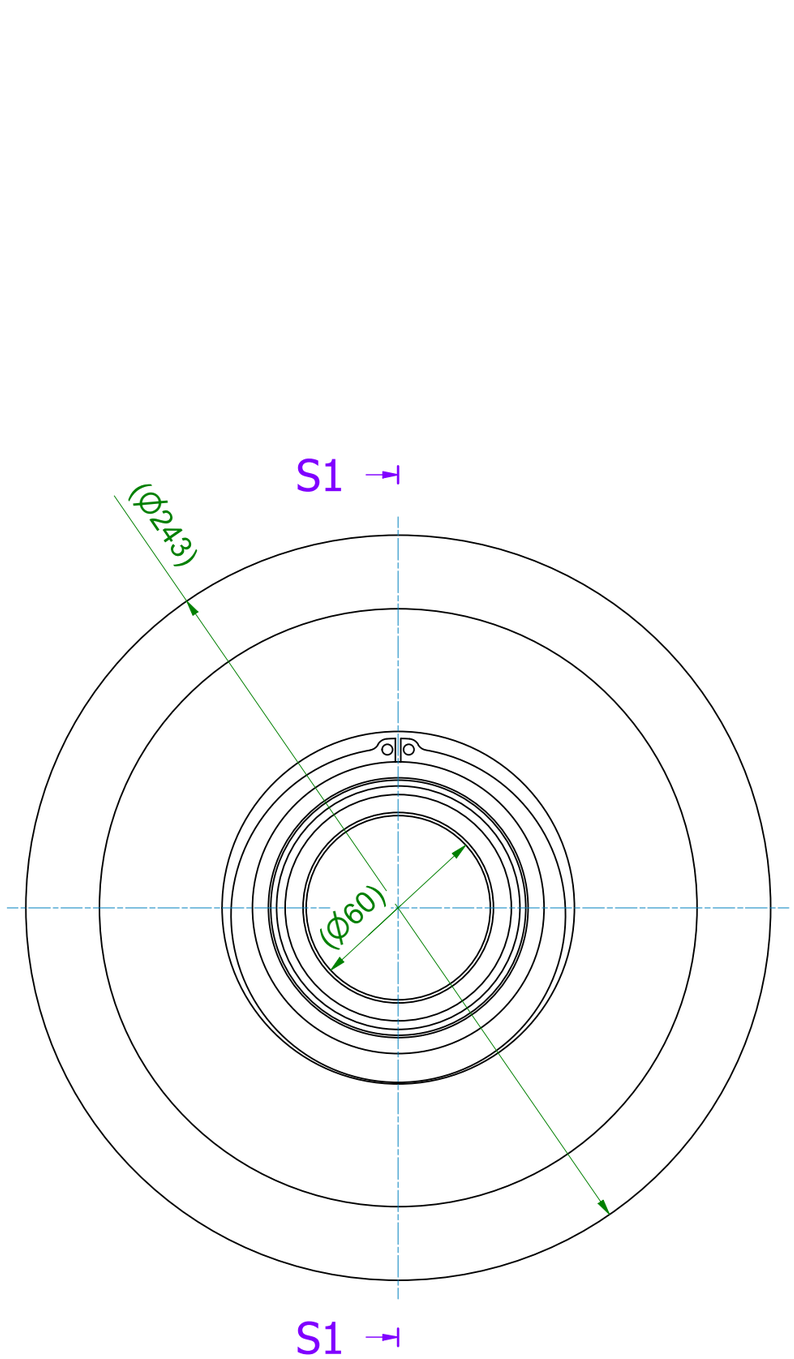
Drawing State:
**Work in Progress**
***FOR CONSTRUCTION***

Q.C.L. :
C3

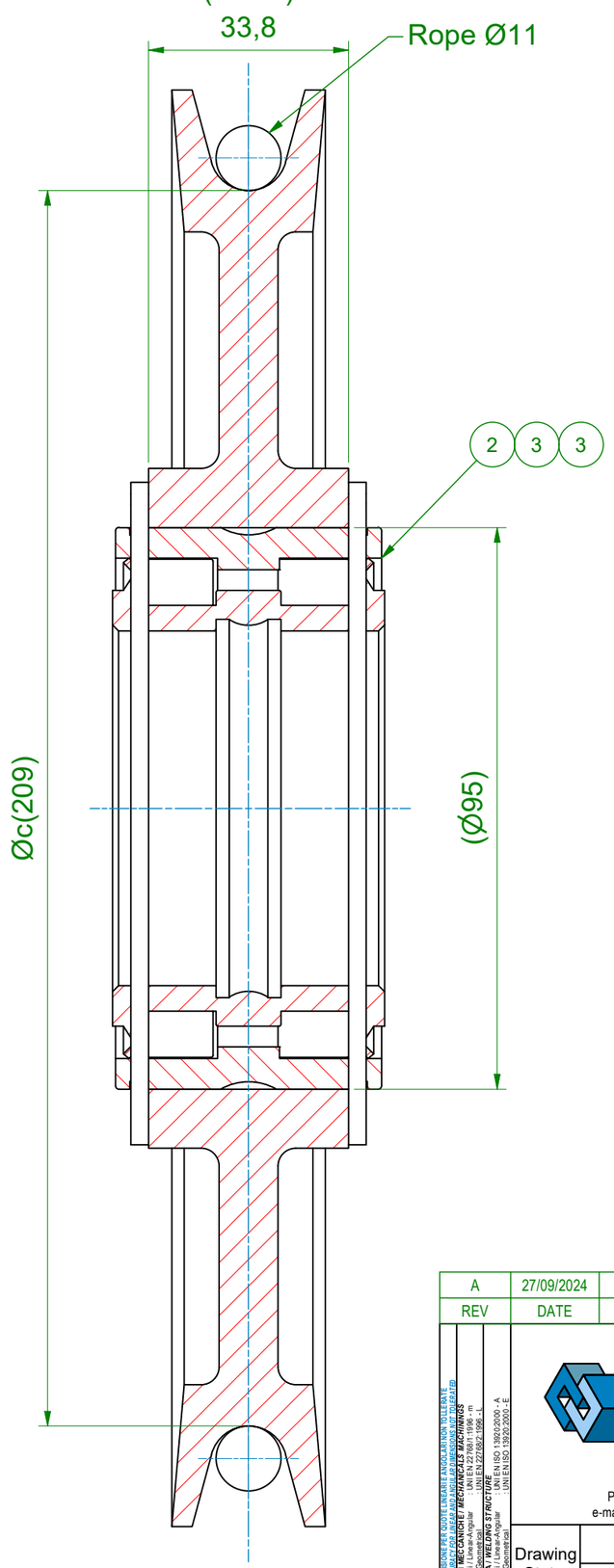
Drawing N° :
C09-0001-A0010

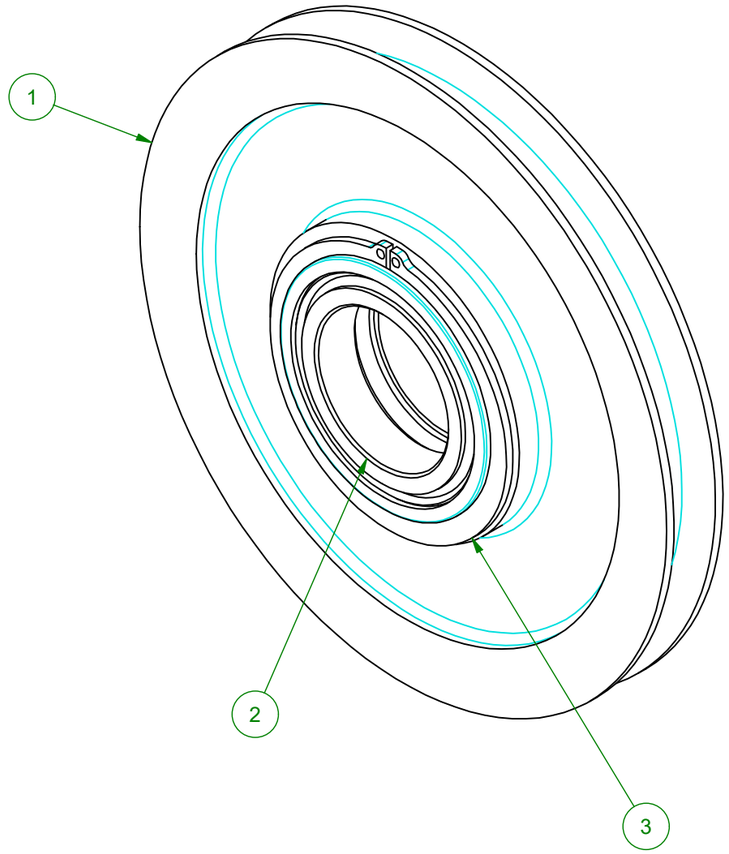
Revision :
A

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




| EL. | PART NUMBER | DESCRIPTION ENG | Q.TY | WEIGHT |
|---|---|---|---|---|
| 3 | DA CODIFICARE | Seeger ring for shaft | 2 | 0,1 kg |
| 2 | R-000361911 | Cylindrical roller bearing | 1 | 1,2 kg |
| 1 | C09-0001-P0045 | Pulley Ø209 for rope Ø11 | 1 | 4,2 kg |

| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| A | 27/09/2024 | Prima emissione / First issued | riccardo.sobani | Sobani R. | De Fazio F. | – |

GRADI DI PRECISIONE PER QUOTE LINEARI E ANGOLARI NON TOLLERATE
DEGREES OF ACCURACY FOR LINEAR AND ANGULAR DIMENSIONS NOT TOLERATED
LAVORAZIONI MECCANICHE / MECHANICAL MACHINING
Linear-Angular / Linear-Angular : UNI EN 22768/1-1996 - m
Esterne-Interne / External-Internal : UNI EN 22768/2-1996 - f
CARPENTERIA / WELDING STRUCTURE
Linear-Angular / Linear-Angular : UNI EN ISO 13920:2000 - A
Esterne-Interne / External-Internal : UNI EN ISO 13920:2000 - E

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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 :
5,6 kg

Title :
Assieme Puleggia Øc209 -fune Ø11
Pulley Assembly Øc209 -rope Ø11

Scale :
1 : 2

Sheet :
2 of 2

**A3**

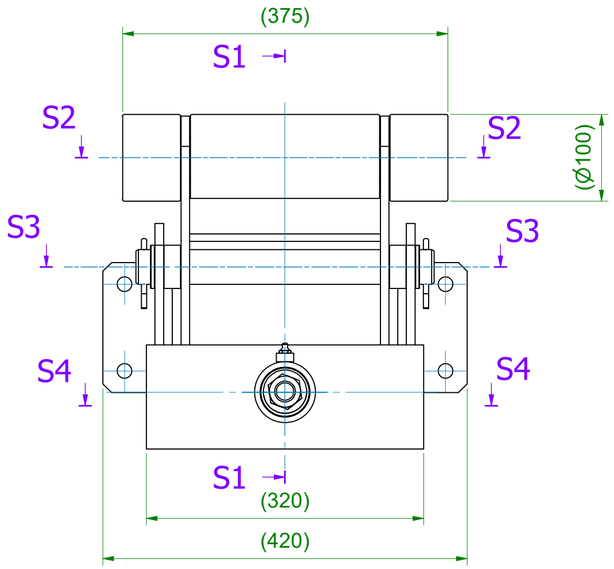
Drawing State:
**Work in Progress**
***FOR CONSTRUCTION***

Q.C.L. :
C3

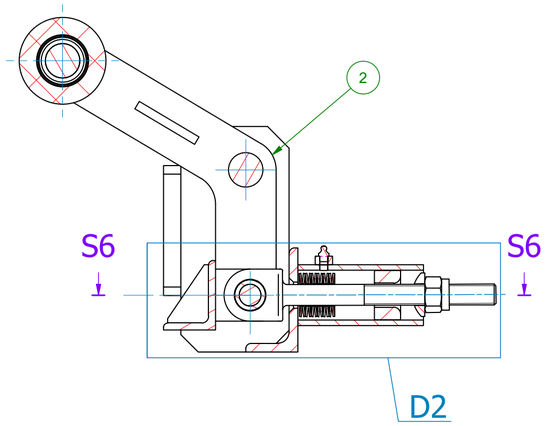
Drawing N° :
C09-0001-A0011

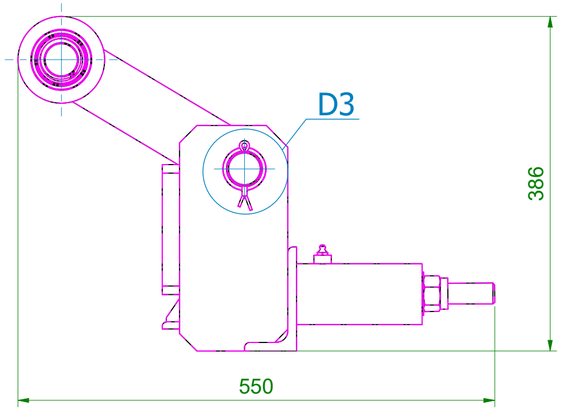
Revision :
A

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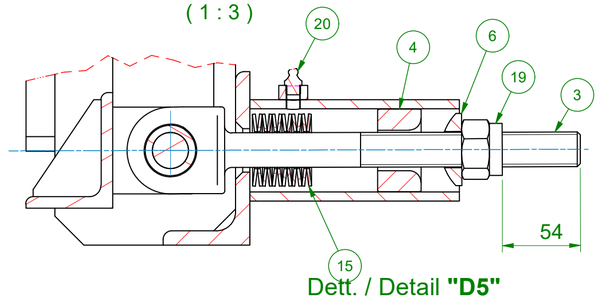



Sez. / Sec. **"S1-S1"**
( 1 : 5 )
ROPE PRESSING ROLLER ASSEMBLY
FIRST LAYER OF ROPE

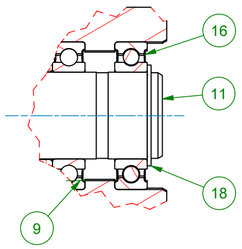


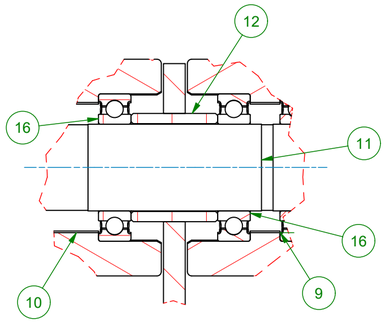

Dett. / Detail **"D2"**
( 1 : 3 )

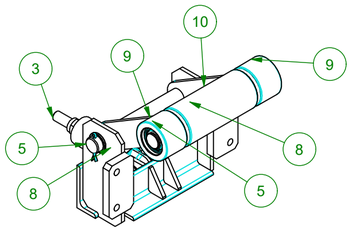



Dett. / Detail **"D4"**
( 1 : 2 )
Tipico / Typical

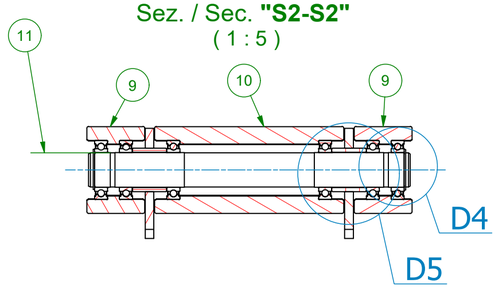


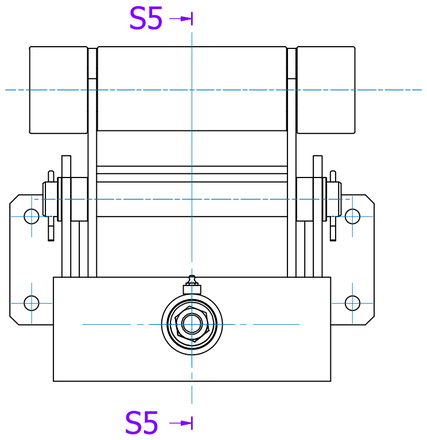

Dett. / Detail **"D5"**
( 1 : 2 )
Tipico / Typical



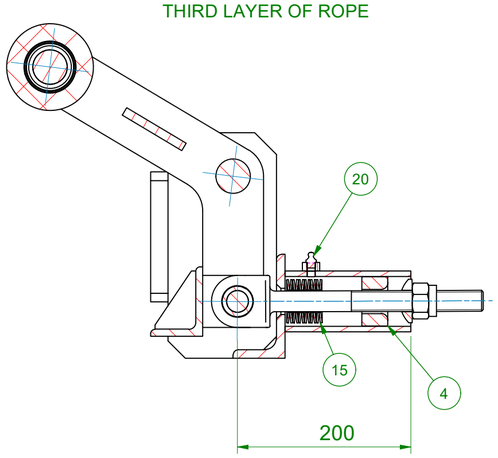




Sez. / Sec. **"S2-S2"**
( 1 : 5 )

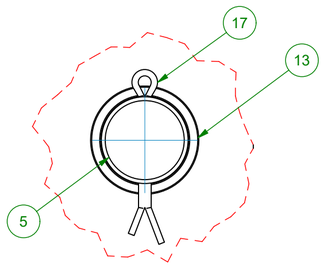



Sez. / Sec. **"S5-S5"**
( 1 : 5 )
ROPE PRESSING ROLLER ASSEMBLY
THIRD LAYER OF ROPE

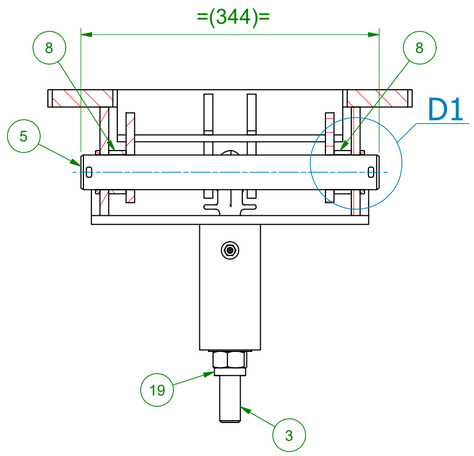



Dett. / Detail **"D3"**
( 1 : 2 )
Tipico / Typical

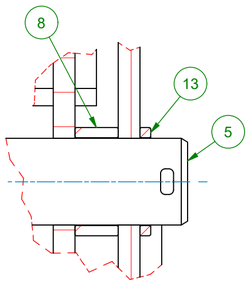



| | | | | |
|---|---|---|---|---|
| 21 | 004-0029-C0090 | Seeger ring for shaft | 2 | 0 kg |
| 20 | 004-0035-C0029 | Greaser | 1 | 0 kg |
| 19 | 004-0032-C0060 | Hexagonal nut | 1 | 0,2 kg |
| 18 | 004-0029-C0118 | Seeger ring for shaft | 2 | 0 kg |
| 17 | 004-0028-C0120 | Cotter pin | 2 | 0 kg |
| 16 | R-000358589 | Deep groove ball bearing | 6 | 0,2 kg |
| 15 | R-000358588 | Belleville Washer | 12 | 0 kg |
| 14 | C09-0001-P0059 | Rope presser bush | 1 | 0,1 kg |
| 13 | C09-0001-P0064 | Spacer | 2 | 0 kg |
| 12 | C09-0001-P0063 | Spacer | 2 | 0,2 kg |
| 11 | C09-0001-P0055 | Rope presser rolls shaft | 1 | 3,7 kg |
| 10 | C09-0001-P0051 | Rope presser big roll | 1 | 2,1 kg |
| 9 | C09-0001-P0052 | Rope presser Small roll | 2 | 0,6 kg |
| 8 | C09-0001-P0053 | Spacer | 2 | 0,1 kg |
| 7 | C09-0001-P0062 | Rope presser hinge shaft | 1 | 0,3 kg |
| 6 | C09-0001-P0058 | Rope presser sferical washer | 1 | 0,1 kg |
| 5 | C09-0001-P0054 | Rope presser lever shaft | 1 | 3,5 kg |
| 4 | C09-0001-P0060 | Springs pressing disc | 1 | 0,5 kg |
| 3 | C09-0001-P0061 | Rope presser threaded rod | 1 | 1,4 kg |
| 2 | C09-0001-P0057 | Rope presser support | 1 | 9,1 kg |
| 1 | C09-0001-P0056 | Rope presser support | 1 | 14 kg |
| EL. | PART NUMBER | DESCRIPTION ENG | Q.TY | WEIGHT |

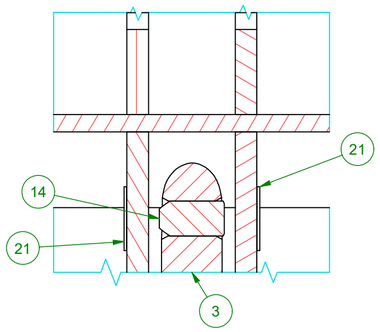
Sez. / Sec. **"S3-S3"**
( 1 : 5 )



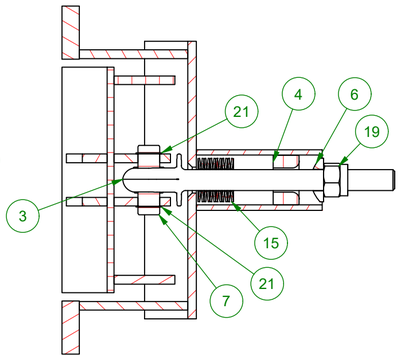

Dett. / Detail **"D1"**
( 1 : 2 )
Tipico / Typical




Sez. / Sec. **"S4-S4"**
( 1 : 2 )




Sez. / Sec. **"S6-S6"**
( 1 : 5 )

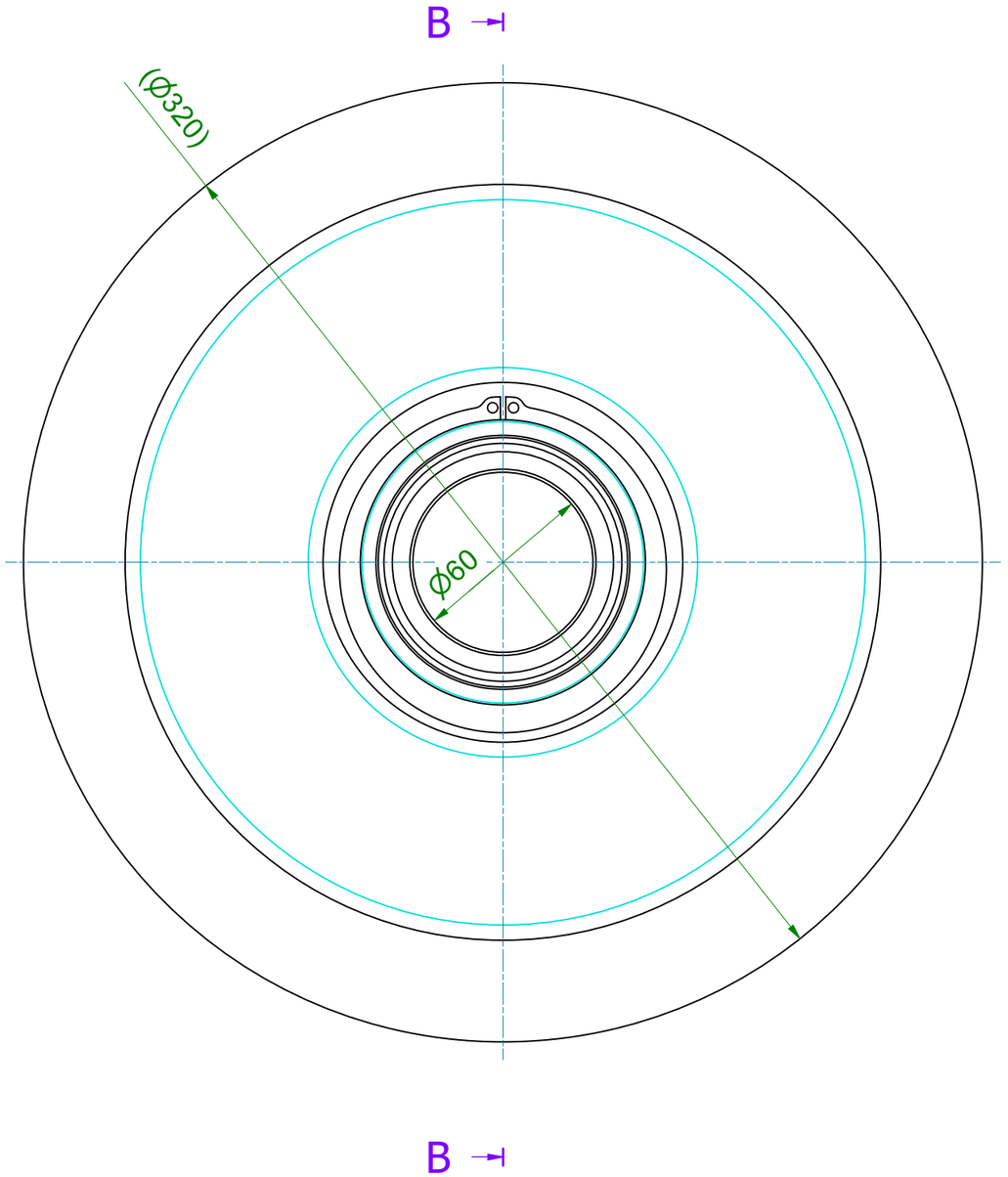



| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | |
|---|---|---|---|---|---|---|
| A | 28/03/2022 | Prima emissione / First issued | CONCRANESrl-Alppolit | Pittana A. | – | Boric M. |

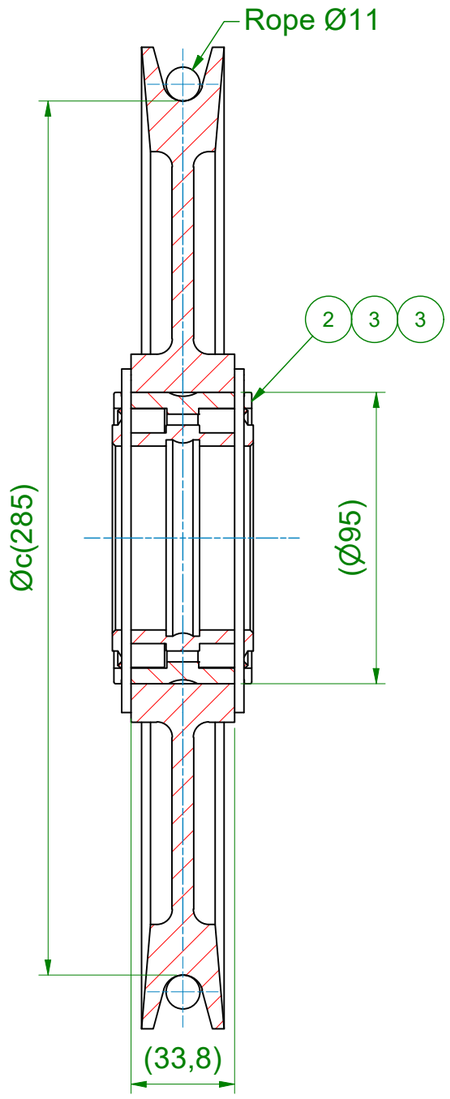
REMAZEL ENGINEERING
Chiuduno (BG) - 24060 - ITALY
Phone : +39-035-68.44.14 - Fax : +39-035-68.78.23
e-mail : info@remazel.com / website : www.remazel.com

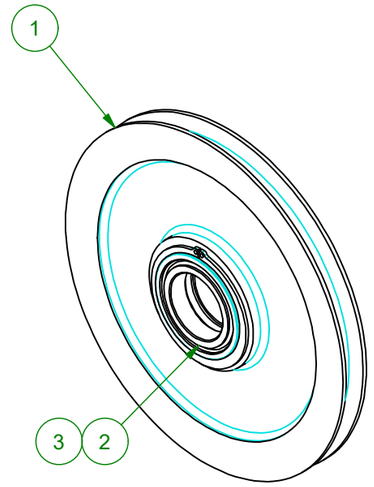
Project / Equipment : **C09-0001**
Weight : 38,4 kg
Title : Assieme premifune / Rope presser assembly
Scale : 1 : 5
Sheet : 2 of 2 — A2
Drawing State: **Work in Progress** / ***FOR CONSTRUCTION***
Q.C.L. : C3
Drawing N° : C09-0001-A0012
Revision : A

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




| EL. | PART NUMBER | DESCRIPTION ENG | Q.TY | WEIGHT |
|---|---|---|---|---|
| 3 | 004-0029-C0221 | Seeger ring for shaft | 2 | 0,1 kg |
| 2 | 006-0003-C0849 | Cylindrical roller bearing | 1 | 1,2 kg |
| 1 | C09-0001-P0066 | Pulley Boom | 1 | 7,3 kg |

| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| A | 27/09/2024 | Prima emissione / First issued | riccardo.sobani | Sobani R. | De Fazio F. | – |

GRADO DI PRECISIONE PER QUOTE LINEARI E ANGOLARI NON TOLLERATE
ACCURACY GRADE FOR LINEAR AND ANGULAR DIMENSIONS NOT TOLERATED
LAVORAZIONI MECCANICHE / MECHANICALS MACHININGS
Lineari-Angolari / Linear-Angular : UNI EN 22768/1-1996 - m
Geometriche / Geometrical : UNI EN 22768/2-1996 - L
CARPENTERIA / WELDING STRUCTURE
Lineari-Angolari / Linear-Angular : UNI EN ISO 13920:2000 - A
Geometriche / Geometrical : UNI EN ISO 13920:2000 - E

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

Project / Equipment :
**C09-0001**

Weight :
8,6 kg

Title :
Assieme Puleggia Øc285 -fune Ø11
Pulley Assembly Øc285 -rope Ø11

Scale :
1 : 2

Sheet :
2 of 2

**A3**

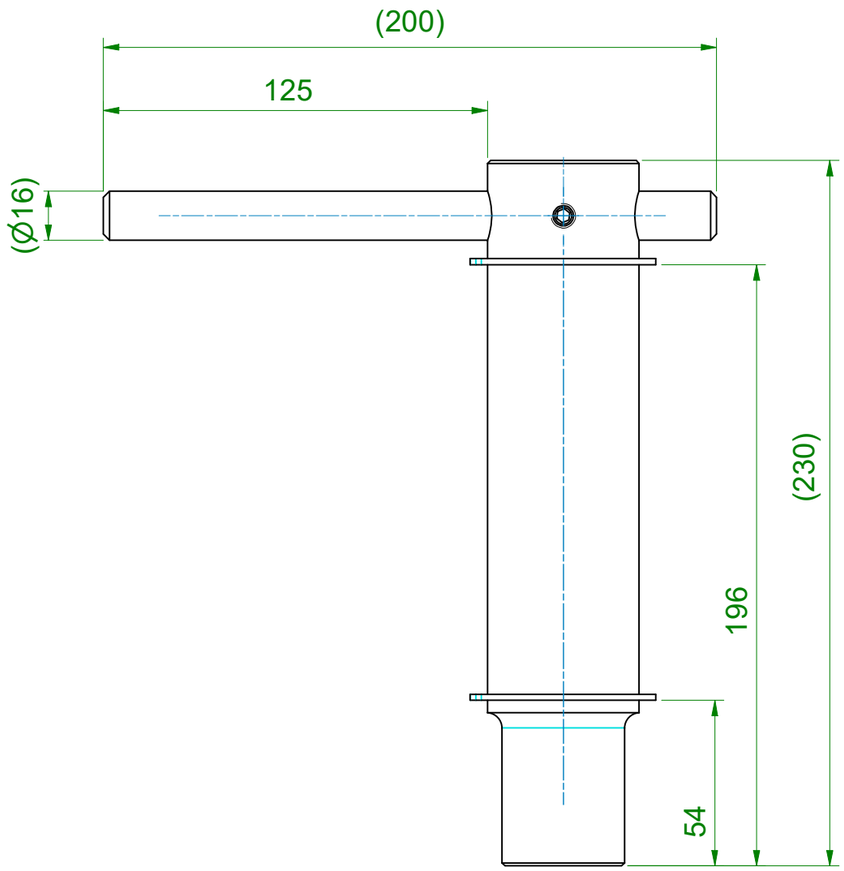
Drawing State:
**Work in Progress**
***FOR CONSTRUCTION***

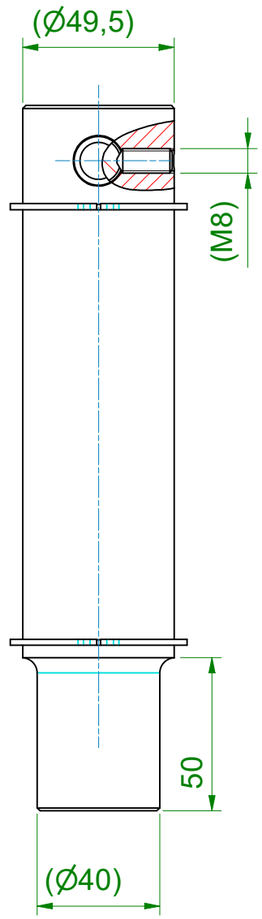
Q.C.L. :
C3

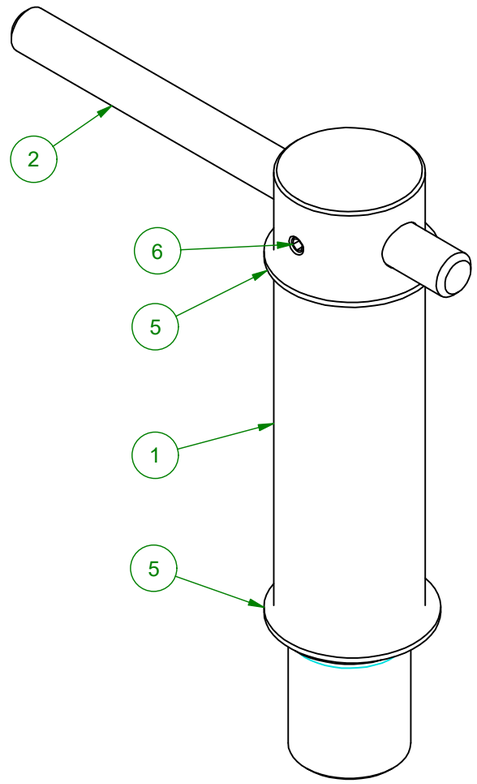
Drawing N° :
C09-0001-A0013

Revision :
A

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| EL. | PART NUMBER | DESCRIPTION ENG | Q.TY | WEIGHT |
|---|---|---|---|---|
| 6 | DA CODIFICARE | Headless screw conical point | 1 | 0 kg |
| 5 | 004-0029-C0071 | Seeger ring for shaft | 2 | 0 kg |
| 2 | C09-0001-P0068 | Handle | 1 | 0,3 kg |
| 1 | C09-0001-P0067 | Locking pin | 1 | 3,2 kg |

| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| A | 03/06/2024 | Prima emissione / First issued | CPI-ENG | Sobani R. | De Fazio F. | – |

PRODOTTI REALIZZATI IN CONFORMITÀ ALLA DIRETTIVA MACCHINE 2006/42/CE
PRODUCTS MANUFACTURED IN COMPLIANCE WITH MACHINERY DIRECTIVE 2006/42/EC
LAVORAZIONI MECCANICHE / MECHANICALS MACHININGS
Lineari-Angolari / Linear-Angular — UNI EN 22768/1:1996 - m
Generiche / Geometrical — UNI EN 22768/2:1996 - L
CARPENTERIA / WELDING STRUCTURE — UNI EN ISO 13920/2000 - A
Lineari-Angolari / Linear-Angular — UNI EN ISO 13920/2000 - E
Generiche / Geometrical — UNI EN ISO 13920/2000 - E

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

Project / Equipment : **C09-0001**

Weight : 3,6 kg

Title : Assieme perno blocco / Locking pin assembly

Scale : 1 : 2

Sheet : 2 of 2

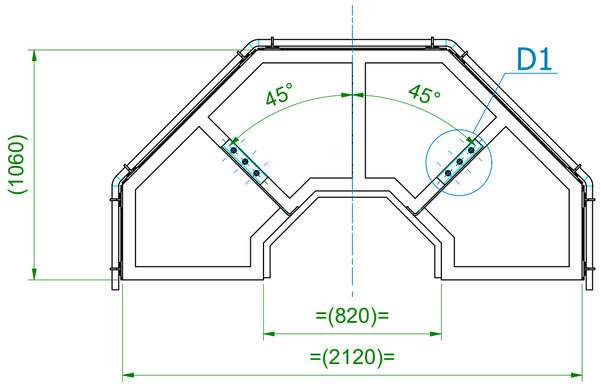
Drawing State: **Work in Progress** / ***FOR CONSTRUCTION***

Q.C.L. : C3

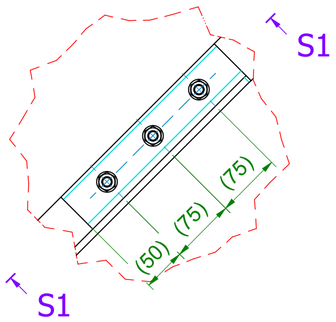
Drawing N° : C09-0001-A0014

Revision : A

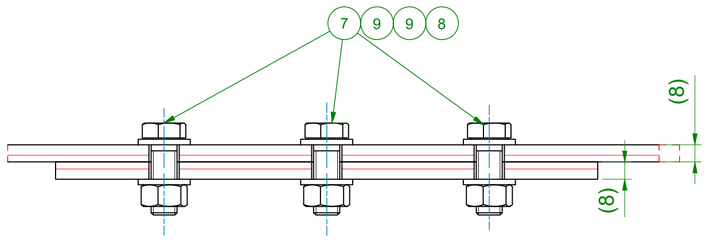
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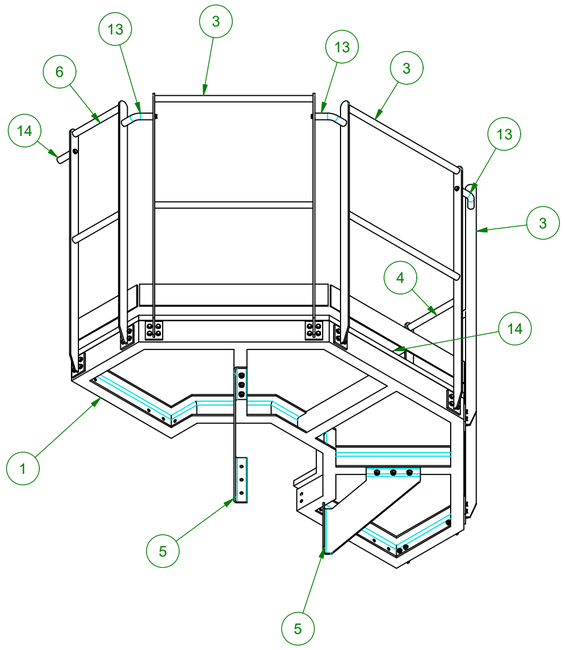


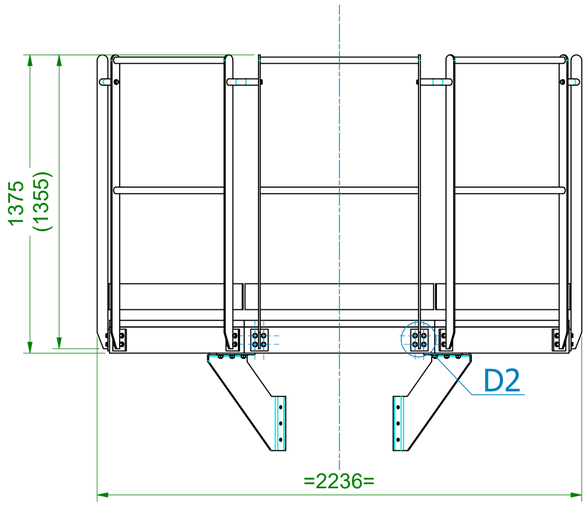

Dett. / Detail **"D1"**
( 1 : 5 )
Typ. (x2)

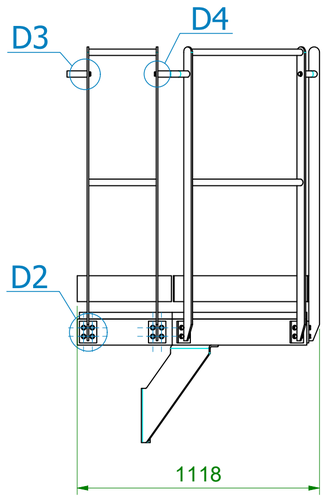



Sez. / Sec. **"S1-S1"**
( 1 : 2 )

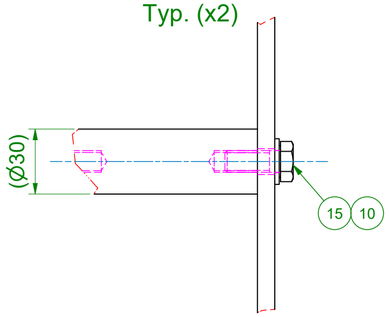


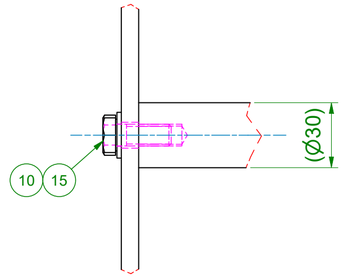



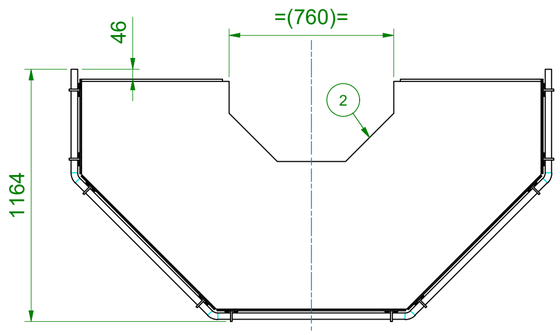




Dett. / Detail **"D3"**
( 1 : 2 )
Typ. (x2)

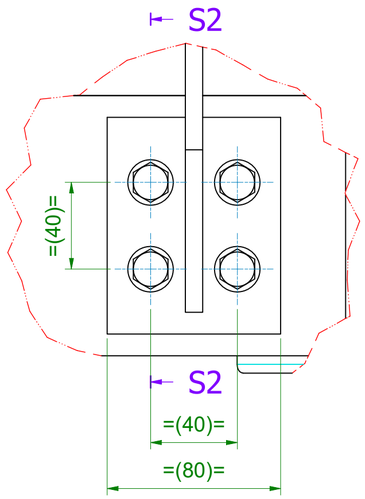



Dett. / Detail **"D4"**
( 1 : 2 )
Typ. (x8)

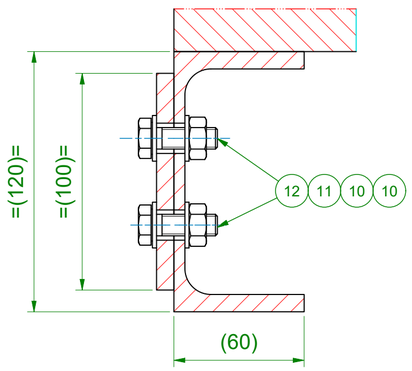



Dett. / Detail **"D2"**
( 1 : 2 )
Typ. (x10)




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



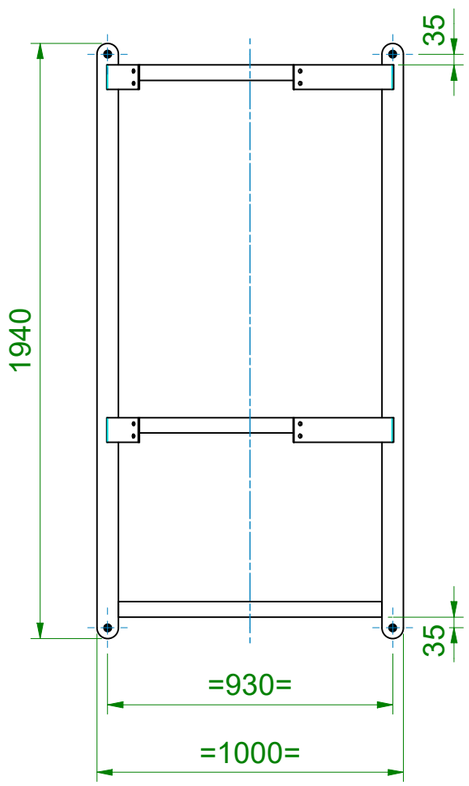

| EL. | PART NUMBER | DESCRIPTION ENG | Q.TY | WEIGHT |
|---|---|---|---|---|
| 15 | 004-0011-C0008 | Hex head screw fully threaded | 10 | 0 kg |
| 14 | C09-0001-P0080 | Handrail Fix | 2 | 0,5 kg |
| 13 | C09-0001-P0079 | Handrail Angular Fix | 4 | 0,9 kg |
| 12 | 004-0011-C0001 | Hex head screw fully threaded | 40 | 0 kg |
| 11 | 004-0021-C0012 | Hexagonal nut | 40 | 0 kg |
| 10 | 004-0023-C0082 | Plain washer | 90 | 0 kg |
| 9 | 004-0023-C0083 | Plain washer | 12 | 0 kg |
| 8 | 004-0021-C0007 | Hexagonal nut | 6 | 0 kg |
| 7 | 004-0011-C0024 | Hex head screw fully threaded | 6 | 0 kg |
| 6 | C09-0001-P0078 | Handrail 3 | 1 | 13,2 kg |
| 5 | C09-0001-P0076 | Fix Gangway | 2 | 7,1 kg |
| 4 | C09-0001-P0075 | Handrail 2 | 1 | 13,2 kg |
| 3 | C09-0001-P0074 | Handrail 1 | 3 | 17,9 kg |
| 2 | C09-0001-P0043 | Fore Floor Gangway | 1 | 379,4 kg |
| 1 | C09-0001-P0034 | Fore Octagonal Gangway | 1 | 93,2 kg |

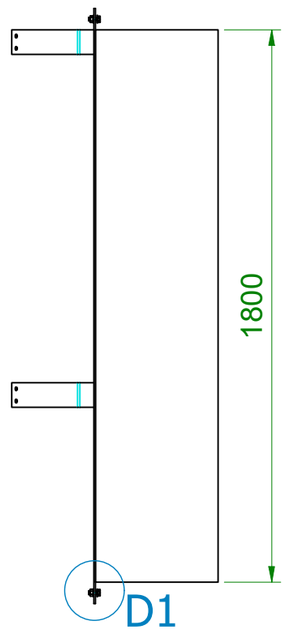
| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| A | 27/09/2024 | Prima emissione / First issued | riccardo.sobani | Sobani R. | De Fazio F. | – |

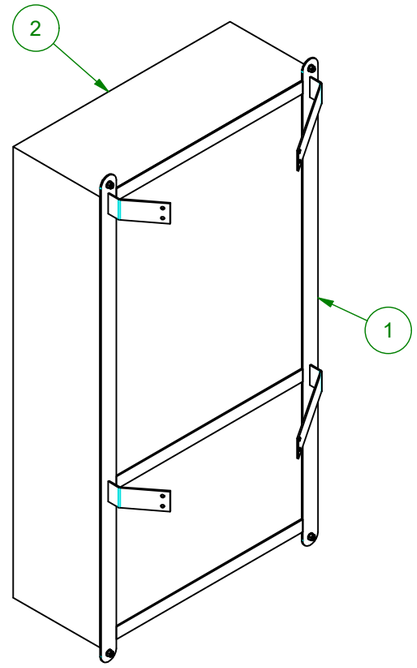
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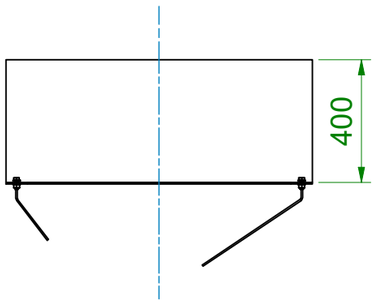
Project / Equipment : **C09-0001**
Weight : 574,1 kg
Title : Assieme Passerrella Anteriore / Fore Gangway Assembly
Scale : 1 : 20
Sheet : 2 of 2 **A2**
Drawing State: **Work in Progress** / ***FOR CONSTRUCTION***
Q.C.L. : C3
Drawing N° : C09-0001-A0015
Revision : A

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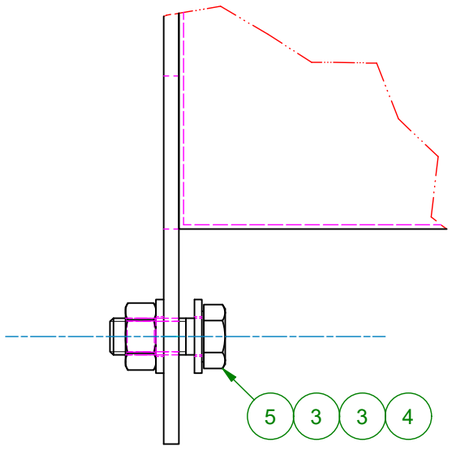



Dett. / Detail **"D1"**
( 1 : 2 )




| EL. | PART NUMBER | DESCRIPTION ENG | Q.TY | WEIGHT |
|---|---|---|---|---|
| 5 | 004-0011-C0060 | Hex head screw fully threaded | 4 | 0 kg |
| 4 | 004-0021-C0007 | Hexagonal nut | 4 | 0 kg |
| 3 | 004-0023-C0083 | Plain washer | 8 | 0 kg |
| 2 | C09-0001-P0012 | Eletric box | 1 | 68,6 kg |
| 1 | C09-0001-P0088 | Chassis El. JB | 1 | 19,7 kg |

| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| A | 27/09/2024 | Prima emissione / First issued | riccardo.sobani | Sobani R. | De Fazio F. | – |

GRADO DI PRECISIONE PER QUOTE LINEARI E ANGOLARI NON TOLLERATE
DEGREE OF PRECISION FOR LINEAR AND ANGULAR DIMENSIONS WITHOUT TOLERANCE
LAVORAZIONI MECCANICHE / MECHANICALS MACHINING
Lineari-Angolari / Linear-Angular : UNI EN 22768/1-1996 - m
Geometriche / Geometrical : UNI EN 22768/2-1996 - L
CARPENTERIA / WELDING STRUCTURE
Lineari-Angolari / Linear-Angular : UNI EN ISO 13920:2000 - A
Geometriche / Geometrical : UNI EN ISO 13920:2000 - E

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

Project / Equipment :
**C09-0001**

Weight :
88,7 kg

Title :
Assieme Quadro Elettrico
Eletric JB Assembly

Scale :
1 : 20

Sheet :
2 of 2

**A3**

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

Q.C.L. :
C3

Drawing N° :
C09-0001-A0016

Revision :
A

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# BASE LOAD POWER HUB (BLPH)

# DAVIT CRANE

# BLOCK DIAGRAM

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

CROSSWIND

ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 01 | 08/08/24 | MPR | GBA | ATR | ISSUE FOR REVIEW (IFR) |
| 00 | 26/07/24 | MPR | GBA | ATR | ISSUE FOR REVIEW (IFR) |

TITLE : BASE LOAD POWER HUB (BLPH)
BLOCK DIAGRAM
FRONT PAGE

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 24-27012-BD-001

SHEET 001

REV. 00

File Name : 24-27012-BD-001 Rev. 01

F.to UNI A3: 420mmx297mm

| REV. | SHEET NUMBER | DESCRIPTION | REF. CODE |
|---|---|---|---|
| 01 | 001 | FRONT PAGE | |
| 01 | 002 | SUMMARY and GENERAL NOTES | |
| 01 | 003 | LEGEND SYMBOL | |
| 01 | 004 | MAIN ELECTRICAL PANEL | |
| 00 | 005 | HOISTING DEVICES | |
| 00 | 006 | ROTATION DEVICES | |
| 00 | 007 | TROLLEY DEVICES | |

## GENERAL NOTES

1:

2:

3:

4:

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CROSSWIND

ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 08/08/24 | MPR | GBA | ATR | ISSUE FOR REVIEW (IFR) |
| 00 | 26/07/24 | MPR | GBA | ATR | ISSUE FOR REVIEW (IFR) |

TITLE : BASE LOAD POWER HUB (BLPH)
BLOCK DIAGRAM
SUMMARY and GENERAL NOTES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 24-27012-BD-001

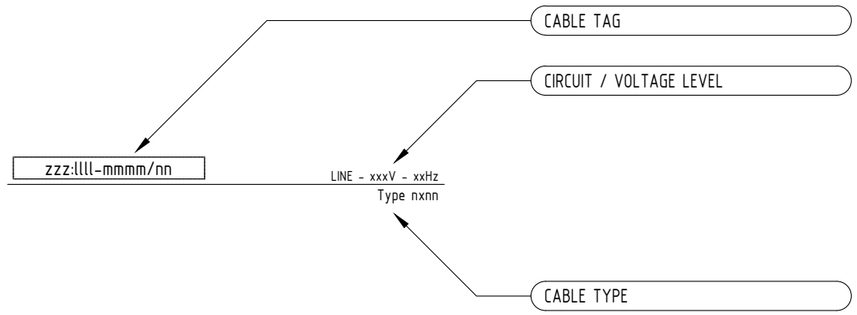
SHEET 002

REV. 00

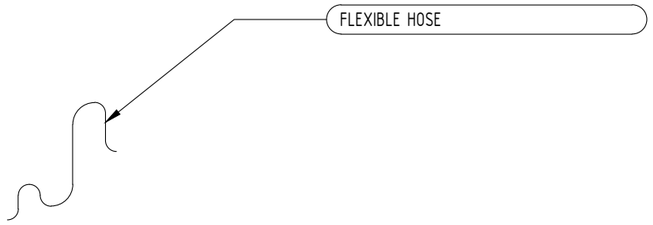
File Name : 24-27012-BD-001 Rev. 01

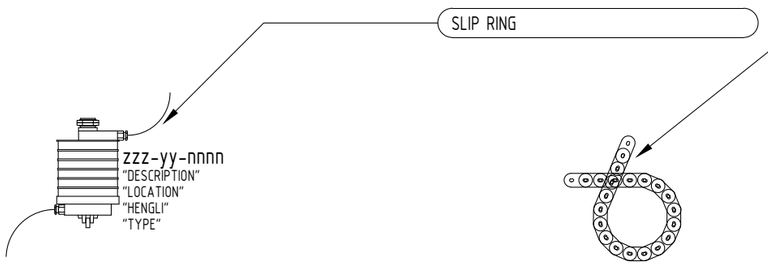
F.to UNI A3: 420mmx297mm

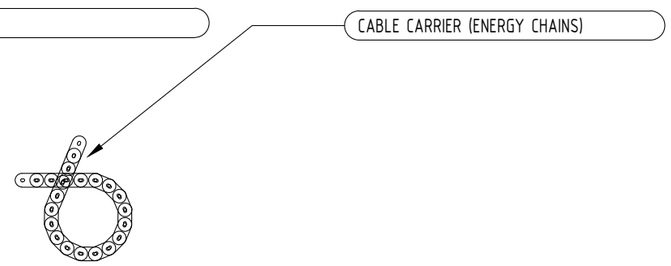
# DAVIT CRANE: 24-27012
# BLOCK DIAGRAM



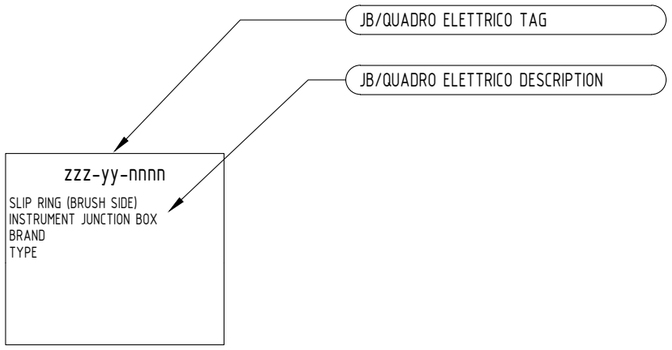

## LEGEND SYMBOL

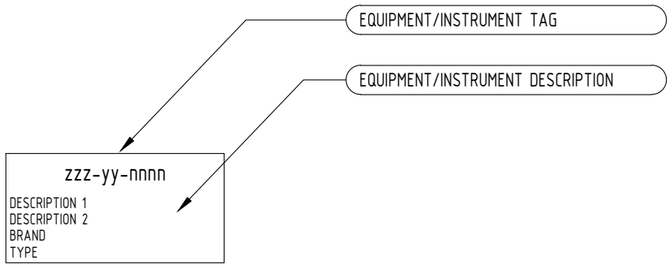


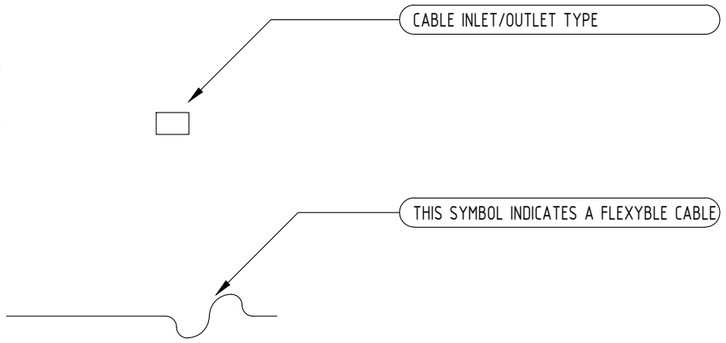



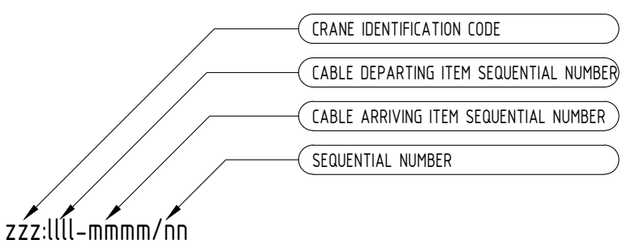

SHIPYARD SCOPE OF SUPPLY CABLE
CONNECTIONS TO BE MADE BY THE SHIPYARD



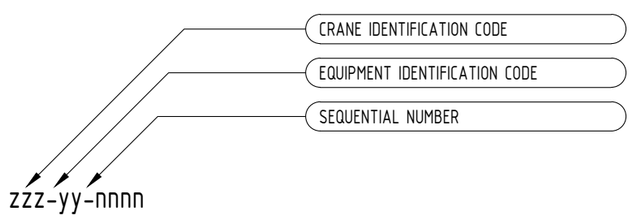




## CABLE TAG LEGEND




## EQUIPMENT TAG LEGEND




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CROSSWIND
ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 08/08/24 | MPR | GBA | ATR | ISSUE FOR REVIEW (IFR) |
| 00 | 26/07/24 | MPR | GBA | ATR | ISSUE FOR REVIEW (IFR) |

TITLE : BASE LOAD POWER HUB (BLPH)
BLOCK DIAGRAM
LEGEND SYMBOL

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 24-27012-BD-001 | SHEET 003 | REV. 00

F.to UNI A3: 420mmx297mm

File Name : 24-27012-BD-001 Rev. 01

POWER SOURCE
400 V - 3ph + N + PE - 50 Hz

20 kW

MAIN POWER - 400 V / 50 Hz
5G16 mm²
M40

PE - PROTECTION EARTH
1G16
M12

## C01-EP-0001

MAIN ELECTRICAL PANEL
AT BASE OF CRANE

### C01-RES-001

HOISTING BRAKE RESISTOR

C01:0001-0015 — BRAKE RESISTOR - 24Vdc, 3G10 — M25

### C01-RES-002

ROTATION AND TROLLEY
BRAKE RESISTOR

C01:0001-0016 — BRAKE RESISTOR - 24Vdc, 3G2,5 — M20

### C01-CHB-0014

ACOUSTIC&VISUAL SIGNALING DEVICE

C01:0001-0014 — CONTROL - 24Vdc, 5G1 — M16

| | | | |
|---|---|---|---|
| C01:0001-0010/01 | M32 | MOTOR - 400 V / 50 Hz, 4G10 | TO P.005 C01-M-0010 |
| C01:0001-0010/02 | M16 | STANDSTILL HEATER- 230 V / 50 Hz, 3G1,5 | TO P.005 C01-M-0010 |
| C01:0001-0010/03 | M16 | PTC, 2x1 | TO P.005 C01-M-0010 |
| C01:0001-0011 | M16 | MOTOR BRAKE - 230V / 50 Hz, 3G1,5 | TO P.005 C01-BR-0011 |
| C01:0001-0020/01 | M20 | MOTOR - 400 V / 50 Hz, 4G2,5 | TO P.6 C01-M-0020 |
| C01:0001-0020/02 | M16 | STANDSTILL HEATER- 230 V / 50 Hz, 3G1,5 | TO P.6 C01-M-0020 |
| C01:0001-0020/03 | M16 | PTC, 2x1 | TO P.6 C01-M-0020 |
| C01:0001-0021 | M16 | MOTOR BRAKE - 400V / 50 Hz, 4G1,5 | TO P.6 C01-BR-0021 |
| C01:0001-0030/01 | M20 | MOTOR - 400 V / 50 Hz, 4G2,5 | TO P.7 C01-M-0030 |
| C01:0001-0030/02 | M16 | STANDSTILL HEATER- 230 V / 50 Hz, 3G1,5 | TO P.7 C01-M-0030 |
| C01:0001-0030/03 | M16 | PTC, 2x1 | TO P.7 C01-M-0030 |
| C01:0001-0031 | M16 | MOTOR BRAKE - 400V / 50 Hz, 4G1,5 | TO P.7 C01-BR-0031 |
| C01:0001-0012 | M20 | 24Vdc, 5x2x0.5 Shielded | TO P.005 C01-ENC-0012 |
| C01:0001-0002/01 | M32 | 24Vdc, 19G1 | TO P.005 C01-JB-0002 |
| C01:0001-0002/02 | M16 | 4.20mA, 2X1 | TO P.005 C01-JB-0002 |
| C01:0001-0013 | M16 | CANOpen, 5x0,5 | TO P.5 C01-ENC-0013 |
| C01:0001-0017 | M16 | MOTOR BRAKE - 230V / 50 Hz, 3G1,5 | TO P.005 C01-BR-0017 |

SHIPYARD SCOPE OF SUPPLY CABLE
CONNECTIONS TO BE MADE BY THE SHIPYARD

SHIYARD SCOPE OF SUPPLY — REMAZEL SCOPE OF SUPPLY

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| 00 | 26/07/24 | MPR | GBA | ATR | ISSUE FOR REVIEW (IFR) |

TITLE : BASE LOAD POWER HUB (BLPH)
BLOCK DIAGRAM
MAIN ELECTRICAL PANEL

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

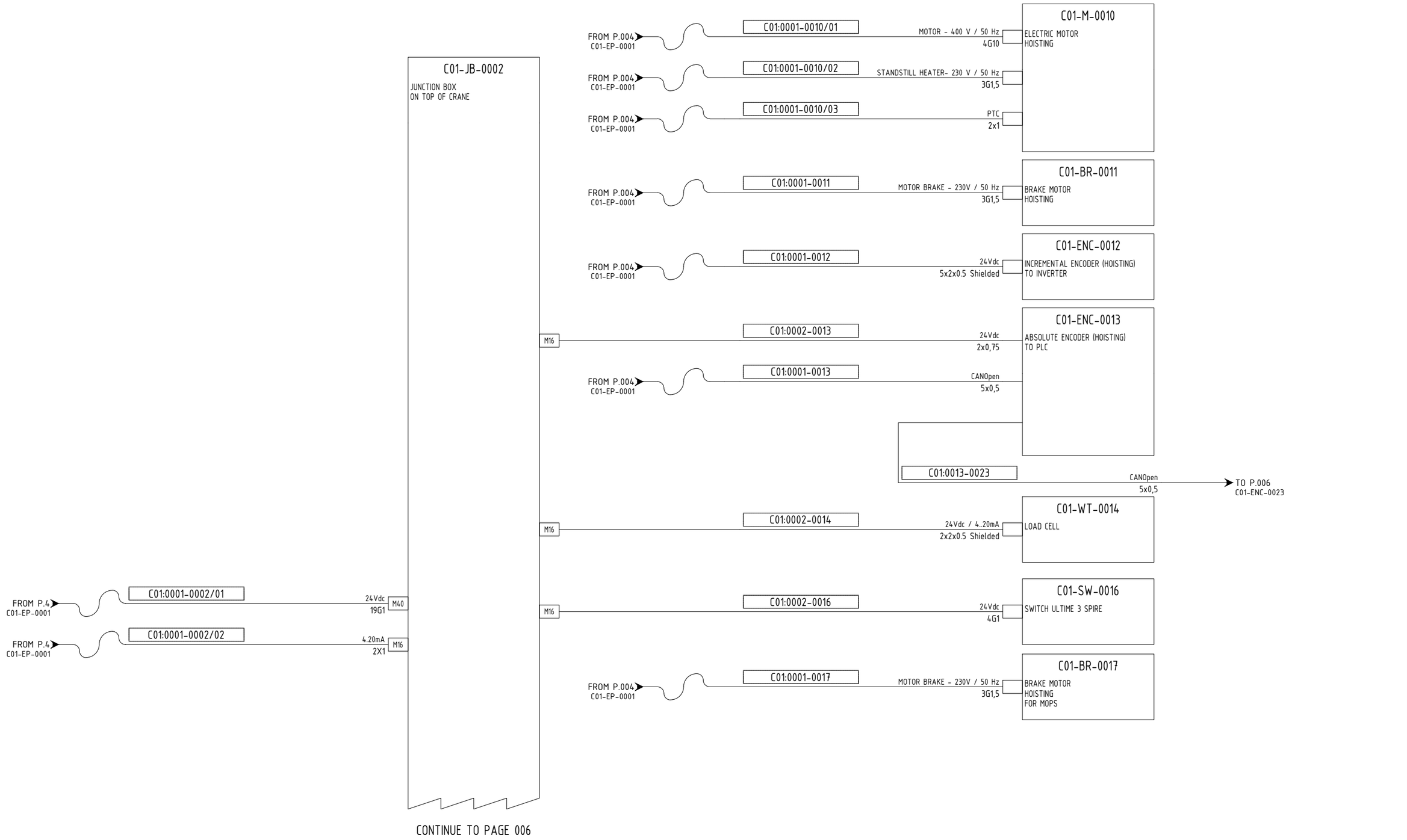
DRAWING NO. 24-27012-BD-001

SHEET 004

REV. 00

F.to UNI A3: 420mmx297mm

File Name : 24-27012-BD-001 Rev. 01




CONTINUE TO PAGE 006

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| 00 | 26/07/24 | MPR | GBA | ATR | ISSUE FOR REVIEW (IFR) |

TITLE : BASE LOAD POWER HUB (BLPH)
BLOCK DIAGRAM
HOISTING DEVICES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 24-27012-BD-001

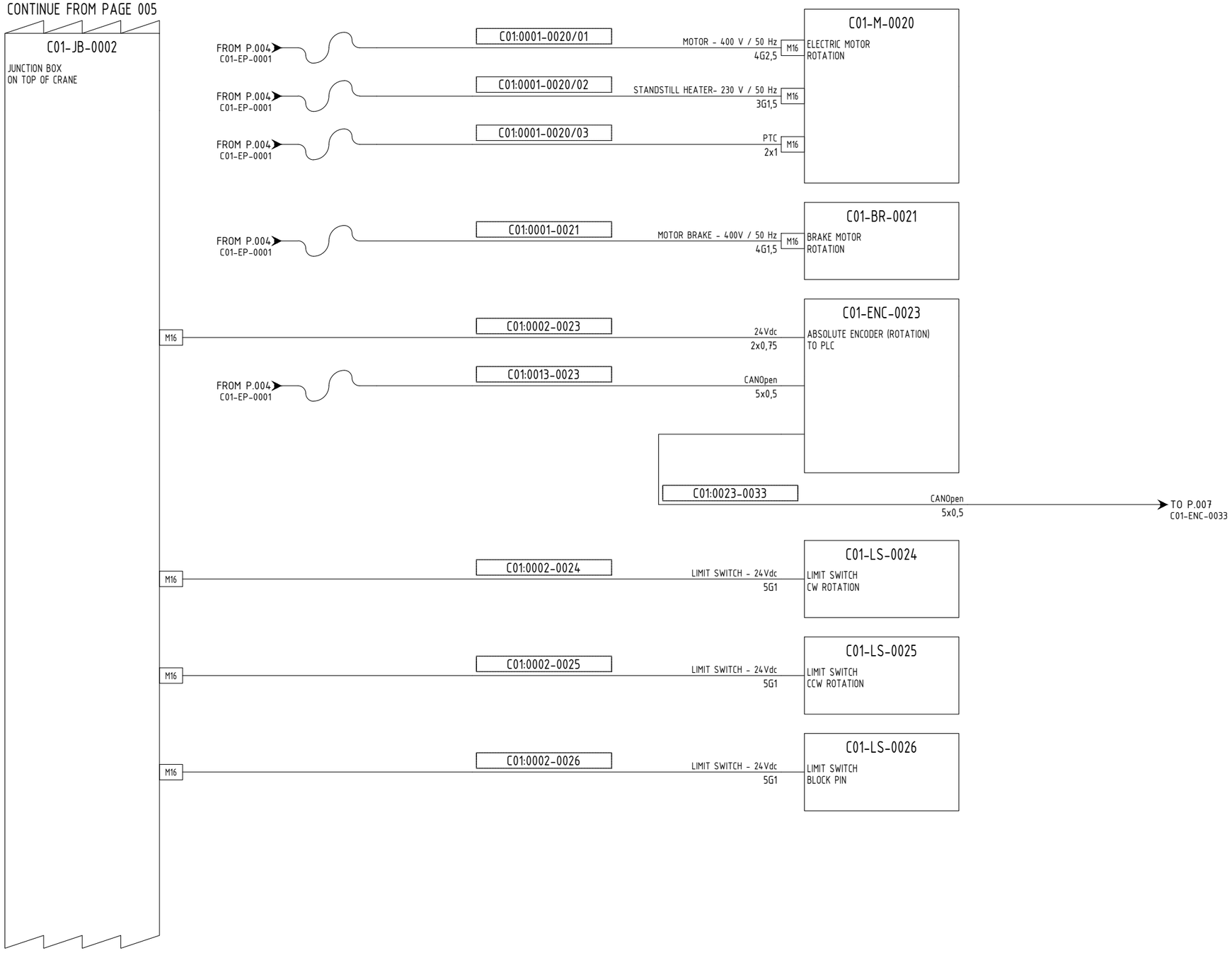
SHEET 005

REV. 00

F.to UNI A3: 420mmx297mm

File Name : 24-27012-BD-001 Rev. 01

CONTINUE FROM PAGE 005




CONTINUE TO PAGE 007

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TITLE : BASE LOAD POWER HUB (BLPH)
BLOCK DIAGRAM
ROTATION DEVICES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 24-27012-BD-001

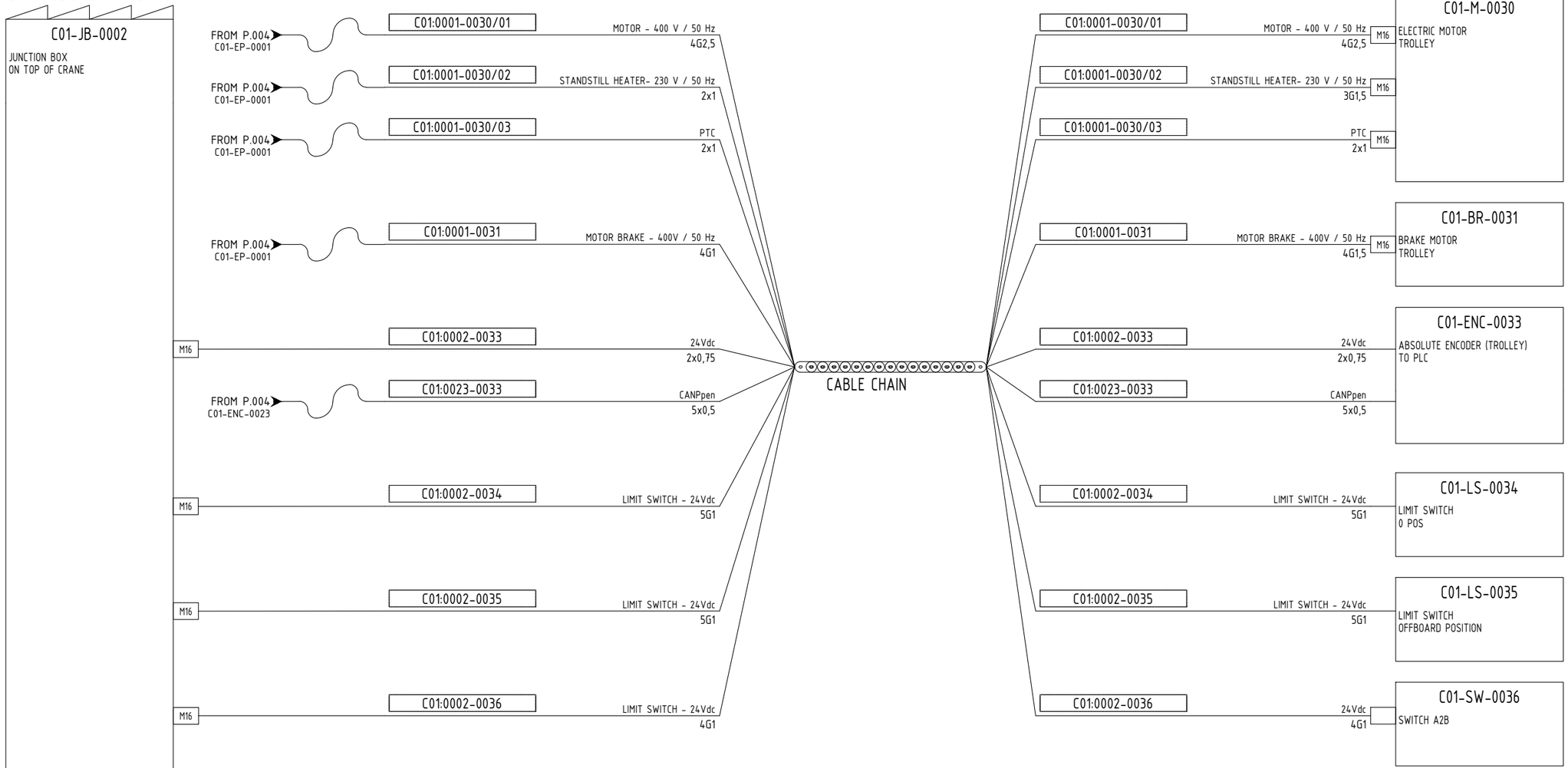
SHEET 006

REV. 00

F.to UNI A3: 420mmx297mm

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CONTINUE FROM PAGE 006




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TITLE : BASE LOAD POWER HUB (BLPH)
BLOCK DIAGRAM
TROLLEY DEVICES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 24-27012-BD-001

SHEET 007

REV. 00

File Name : 24-27012-BD-001 Rev. 01

F.to UNI A3: 420mmx297mm

# BASE LOAD POWER HUB (BLPH)

# DAVIT CRANE

# WIRING DIAGRAM

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| 01 | 03/09/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |
| 00 | 26/07/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |

TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1724001010-MAC-DG-00012

SHEET 1

REV. 01

File Name : 24-27012-WD-001 Rev. 00

F.to UNI A3: 420mmx297mm

| REV. | SHEET NUMBER | DESCRIPTION | REF. CODE |
|---|---|---|---|
| 01 | 1 | FRONT PAGE | |
| 01 | 2 | SUMMARY and GENERAL NOTES | |
| 01 | 10 | SYMBOLS LEGEND | |
| 01 | 30 | INCOMING POWER LINE | |
| 01 | 32 | ENCLOSURE SERVICE | |
| 01 | 34 | UPS AND STANDSTILL HEATERS | |
| 01 | 40 | 24Vdc SUPPLY | |
| 01 | 50 | HOISTING VFD CONNECTIONS | |
| 01 | 52 | ROTATION AND TROLLEY VFD CONNECTIONS | |
| 01 | 54 | ROTATION AND TROLLEY MOTORS | |
| 01 | 56 | MOTOR BRAKES | |
| 01 | 60 | CPU | |
| 01 | 62 | SAFETY MODULES | |
| 01 | 64 | SAFETY MODULES | |
| 01 | 66 | DIGITAL INPUT | |
| 01 | 68 | DIGITAL INPUT | |
| 01 | 70 | DIGITAL INPUT | |
| 01 | 72 | DIGITAL INPUT | |
| 01 | 74 | DIGITAL OUTPUT | |
| 01 | 76 | DIGITAL OUTPUT | |
| 01 | 78 | ANALOG INPUT AND OUTPUT | |
| 01 | 80 | LOAD CELL | |
| 01 | 82 | HOISTING AND ROTATION ENCODERS | |
| 01 | 84 | TROLLEY ENCODER | |
| 01 | 86 | MOPS COMMAND | |
| 01 | 90 | TERMINAL STRIP X01 | |
| 01 | 92 | TERMINAL STRIP XS1 | |
| 01 | 94 | TERMINAL STRIP JB / X02 | |
| | | | |
| | | | |
| | | | |

## GENERAL NOTES

1:

2:

3:

4:

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TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

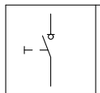
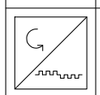
DRAWING NO. 1724001010-MAC-DG-00012

SHEET 2

REV. 01

File Name : 24-27012-WD-001 Rev. 00

F.to UNI A3: 420mmx297mm

| | | | | | |
|---|---|---|---|---|---|
|  | MANUAL POWER DISCONNECTING SWITCH |  | FAN | | |
|  | FUSE POWER DISCONNECTING SWITCH |  | STANDSTILL HEATER | | |
|  | THERMAL-MAGNETIC CIRCUIT BREAKER |  | NORMALLY OPEN THERMOSTAT | | |
|  | DIFFERENTIAL THERMAL-MAGNETIC CIRCUIT BREAKER |  | NORMALLY CLOSE THERMOSTAT | | |
|  | CONTACTOR / RELE' COIL |  | LAMP | | |
|  | POWER CONTACT |  | EMERGENCY PUSH BUTTON | | |
|  | NORMALLY OPEN CONTACT |  | NORMALLY OPEN PUSH BUTTON | | |
|  | NORMALLY CLOSE CONTACT |  | NORMALLY OPEN KEY SELECTOR | | |
|  | SWITCHING POWER SUPPLY |  | NORMALLY CLOSE LIMIT SWITCH | | |
|  | MOTOR |  | INDUCTIVE LIMIT SWITCH | | |
|  | MOTOR THERMAL PROTECTION |  | HORN | | |
|  | ENCODER |  | LOAD CELL | | |
|  | MOTOR BRAKE |  | PROTECTIVE EARTH | | |
|  | SERVICE SOCKET | | | | |

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| 01 | 03/09/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |
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TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
SYMBOLS LEGEND

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1724001010-MAC-DG-00012

SHEET 10

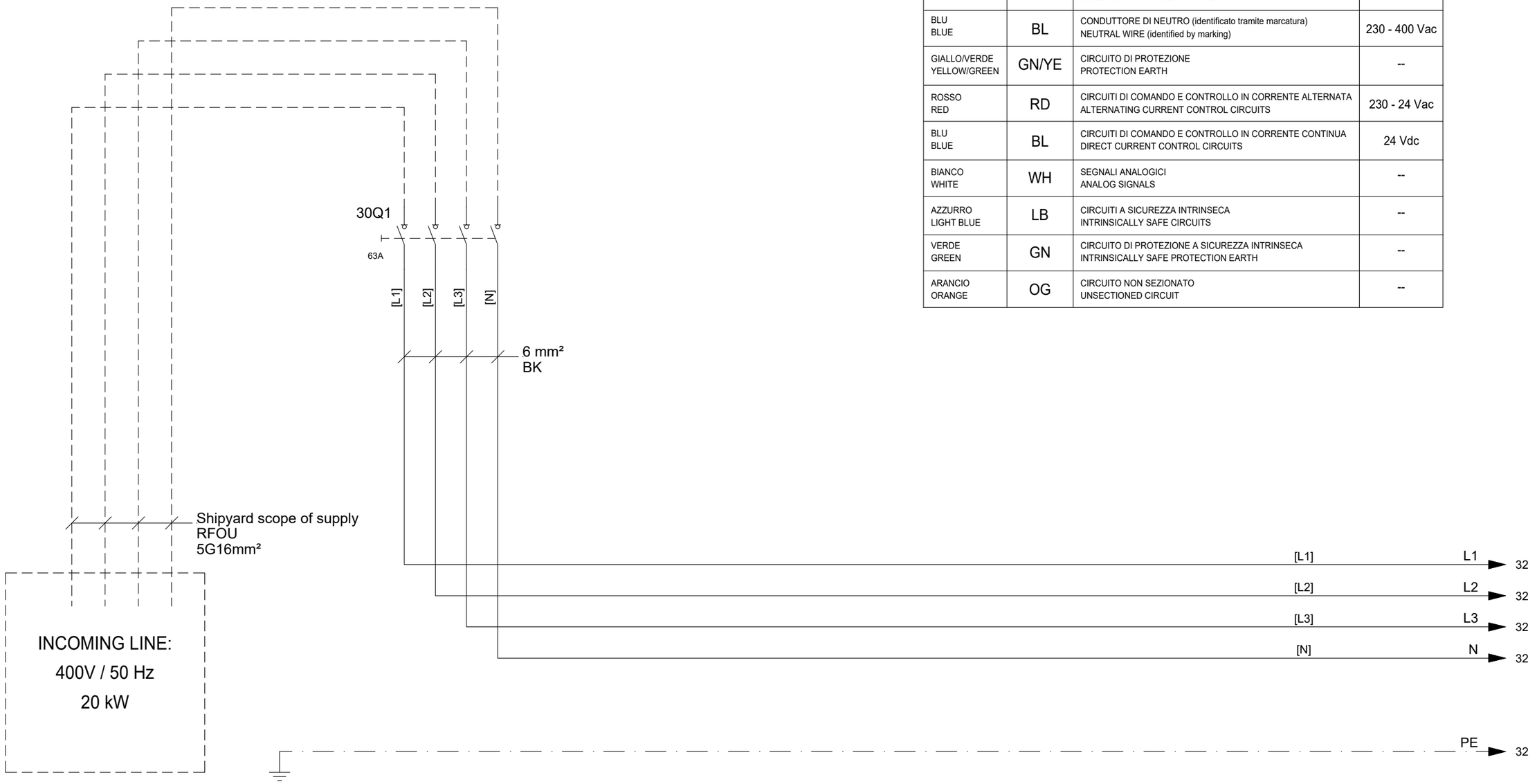
REV. 01

File Name : 24-27012-WD-001 Rev. 00

F.to UNI A3: 420mmx297mm

## IDENTIFICAZIONE CONDUTTORI (CEI EN 60204-32)
## WIRES IDENTIFICATION

| COLORE<br>COLOR | LEGENDA<br>LEGEND | TIPO DI CIRCUITO<br>CIRCUIT TYPE | TENSIONE<br>VOLTAGE |
|---|---|---|---|
| NERO<br>BLACK | BK | CIRCUITI DI ALIMENTAZIONE IN CORRENTE ALTERNATA<br>ALTERNATING CURRENT SUPPLY CIRCUITS | 690 - 400 Vac |
| ROSSO<br>RED | RD | CIRCUITI DI ALIMENTAZIONE IN CORRENTE ALTERNATA<br>ALTERNATING CURRENT SUPPLY CIRCUITS | 230 Vac |
| BLU<br>BLUE | BL | CONDUTTORE DI NEUTRO (identificato tramite marcatura)<br>NEUTRAL WIRE (identified by marking) | 230 - 400 Vac |
| GIALLO/VERDE<br>YELLOW/GREEN | GN/YE | CIRCUITO DI PROTEZIONE<br>PROTECTION EARTH | -- |
| ROSSO<br>RED | RD | CIRCUITI DI COMANDO E CONTROLLO IN CORRENTE ALTERNATA<br>ALTERNATING CURRENT CONTROL CIRCUITS | 230 - 24 Vac |
| BLU<br>BLUE | BL | CIRCUITI DI COMANDO E CONTROLLO IN CORRENTE CONTINUA<br>DIRECT CURRENT CONTROL CIRCUITS | 24 Vdc |
| BIANCO<br>WHITE | WH | SEGNALI ANALOGICI<br>ANALOG SIGNALS | -- |
| AZZURRO<br>LIGHT BLUE | LB | CIRCUITI A SICUREZZA INTRINSECA<br>INTRINSICALLY SAFE CIRCUITS | -- |
| VERDE<br>GREEN | GN | CIRCUITO DI PROTEZIONE A SICUREZZA INTRINSECA<br>INTRINSICALLY SAFE PROTECTION EARTH | -- |
| ARANCIO<br>ORANGE | OG | CIRCUITO NON SEZIONATO<br>UNSECTIONED CIRCUIT | -- |





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TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
INCOMING POWER LINE

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1724001010-MAC-DG-00012

SHEET 30

REV. 01

File Name : 24-27012-WD-001 Rev. 00

F.to UNI A3: 420mmx297mm

30 L1 — [L1] — [L1] — L1 — 34
30 L2 — [L2] — [L2] — L2 — 34
30 L3 — [L3] — [L3] — L3 — 34
30 N — [N] — [N] — N — 34
30 PE — PE — 34

[L1] [L2] [L3] [N] — 1,5 mm² BK x 3 + BL

32Q1 — 2A — 1 3 5 — 2 4 6

[L1] [N] — 1,5 mm² RD + BL + GN/YE

32Q2 — C 6A — 1 3 — 2 4

[L2] [N] — 1,5 mm² RD + BL + GN/YE

32Q3 — 2A

1,5 mm² BK

32E1 Stigo ZR 011 — θ θ — 11 12 23 24

[32-1] [32-1] [32-2] [32-3] [32-4]

32KA1 — 66

32HL1 32HL2 32HL3

[32-5] [32-6]

32X1

[32-7] [32-8]

32R1

32E2 — M 1AC

400Vac VOLTAGE PRESENCE

ELECTRIC SOCKET

HEATER FAN

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
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TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
ENCLOSURE SERVICE

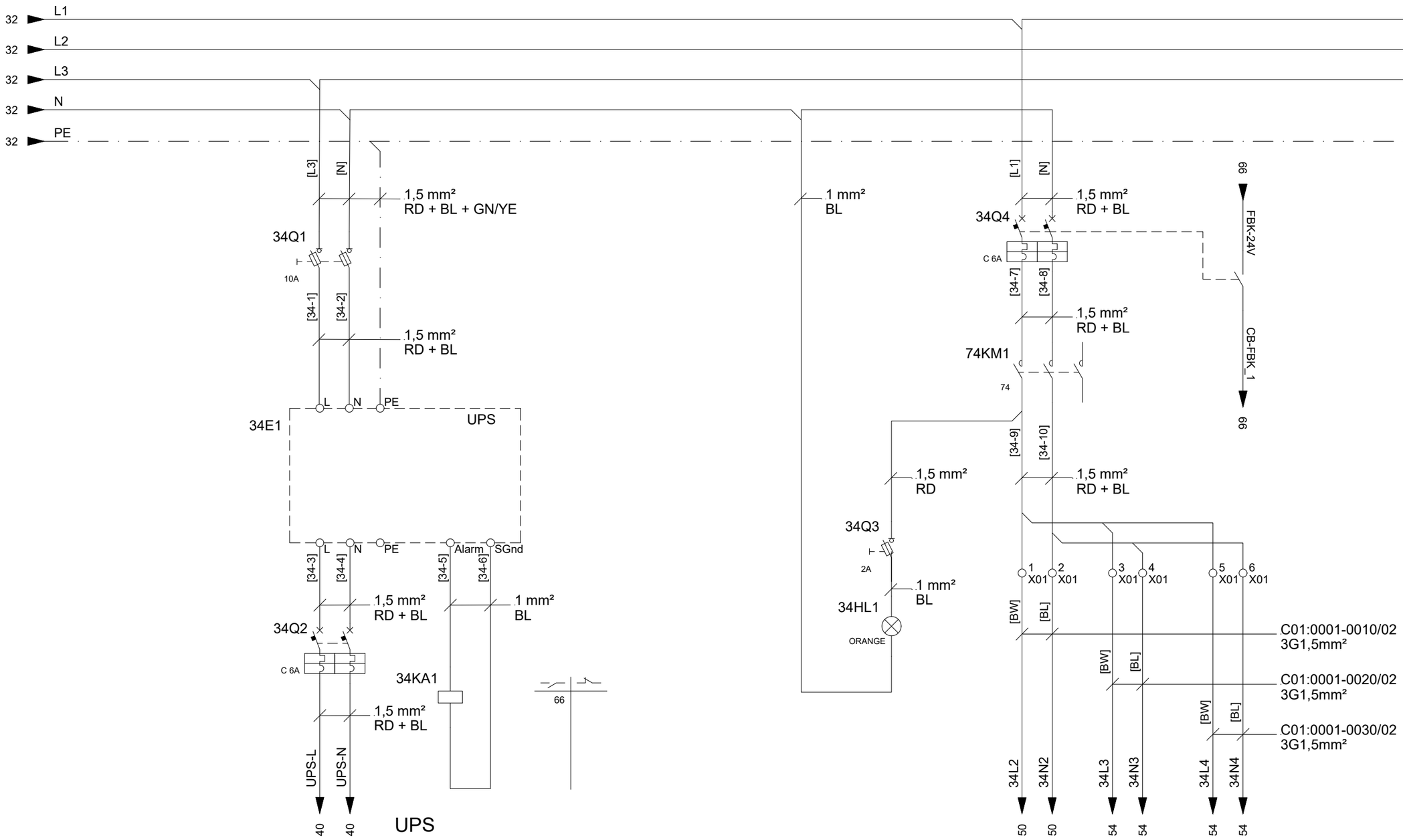
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3 | DRAWING NO. 1724001010-MAC-DG-00012 | SHEET 32 | REV. 01

File Name : 24-27012-WD-001 Rev. 00

F.to UNI A3: 420mmx297mm




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TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
UPS AND STANDSTILL HEATERS

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

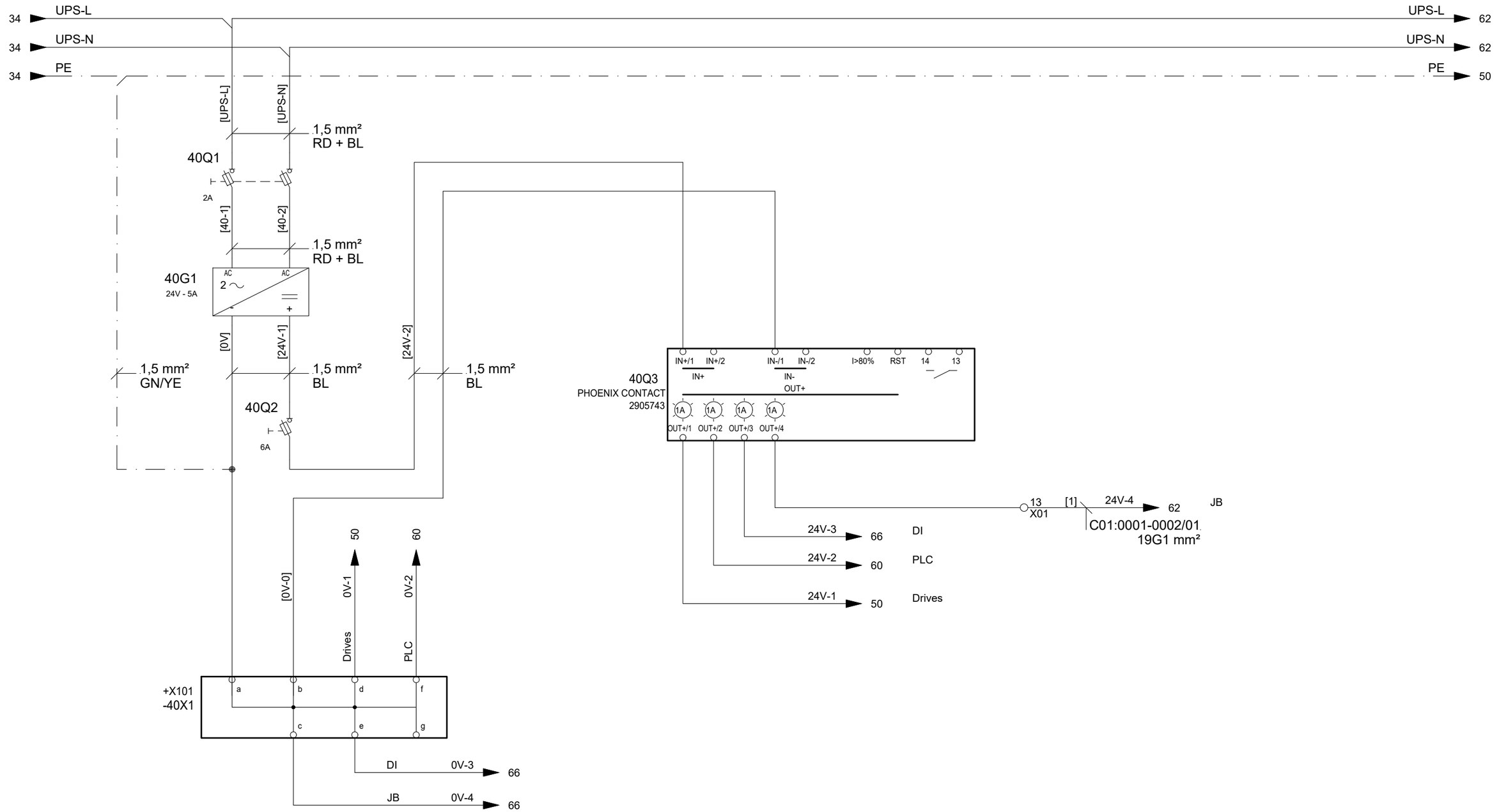
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SHEET 34

REV. 01

File Name : 24-27012-WD-001 Rev. 00

F.to UNI A3: 420mmx297mm




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ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 03/09/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |
| 00 | 26/07/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |

TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
24Vdc SUPPLY

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

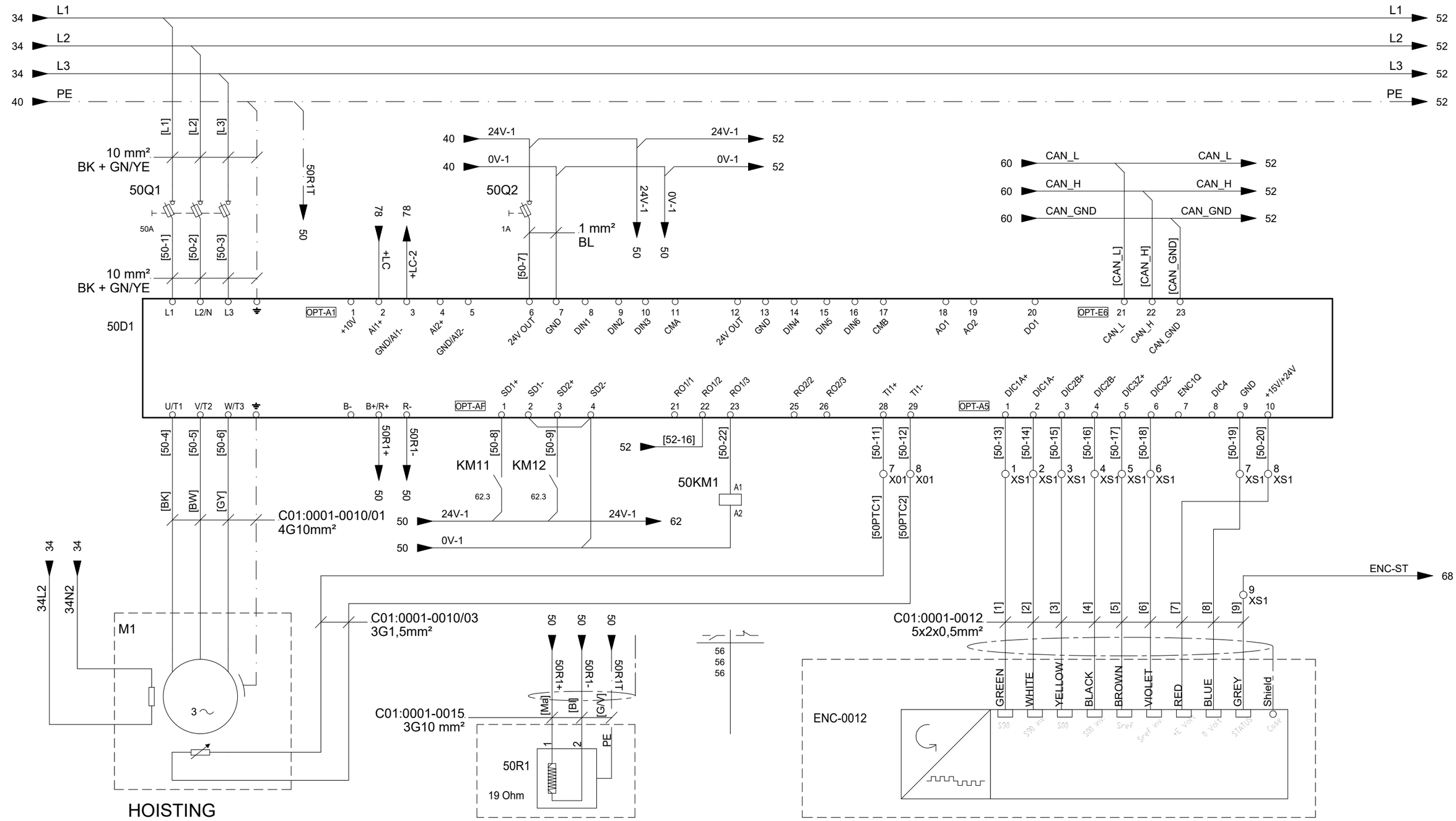
DRAWING NO. 1724001010-MAC-DG-00012

SHEET 40

REV. 01

File Name : 24-27012-WD-001 Rev. 00

F.to UNI A3: 420mmx297mm




| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 03/09/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |
| 00 | 26/07/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |

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CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
HOISTING VFD CONNECTIONS

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1724001010-MAC-DG-00012

SHEET 50

REV. 01

F.to UNI A3: 420mmx297mm

File Name : 24-27012-WD-001 Rev. 00

50 L1 → L1 56
50 L2 → L2 56
50 L3 → L3 56
50 PE → PE 56

[L1] [L2] [L3]
2,5 mm² BK + GN/YE
52Q1
16A
[52-1] [52-2] [52-3]
2,5 mm² BK + GN/YE

50 24V-1
50 0V-1
52Q2
2A
[52-7]
1 mm² BL
24V-1 → 52
0V-1 → 52

50 CAN_L → CAN_L 60
50 CAN_H → CAN_H 60
50 CAN_GND → CAN_GND 60
[CAN_L] [CAN_H] [CAN_GND]

52D1

L1 L2/N L3

OPT-A1: 1 +10V | 2 AI1+ | 3 GND/AI1- | 4 AI2+ | 5 GND/AI2- | 6 24V OUT | 7 GND | 8 DIN1 | 9 DIN2 | 10 DIN3 | 11 CMA | 12 24V OUT | 13 GND | 14 DIN4 | 15 DIN5 | 16 DIN6 | 17 CMB | 18 AO1 | 19 AO2 | 20 DO1

OPT-E6: 21 CAN_L | 22 CAN_H | 23 CAN_GND

OPT-AF: SD1+ | SD1- | SD2+ | SD2-

OPT-A5: RO1/1 | RO1/2 | RO1/3 | RO2/2 | RO2/3 | TI1+ | TI1- | DIC1A+ | DIC1A- | DIC2B+ | DIC2B- | DIC3Z+ | DIC3Z- | ENC1Q | DIC4 | GND | +15V/+24V

OPT-B5: 22 23 25 26 28 29

U/T1 V/T2 W/T3 B- B+/R+ R-

[52-4] [52-5] [52-6] [52-8] [52-9] [52-11] [52-13] [52-16] [52-17] [52-14] [52-15]

KA13
62.4
[52-16] → 50

KM11 62.3
KM12 62.3

52KM2 [52-10] 52
52KM1 [52-12] 52

52KM1 A1/A2
52KM2 A1/A2
9 X01 | 10 X01 | 11 X01 | 12 X01
52KM3 A1/A2
52KM4 A1/A2

52 24V-1
52 0V-1

54 54 54 52
54 54 54 52
56 56 56
56 56 56

52PCT1 52PCT2 52PCT3 52PCT4 → 54

52L1 52L2 52L3 52GND → 54

[Ma] [Bl] [G/V] PE
C01:0001-0016
3G2,5mm²
52R1
63 Ohm

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
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| 00 | 26/07/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |

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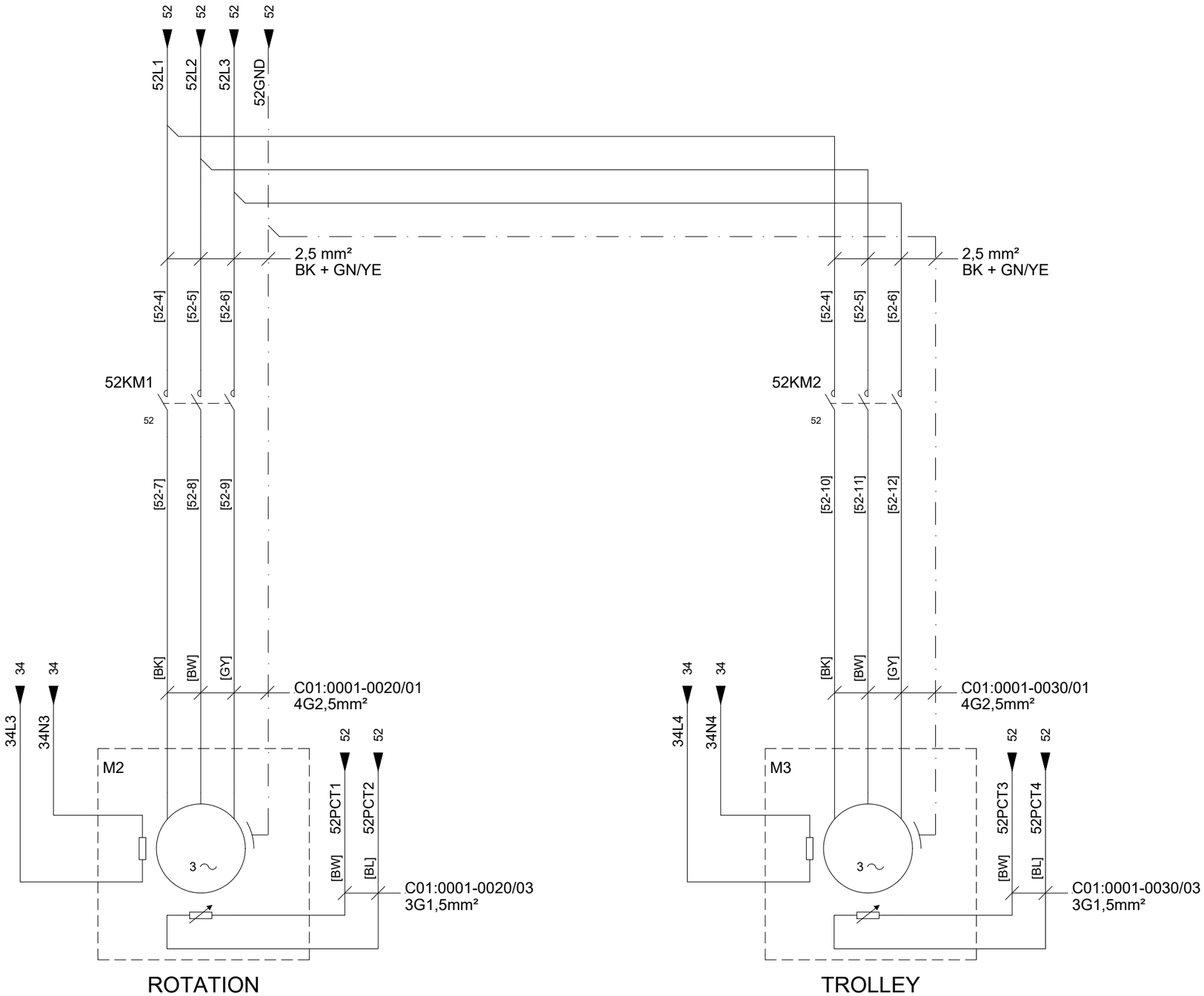
CROSSWIND
ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
ROTATION AND TROLLEY VFD CONNECTIONS

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK
SCALE : NTS
A3
DRAWING NO. 1724001010-MAC-DG-00012
SHEET 52
REV. 01

File Name : 24-27012-WD-001 Rev. 00

F.to UNI A3: 420mmx297mm




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CROSSWIND
ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 03/09/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |
| 00 | 26/07/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |

TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
ROTATION AND TROLLEY MOTORS

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

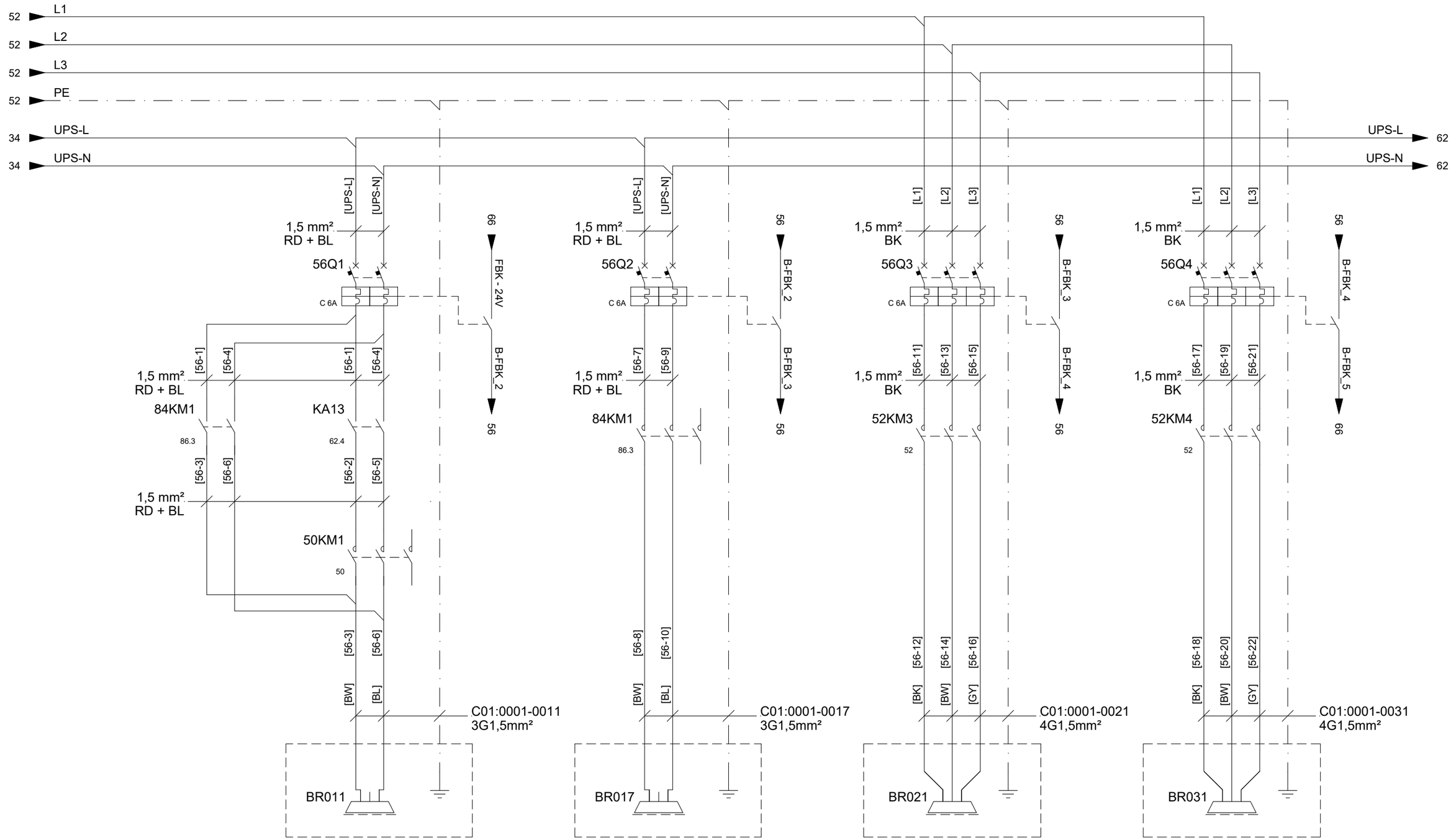
DRAWING NO. 1724001010-MAC-DG-00012

SHEET 54

REV. 01

File Name : 24-27012-WD-001 Rev. 00

F.to UNI A3: 420mmx297mm




| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 03/09/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |
| 00 | 26/07/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |

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CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
MOTOR BRAKES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

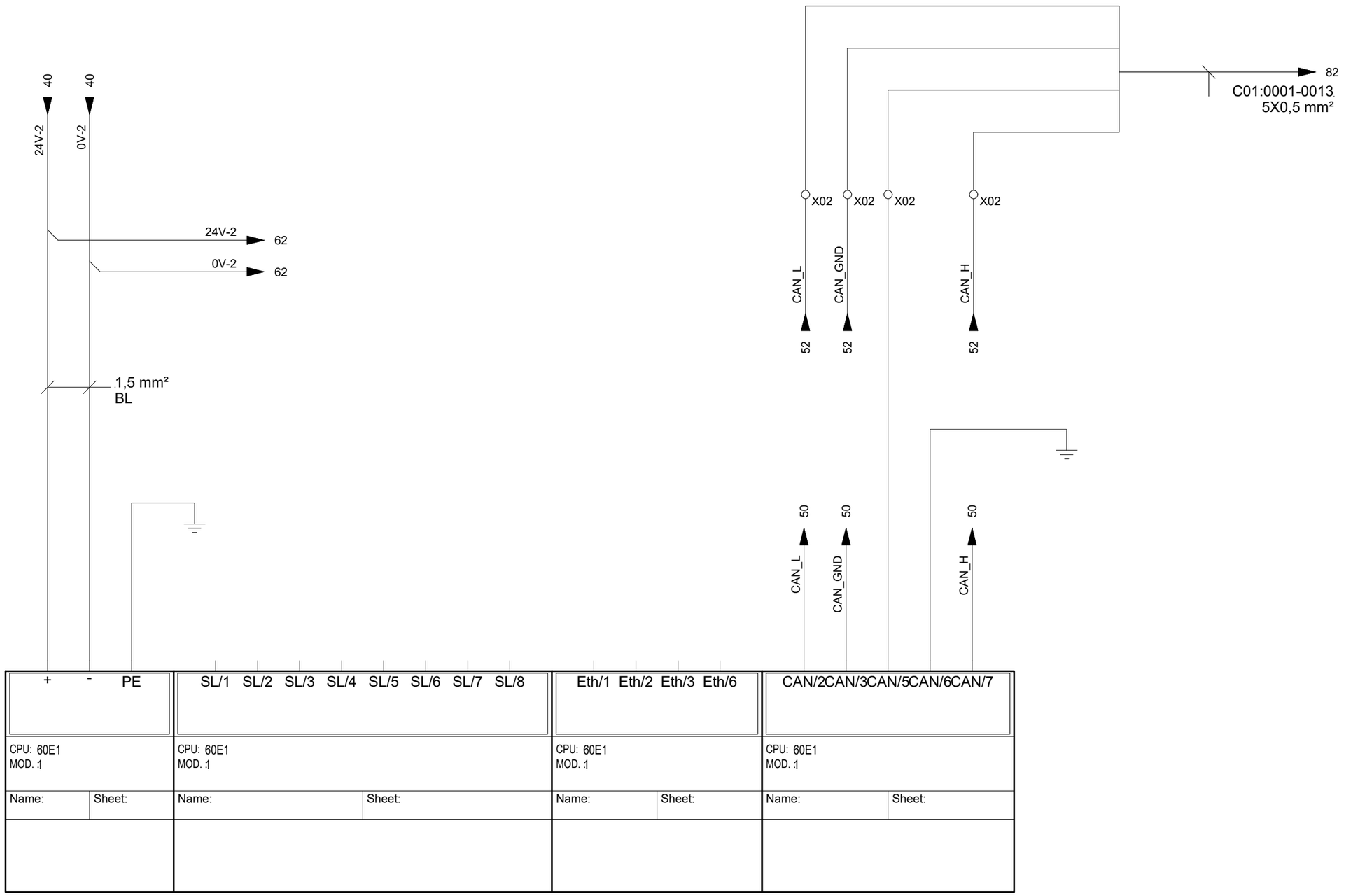
DRAWING NO. 1724001010-MAC-DG-00012

SHEET 56

REV. 01

File Name : 24-27012-WD-001 Rev. 00

F.to UNI A3: 420mmx297mm




CPU

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CROSSWIND
ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 03/09/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |
| 00 | 26/07/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |

TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
CPU

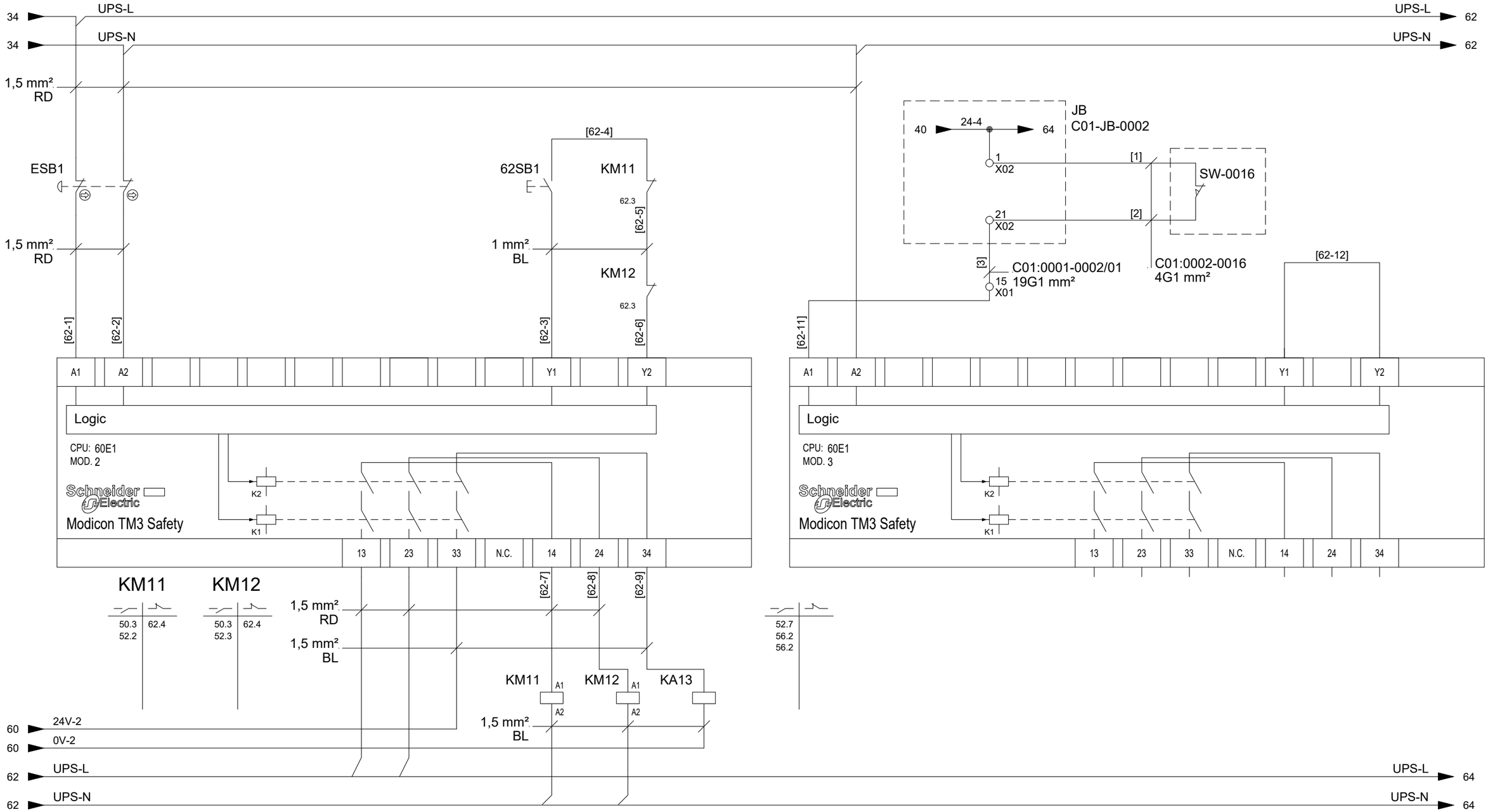
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

| A3 | DRAWING NO. 1724001010-MAC-DG-00012 | SHEET 60 | REV. 01 |
|---|---|---|---|

File Name : 24-27012-WD-001 Rev. 00

F.to UNI A3: 420mmx297mm




EESD

PAYOUT LIMIT

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 03/09/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |
| 00 | 26/07/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |

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CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
SAFETY MODULES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1724001010-MAC-DG-00012

SHEET 62

REV. 01

File Name : 24-27012-WD-001 Rev. 00

F.to UNI A3: 420mmx297mm

62 UPS-L → UPS-L 64

62 UPS-N → UPS-N 64

JB
C01-JB-0002

62 → 66

2
X02

22
X02

[1]

[2]

SW-0036

[4]

C01:0001-0002/01
16 19G1 mm²
X01

C01:0002-0036
4G1 mm²

[64-1]

[64-3]

A1 | A2 | Y1 | Y2

Logic

CPU: 60E1
MOD. 4

Schneider Electric
Modicon TM3 Safety

K2

K1

13 | 23 | 33 | N.C. | 14 | 24 | 34

64 UPS-L → UPS-L 86

64 UPS-N → UPS-N 86

A2B

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 03/09/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |
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CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
SAFETY MODULES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

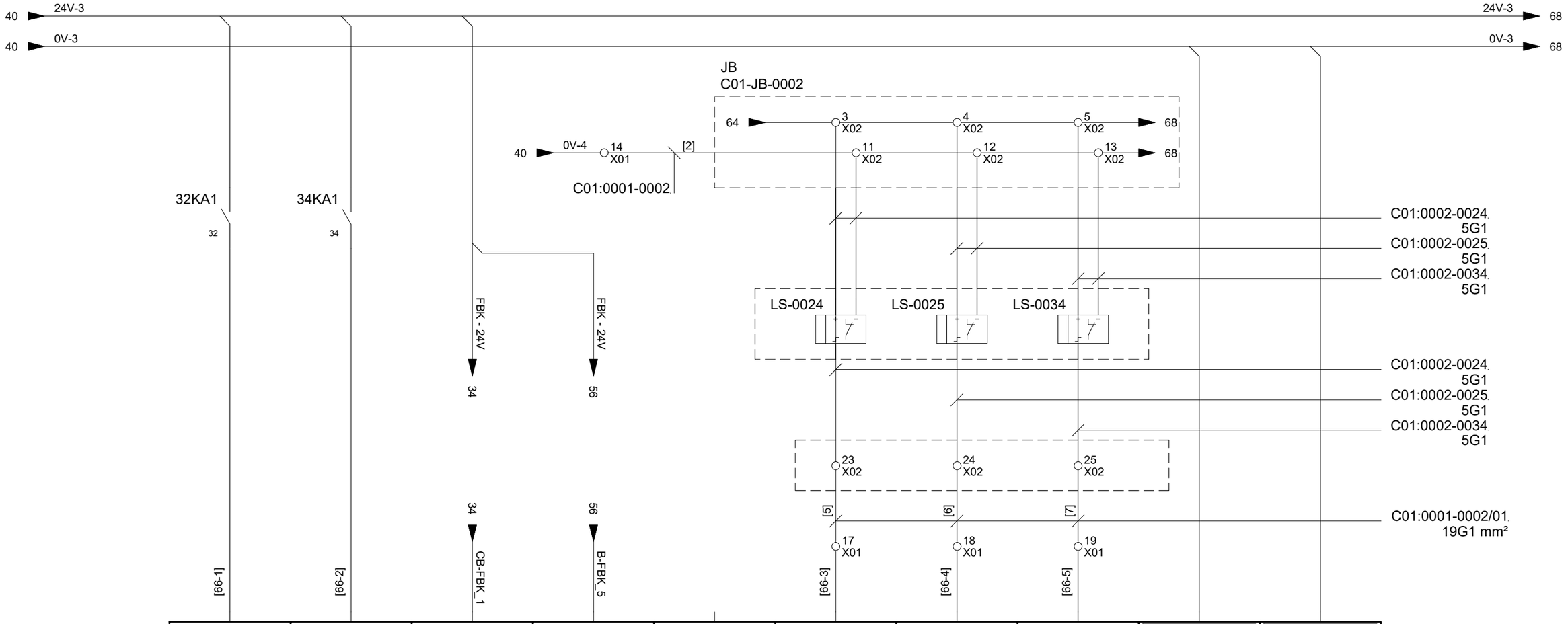
DRAWING NO. 1724001010-MAC-DG-00012

SHEET 64

REV. 01

File Name : 24-27012-WD-001 Rev. 00

F.to UNI A3: 420mmx297mm




| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | COM | COM |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| CPU: 60E1 MOD. 5 | CPU: 60E1 MOD. 5 | CPU: 60E1 MOD. 5 | CPU: 60E1 MOD. 5 | CPU: 60E1 MOD. 5 | CPU: 60E1 MOD. 5 | CPU: 60E1 MOD. 5 | CPU: 60E1 MOD. 5 | CPU: 60E1 MOD. 5 | CPU: 60E1 MOD. 5 |
| Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: |
| 400Vac OK | UPS STATUS OK | CB FEEDBACK | BRAKE CB FEEDBACK | SPARE | LIMIT SWITCH ROTATION CW | LIMIT SWITCH ROTATION CCW | LIMIT SWITCH TROLLEY TRAVELING FORWARD | | |

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CROSSWIND

ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 03/09/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |
| 00 | 26/07/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |

TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
DIGITAL INPUT

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

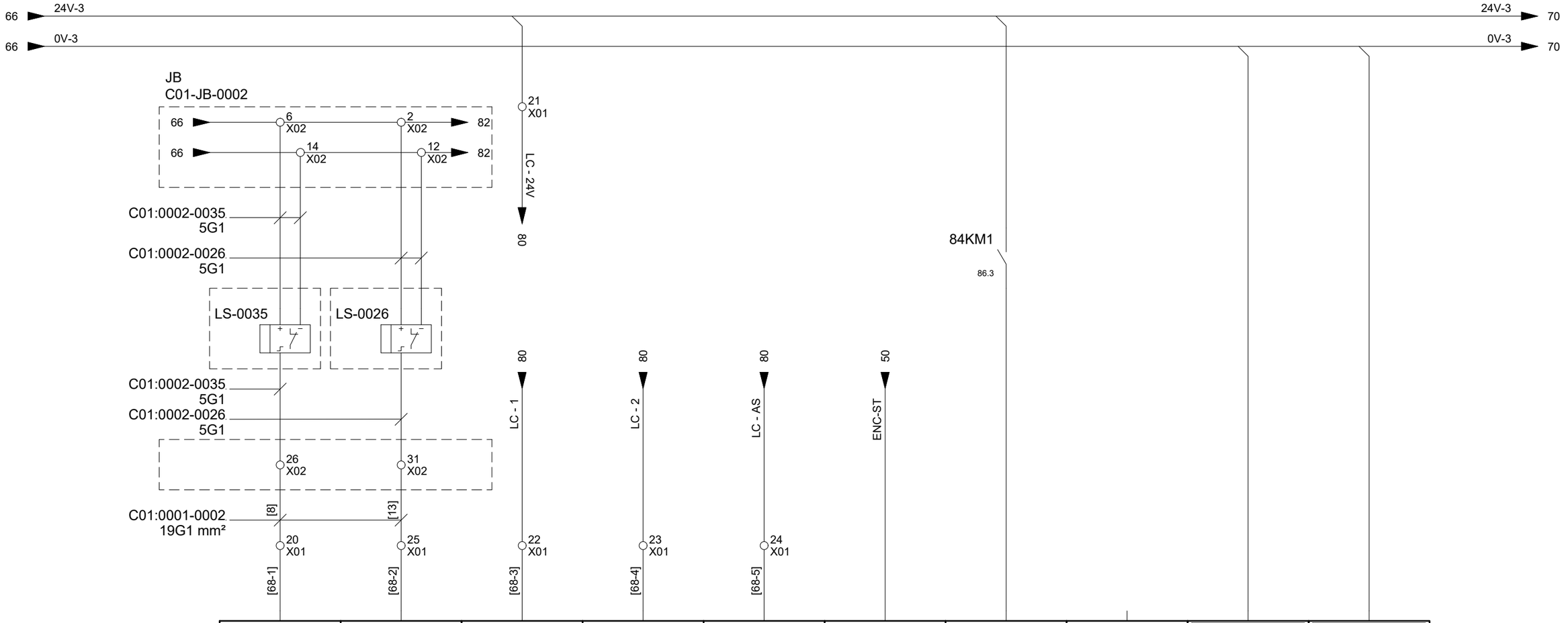
DRAWING NO. 1724001010-MAC-DG-00012

SHEET 66

REV. 01

File Name : 24-27012-WD-001 Rev. 00

F.to UNI A3: 420mmx297mm




| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | COM | COM |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| CPU: 60E1 MOD. 5 | CPU: 60E1 MOD. 5 | CPU: 60E1 MOD. 5 | CPU: 60E1 MOD. 5 | CPU: 60E1 MOD. 5 | CPU: 60E1 MOD. 5 | CPU: 60E1 MOD. 5 | CPU: 60E1 MOD. 5 | CPU: 60E1 MOD. 5 | CPU: 60E1 MOD. 5 |
| Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: |
| LIMIT SWITCH TROLLEY TRAVELING BACKWARD | LIMIT SWITCH BLOCK PIN | OVERLOAD 1st LIMIT | OVERLOAD 2nd LIMIT | ANTISLACK | HOISTING ENCODER STATUS | MOPS ACTIVE | SPARE | | |

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 03/09/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |
| 00 | 26/07/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |

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CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
DIGITAL INPUT

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

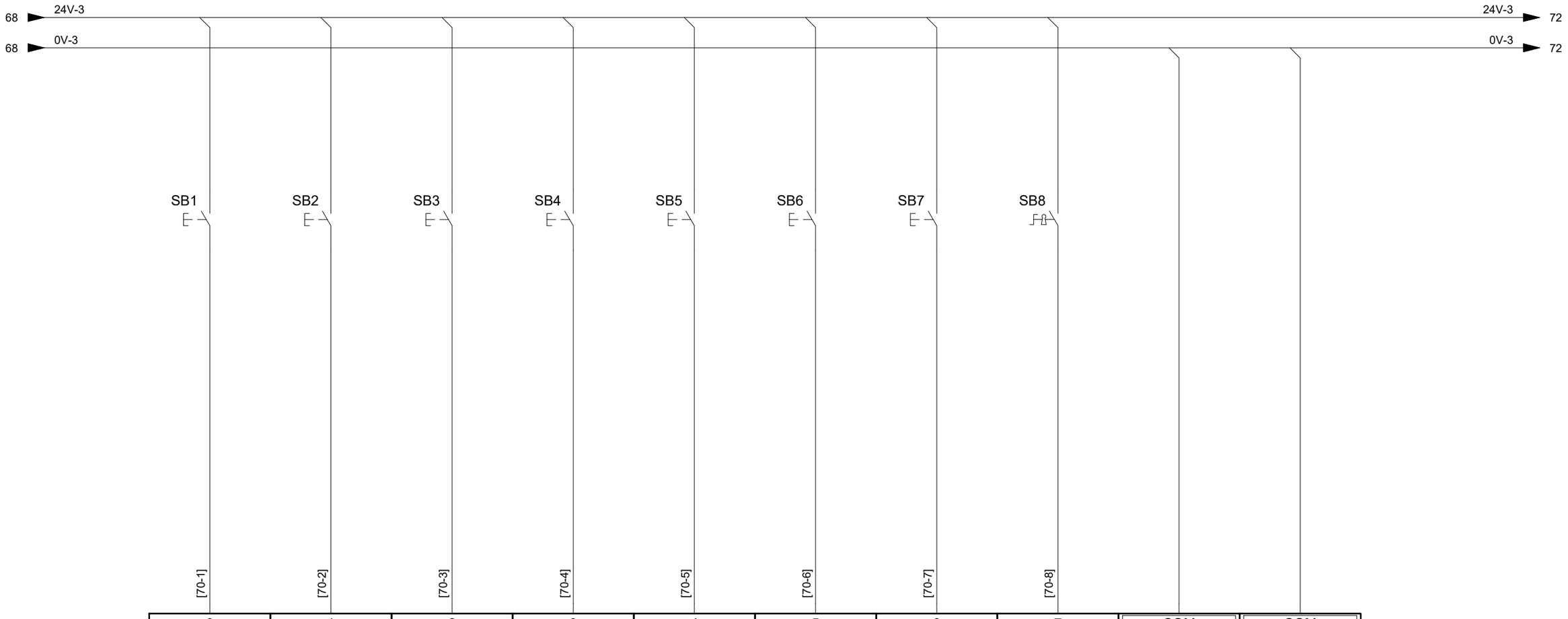
DRAWING NO. 1724001010-MAC-DG-00012

SHEET 68

REV. 01

File Name : 24-27012-WD-001 Rev. 00

F.to UNI A3: 420mmx297mm




| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | COM | COM |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| CPU: 60E1 MOD. 6 | CPU: 60E1 MOD. 6 | CPU: 60E1 MOD. 6 | CPU: 60E1 MOD. 6 | CPU: 60E1 MOD. 6 | CPU: 60E1 MOD. 6 | CPU: 60E1 MOD. 6 | CPU: 60E1 MOD. 6 | CPU: 60E1 MOD. 6 | CPU: 60E1 MOD. 6 |
| Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: |
| ROTATION CW PUSH BUTTON | ROTATION CCW PUSH BUTTON | TROLLEY TRAVELING FORWARD PUSH BUTTON | TROLLEY TRAVELING BACKWARD PUSH BUTTON | HOISTING UP PUSH BUTTON | HOISTING DOWN PUSH BUTTON | SECOND SPEED PUSH BUTTON | OVERLOAD BYPASS | | |

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ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 03/09/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |
| 00 | 26/07/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |

TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
DIGITAL INPUT

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1724001010-MAC-DG-00012 | SHEET 70 | REV. 01

File Name : 24-27012-WD-001 Rev. 00

F.to UNI A3: 420mmx297mm

70 24V-3 → 24V-3 74

70 0V-3 → 0V-3 74

| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | COM | COM |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| CPU: 60E1<br>MOD. 6 | CPU: 60E1<br>MOD. 6 | CPU: 60E1<br>MOD. 6 | CPU: 60E1<br>MOD. 6 | CPU: 60E1<br>MOD. 6 | CPU: 60E1<br>MOD. 6 | CPU: 60E1<br>MOD. 6 | CPU: 60E1<br>MOD. 6 | CPU: 60E1<br>MOD. 6 | CPU: 60E1<br>MOD. 6 |
| Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: |
| SPARE | SPARE | SPARE | SPARE | SPARE | SPARE | SPARE | SPARE | | |

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ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 03/09/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |
| 00 | 26/07/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |

TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
DIGITAL INPUT

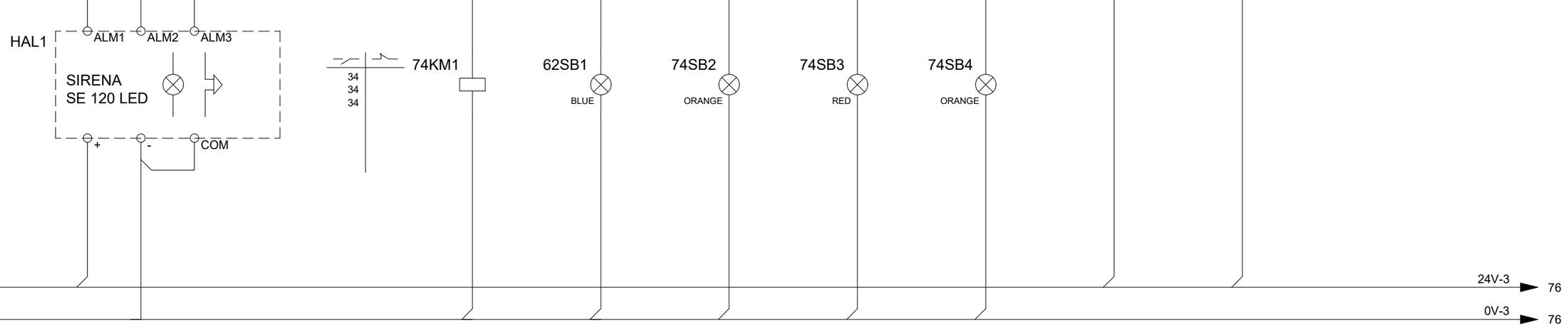
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1724001010-MAC-DG-00012 | SHEET 72 | REV. 01

F.to UNI A3: 420mmx297mm

File Name : 24-27012-WD-001 Rev. 00

| HORN COMAND | | HORN STAGE 2 | | HORN STAGE 3 | | STANDSTILL HEATERS | | RESET REQUEST | | PIN ENGAGED | | ALARM | | OVERLOAD WARNING | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name: | Sheet: | Name: | Sheet: | Name: | Sheet: | Name: | Sheet: | Name: | Sheet: | Name: | Sheet: | Name: | Sheet: | Name: | Sheet: | Name: | Sheet: | Name: | Sheet: |
| CPU: 60E1<br>MOD. 7 | | CPU: 60E1<br>MOD. 7 | | CPU: 60E1<br>MOD. 7 | | CPU: 60E1<br>MOD. 7 | | CPU: 60E1<br>MOD. 7 | | CPU: 60E1<br>MOD. 7 | | CPU: 60E1<br>MOD. 7 | | CPU: 60E1<br>MOD. 7 | | CPU: 60E1<br>MOD. 7 | | CPU: 60E1<br>MOD. 7 | |
| | | | | | | | | | | | | | | | | | | | |
| 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | COM0 | | COM0 | |




| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 01 | 03/09/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |
| 00 | 26/07/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |


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CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
DIGITAL OUTPUT

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1724001010-MAC-DG-00012

SHEET 74

REV. 01

File Name : 24-27012-WD-001 Rev. 00

F.to UNI A3: 420mmx297mm

| AOPS ACTIVATED | | MOPS ACTIVATED | | 3.5 tonn LOAD LIMIT | | 1 tonn LOAD LIMIT | | SPARE | | SPARE | | SPARE | | SPARE | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name: | Sheet: | Name: | Sheet: | Name: | Sheet: | Name: | Sheet: | Name: | Sheet: | Name: | Sheet: | Name: | Sheet: | Name: | Sheet: | Name: | Sheet: | Name: | Sheet: |
| CPU: 60E1<br>MOD. 7 | | CPU: 60E1<br>MOD. 7 | | CPU: 60E1<br>MOD. 7 | | CPU: 60E1<br>MOD. 7 | | CPU: 60E1<br>MOD. 7 | | CPU: 60E1<br>MOD. 7 | | CPU: 60E1<br>MOD. 7 | | CPU: 60E1<br>MOD. 7 | | CPU: 60E1<br>MOD. 7 | | CPU: 60E1<br>MOD. 7 | |
| | | | | | | | | | | | | | | | | | | | |
| 8 | | 9 | | 10 | | 11 | | 12 | | 13 | | 14 | | 15 | | COM1 | | COM1 | |

76SB1 YELLOW

76SB2 YELLOW

76SB3 YELLOW

76SB4 YELLOW

74 24V-3 ▶ 24V-3 ▶ 78

74 0V-3 ▶ 0V-3 ▶ 78

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| 00 | 26/07/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |

TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
DIGITAL OUTPUT

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1724001010-MAC-DG-00012

SHEET 76

REV. 01

File Name : 24-27012-WD-001 Rev. 00

F.to UNI A3: 420mmx297mm

76 24V-3

76 0V-3

80 +LC

80 -LC

10 XS1

11 XS1

+LC 50

50 +LC-2

| Name: | Sheet: | Name: | Sheet: |
|---|---|---|---|
| CPU: 60E1<br>MOD. 8 | | CPU: 60E1<br>MOD. 8 | |
| | | | |
| Q0+ Q0- | | Q1+ Q1- | |

78E1 A1 A2 E5 E6

| 24V 0V PE |
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| CPU: 60E1<br>MOD. 8 |
| Name: Sheet: |
| |

| I0+ I0- | I1+ I1- | I2+ I2- | I3+ I3- |
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| Name: Sheet: | Name: Sheet: | Name: Sheet: | Name: Sheet: |
| LOAD CELL<br>4-20mA | | | |

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TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
ANALOG INPUT AND OUTPUT

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

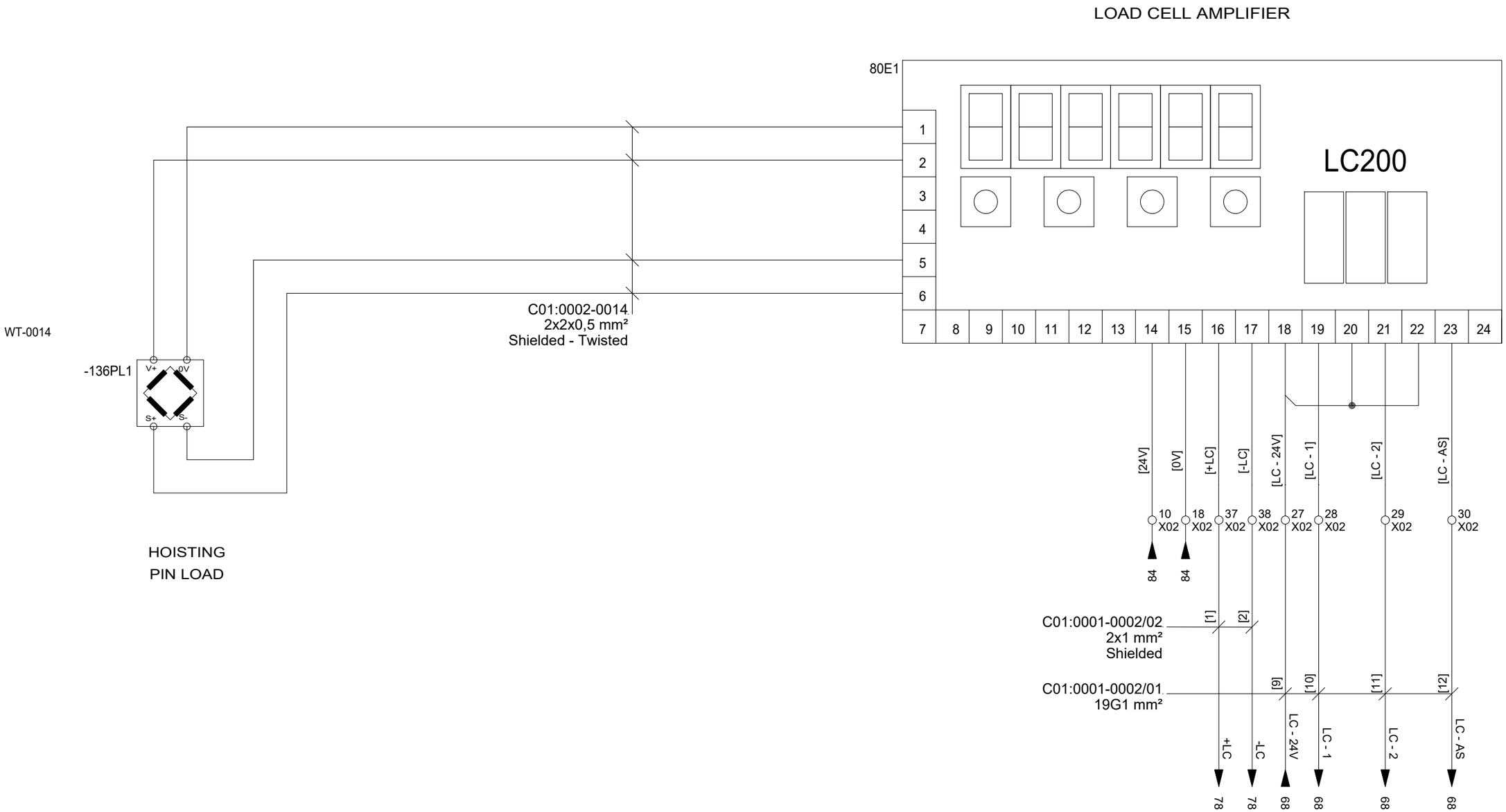
DRAWING NO. 1724001010-MAC-DG-00012

SHEET 78

REV. 01

File Name : 24-27012-WD-001 Rev. 00

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LOAD CELL

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DAVIT CRANE WIRING DIAGRAM
LOAD CELL

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

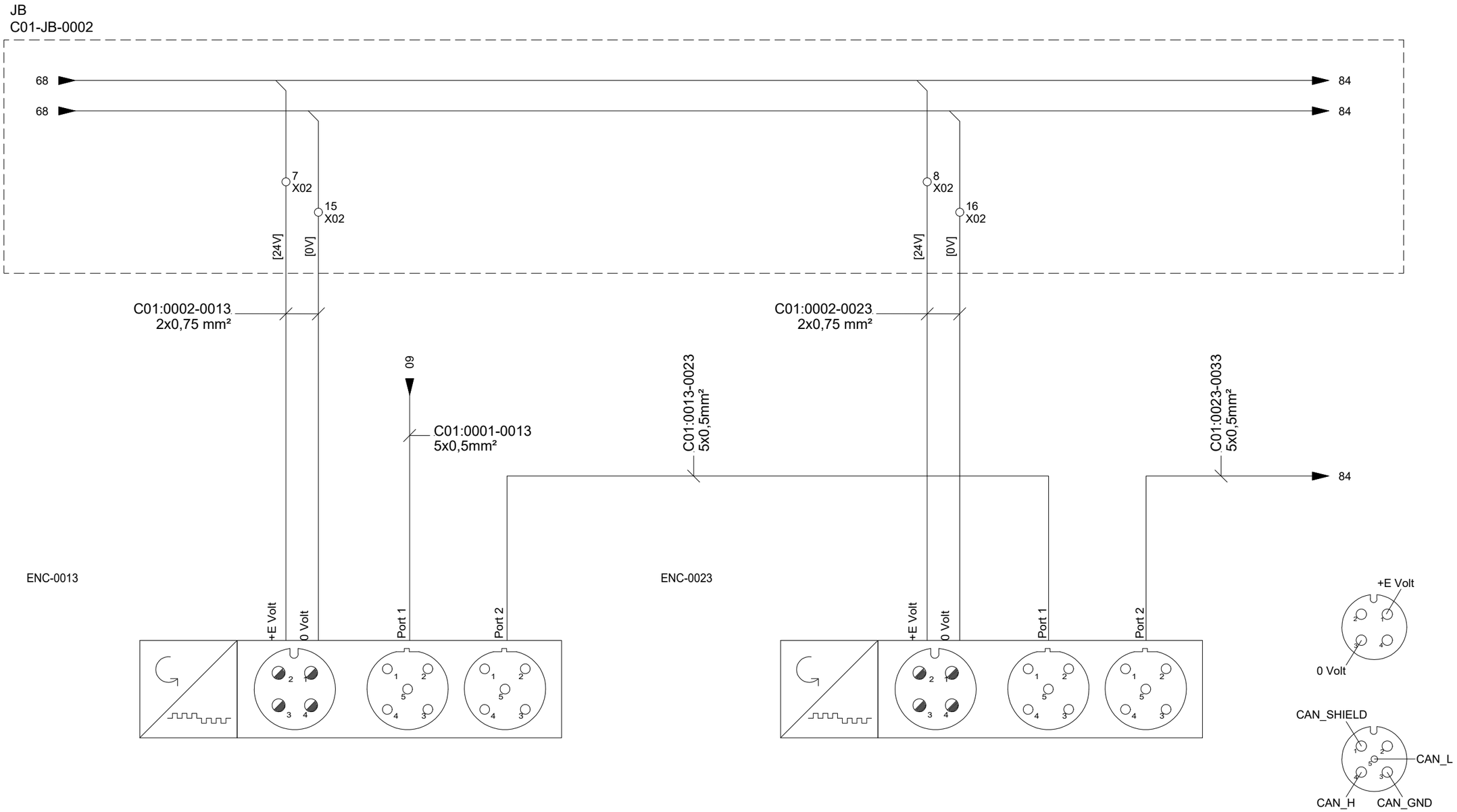
DRAWING NO. 1724001010-MAC-DG-00012

SHEET 80

REV. 01

File Name : 24-27012-WD-001 Rev. 00

F.to UNI A3: 420mmx297mm




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TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
HOISTING AND ROTATION ENCODERS

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SCALE : NTS

A3

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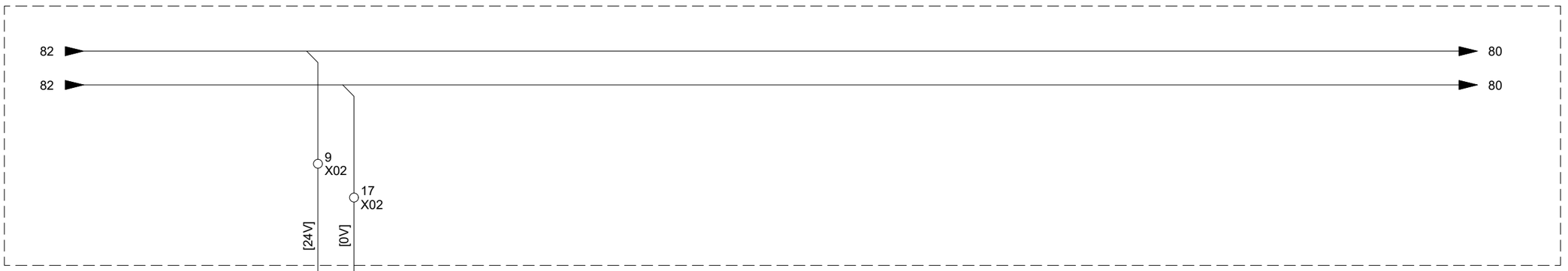
SHEET 82

REV. 01

File Name : 24-27012-WD-001 Rev. 00

F.to UNI A3: 420mmx297mm

JB
C01-JB-0002

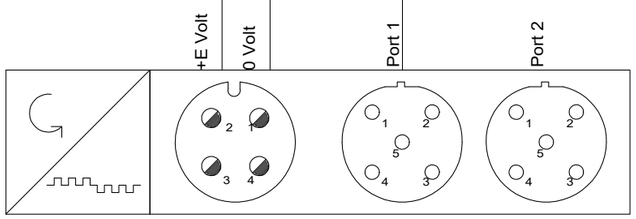


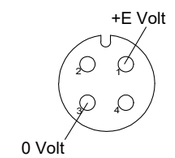

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2x0,75 mm²

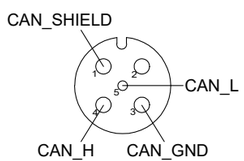
C01:0023-0033
5x0,5mm²

82

ENC-0033




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TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
TROLLEY ENCODER

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

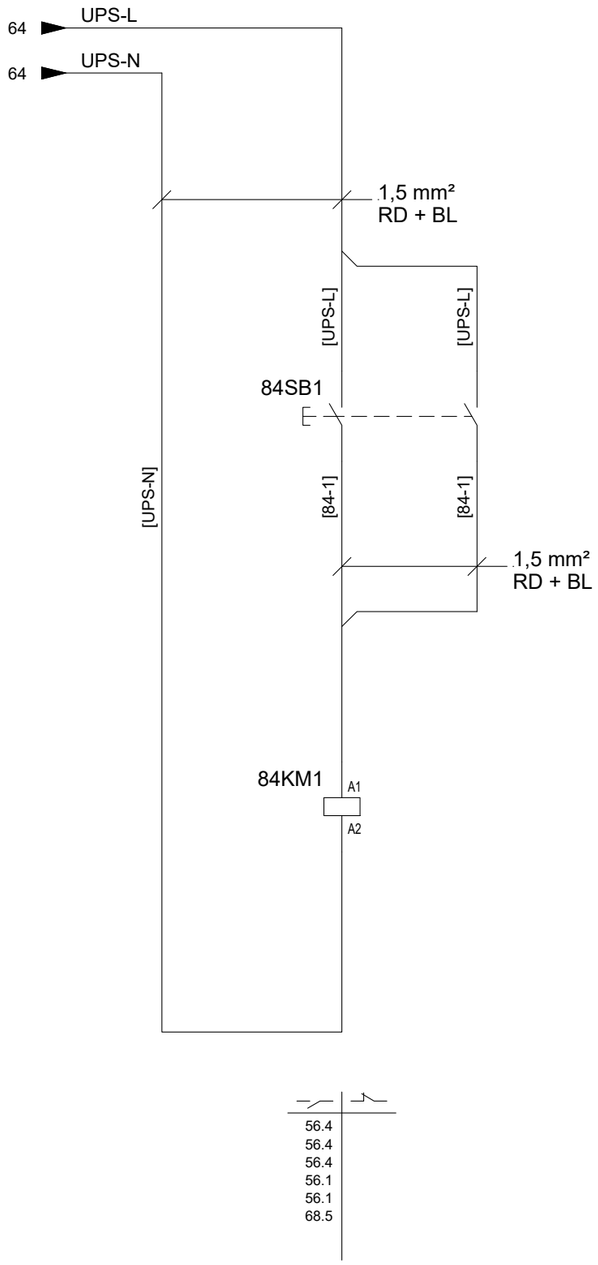
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SHEET 84

REV. 01

File Name : 24-27012-WD-001 Rev. 00

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TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
MOPS COMMAND

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

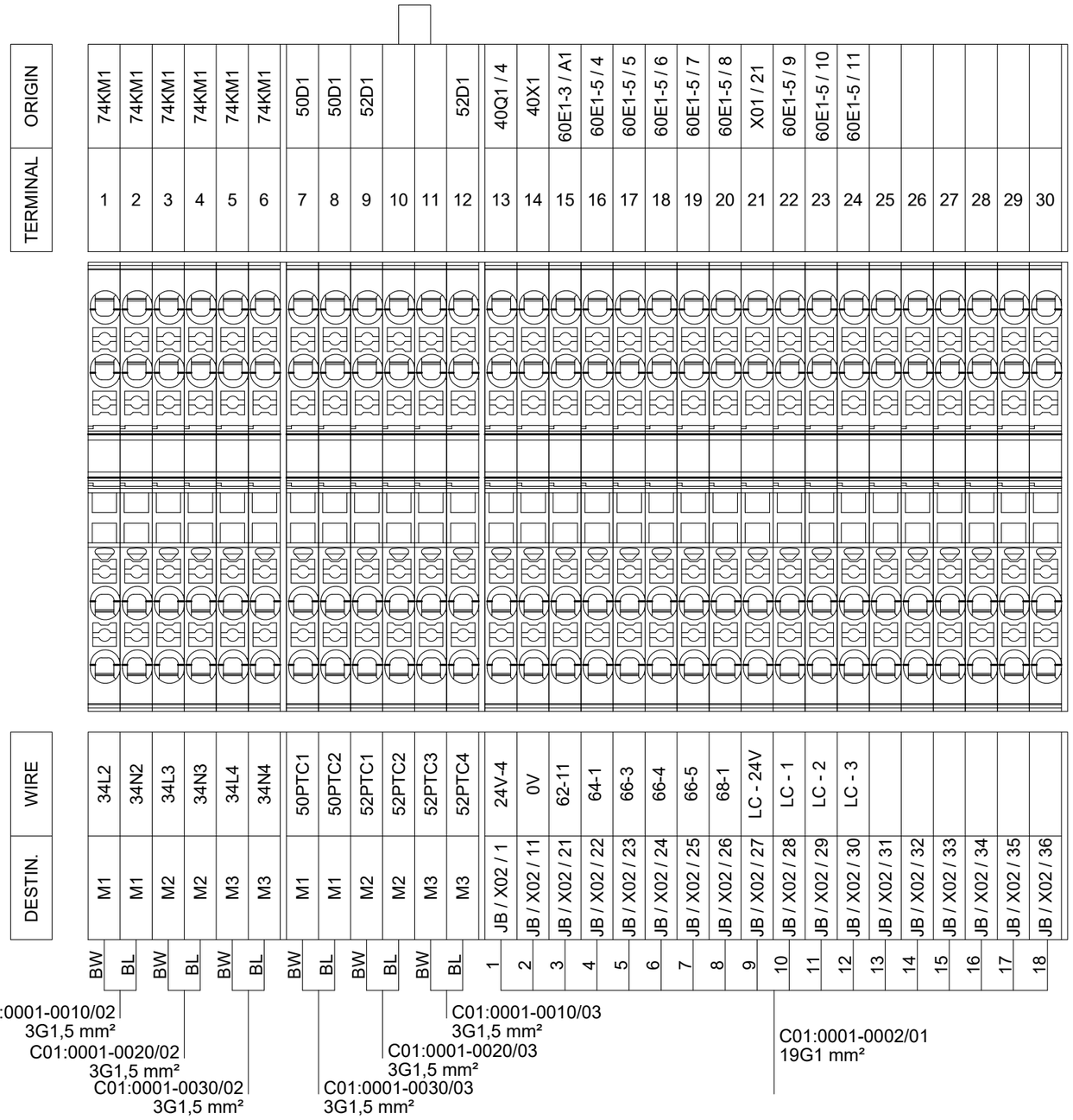
DRAWING NO. 1724001010-MAC-DG-00012

SHEET 86

REV. 01

File Name : 24-27012-WD-001 Rev. 00

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TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
TERMINAL STRIP X01

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

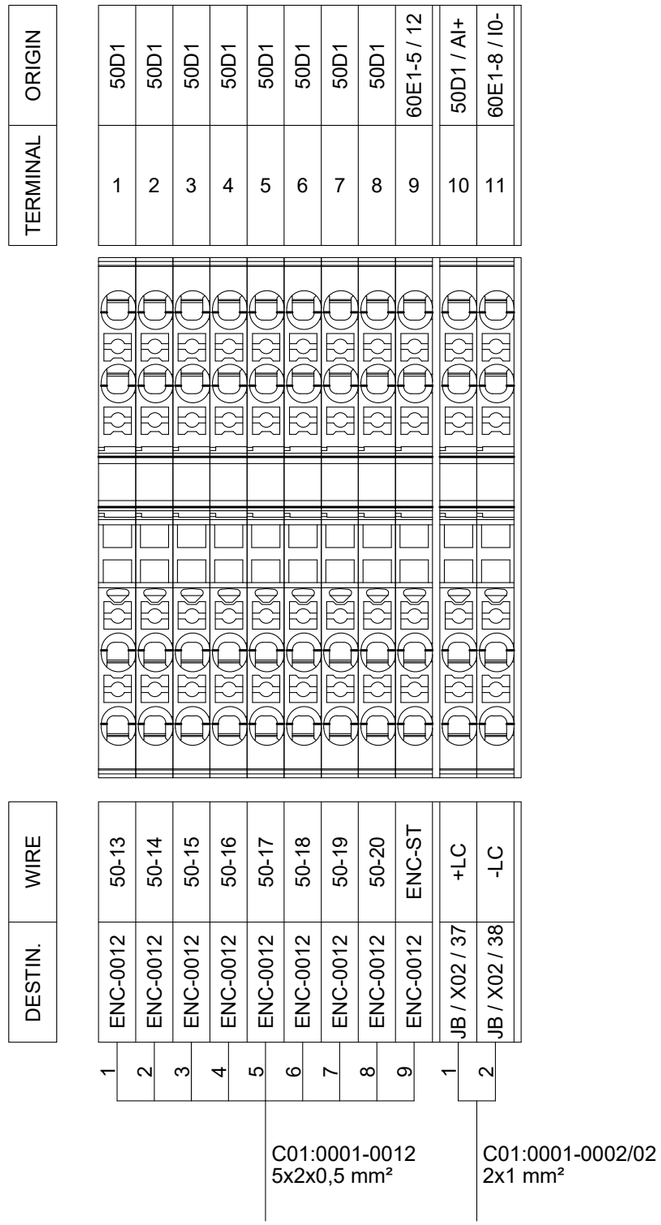
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SHEET 90

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TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
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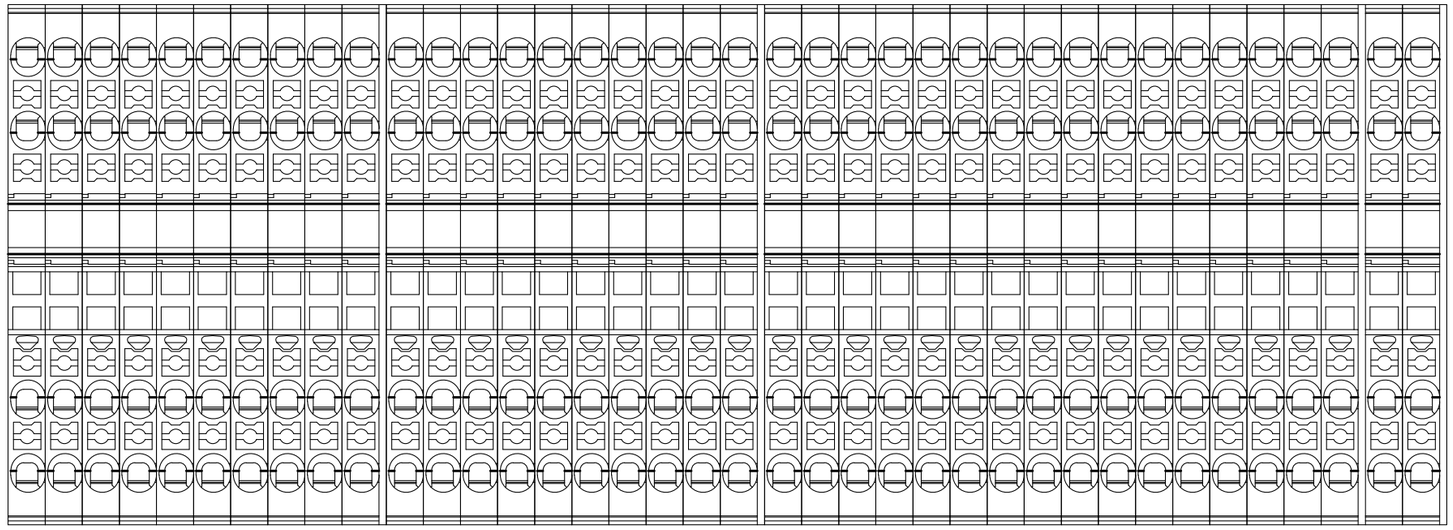
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1724001010-MAC-DG-00012 | SHEET 92 | REV. 01

File Name : 24-27012-WD-001 Rev. 00

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| TERMINAL | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ORIGIN | SW-0016 | SW-0036 | LS-0024 | LS-0025 | LS-0034 | LS-0035 | ENC-0013 | ENC-0023 | ENC-0033 | 80E1 / 14 | LS-0024 | LS-0025 | LS-0034 | LS-0035 | ENC-0013 | ENC-0023 | ENC-0033 | 80E1 / 15 | | | SW-0016 | SW-0036 | LS-0024 | LS-0025 | LS-0034 | LS-0035 | | 80E1 / 19 | 80E1 / 21 | 80E1 / 23 | LS-0026 | | | | | | 80E1 / 16 | 80E1 / 17 |



| WIRE | 24V-4 | 24V-4 | 24V-4 | 24V-4 | 24V-4 | 24V-4 | 24V-4 | 24V-4 | 24V-4 | 24V-4 | 0V | 0V | 0V | 0V | 0V | 0V | 0V | 0V | | | 62-11 | 64-1 | 66-3 | 66-4 | 66-5 | 68-1 | LC - 24V | LC - 1 | LC - 2 | LC - 3 | 68-2 | | | | | | +LC | -LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESTIN. | X01 / 13 | LS-0026 | | | | | | | | | X01 / 14 | LS-0026 | | | | | | | | | X01 / 15 | X01 / 16 | X01 / 17 | X01 / 18 | X01 / 19 | X01 / 20 | X01 / 21 | X01 / 22 | X01 / 23 | X01 / 24 | X01 / 25 | X01 / 26 | X01 / 27 | X01 / 28 | X01 / 29 | X01 / 30 | 50D1 / AI+ | 60E1-8 / I0- |

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 1 2

C01:0001-0002/01
19G1 mm²

C01:0001-0002/02
2X1 mm² shielded

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| 00 | 26/07/2024 | MPR | GBA | ATR | ISSUE FOR COMMENT (IFC) |

TITLE : BASE LOAD POWER HUB (BLPH)
DAVIT CRANE WIRING DIAGRAM
TERMINAL STRIP JB / X02

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1724001010-MAC-DG-00012

SHEET 94

REV. 01

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Remazel Engineering

# Base Load Power Hub (BLPH)

## DAVIT CRANE

## SPARE PART INDEX REGISTER (COMMISSIONING AND 2 YEAR OPERATION)

Document Number: 1724001010-COM-LIS-00015

Document Class: 2

ROSETTI MARINO

| | |
|---|---|
| 1 | NO COMMENTS - APPROVED - WORK MAY PROCEED |
| 2 | MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED |
| 3 | MAJOR COMMENTS – REJECTED – DO NOT PROCEED |
| 4 | APPROVAL NOT REQUIRED |

*NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.*

| Sign | Date |
|---|---|
| M. Di Scipio | 09/12/2024 |

| Rev. | Date | Description | Prepared | Reviewed | Approved |
|---|---|---|---|---|---|
| | | | | | |
| 02 | 05/12/2024 | Accepted for construction (AFC) | MP | MB | MT |
| 01 | 12/11/2024 | Issue for Review (IFR) | MP | MB | MT |
| 00 | 03/10/2024 | Issue for Review (IFR) | MP | MB | MT |

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Revision / Change Log

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| 00 | Issue for Review (IFR) |
| 01 | Issue for Review (IFR) |
| 02 | Accepted for construction (AFC) |
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# Table of contents


1 INTRODUCTION ..... 5

1.1 PROJECT OVERVIEW ..... 5

1.1.1 Project Location ..... 5

1.1.2 Project Concept ..... 6

2 DOCUMENT SCOPE ..... 8

2.1 REFERENCES ..... 8

2.2 DEFINITIONS AND ABBREVIATIONS ..... 8

3 Spare parts Index Register ..... 10

3.1 Spare parts for commissioning/start up ..... 10

3.2 Spare parts 2Y operation ..... 10



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# List of Figures


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map ..... 5
Figure 2 - Wind Park Details ..... 6
Figure 3 – BLPH Concept ..... 7


# List of tables


Table 1 - Reference Documents ..... 8
Table 2 - Definitions and Abbreviations ..... 8


# List of Attachments


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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.

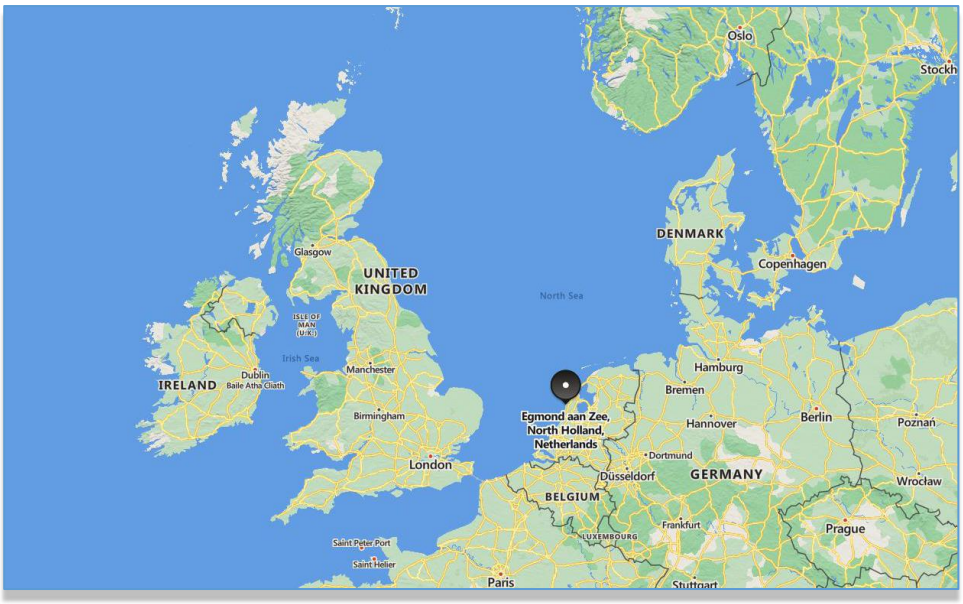



*Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map*




*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.

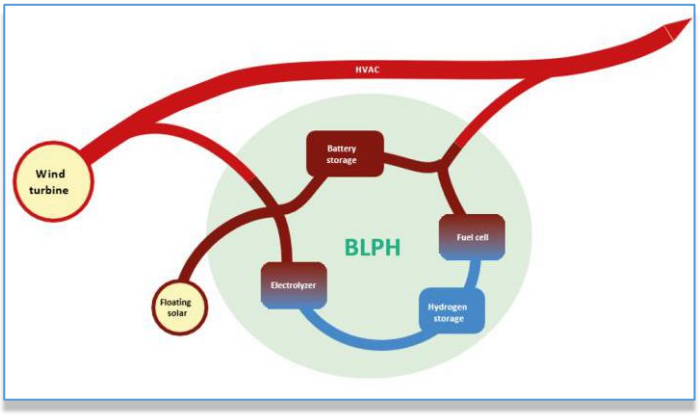


*Figure 3 – BLPH Concept*

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.

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# 2 DOCUMENT SCOPE

The purpose of the document is to provide a list of replacement parts for the davit crane. The parts list will be divided between components needed for commissioning and those for the two-year

## 2.1 REFERENCES

| Doc. No. | Description |
|---|---|
| 1724001010 123A90A | Purchase order |
| | |
| | |

*Table 1 - Reference Documents*

## 2.2 DEFINITIONS AND ABBREVIATIONS

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

*Table 2 - Definitions and Abbreviations*

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# 3 SPARE PARTS INDEX REGISTER

## 3.1 SPARE PARTS FOR COMMISSIONING/START UP

## 3.2 SPARE PARTS 2Y OPERATION

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| SPARE PARTS FOR COMMISSIONING/START UP | | | | | | |
|---|---|---|---|---|---|---|
| Item | Number | Q.ty | Units | Item Description | Description Additional | Wiring Diagram |
| 1 | 011-0014-C1311 | 2 | Each | Fuse | 10,3x38 CH10 1A gG | 50Q2 |
| 2 | 011-0014-C1315 | 6 | Each | Fuse | 10,3x38 CH10 2A gG | 32Q1 |
| 3 | 011-0014-C0643 | 1 | Each | Fuse | 10,3x38 CH10 6A gG | 40Q2 |
| 4 | 011-0014-C0641 | 1 | Each | Fuse | 10,3x38 CH10 10A gG | 34Q1 |
| 5 | 011-0014-C2598 | 2 | Each | Fuse | 22x58, CH22, 50A, aM | 50Q1 |
| 6 | 011-0014-C1527 | 1 | Each | Contactor | Contactor TeSys LC1D - 3 poles - AC3 440V 9 A - 24 V CC | 50KM1 |
| 7 | 011-0014-C2604 | 1 | Each | Contactor | Contactor TeSys LC1D - 4 poles - AC1 440V 32 A- 24 V CC | KM11 |
| 8 | 011-0014-C2605 | 1 | Each | Contactor | Contactor aux TeSys CA3SK - 10 A - 24 V CC | 74KM1 |
| 9 | 011-0014-C1828 | 1 | Each | Contactor | Contactor TeSys LC1D - 3 poles - AC3 440V 9 A - 230 V AC | 84KM1 |
| 10 | 006-0003-C0210 | 1 | Each | Cylindrical roller bearing | Wheel roller bearing NNF 5008 ADA-2LSV (40x68x38) | N.A. |
| 11 | 006-0003-C0849 | 1 | Each | Cylindrical roller bearing | Pulley roller bearingNNF 5012 ADB-2LSV (60x95x46) | N.A. |

| SPARE PARTS 2Y OPERATION | | | | | | |
|---|---|---|---|---|---|---|
| Item | Number | Q.ty | Units | Item Description | Description Additional | Wiring Diagram |
| 1 | 011-0014-C2599 | 2 | Each | Relay | PLC-INTERFACE, with PLC-BPT.../21 with connection Push-in and relay, mounting on NS 35/7,5, 1 contact, input voltage 24 V DC | 32KA1 |
| 2 | 011-0015-C0034 | 1 | Each | Load cell amplifier | Load cell amplifier, output 4-20mA | 80E1 |
| 3 | 011-0008-C2442 | 1 | Each | Load cell | PSPRX pin load cell - model PRX, rated capacity 500 kg to 4000 kg, double shear, Stainless steel, IP65 | WT-0014 |
| 4 | 007-0003-C0579 | 1 | m | Cable chain | Dim. 100mm, pitch: 75, curvature radius: 75mm, pitch n°: 72 | N.A. |
| 5 | 011-0008-C2429 | 1 | Each | Limit switch | Proximity switch, M12, 4 mm, DC, 3 wires, PNP NA, IO-Link COM3, cable 5 m | LS0024-0025 |
| 6 | 011-0008-C2430 | 1 | Each | Limit switch | Proximity switch, M12, 4 mm, DC, 3 wires, PNP NA, IO-Link COM3, cable 15 m | LS0034-0035 |
| 7 | 011-0008-C2436 | 1 | Each | Hoisting limit switch | hoisting down limit switch for payout prevention | SW-0016 |
| 8 | 006-0003-C0210 | 2 | Each | Cylindrical roller bearing | Wheel roller bearing NNF 5008 ADA-2LSV (40x68x38) | N.A. |
| 9 | 006-0003-C0849 | 2 | Each | Cylindrical roller bearing | Pulley roller bearingNNF 5012 ADB-2LSV (60x95x46) | N.A. |
| 10 | 007-0006-C1220 | 1 | Each | Electric motor | Slewing motor MGM BAHK2 100 LB4 Enhanced Power (E.P.) | M2 |
| 11 | 007-0006-C1221 | 1 | Each | Electric motor | Hoisting motor MGM BAHK2 132 MC4 Enhanced Power (E.P.) | M1 |
| 12 | 007-0006-C1222 | 1 | Each | Electric motor | Traversing motor MGM BAHK2 90 SA4 Enhanced Power (E.P.) | M3 |

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# 4 PART 2 – CERTIFICATION DOSSIER

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# Base Load Power Hub (BLPH)

## DAVIT CRANE

## Tag.No.X-99001

## Inspection Test Plan

Document Number: 1724001010-QC-ITP-00002

Document Class: 2

ROSETTI MARINO

| | |
|---|---|
| 1 | NO COMMENTS - APPROVED - WORK MAY PROCEED |
| 2 | MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED |
| 3 | MAJOR COMMENTS – REJECTED – DO NOT PROCEED |
| 4 | APPROVAL NOT REQUIRED |

*NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.*

| Sign | Date |
|---|---|
| ROSETTI MARINO SpA | 11-09-2024 |

| | | | | | |
|---|---|---|---|---|---|
| 03 | 03/09/2024 | Accepted for Construction (AFC) | CZI | GDC | MPU |
| 02 | 26/07/2024 | Accepted For Construction (AFC) | CZI | GDC | MPU |
| 01 | 10/07/2024 | Issued for comments | CZI | GDC | MPU |
| 00 | 21/06/2024 | Issued for Review (IFR) | CZI | GDC | MPU |
| Rev. | Date | Description | Prepared | Reviewed | Approved |

REMAZEL ENGINEERING

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## Revision / Change Log

| Rev. | Description |
|---|---|
| 00 | Issued for Review (IFR) |
| 01 | Issued for layout comments |
| 02 | Accepted For Construction (AFC) |
| 03 | Issued Accepted for Construction (AFC) |
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## HOLDS LIST

| No. | Description |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |

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# Table of contents

1 INTRODUCTION ..... 5
1.1 PROJECT OVERVIEW ..... 5
1.1.1 Project Location ..... 5
1.1.2 Project Concept ..... 6
2 DOCUMENT SCOPE ..... 8
2.1 DEFINITIONS AND ABBREVIATIONS ..... 8
3 Inspection test plan ..... 9

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# List of Figures

Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map ..... 5
Figure 2 - Wind Park Details ..... 6
Figure 3 – BLPH Concept ..... 6

# List of tables

Table 1 - Definitions and Abbreviations ..... 8

# List of Attachments

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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.

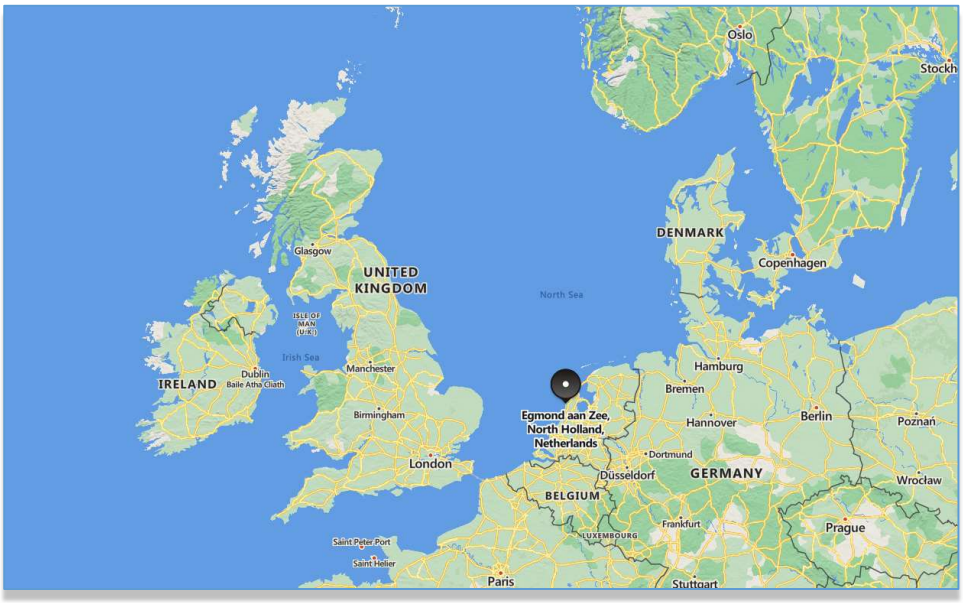



*Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map*




*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.

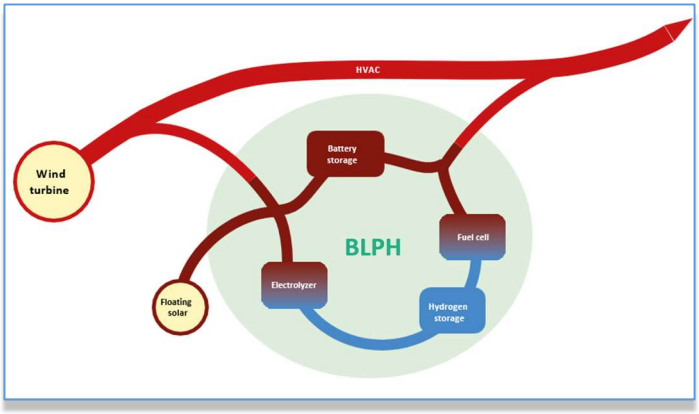



*Figure 3 – BLPH Concept*

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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.

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# 2 DOCUMENT SCOPE

Inspection Test Plan

## 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 1 - Definitions and Abbreviations*

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# 3 INSPECTION TEST PLAN

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# Davit Crane

# Tag.No.X-99001

# Inspection Test Plan

# 24-27012_ITP-001

| Rev | Date | Revision Description | Prepared | Checked | Approved |
|---|---|---|---|---|---|
| 03 | 03/09/2024 | Issued for CW comments | CZI | GDC | MPU |
| 02 | 26/07/2024 | Issued for comments | CZI | GDC | MPU |
| 01 | 10/07/2024 | Issued for comments | CZI | GDC | MPU |
| 00 | 10/06/2024 | First Issued | CZI | GDC | MPU |

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## SUMMARY OF REVISION

| Rev. | Revised chapters | Revision description | Reason for revision |
|---|---|---|---|
| 00 | / | / | First Issued |
| 01 | / | / | Layout comments |
| 02 | / | / | Issued for comments |
| 03 | 4.0; 7.0; 9.02; 15.03 | Added crane tag n°; Added year revision for standard; added step for painting; modify surveillance for step 7.0; 9.02 ;15.03 | Issued for comments |

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# Index


**1 Scope ..... 4**

**2 Abbreviations and acronyms ..... 5**

**3 Document reference ..... 6**

**4 Rules and standard reference ..... 6**

**5 Inspection keys ..... 7**

**5.1 Remarks ..... 7**

**6 Main and commercial items ..... 8**

**6.1 Main items ..... 8**

**6.2 Commercial items ..... 9**

**7 Inspection and test plan ..... 10**

**7.1 Main items ..... 10**

**7.2 Commercial items ..... 14**

**7.2.1 Other components ..... 14**

**7.3 Completion Activities ..... 16**



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# 1 Scope

The scope of this document is to define the construction steps and intervention points of all the parts followed during the construction of the following project:

| Customer | Hull/Project | Company |
|---|---|---|
| ROSETTI MARINO | HOLLANDSE KUST NOORD WIND PARK Project | CROSSWIND |

The supply included the following items:

| Order position | Description | Q.ty | ROSETTI MARINO tag |
|---|---|---|---|
| 10-20 | Davit crane | 1 | Tag.No. X-99001 |

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# 2 Abbreviations and acronyms

| | | | |
|---|---|---|---|
| **AF** | Antifouling | **NACE** | NACE International |
| **ASTM** | American Society for Testing and Materials | **NDE** | Non-Destructive Examination |
| **AW** | As Welded | **NDFT** | Nominal Dry Film Thickness |
| **AWS** | American Welding Society | **NDT** | Non-Destructive Testing |
| **CDR** | Contractor Data Requirements | **NORSOK** | Norsk Sokkels Konkuranseposisjon |
| **COSHH** | Control of Substances Hazardous to Health Regulation | **PCN** | Personnel Certification in Non-Destructive Testing |
| **CRA** | Corrosion Resistant Alloys | **PDS** | Product Data Sheet |
| **CSWIP** | Certification Scheme for Weldment Inspection Personnel | **PO** | Purchase Order |
| **DFT** | Dry Film Thickness | **PQR** | Procedure Qualification Record |
| **FAT** | Factory Acceptance Test | **PT** | Dye-Penetrant Testing |
| **FCAW** | Flux Cored Arc Weld | **PWHT** | Post Weld Heat Treated |
| **FL** | Fusion Line | **QCP** | Quality Control Plan |
| **GMAW** | Gas Metal Arc Welding | **RT** | Radiographic Testing |
| **GTC** | General Terms and Conditions | **SAW** | Submerged Arc Welding |
| **GTS** | Group Technical Standards | **SMAW** | Shielded Metal Arc Welding |
| **HAZ** | Heat Affected Zone | **SOW** | Scope Of Work |
| **HDG** | Hot Dip Galvanising | **SSPC** | The Society for Protective Coating |
| **HP** | High Pressure | **STC** | Specific Terms and Conditions |
| **HPU** | Hydraulic Power Unit | **SWL** | Safe Working Load |
| **HV** | High Voltage | **TBC** | To Be Confirmed |
| **ITP** | Inspection & Test Plan | **TBD** | To Be Defined |
| **LP** | Low Pressure | **TD** | Design temperature |
| **LV** | Low Voltage | **UHP** | Ultra-High Pressure |
| **MBL** | Minimum Breaking Load | **UT** | Ultrasonic Testing |
| **MCAW** | Metal Core Arc Welding | **UTS** | Ultimate Tensile Strength |
| **MPI** | Magnetic Particle Inspection | **VDB** | Vendor Data Book |
| **MSDS** | Material Safety Data Sheet | **WFT** | Wet Film Thickness |
| **MT** | Magnetic Testing | **WPQ** | Welder Performance Qualification |
| **N.A.** | Not Applicable | **WPS** | Welding Procedure Specification. |

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# 3 Document reference

| Ref. | Description | ROSETTI MARINO doc. number | Rev. |
|---|---|---|---|
| [1] | Technical Specification for DAVIT CRANE | 123A90-DDL-MAC-SP-50034 | 01 |
| [2] | TDS - Davit Crane | 123A90-DDL-MAC-DS-50036 | 00 |
| [3] | Coating and Painting spec | 123A90-DDL-MAT-SP-60006 | 01 |

# 4 Rules and standard reference

| No. | Description |
|---|---|
| UNI EN 10025-1 Ed.2005 | Hot rolled products of structural steels – General technical delivery conditions |
| UNI EN 10025-2 Ed.2019 | Hot rolled products of structural steels – Technical delivery conditions for non-alloy structural steels |
| UNI EN 10025-3 Ed.2019 | Hot rolled products of structural steels – Technical delivery conditions normalized/normalized rolled weldable fine grain structural steels |
| UNI EN 10025-4 Ed.2023 | Hot rolled products of structural steels – Technical delivery conditions for thermomechanical rolled weldable fine grain structural steels |
| UNI EN 10028-3 Ed.2017 | Flat products made of steels for pressure purposes Weldable fine grain steels, normalized |
| UNI EN 10210-1 Ed.2006 | Hot finished structural hollow sections of non-alloy and fine grain steel - Technical delivery conditions |
| UNI EN 10216-5 Ed.2021 | Stainless Steel Seamless Tubes |
| UNI EN ISO 15614-1 Ed.2019 | Specification and qualification of welding procedures for metallic materials |
| UNI EN ISO 9606-1 Ed.2017 | Qualification testing of welders |
| UNI EN 10160 Ed.2001 | Ultrasonic testing of steel flat product of thickness equal or greater than 6 mm (reflection method) |
| UNI EN 10250-2 Ed.2022 | Open die steel forgings for general engineering purposed |
| UNI EN ISO 683-2 Ed.2018 | Alloy Steel for quenching and tempering |
| UNI EN 10228-1 Ed.2016 | Non-destructive testing of steel forgings – Magnetic particle inspection |
| UNI EN 10228-3 Ed.2016 | Non-destructive testing of steel forgings – Part. 3 – Ultrasonic testing of ferritic or martensitic steel forgings |
| UNI EN 10204 Ed.2005 | Metallic products – Types of inspection documents |
| UNI EN ISO 9712 Ed.2022 | Non-destructive testing – Qualification and certification of NDT personnel |
| UNI EN ISO 17637 Ed.2017 | Non-destructive testing of welds – Visual testing of fusion-welded joints |
| UNI EN ISO 17638 Ed.2016 | Non-destructive testing of welds – Magnetic particle testing |
| UNI EN ISO 23278 Ed.2015 | Non-destructive testing of welds – Magnetic particle testing – Acceptance levels |
| UNI EN ISO 17640 Ed.2019 | Non-destructive testing of welds. Ultrasonic testing. Techniques, testing levels, and assessment |
| UNI EN ISO 11666 Ed.2018 | Non-destructive testing of welds. Ultrasonic testing. Acceptance levels |
| UNI EN ISO 5817 Ed.2023 | Welding – Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) – Quality levels for imperfections |
| EN ISO 3452 Ed.2021 | Non-destructive testing of welds – Penetrant testing |
| UNI EN ISO 23277 Ed.2015 | Non-destructive testing of welds – Penetrant testing – Acceptance levels |
| UNI EN 10308 Ed.2004 | Non-destructive testing. Ultrasonic testing of steel bars |

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| No. | Description |
|---|---|
| UNI EN ISO 898 Ed.2013 | Mechanical properties of fasteners made of carbon steel and alloy steel |
| UNI EN 10088-3 Ed.2024 | Technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general purposes |
| UNI EN 10083-3 Ed.2006 | Steels For Quenching And Tempering. Technical Delivery Conditions For Alloy Steels |
| ISO 19840 Ed.2012 | Paints and varnishes—Corrosion protection of steel structures by protective paint systems |

# 5 Inspection keys

| ID | Activity | Description |
|---|---|---|
| H | Hold | Mandatory inspection point beyond which a work cannot proceed.<br>The party involved shall be invited to witness the activity, **5 working days notification.**<br>Works may proceed only after approval of inspection points by designated responsible person. |
| W | Witness | Mandatory inspection point.<br>The party involved shall be invited to witness the activity, **5 working days notification.** The activity may proceed if the party involved confirms in advance in writing that they will not attend. |
| R | Review | Review of documentation and/or raised report relating to this activity. Requirements shall be met in order to close this activity. |
| A | Approval | The supplier shall issue and send the documentation related to this phase for approval to all the involved party, without written approval of the documentation the supplier can't proceed with the next steps. |
| M | Monitor | Vendor/Subcontractor shall communicate to the involved party by writing the starting date and time of the relevant activity, to allow it to carry out proper surveillance of the ongoing activities. The party involved shall be invited to witness the activity, **5 working days notification.** |

## 5.1 Remarks

The inspection notice time to all the involved parties is **5 working days notification**. Remazel and Rosetti Marino deserve the possibility to change this document during all the construction phases.

The other miscellaneous items not clearly in this ITP will be inspected and tested by Remazel only.

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# 6 Main and commercial items

## 6.1 Main items

| Drawing | Description | ROSETTI MARINO tag | Structural definition | Material certificate | 1.00 Carbon & Stainless steels material (Plate, pipes, and profiles) | 2.00 Forging (Shape) | 3.00 Forging (Commercial bars) | 4.00 Assembly & Welding | 5.00 Hardening | 6.00 Machining | 7.00 Painting |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Offshore Davit Cranes** | | | | | | | | | | | |
| TBD | Boom | Tag.No. X-99001 | Primary | EN 10204 3.1 | X | | | X | | X | X |
| TBD | Column | | Primary | EN 10204 3.1 | X | | | X | | X | X |
| TBD | Pedestal | | Primary | EN 10204 3.1 | X | | | X | | X | X |
| TBD | Slewing bearing | | Primary | EN 10204 3.1 | | X | | | X | X | X |
| TBD | Pinion | | Primary | EN 10204 3.1 | | | X | | X | X | |
| TBD | Pin | | Primary | EN 10204 3.1 | X | | | | | X | |
| TBD | Pulley | | Primary | EN 10204 3.1 | X | | | | | X | X |
| TBD | Trolley | | Primary | EN 10204 3.1 | X | | | X | | X | X |
| TBD | Drum | | Primary | EN 10204 3.1 | X | | | X | | X | X |
| TBD | Shoulder | | Primary | EN 10204 3.1 | X | | | | | X | X |

*Table 6-1 - Main items list .*

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## 6.2 Commercial items

| OTHER COMPONENTS | |
|---|---|
| Hook | Section 8.00 |
| Wire rope and socket | Section 9.00 |
| Slew bolts | Section 10.00 |
| Gearbox and brakes | Section 11.00 |
| Electrical motor | Section 12.00 |
| Frequency converters | Section 13.00 |
| Load Cell | Section 14.00 |

*Table 6-2 - Commercial items list*

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# 7 Inspection and test plan

## 7.1 Main items

| Section | Description | Applicable Specification / Standard / Procedure | Acceptance Criteria | Verifying Document | Remarks | Sub-Supplier | Remazel | ROSETTI MARINO | CROSSWIND |
|---|---|---|---|---|---|---|---|---|---|
| **1.00** | **CARBON & STAINLESS STEEL MATERIAL (Plate, pipes, and profiles)** | | | | | | | | |
| 1.01 | Material traceability | Material Traceability procedure 24-27012_MTP-00 | Material Traceability procedure 24-27012_MTP-00 | Certification list | | H | R | R | R |
| 1.02 | UT Control (Plates ≥20mm) | EN 10160<br>1724001010-NDT-PRO-00006 | As per<br>EN 10160 Class S2/E3 | NDE Report | Lamination Check<br>Personnel qualified EN 9712 Level II | H | M | R | R |
| 1.03 | Chemical analysis and mechanical properties | EN 10025<br>EN 10250<br>EN ISO 683<br>EN 10210<br>ASTM A564<br>EN 10088<br>EN10028 | As per<br>EN 10025<br>EN 10250<br>EN ISO 683<br>EN 10210<br>ASTM A564<br>EN 10088<br>EN10028 | EN 10204 3.1 certificate | | H | R | R | R |
| **2.00** | **FORGING (Shape)** | | | | | | | | |
| 2.01 | Chemical analysis and mechanical properties | Forging Manufacturer Procedure<br>EN 10250-2<br>EN 10250-3<br>EN ISO 683-2<br>ASTM A564 | As per<br>Forging Manufacturer Procedure<br>EN 10250-2<br>EN 10250-3<br>EN ISO 683-2<br>ASTM A564 | EN 10204 3.1 Certificate | | H | R | R | R |
| 2.02 | MT Control | EN 10228-1<br>1724001010-NDT-PRO-00006 | As per<br>EN 10228-1 Liv. 3 | NDT Report | Slewing Bearings will be inspected with MT after final machining (Step 6.02) | H | W | R | R |
| 2.03 | UT control | EN 10228-3<br>1724001010-NDT-PRO-00006 | As per<br>EN 10228-3 Liv. 2 | NDT Report | | H | W | R | R |
| 2.04 | Dimensional check after roughing | Drawing | As per<br>Drawings | Dimensional report | | H | R | R | R |

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| Section | Description | Applicable Specification / Standard / Procedure | Acceptance Criteria | Verifying Document | Remarks | Sub-Supplier | Remazel | ROSETTI MARINO | CROSSWIND |
|---|---|---|---|---|---|---|---|---|---|
| 2.05 | Material traceability | Material Traceability procedure 24-27012_MTP-00 | Material Traceability procedure 24-27012_MTP-00 | Certification list | | H | R | R | R |
| 2.06 | Marking | Forging Manufacturer Procedure | As per EN 10250-2 EN 10250-3 EN ISO 683-2 ASTM A564 | N.A. | | H | R | R | R |
| **3.00** | **FORGING (Commercial bars)** | | | | | | | | |
| 3.01 | Material traceability | According to Standard specification | According to Standard specification | Certification list | | H | R | R | R |
| 3.02 | Chemical analysis and mechanical properties | EN 10250-2 EN 10250-3 EN ISO 683-2 ASTM A564 | As per EN 10250-2 EN 10250-3 EN ISO 683-2 ASTM A564 | EN 10204 3.1 certificate | See table 6.1 | H | R | R | R |
| 3.03 | Dimensional check after roughing | Drawing | As per Drawings | Dimensional report | | H | R | R | R |
| 3.04 | Marking | Forging Manufacturer Procedure | As per EN 10250-2 EN 10250-3 EN ISO 683-2 ASTM A564 | N.A. | | H | R | R | R |
| **4.00** | **ASSEMBLY & WELDING** | | | | | | | | |
| 4.01 | Welding book submission | EN ISO 15614-1 EN ISO 9606-1 1724001010-WEL-PRO-00005 | As per EN ISO 15614-1 EN ISO 9606-1 | Welding book | Welding book must be included: • PQR • Weld map • WPS • Welder qualification The PQR shall be approved by Notified Body. | H | A | R | R |
| 4.02 | Welding Consumables | EN Standard | As per EN Standard | EN 10204 3.1 Certificate for chemical analysis and 2.2 for mechanical properties | | H | R | R | R |
| 4.03 | Fit-up inspection | WPS | As per WPS | Internal Inspection report | | H | M | R | R |

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| Section | Description | Applicable Specification / Standard / Procedure | Acceptance Criteria | Verifying Document | Remarks | Sub-Supplier | Remazel | ROSETTI MARINO | CROSSWIND |
|---|---|---|---|---|---|---|---|---|---|
| 4.04 | Welding activities | WPS | As per WPS | Internal Inspection report | | H | M | R | R |
| 4.05 | NDT Operator Qualification | EN ISO 9712 | As per EN ISO 9712 level II | NDT operator qualification | | H | A | R | R |
| 4.06 | VT inspection of welds | EN ISO 17637 1724001010-NDT-PRO-00006 | As per EN ISO 5817 Lev. C | NDT report | Testing of welds shall be performed not sooner than 48 hours after completion. In process NDT inspection is not limited. Only the final acceptance inspection shall meet the 48-hour hold. The percentage of checks is shown on the drawings. | H | W | R | R |
| 4.07 | MT inspection of welds | EN ISO 17638 1724001010-NDT-PRO-00006 | As per EN ISO 23278 Lev. 2 | NDT report | | H | W | R | R |
| 4.08 | UT inspection of welds | EN ISO 17640 1724001010-NDT-PRO-00006 | As per EN ISO 11666 Lev. 2 | NDT report | | H | W | R | R |
| 4.09 | Dimensional check after welding | Drawing | As per drawing | Dimensional report | | H | W | R | R |
| 4.10 | Material traceability | Material Traceability procedure TBD | As per Material Traceability procedure TBD | Certification list | | H | R | R | R |
| **5.00** | **HARDENING** | | | | | | | | |
| 5.01 | Hardness Check | As per Drawing | As per Drawing | Hardness Report | | H | W | R | R |
| 5.02 | MT control on hardened surfaces | EN 10228-1 1724001010-NDT-PRO-00006 | As per EN 10228-1 Lev. 3 | NDE Report | Personnel qualified EN 9712 Level 2 | H | W | R | R |
| **6.00** | **MACHINING** | | | | | | | | |
| 6.01 | Dimensional check after machining | As per Drawing | As per drawing | / | Visual Inspection before painting will be performe during dimensional check Dimensional report | H | W | W | R |
| 6.02 | Magnetic Test on machined parts Forging & machined welds | EN 10228-1 NDT Procedure 1724001010-NDT-PRO-00006 | EN 10228-1 Lev. 3 NDT Procedure 1724001010-NDT-PRO-00006 | NDE Report | | H | W | R | R |
| 6.03 | Rust protection on machined parts | N.A. | N.A. | N.A. | | H | R | R | R |
| **7.00** | **PAINTING** | | | | | | | | |

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| Section | Description | Applicable Specification / Standard / Procedure | Acceptance Criteria | Verifying Document | Remarks | Sub-Supplier | Remazel | ROSETTI MARINO | CROSSWIND |
|---|---|---|---|---|---|---|---|---|---|
| 7.01 | Steel preparation visual Inspection<br>- Surface profile checks<br>- Dust checks<br>- Salt checks | Painting Specification 1724001010-MAT-PRO-00007 | Painting Specification 1724001010-MAT-PRO-00007 | Painting report | | H | W | W | W |
| 7.02 | Visual inspection of Final Coat | Painting Specification 1724001010-MAT-PRO-00007 | Painting Specification 1724001010-MAT-PRO-00007 | Painting report | | H | W | W | W |
| 7.03 | DFT Test | Painting Specification 1724001010-MAT-PRO-00007 | Painting Specification 1724001010-MAT-PRO-00007 | Painting report | | H | W | W | W |
| 7.04 | Adhesion test | Painting Specification 1724001010-MAT-PRO-00007 | Painting Specification 1724001010-MAT-PRO-00007 | Painting report | | H | W | W | W |

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## 7.2 Commercial items

### *7.2.1 Other components*

| Section | Description | Applicable Specification / Standard / Procedure | Acceptance Criteria | Verifying Document | Remarks | Sub-Supplier | Remazel | ROSETTI MARINO | CROSSWIND |
|---|---|---|---|---|---|---|---|---|---|
| **8.00** | **HOOK** | | | | | | | | |
| 8.01 | Base Material chemical analysis and mechanical properties | EN 10025-2<br>EN 10250-2<br>EN ISO 683-2 | As per<br>EN 10025-2<br>EN 10250-2<br>EN ISO 683-2 | EN 10204 3.1 Certificate | | H | R | R | R |
| 8.02 | UT Control (Plates ≥20mm) | EN 10160 | As per<br>EN 10160 Class S2/E3 | NDE Report | Personnel qualified EN 9712 Level II | H | R | R | R |
| 8.03 | UT Control (Round bars) | EN 10308 | As per<br>EN 10308 Class 3 | NDE Report | Personnel qualified EN 9712 Level II | H | R | R | R |
| 8.04 | UT control (Forging) | EN 10228-3 | As per<br>EN 10228-3 Lev. 3 | NDE Report | Personnel qualified EN 9712 Level II | H | R | R | R |
| 8.05 | Load Test | Manufacturer Specification | As per<br>Manufacturer Specification | CE declaration<br>Declaration of Conformity | CE Marking is required | H | W | R | R |
| 8.06 | Dimensional Check | Drawing | As per<br>Drawing | Dimensional Report | | H | W | W | R |
| 8.07 | Material traceability | According to Standard specification | According to Standard specification | Certification list | | H | R | R | R |
| **9.00** | **WIRE ROPE AND SOCKET** | | | | | | | | |
| 9.01 | Chemical analysis and mechanical properties | API 9A | As per<br>API 9A | EN 10204 3.1 Certificate | | H | R | R | R |
| 9.02 | Breaking Test | Manufacturer Specification | As per<br>Manufacturer Specification | CE declaration<br>Certificate of test and through examination of wire rope | CE Marking is required | H | R | R | W |
| **10.00** | **SLEW BOLTS** | | | | | | | | |
| 10.01 | Chemical analysis and mechanical properties | EN ISO 898 | As per<br>EN ISO 898 | EN 10204 3.1 Certificate | | H | R | R | R |
| 10.02 | Material traceability | According to Standard specification | According to Standard specification | Certification list | | H | R | R | R |
| **11.00** | **GEARBOX AND BRAKES** | | | | | | | | |
| 11.01 | Manufacturer Certificate | Standard Manufacturer | As per<br>Standard Manufacturer | Declaration of Conformity | | H | R | R | R |

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| Section | Description | Applicable Specification / Standard / Procedure | Acceptance Criteria | Verifying Document | Remarks | Sub-Supplier | Remazel | ROSETTI MARINO | CROSSWIND |
|---|---|---|---|---|---|---|---|---|---|
| 11.02 | Chemical analysis and mechanical properties | EN Standards | As per EN standards | EN 10204 3.1 Certificate | Applicable for torque items | H | R | R | R |
| 11.03 | Dynamic and static test | Manufacturer procedure | As per Manufacturer procedure | CE declaration Declaration of Conformity | | H | R | R | R |
| **12.00** | **ELECTRICAL MOTOR** | | | | | | | | |
| 12.01 | Manufacturer Certificate | Manufacturer Specification | As per Manufacturer Specification | CE declaration Declaration of Conformity | CE Marking is required | H | R | R | R |
| **13.00** | **FREQUENCY CONVERTERS** | | | | | | | | |
| 13.01 | Manufacturer Certificate | Manufacturer Specification | As per Manufacturer Specification | CE declaration Declaration of Conformity | CE Marking is required | H | R | R | R |
| **14.00** | **LOAD CELL** | | | | | | | | |
| 14.01 | Base Material chemical analysis and mechanical properties | ASTM A564 | As per ASTM A564 | EN ISO 10204 3.1 Certificate | | H | R | R | R |
| 14.02 | MT on Forging machined parts | EN ISO 10228-1 | As per EN ISO 10228-3 Lev. 3 | NDE Report | Personnel qualified ISO 9712 Level 2 | H | R | R | R |
| 14.03 | UT Control (Round bars) | EN ISO 10308 | As per EN 10308 Class 3 | NDE Report | | H | R | R | R |
| 14.04 | UT Control (Forging) | EN ISO 10228-3 | As per EN ISO 10228-3 Lev. 3 | NDE Report | | H | R | R | R |
| 14.05 | Load Test / Calibration Check | Load Cell Calibration Procedure | As per Construction Drawing | Load Cell Calibration Report | | H | R | R | R |
| 14.06 | Dimensional Check | Drawing | As per Drawing | Dimensional Report | | H | R | R | R |
| 14.07 | Marking | As per Construction Drawing | As per Construction Drawings | N.A. | | H | R | R | R |

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## 7.3 Completion Activities

| Section | Description | Applicable Specification / Standard / Procedure | Acceptance Criteria | Verifying Document | Remarks | Sub-Supplier | Remazel | ROSETTI MARINO | CROSSWIND |
|---|---|---|---|---|---|---|---|---|---|
| **15.00** | **ASSEMBLY & TESTING** | | | | | | | | |
| 15.01 | Cleanliness check | 123A90-DDL-MAC-SP-50034_00 | All dirt, grime, grease, and shop residue shall be removed from the surface of furnished equipment prior to packaging and shipping from the manufacturing facility. | \ | | - | H | R | R |
| 15.02 | Final Check Assembly | General Assembly Drawing | As per General Assembly Drawing | Test Report | | - | H | - | - |
| 15.03 | Factory Acceptance Test | FAT Procedure TBD 1724001010-QC-PRO-00008 | As per FAT Procedure TBD | FAT Report | Including as min. static load test, functional test without & with load, overload functional test | - | H | W | W |
| 15.04 | Safety requirements check | \ | \ | \ | safety instruction in English languages/ Check safety labels | - | H | R | R |
| 15.05 | Weight Control | Weight Procedure TBD | As per Weight Procedure TBD | Test Report | | - | H | R | R |
| 15.06 | Nameplate Check | Nameplate Check Drawing | As per Nameplate Check Drawing | Nameplate picture | CE Marking is required | - | H | W | R |
| 15.07 | Final and packing inspection | Packing Procedure TBD | As per Packing procedure TBD | Inspection Report | | - | H | R | R |
| 15.08 | Manufacturer Data Book Review | Data Book Index | Data Book Index | Data Book Dossier | | - | H | R | R |
| **16.00** | **SPARE PARTS** | | | | | | | | |
| 16.00 | Check commissioning spare parts | 1724001010-COM-LIS-00015 | Spare parts list | Spare parts list Inspection release note | | - | H | W | R |
| 16.01 | Check 2y spare parts | 1724001010-COM-LIS-00015 | Spare parts list | Spare parts list Inspection release note | | - | H | W | R |

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# 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

ROSETTI MARINO

| | |
|---|---|
| 1 | NO COMMENTS - APPROVED - WORK MAY PROCEED |
| 2 | MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED |
| 3 | MAJOR COMMENTS – REJECTED – DO NOT PROCEED |
| 4 | APPROVAL NOT REQUIRED |

*NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.*

| Sign | Date |
|---|---|
| DAVIDE CENACCHI | 23/12/2024 |

Document Class: 2

| Rev. | Date | Description | Prepared | Reviewed | Approved |
|---|---|---|---|---|---|
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| 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

| No. | Description |
|---|---|
| 1 | |
| 2 | |
| 3 | |
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# Table of contents


1 INTRODUCTION ..... 5

1.1 PROJECT OVERVIEW ..... 5

1.1.1 Project Location ..... 5

1.1.2 Project Concept ..... 6

2 DOCUMENT SCOPE ..... 8

2.1 DEFINITIONS AND ABBREVIATIONS ..... 8

3 WELDING BOOK ..... 9



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# List of Figures


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map ..... 6

Figure 2 - Wind Park Details ..... 6

Figure 3 – BLPH Concept ..... 7


# List of tables


Table 1 - Reference Documents ..... 8

Table 2 - Definitions and Abbreviations ..... 8



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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.

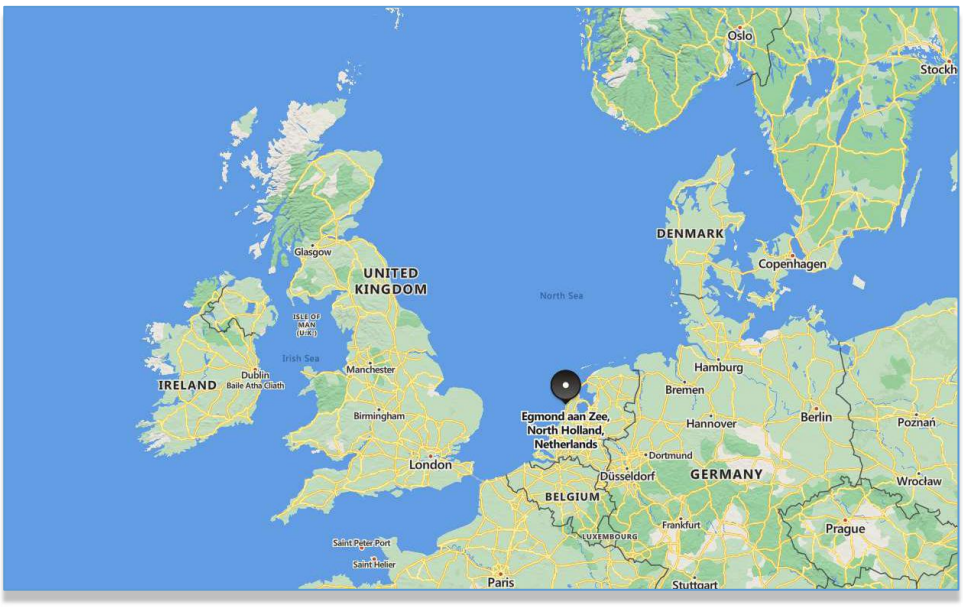


*Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map*




*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.

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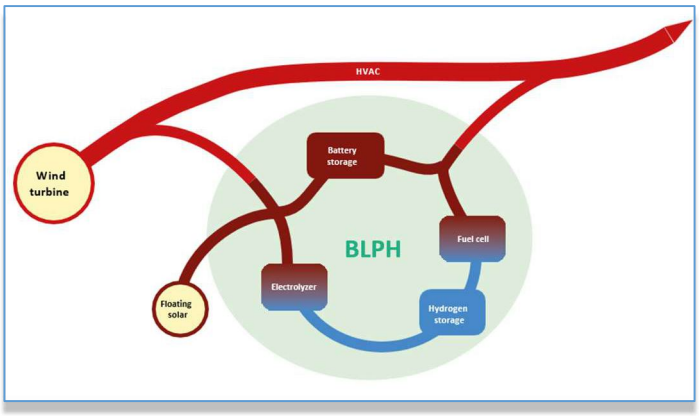



*Figure 3 – BLPH Concept*

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.

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# 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

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# DAVIT CRANE

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

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| 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 |
| 00 | 26/07/2024 | 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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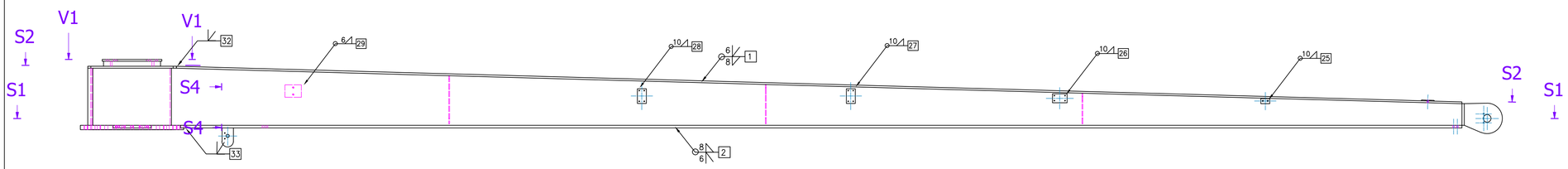
# Index

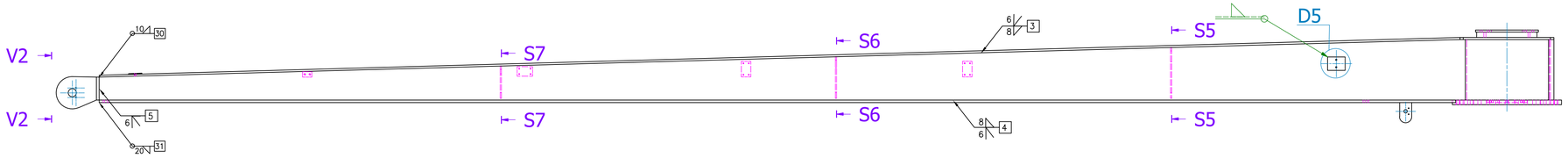

1. Weld Map ..... 13
2. WPS ..... 14
3. WPQR ..... 15
4. Welder Certificates ..... 16
5. Attachments ..... 8


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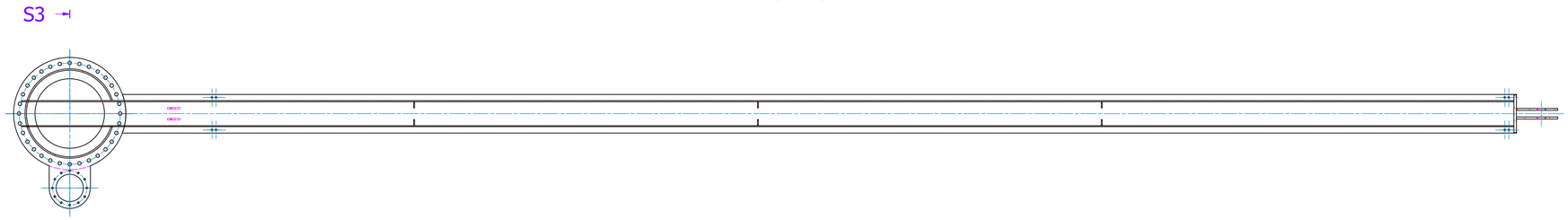
# 1. Weld Map

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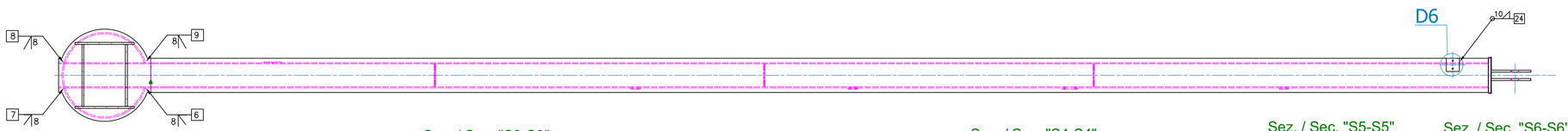


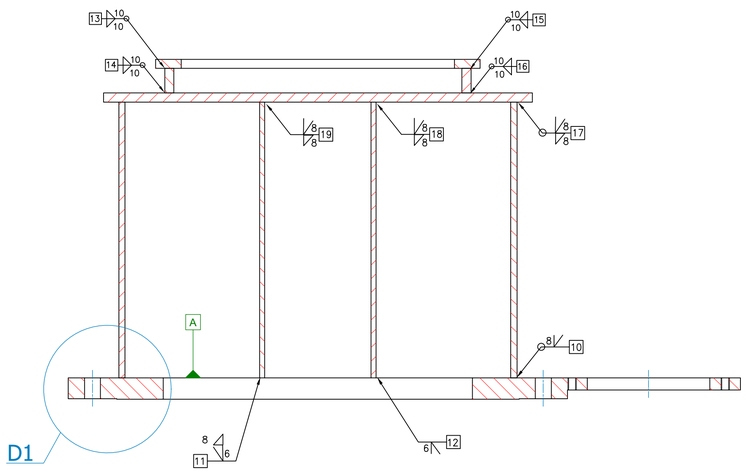

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( 1 : 20 )



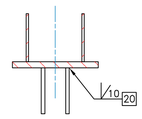

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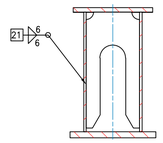

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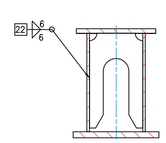

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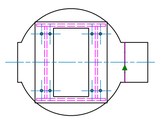

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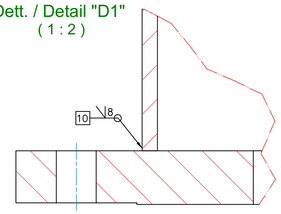

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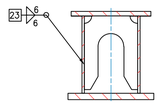

Vista da / View from "V1"
( 1 : 20 )



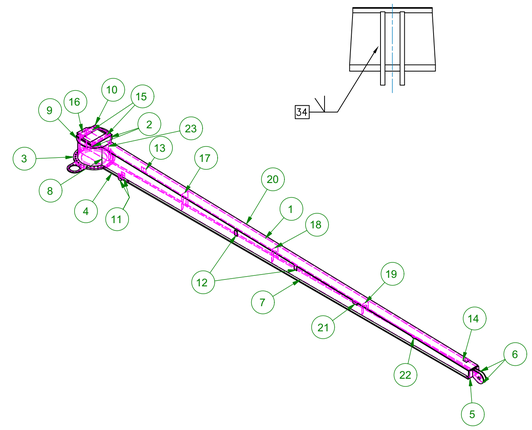
Dett. / Detail "D1"
( 1 : 2 )




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




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




| | | | | | |
|---|---|---|---|---|---|
| 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 |
| 9 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | C3 | 45,88 kg |
| 8 | Sheet metal | Thk = 10 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | C3 | 28,73 kg |
| 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 |
| 5 | Sheet metal | Thk = 20 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | C3 | 7,22 kg |
| 4 | Sheet metal | Thk = 20 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | C3 | 444,42 kg |
| 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**

**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

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

**Su un lato / One side**
**t = min ( T1;T2 )**
**5**

**NDT:**
**100 % VI**

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

**Sui due lati / Both side**
**t = min ( T1;T2 )**
**0,5**

**NDT:**
**100 % VI**

Eliminare spigoli vivi
*Remove all edges*

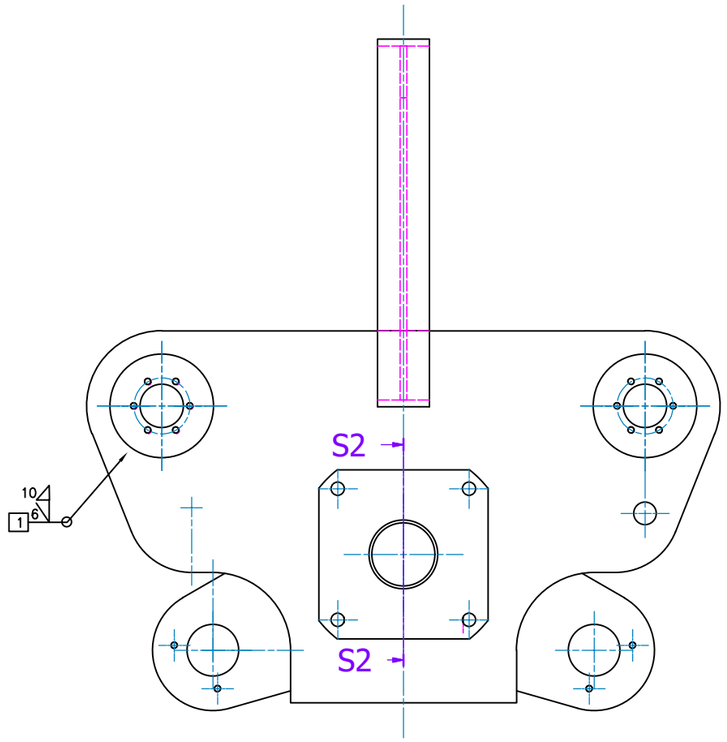
Simboli saldatura secondo
*Welding symbols according to*
**UNI EN ISO 2553**

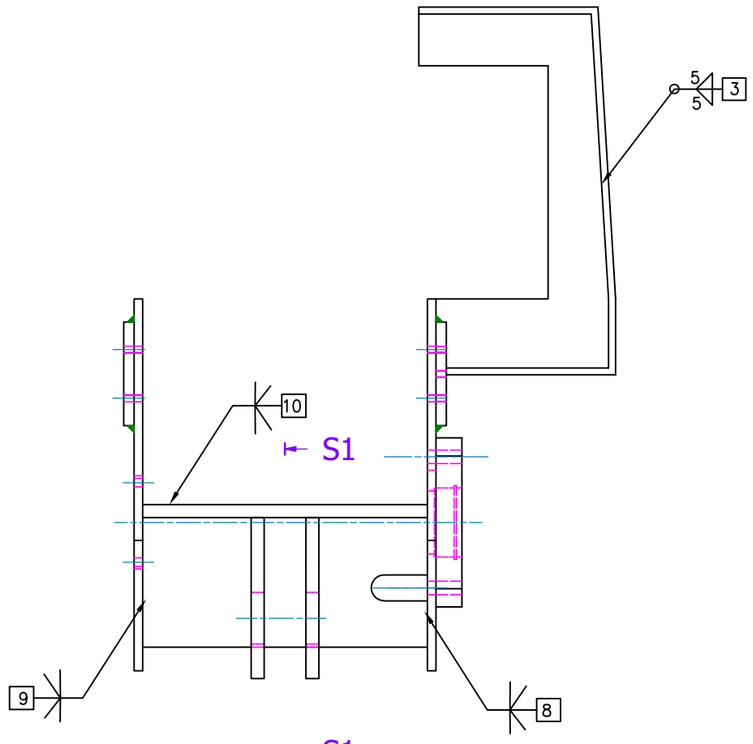
| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| A | 17/07/2024 | Prima emissione / First issued | riccardo.sobani | | - | |

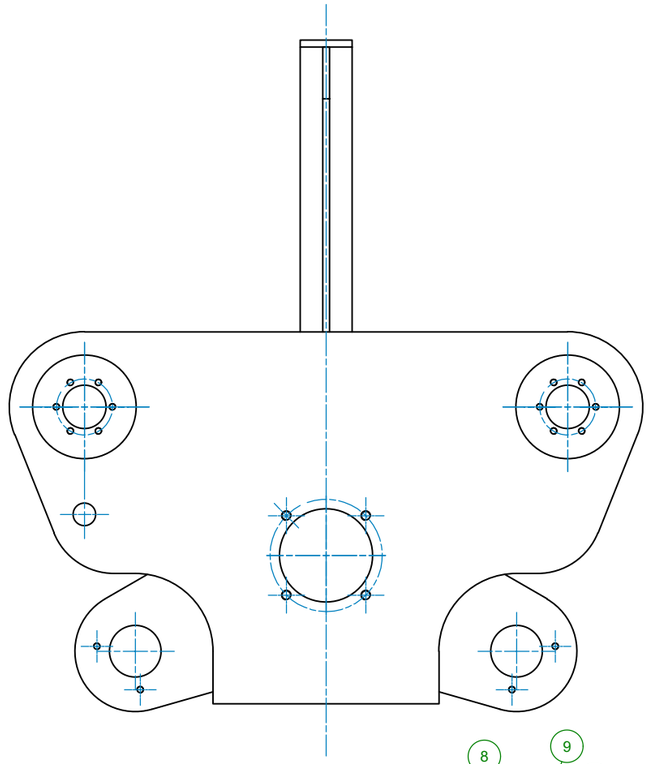
REMAZEL ENGINEERING
Chiuduno (BG) - 24060 - ITALY
Phone : +39-035-68.44.14 - Fax : +39-035-68.78.23
e-mail : info@remazel.com / website : www.remazel.com

Project / Equipment : **C09-0001**
Title : Carpenteria Braccio / Boom Carpentry
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

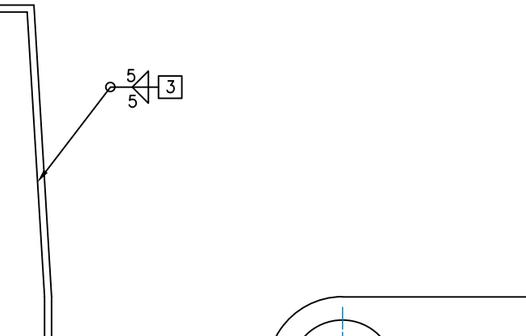
This drawing is property of REMAZEL ENGINEERING S.p.A. It is strictly forbidden to copy, reproduce, modify or distribute the drawing to third persons without owner's written permission.

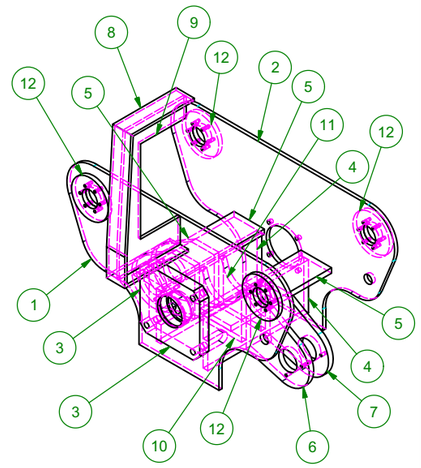


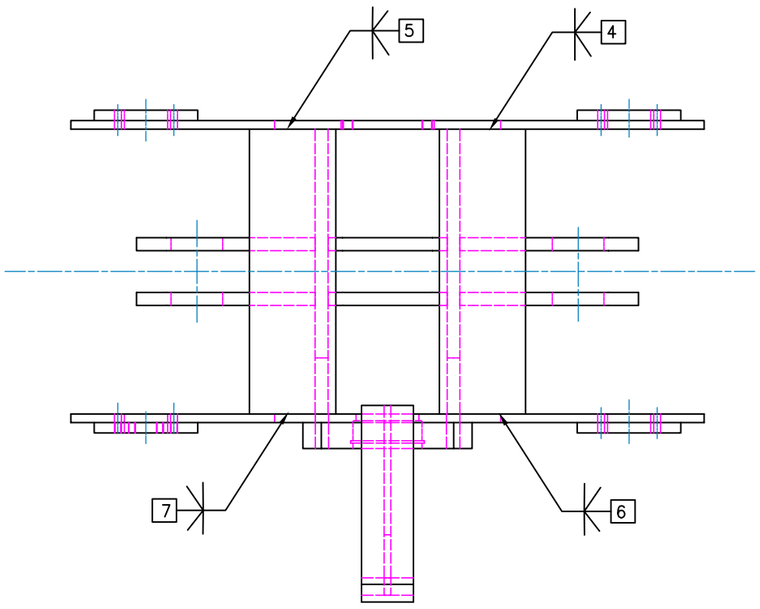



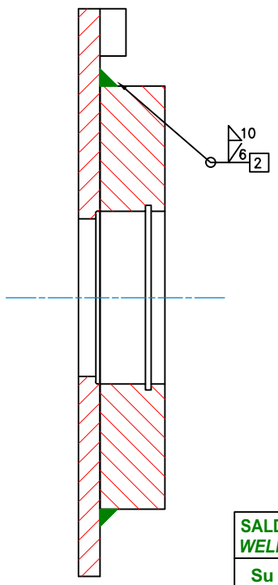
Sez. / Sec. **"S1-S1"**
( 1 : 5 )




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

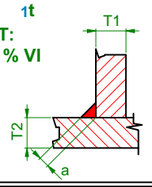



| EL. | DESCRIPTION | ADDITIONAL DESCRIPTION | Q.C.L. | Q.TY | WEIGHT |
|---|---|---|---|---|---|
| 12 | Flange | Ø120 mm - S 355 J2+N UNI EN 10025_Cert 3.1 | C3 | 4 | 0,86 kg |
| 11 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert 3.1 | C3 | 1 | 1,64 kg |
| 10 | Sheet metal | Thk = 15 mm - 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 |

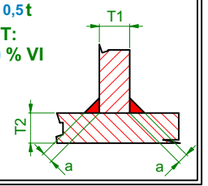
**SALDATURE NON QUOTATE**
***WELD WITHOUT DIMENSION***

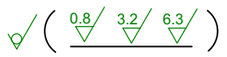
Su un lato / *One side*
t = min ( T1;T2 )
a = 1t
NDT:
100 % VI




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

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




Eliminare spigoli vivi
*Remove all edges*

**SALDATURA CONTINUA**
*CONTINUOUS WELDING*

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

REMAZEL ENGINEERING
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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***

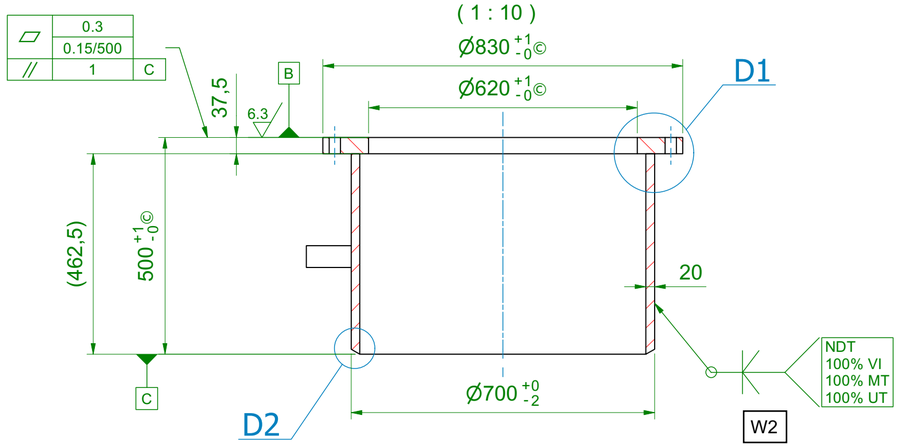
Q.C.L. :
C3

Drawing N° :
C09-0001-P0006

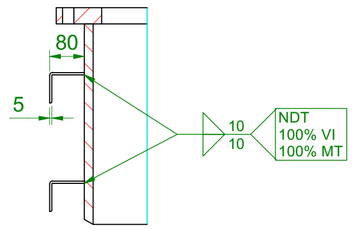
Revision :
A

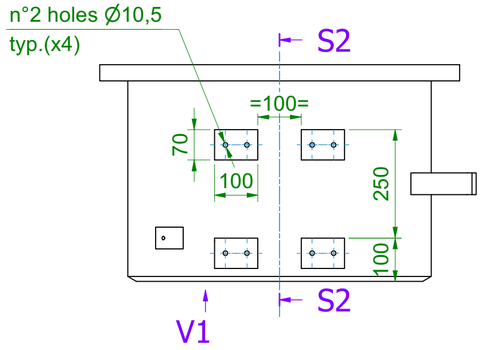
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## Sez. / Sec. **"S1-S1"**
( 1 : 10 )

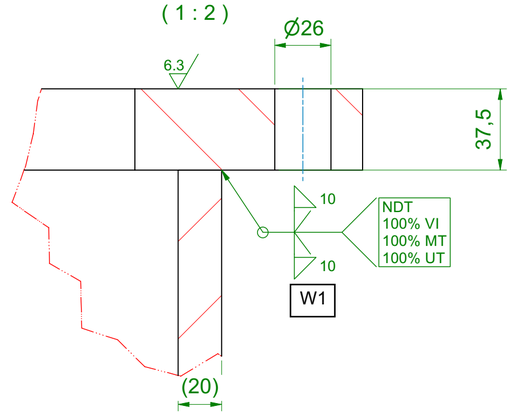



## Sez. / Sec. **"S2-S2"**
( 1 : 10 )

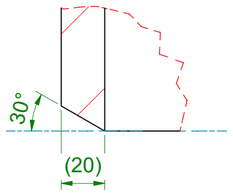


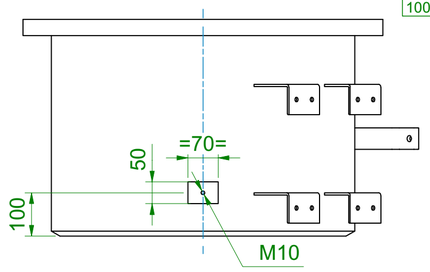

## Dett. / Detail **"D1"**
( 1 : 2 )



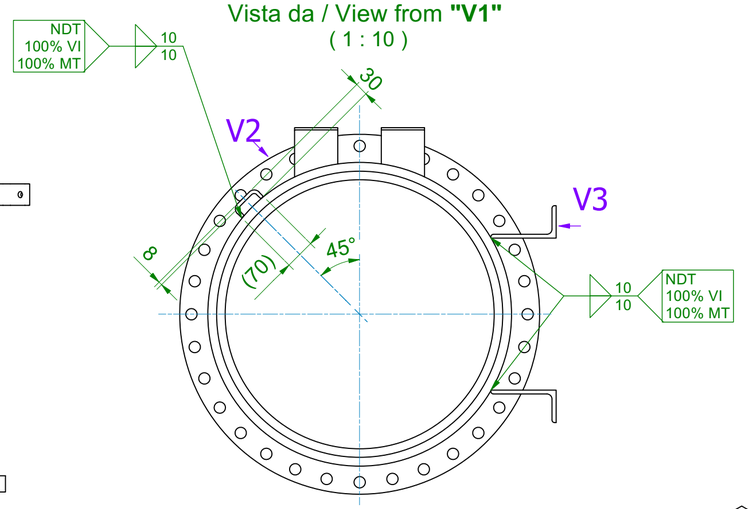

## Dett. / Detail **"D2"**
( 1 : 2 )

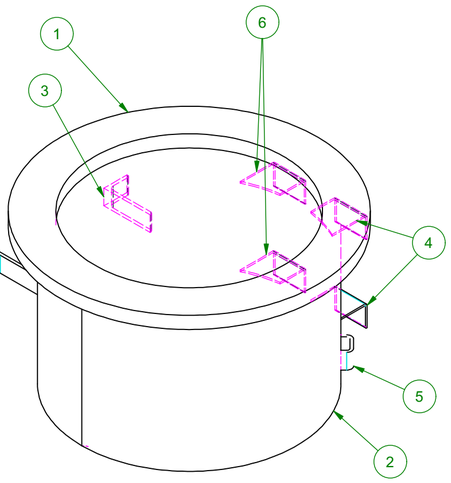


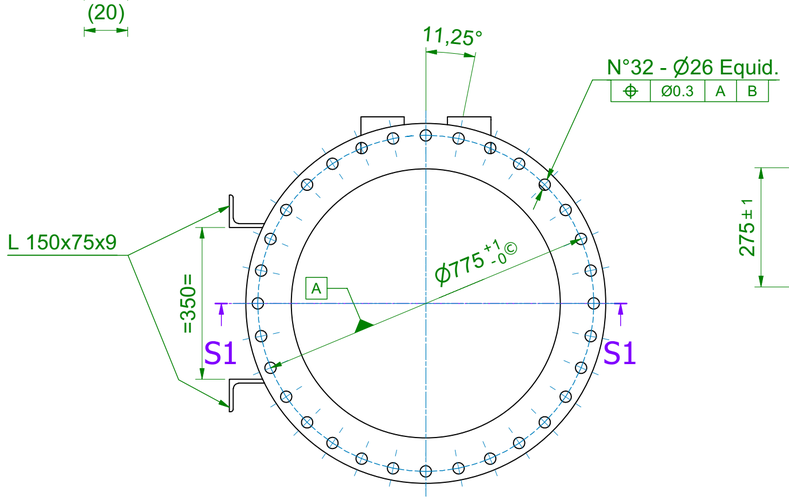

## Vista da / View from **"V2"**
( 1 : 10 )



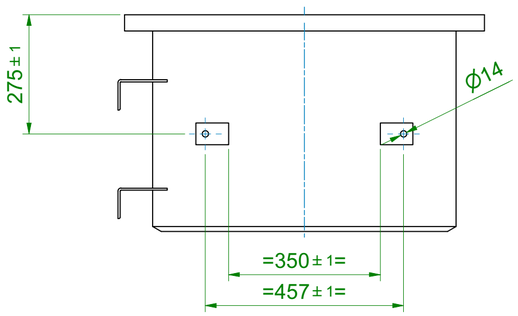

## Vista da / View from **"V1"**
( 1 : 10 )




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




| 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 |

**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*

6.3

**PRIMER ONLY**

**SALDATURA CONTINUA**
*CONTINUOUS WELDING*

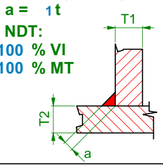
Tutte le saldature testa a testa
non indicate a disegno devono essere
a piena penetrazione

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

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

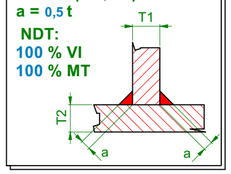
**SALDATURE NON QUOTATE**
***WELD WITHOUT DIMENSION***

**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. |

| 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 | | | |


PRIMA DI INIZIARE I LAVORI RISCUOTERE NEL TOLLETTE
LAVORAZIONI MECCANICHE RECIPIENTI A PRESSIONE
Direttiva PED 2014/68/UE Modulo H
Direttiva ATEX 2014/34/UE
Norme EN 13445-3 Edizione 2021
Norme EN 13445-4 Edizione 2021
Norme ASME Sez. VIII Div. 1 Edizione 2023
Norme ASME Sez. II Parte A Edizione 2023



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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**

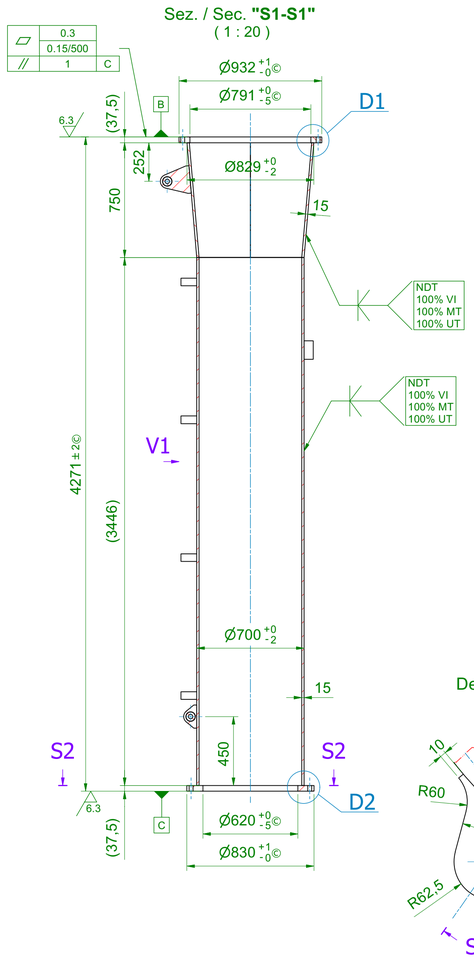
Drawing State: **Work in Progress** / ***FOR CONSTRUCTION***

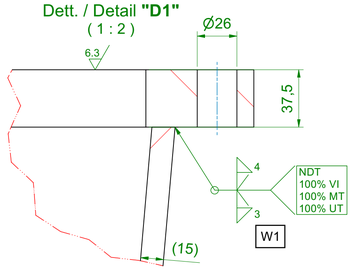
Q.C.L. : C1

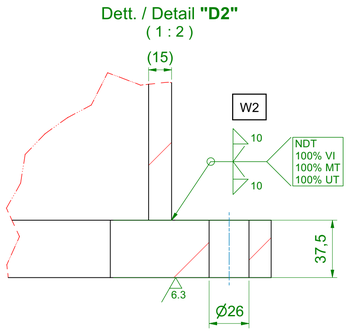
Drawing N° : C09-0001-P0001

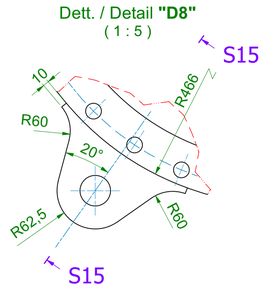
Revision : D

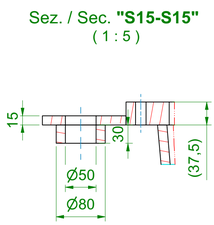

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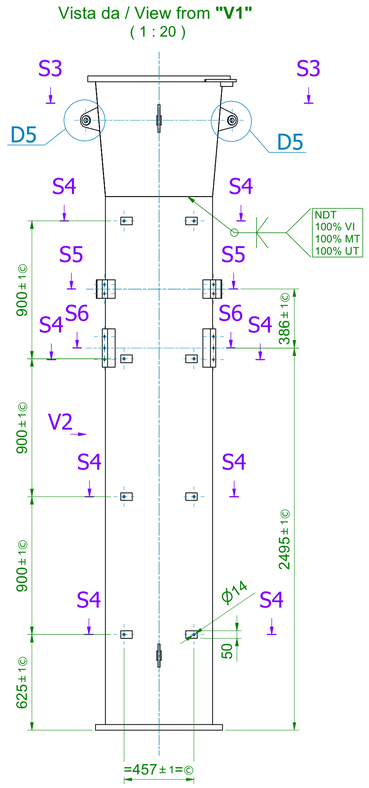


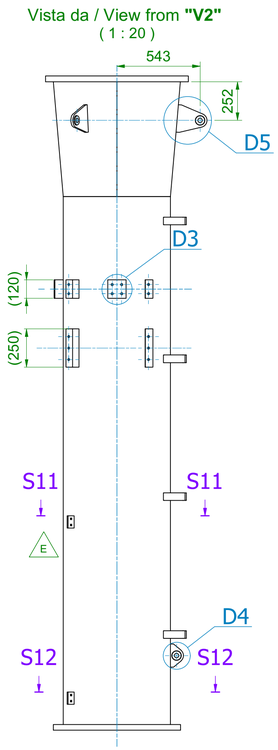



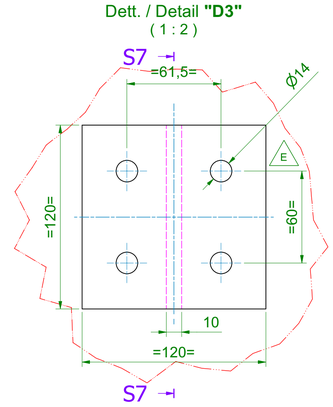



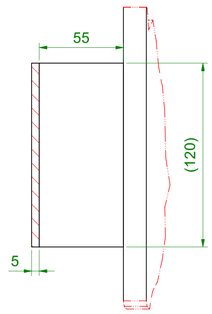



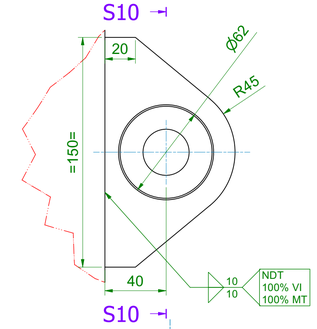



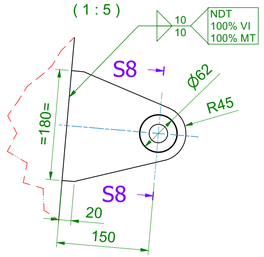



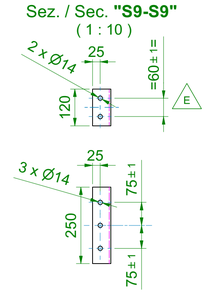



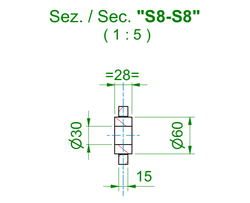



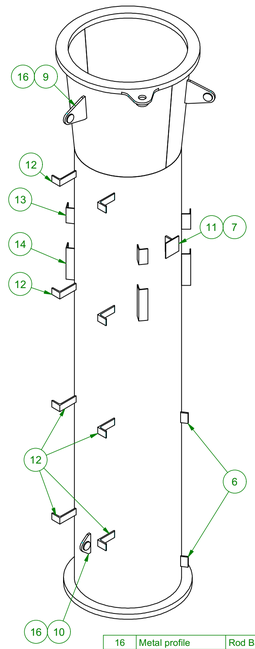



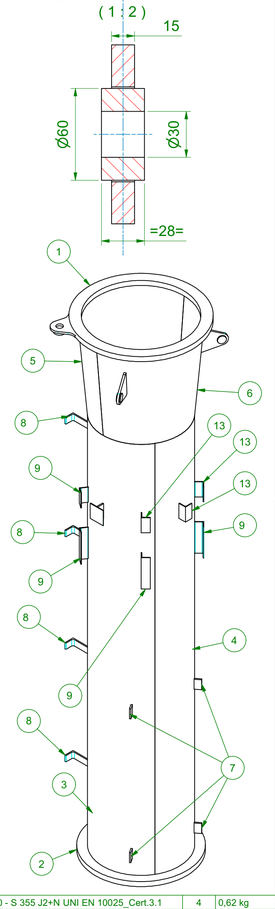



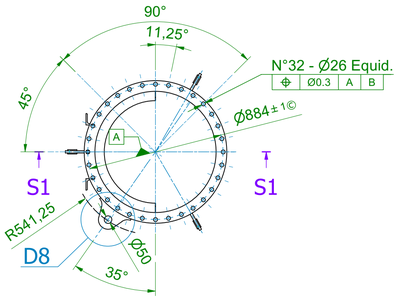



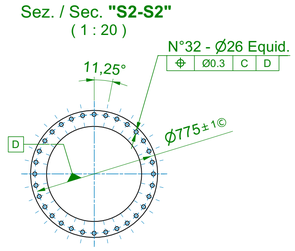



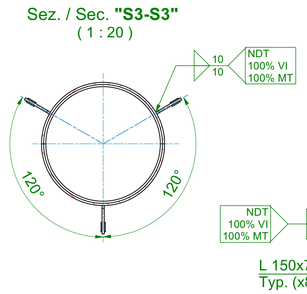



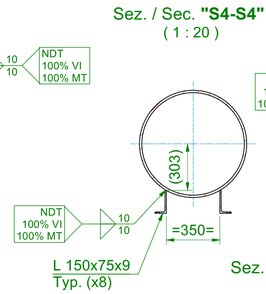



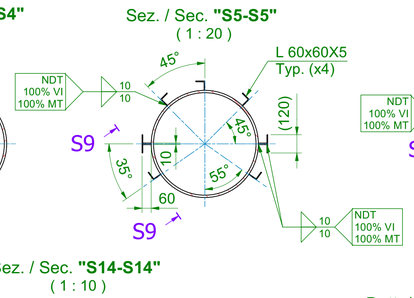



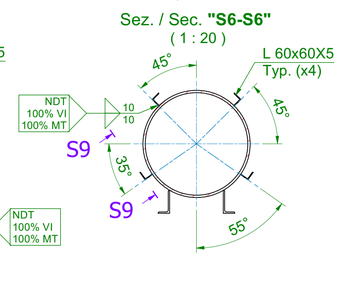



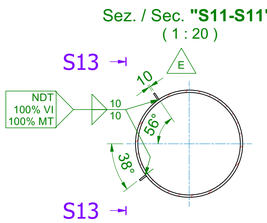



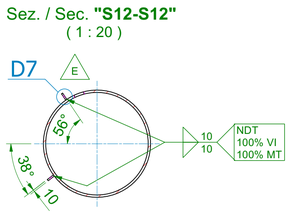



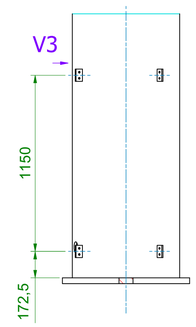



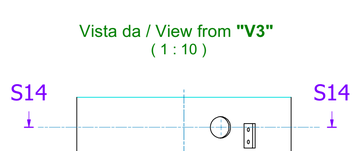



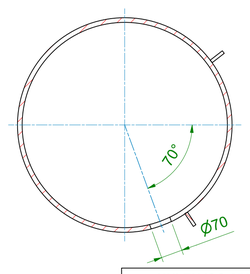



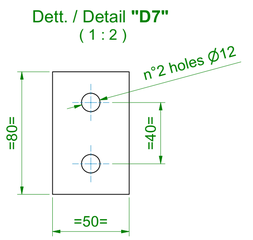




| | | | | |
|---|---|---|---|---|
| 16 | Metal profile | Rod Bar Ø60 - S 355 J2+N UNI EN 10025_Cert.3.1 | 4 | 0,62 kg |
| 15 | Metal profile | Rod Bar Ø60 - S 355 J2+N UNI EN 10025_Cert.3.1 | 1 | 1,19 kg |
| 14 | Metal profile | L 60x60x5 - S 355 J2+N UNI EN 10025_Cert.3.1 | 4 | 1,14 kg |
| 13 | Metal 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 |

6.3

| 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* |

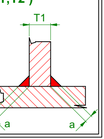
Eliminare spigoli vivi
*Remove all edges*

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

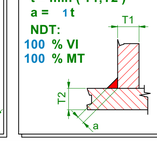
**UNI EN ISO 8501-3**
**Grado di preparazione saldature, bordi e altre aree con imperfezioni superficiali**
*Preparation grade of welds, edges and other areas with surface imperfections*

| 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**



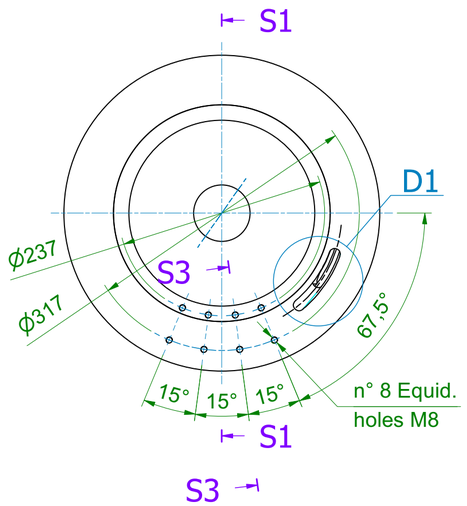

**SALDATURE NON QUOTATE**
***WELD WITHOUT DIMENSION***
**Su un lato / *One side***
**t = min ( T1;T2 )**
**a = 1 t**
**NDT:**
**100 % VI**
**100 % MT**



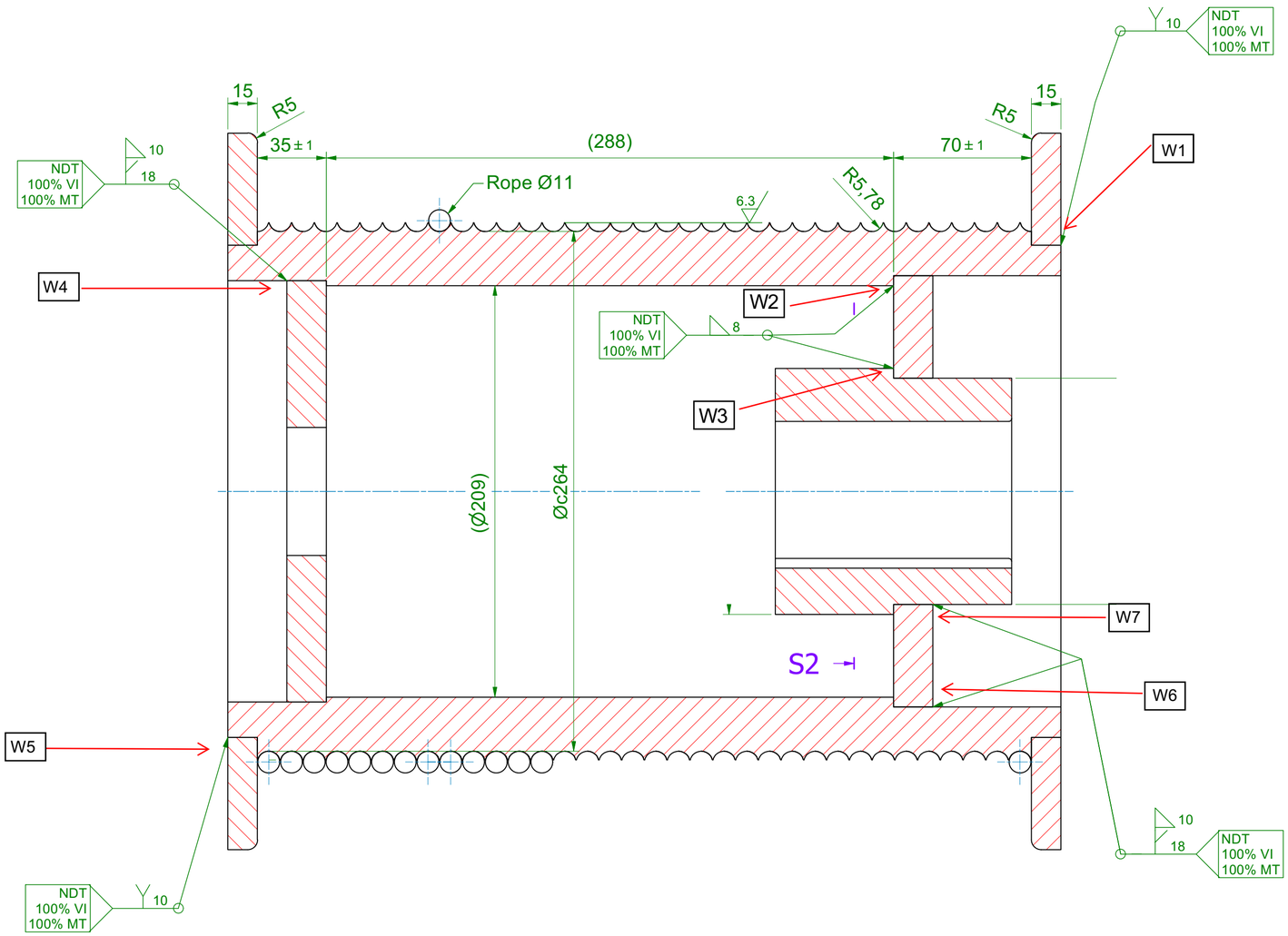

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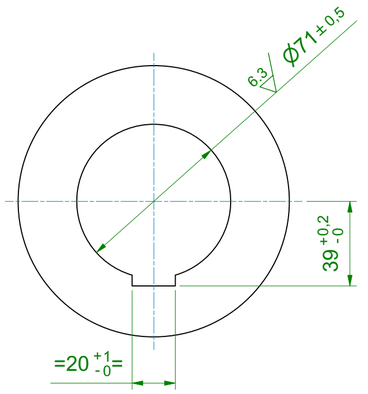
REMAZEL ENGINEERING
Chiaduno (BG) - 24060 - ITALY
Phone : +39-035-68.44.14 - Fax : +39-035-68.78.23
e-mail : info@remazel.com / website : www.remazel.com

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

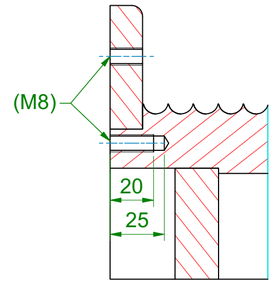


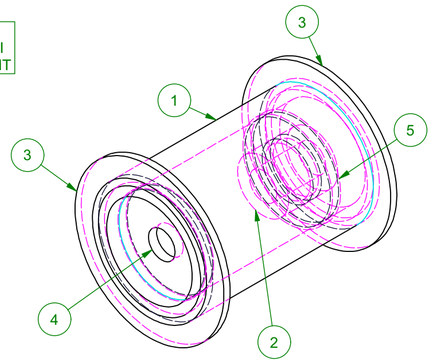

NOTA:
Fori filettati da eseguire dopo assemblaggio
Threaded holes to be drilled after assembly




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* |

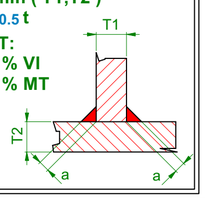
**UNI EN ISO 8501-3**

**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. |

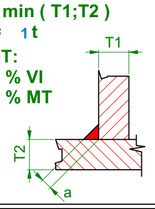
**SALDATURE NON QUOTATE**
***WELD WITHOUT DIMENSION***

**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. | – |


QUESTO DISEGNO E' STATO REALIZZATO NEL RISPETTO DELLE NORME UNI EN ISO 9001:2015 - UNI EN ISO 3834-2:2006 - UNI EN ISO 1090-1:2012 - UNI EN ISO 1090-2:2018 - UNI EN ISO 12944-5:2018 - UNI EN ISO 17607:2003 - UNI EN ISO 15607:2019 - UNI EN ISO 15609-1:2019 - UNI EN ISO 15614-1:2017 - UNI EN ISO 17637:2016 - UNI EN ISO 17638:2016 - UNI EN ISO 9606-1:2017 - UNI EN ISO 9712:2012 - UNI EN ISO 17640:2018 - UNI EN ISO 5817:2014 - UNI EN ISO 10042:2018 - UNI EN ISO 13920:1998 - UNI EN ISO 14731:2019 - UNI EN ISO 3452-1:2013 - UNI EN ISO 3059:2012 - UNI EN ISO 23277:2015 - UNI EN ISO 22825:2012 - UNI EN ISO 22826:2005 - UNI EN ISO 898-1:2013 - UNI EN ISO 3506-1:2020 - UNI EN ISO 3506-2:2020 - UNI EN ISO 4014:2011 - UNI EN ISO 4017:2014 - UNI EN ISO 4032:2013 - UNI EN ISO 4034:2013 - UNI EN ISO 4762:2006 - UNI EN ISO 7089:2000 - UNI EN ISO 7090:2000 - UNI EN ISO 7091:2000 - UNI EN ISO 7093-1:2000 - UNI EN ISO 7094:2000 - UNI EN ISO 10083-1:2006 - UNI EN ISO 10083-2:2006 - UNI EN ISO 10083-3:2008 - UNI EN ISO 15614-1:2017 - UNI EN ISO 15609-1:2019 - UNI EN ISO 9606-1:2017 - UNI EN ISO 9712:2012 - UNI EN ISO 17640:2018 - UNI EN ISO 5817:2014 - UNI EN ISO 10042:2018 - UNI EN ISO 13920:1998 - UNI EN ISO 14731:2019 - UNI EN ISO 3452-1:2013 - UNI EN ISO 3059:2012 - UNI EN ISO 23277:2015 - UNI EN ISO 22825:2012 - UNI EN ISO 22826:2005 - UNI EN ISO 898-1:2013 - UNI EN ISO 3506-1:2020 - UNI EN ISO 3506-2:2020 - UNI EN ISO 4014:2011 - UNI EN ISO 4017:2014 - UNI EN ISO 4032:2013 - UNI EN ISO 4034:2013 - UNI EN ISO 4762:2006 - UNI EN ISO 7089:2000 - UNI EN ISO 7090:2000 - UNI EN ISO 7091:2000 - UNI EN ISO 7093-1:2000 - UNI EN ISO 7094:2000 - UNI EN ISO 10083-1:2006 - UNI EN ISO 10083-2:2006 - UNI EN ISO 10083-3:2008

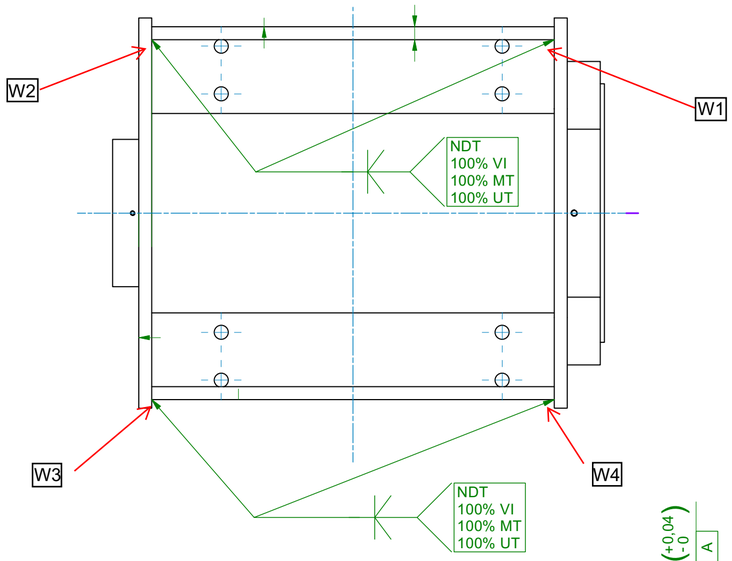


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Phone : +39-035-68.44.14 - Fax : +39-035-68.78.23
e-mail : info@remazel.com / website : www.remazel.com

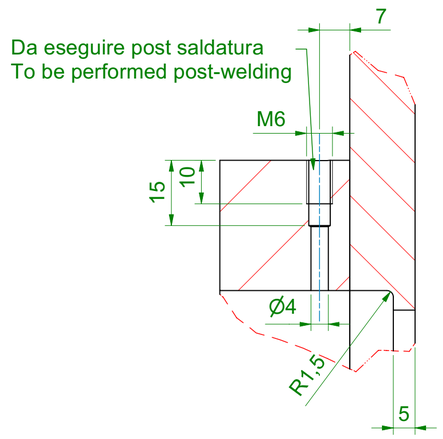

Project / Equipment : **C09-0001**
Weight : 120,1 kg
Title : Cassa Winch / Winch Box
Scale : 1 : 7.5
Sheet : 1 of 3 **A2**
Drawing State: **Released** **FOR CONSTRUCTION**
Q.C.L. : C1
Drawing N° : C09-0001-P0085
Revision : A


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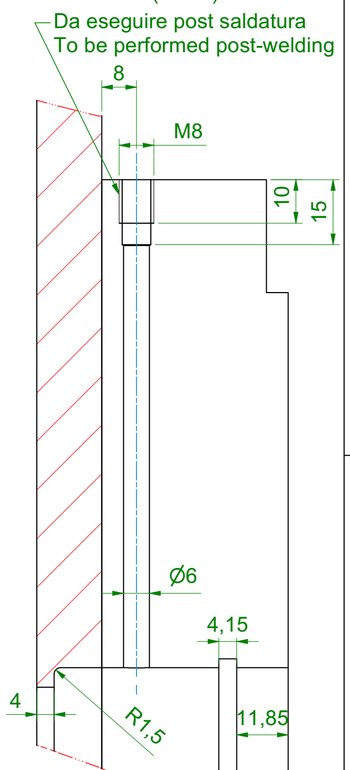
Sez. / Sez. **"S5-S5"**
( 1 : 5 )



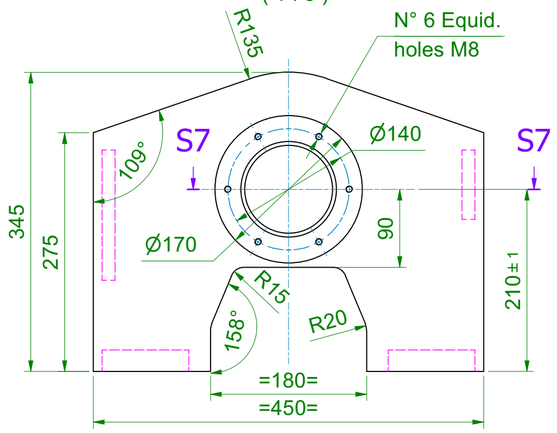

Dett. / Detail **"D1"**
( 1 : 1 )



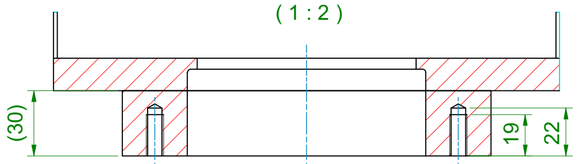

Dett. / Detail **"D2"**
( 1 : 1 )

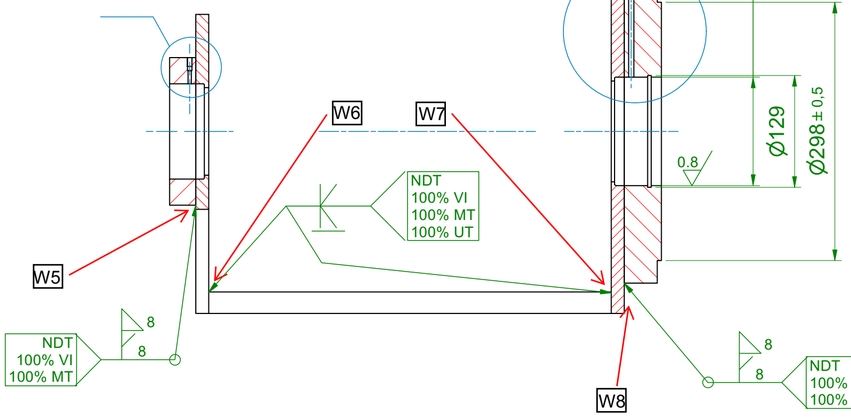



Sez. / Sez. **"S3-S3"**
( 1 : 5 )

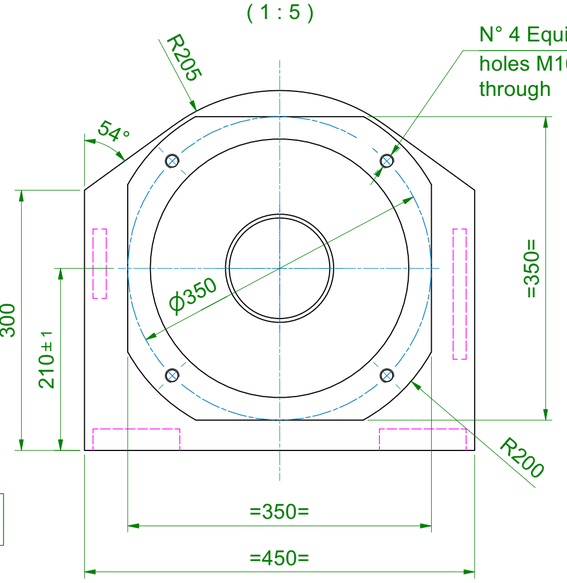


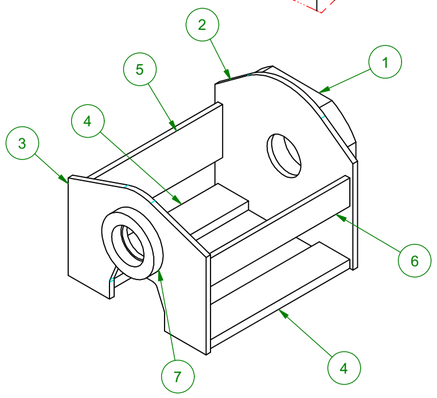

Sez. / Sez. **"S7-S7"**
( 1 : 2 )

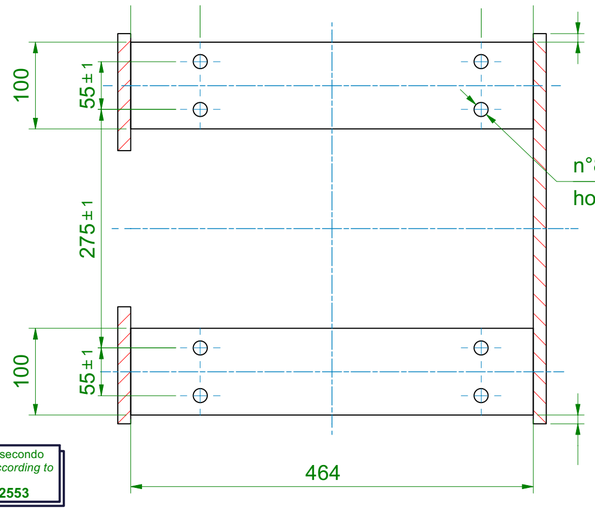



Sez. / Sez. **"S2-S2"**
( 1 : 5 )



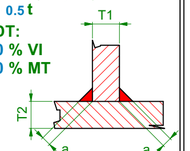




| | | | | |
|---|---|---|---|---|
| 7 | Sheet metal | Thk = 30 mm - S 355 J2 UNI EN 10025_Cert. 3.1 | 1 | 3,31 kg |
| 6 | Sheet metal | Thk = 15 mm - S 355 J2 UNI EN 10025_Cert. 3.1 | 1 | 4,38 kg |
| 5 | Sheet metal | Thk = 15 mm - S 355 J2 UNI EN 10025_Cert. 3.1 | 1 | 8,21 kg |
| 4 | Sheet metal | Thk = 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 |

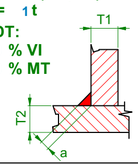
**SALDATURE NON QUOTATE**
***WELD WITHOUT DIMENSION***

**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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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 : 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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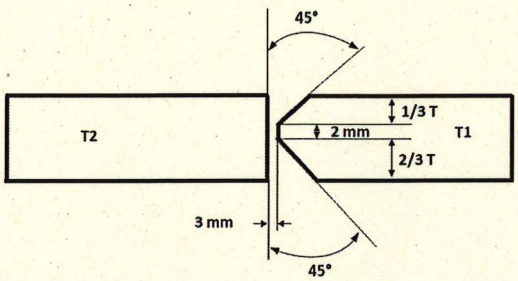
# 2. WPS

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.

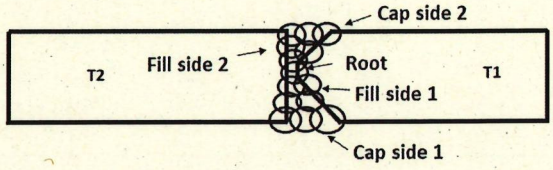
| CONCRANE A REMAZEL Group Company | **WELDING PROCEDURE SPECIFICATION (WPS)** | WPS n°: CCP09-1<br>WPQR: CCP09<br>Rev. 01 – 18/07/2024 \| Pag. 1 / 1 |
|---|---|---|

| | | | |
|---|---|---|---|
| *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**

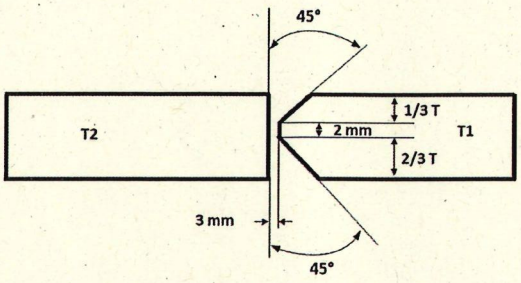
| *REV* | *Date* | *Description* | *Prepared* | *Approved* |
|---|---|---|---|---|
| | | | | |
| 00 | 18/07/2024 | First issue | | |

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

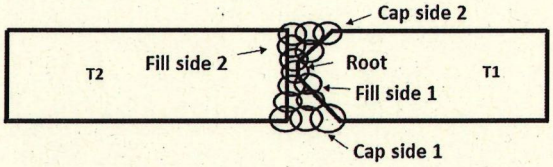
| REMAZEL ENGINEERING | WELDING PROCEDURE SPECIFICATION (WPS) | WPS n°: CCP10-2<br>WPQR: CCP10<br>Rev. 01 – 18/07/2024 | Pag. 1 / 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| *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** | | | **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 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** |

*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. | | | |

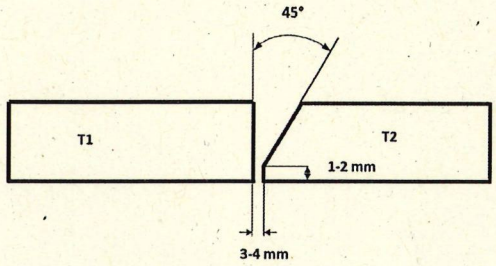
| CONCRANE A REMAZEL Group Company | WELDING PROCEDURE SPECIFICATION (WPS) | WPS n°: CCP12-1<br>WPQR: CCP12<br>Rev. 01 – 08/10/2024 | Pag. 1 / 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| *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 |

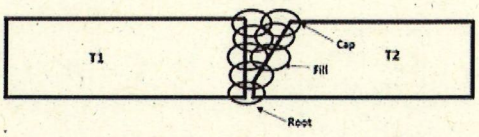
**JOINT DESIGN**

| | | | |
|---|---|---|---|
| *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 | | |
|---|---|---|
| *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 | 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**

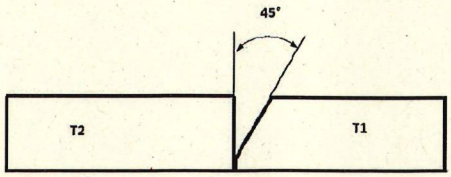
| *REV* | *Date* | *Description* | *Prepared* | *Approved* |
|---|---|---|---|---|
| 01 | 08/10/2024 | Revised heat input | | |
| 00 | 22/07/2024 | | | |

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

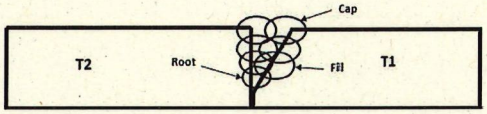
| CONCRANE A REMAZEL Group Company | WELDING PROCEDURE SPECIFICATION (WPS) | WPS n°: CCP12-2<br>WPQR: CCP12<br>Rev. 01 – 08/10/2024 | Pag. 1 / 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| *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** | | | **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** | | | *Other remarks for preheat and interpass temeprature* | |
| *Welding process* | GMAW (135) | | Monitor interpass temperature with tempilstik or laser thermometer. | |
| *Specification* | EN ISO 14341-A | | | |
| *Classification* | G42 4 M21 3Si1 | | **PWHT** | |
| *Trade marker* | ESAB OK AristoRod 12.50 | | *Time and temperature* | N.A. |
| *Size* | Ø 1.2 mm | | | |
| **SHIELD GAS** | | | *PWHT method* | N.A. |
| *Welding process* | GMAW (135) | | | |
| *Specification* | EN ISO 14175 | | *Heating and cooling rates* | N.A. |
| *Class* | M21 | | | |
| *Trade marker* | 82% Ar + 18% CO2 | | *Other remarks for PWHT:* | |
| *Flow rate* | 18-24 l/min | | N.A. | |
| *Nozzle diameter* | Ø16 mm | | | |

| **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**

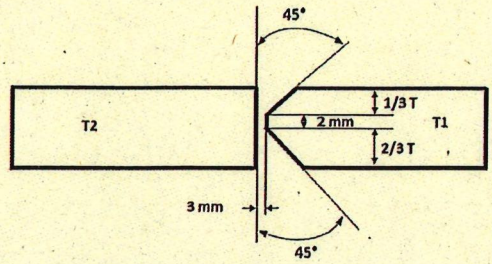
| *REV* | *Date* | *Description* | *Prepared* | *Approved* |
|---|---|---|---|---|
| 01 | 08/10/2024 | Revised heat input | | |
| 00 | 22/07/2024 | | | |

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

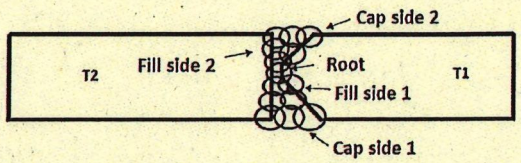
| REMAZEL ENGINEERING | WELDING PROCEDURE SPECIFICATION (WPS) | WPS n°: CCP12-3<br>WPQR: CCP12<br>Rev. 00 – 22/07/2024 | Pag. 1 / 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 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 ArlstoRod 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: |
|---|---|---|---|
| | REMAZEL ENGINEERING S.p.A. | | |

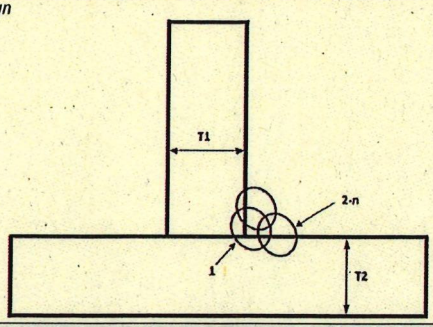
| REMAZEL ENGINEERING | WELDING PROCEDURE SPECIFICATION (WPS) | WPS n°: CCP13-01<br>WPQR: CCP13<br>Rev. 00 – 18/07/2024 | Pag. 1 / 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| *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 |

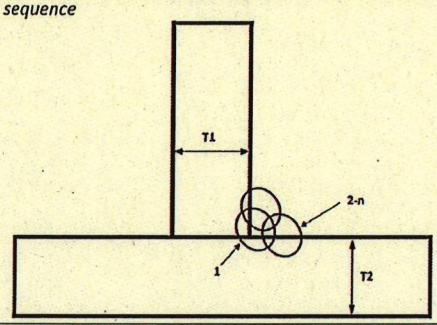
**JOINT DESIGN**

| | | | |
|---|---|---|---|
| *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**

| *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* | 3-48 mm | 3-48 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 ArlstoRod 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° |

**FILLER MATERIALS**

Monitor interpass temperature with tempilstik or laser thermometer.

**PWHT**

| | |
|---|---|
| *Time and temperature* | N.A. |
| SHIELD GAS | |
| *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= 0.45; |
| *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. | | |

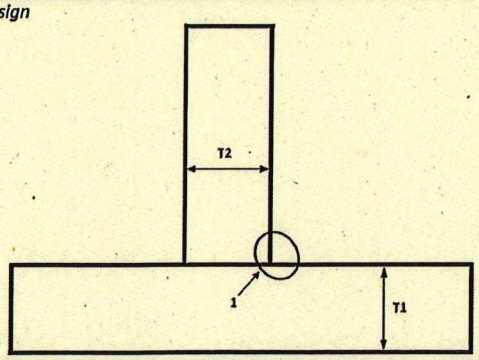
| REMAZEL ENGINEERING | WELDING PROCEDURE SPECIFICATION (WPS) | WPS n°: CCP14-1<br>WPQR: CCP14<br>Rev. 00 – 18/07/2024 | Pag. 1 / 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 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 |

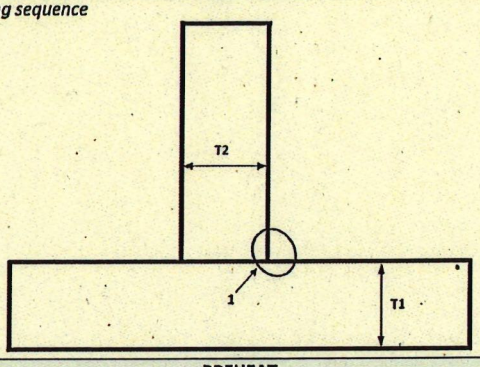
**JOINT DESIGN**

| | | | |
|---|---|---|---|
| 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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# 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**.**

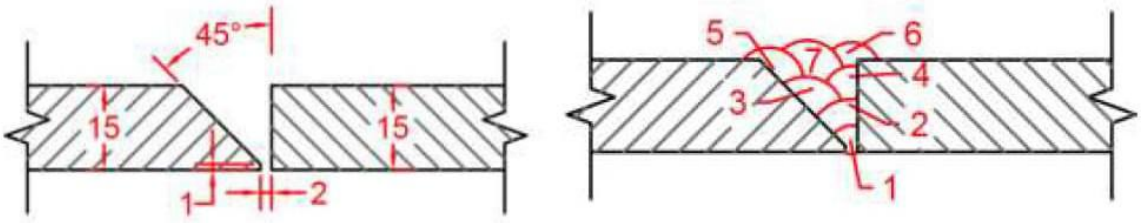
Issued at: Genova on 15 July 2021

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** | | | | **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 **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 |
| **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

# 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

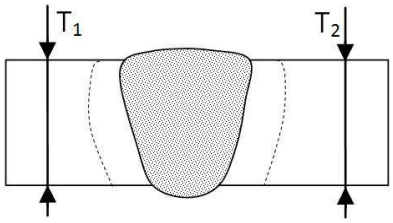
**ISSUED ON 21/06/2021**

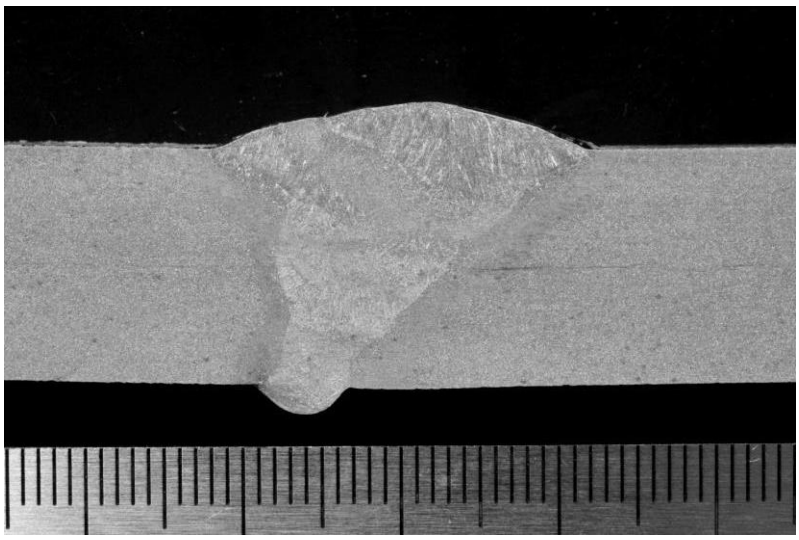
**This document replace the test report no. 21.0368 Rev.0**

## 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

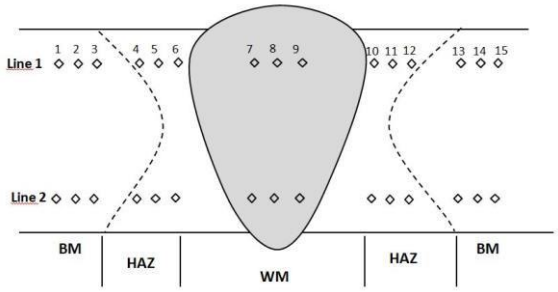
| Sample no. | Date | Type of test | Indentation | Position | Line 1 (HV) | Line 2 (HV) | Line 3 (HV) |
|---|---|---|---|---|---|---|---|
| 1238 Macro #1 | 03/06/2021 | HV10 | 1 | BM | 150 | 154 | - |
| | | | 2 | BM | 151 | 152 | - |
| | | | 3 | BM | 158 | 156 | - |
| | | | 4 | HAZ | 177 | 169 | - |
| | | | 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
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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 + 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 TEMPERATURA INIZIO °C BEGINNING TEMPERATURE | VELOCITA' RISCALDO C/h HEATING RATE | TEMPERATURA TRATTAMENTO °C TEMPERATURE TREATMENT | TEMPERATURA MIn HOLDING TIME | PERMANENZA Min PERMANENZA COOLING | 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 (Q) Min PERMANENZA | COOLING RAFFREDDAMENTO | TEMPERATURA (T) °C TEMPERATURE | HOLDING TIME (T) Min PERMANENZA | 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~~ | ~~4,05~~ | ~~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 | PLATE THICKNESS SPESSORE LAMIERA | POSIZIONE (1) LOCATION | POSIZIONE (2) LOCATION | ORIENTATION DIREZIONE (3) | TEST TEMPERATURE TEMPERATURA [°C] | YIELD STRENGTH ReH [Mpa] | TENSILE STRENGTH Rm [Mpa] | ReH/Rm | ELONGATION A% | PROOF/YIELD STRENGTH Rp 0.2 [Mpa] | SHAPE OF TEST PIECE FORMA PROVINO (4) | WIDTH LARGHEZZA [mm] | ORIENTATION DIREZIONE (3) | TEST TEMPERATURE TEMPERATURA [°C] | LOCATION POSIZIONE (2) | INDIVIDUAL VALUES SINGOLI VALORI [J] | MEAN VALUE MEDIA [J] | ORIENTATION DIREZIONE (3) | MANDREL MANDRINO [mm] | ANGLE ANGOLO [°] | RESULT ESITO (5) | LOCATION POSIZIONE (2) | METHOD METODO | INDIVIDUAL VALUES SINGOLI VALORI | MEAN VALUE MEDIA | Z% INDIVIDUAL VALUES Z% SINGOLI VALORI | Z% MEAN VALUE Z% VALORE MEDIO |
| 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 Bernl
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)

## 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 |

## 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% |

## 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** | | |

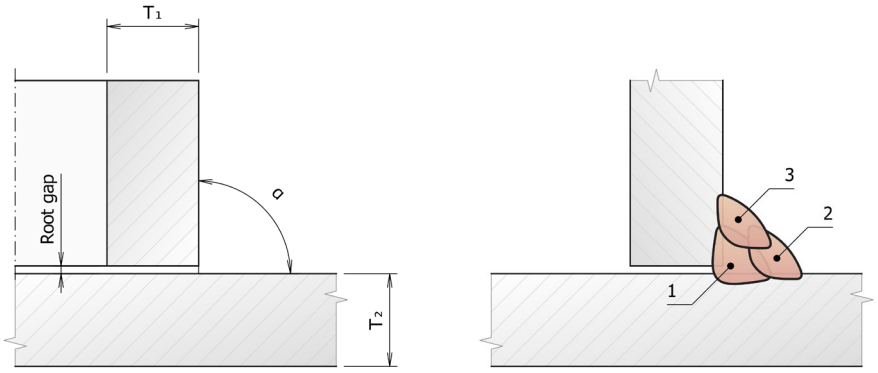
We confirm that statements in this record are correct and that the test welds were prepared, welded and tested and have fulfilled the requirements in accordance with **UNI EN ISO 15614-1: 2019** Standard.

Issued at: Genova on 15 July 2021

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

**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** | | | | **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 **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

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

# TEST REPORT No. 21.0384 Rev.1

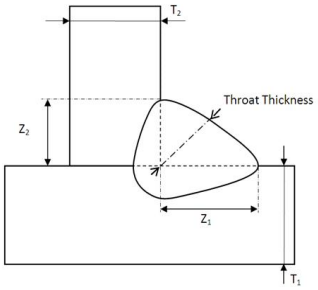
**ISSUED ON 21/06/2021**

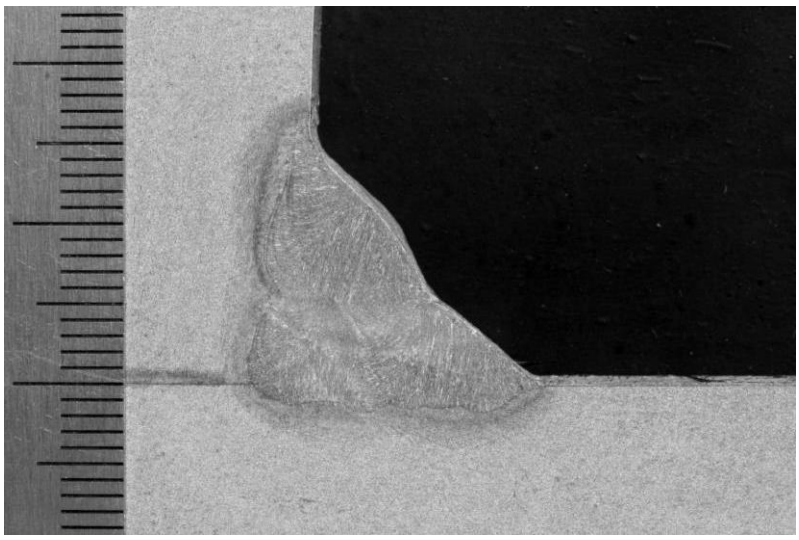
**This document replace the test report no. 21.0384 Rev.0**

## 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**



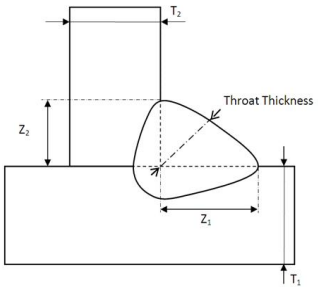
**Imperfection**

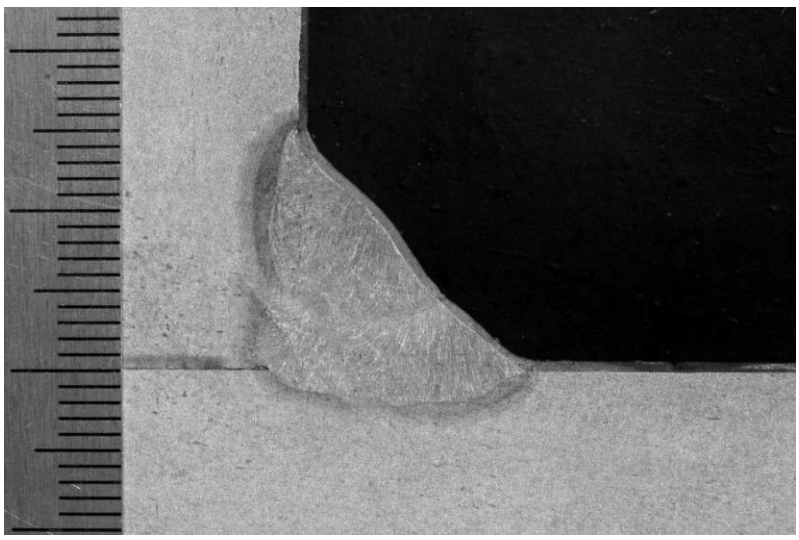
No recordable indications

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

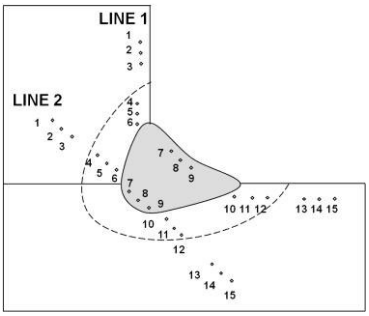
| Sample no. | Date | Type of test | Indentation | Position | Line 1 (HV) | Line 2 (HV) | Line 3 (HV) |
|---|---|---|---|---|---|---|---|
| 1239 Macro #1 | 03/06/2021 | HV10 | 1 | BM | 160 | 153 | - |
| | | | 2 | BM | 156 | 155 | - |
| | | | 3 | BM | 168 | 152 | - |
| | | | 4 | HAZ | 235 | 211 | - |
| | | | 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 |

# 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 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 TEMPERATURA (Q) °C TEMPERATURE | PERMANENZA (Q) Min HOLDING TIME | RAFFREDDAMENTO COOLING | TEMPERATURA (T) °C TEMPERATURE | PERMANENZA (T) Min HOLDING TIME | RAFFREDDAMENTO COOLING |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~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 | C | Mn | Si | P | S | Cu | Ni | Cr | Mo | Al | V | Nb | Ti | Sn | Ca | N | B | H | Ceq1 | Ceq2 | Pcm |
| HEAT | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % (D) | % (D) | % (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 LOCATION (1) | POSIZIONE LOCATION (2) | DIREZIONE ORIENTATION (3) | TEMPERATURA TEST TEMPERATURE [°C] | 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 ORIENTATION (3) | TEMPERATURA TEST TEMPERATURE [°C] | POSIZIONE LOCATION (2) | INDIVIDUAL [J] SINGOLI VALORI | MEDIA [J] MEAN VALUE | DIREZIONE ORIENTATION (3) | MANDRINO MANDREL [mm] | ANGOLO ANGLE [°] | ESITO RESULT (5) | POSIZIONE LOCATION (2) | METODO TEST METHOD | SINGOLI VALORI INDIVIDUAL VALUES | MEDIA MEAN VALUE | Z% INDIVIDUAL VALUES Z% SINGOLI VALORI | Z% MEAN VALUE Z% VALORE MEDIO |
| 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 | | | | | | | | | | |

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

C10

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

**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%<br>Plates acc. to PED 97/23/EC** | TIMBRO DELL'ISPETTORE<br>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,

# 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**

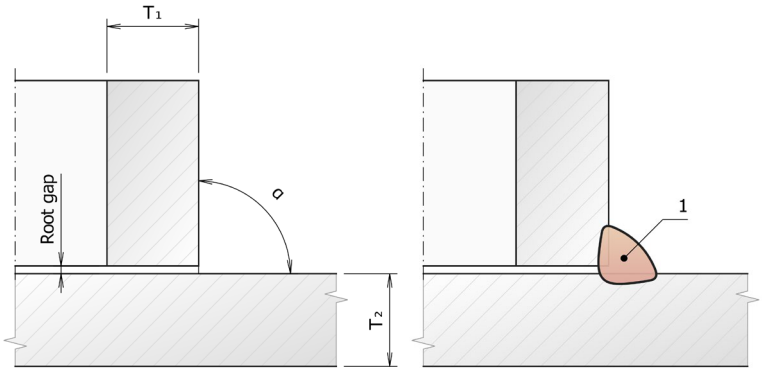
We confirm that statements in this record are correct and that the test welds were prepared, welded and tested and have fulfilled the requirements in accordance with **UNI EN ISO 15614-1: 2019** Standard and **RINA Rules for the Classification of Ships** requirements**.**

Issued at: Genova on 15 July 2021

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

**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** | | | | **POSTWELD HEAT TREATMENT** | | |
|---|---|---|---|---|---|---|
| Preheat temperature | **+20°C** | | | Temperature | **None** | Time - |
| Interpass temperature | **N.A.** | | | Method | **-** | |
| Postheat temperature | **None** | Time | **-** | 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

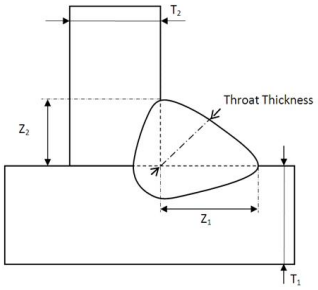
**ISSUED ON 21/06/2021**

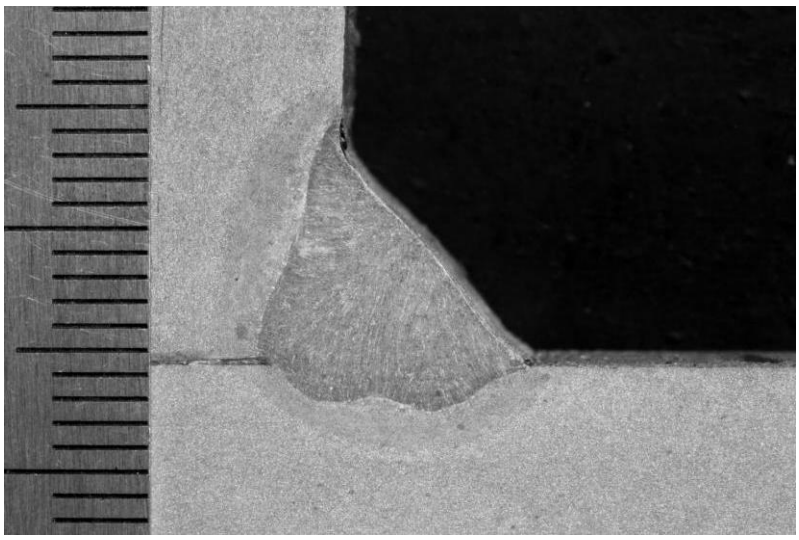
**This document replace the test report no. 21.0385 Rev.0**

## 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**



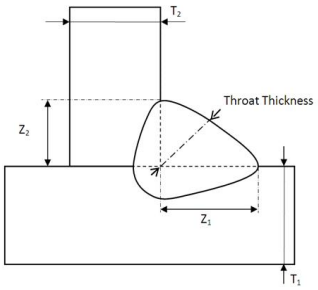
**Imperfection**

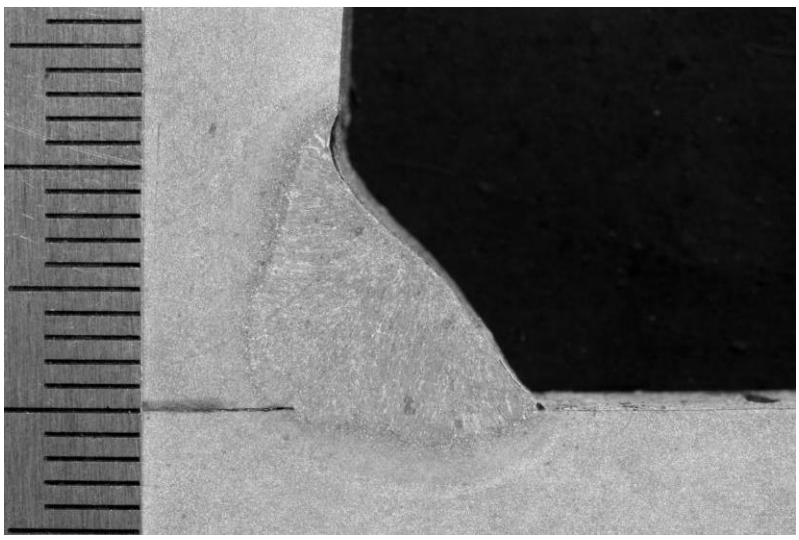
No recordable indications

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

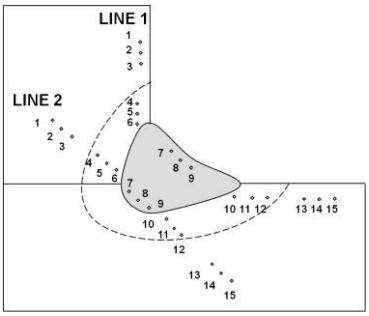
| Sample no. | Date | Type of test | Indentation | Position | Line 1 (HV) | Line 2 (HV) | Line 3 (HV) |
|---|---|---|---|---|---|---|---|
| 1240 Macro #1 | 03/06/2021 | HV10 | 1 | BM | 153 | 151 | - |
| | | | 2 | BM | 153 | 152 | - |
| | | | 3 | BM | 151 | 153 | - |
| | | | 4 | HAZ | 191 | 183 | - |
| | | | 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 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 TEMPERATURA (Q) °C TEMPERATURE | PERMANENZA (Q) Min HOLDING TIME | RAFFREDDAMENTO COOLING | TEMPERATURA (T) °C TEMPERATURE | PERMANENZA (T) Min HOLDING TIME | RAFFREDDAMENTO COOLING |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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~~ | ~~4,05~~ | ~~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 | PLATE THICKNESS SPESSORE LAMIERA | 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 | 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 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 Bernl
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)

## 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 |

## 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% |

## 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

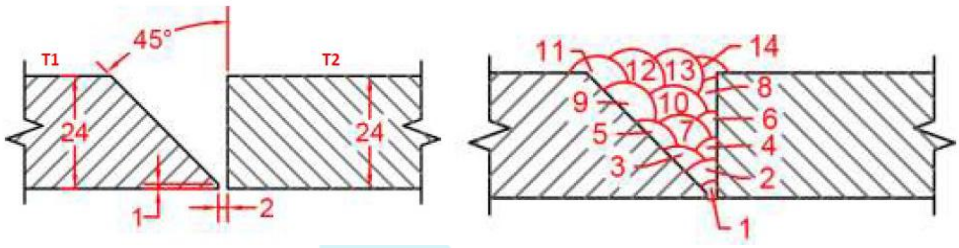
RINA Services S.p.A.
PED No. Bo. 0474

**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** | | | | **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 **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 |
|---|---|---|---|
| | | Date | 14/05/2021 |
| | | 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** |

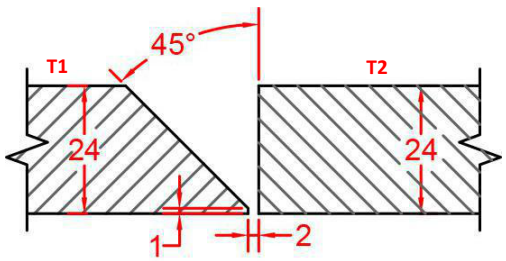
| **BASE MATERIAL** | | |
|---|---|---|
| *Part identification* | **A** | **B** |
| *Pipe or plate* | **PLATE** | **PLATE** |
| *Material group* | **1.2** | **1.2** |
| *Material type* | **EH36 (SA516GR70)** | **EH36 (SA516GR70)** |
| *Thickness* | **24mm** | **24 mm** |
| *Heat* | **477041** | **477041** |
| *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.** |

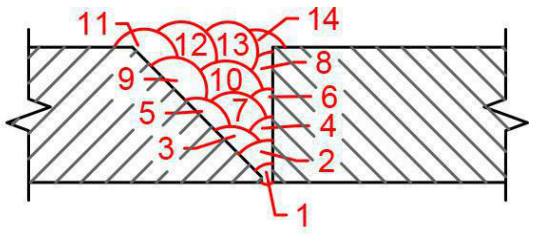
**PARAMETERS RECORD**

| 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 | | | |

# 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 | 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**

## 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

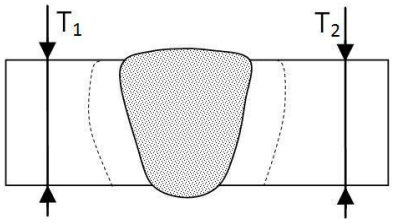
**ISSUED ON 21/06/2021**

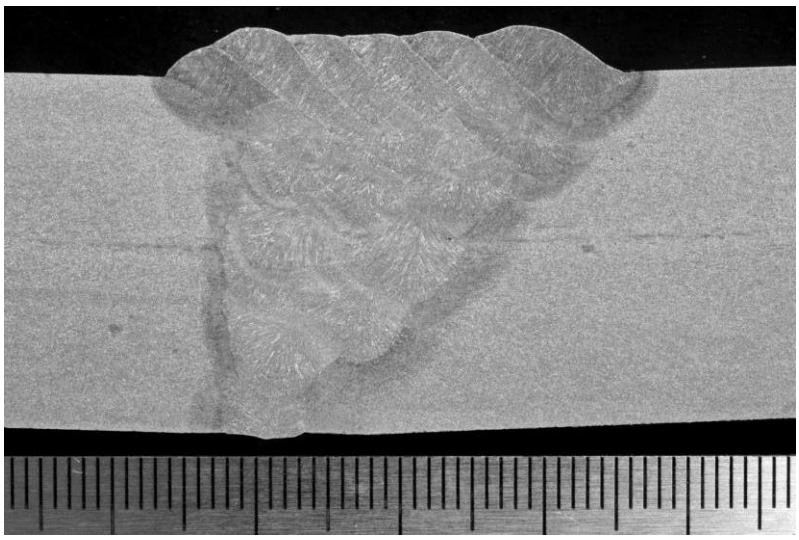
**This document replace the test report no. 21.0365 Rev.0**

## 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

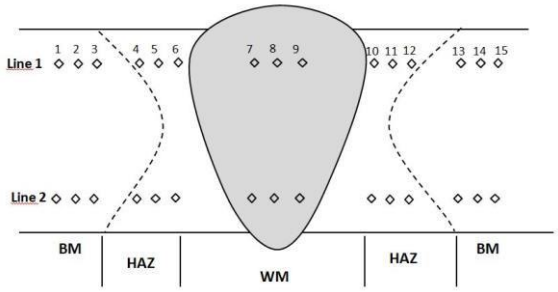
| Sample no. | Date | Type of test | Indentation | Position | Line 1 (HV) | Line 2 (HV) | Line 3 (HV) |
|---|---|---|---|---|---|---|---|
| 1235 Macro #1 | 03/06/2021 | HV10 | 1 | BM | 159 | 159 | - |
| | | | 2 | BM | 157 | 157 | - |
| | | | 3 | BM | 155 | 155 | - |
| | | | 4 | HAZ | 241 | 188 | - |
| | | | 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

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 + 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

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.: 377095

Z02 Data / Date: 05/05/2016

A08 N° Ordine Trametal / Works order: 31601531

A07 N° Ordine cliente / Customer's order: B6000428

DDT: BOL 31607710

del / date: 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 TEMPERATURA INIZIO °C | 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 | PERMANENZA (Q) Min HOLDING TIME | RAFFREDDAMENTO COOLING | TEMPERATURA (T) °C TEMPERATURE | PERMANENZA (T) Min HOLDING TIME | RAFFREDDAMENTO COOLING |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~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 - 50.00 | 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 LOCATION (1) | POSIZIONE LOCATION (2) | DIREZIONE ORIENTATION (3) | TEMPERATURA TEST TEMPERATURE [°C] | 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 ORIENTATION (3) | TEMPERATURA TEST TEMPERATURE [°C] | POSIZIONE LOCATION (2) | INDIVIDUAL [J] SINGOLI VALORI INDIVIDUAL VALUES | MEDIA [J] MEAN VALUE | DIREZIONE ORIENTATION (3) | MANDRINO MANDREL [mm] | ANGOLO ANGLE [°] | ESITO RESULT (5) | POSIZIONE LOCATION (2) | 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 | | | | | | | | | | |

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

C10

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

**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%<br>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,

# 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**.**

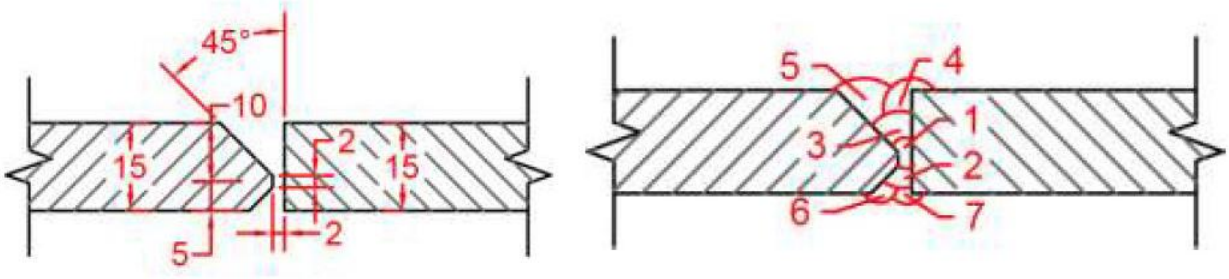
Issued at: Genova on 15 July 2021

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** |

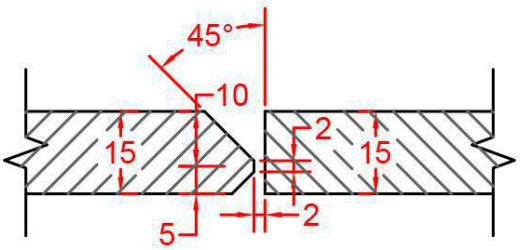
| **BASE MATERIAL** | | |
|---|---|---|
| *Part identification* | **A** | **B** |
| *Pipe or plate* | **PLATE** | **PLATE** |
| *Material group* | **1.2** | **1.2** |
| *Material type* | **EH36 (SA516GR70)** | **EH36 (SA516GR70)** |
| *Thickness* | **EH36** | **EH36** |
| *Heat* | **15 mm** | **15 mm** |
| *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.** |

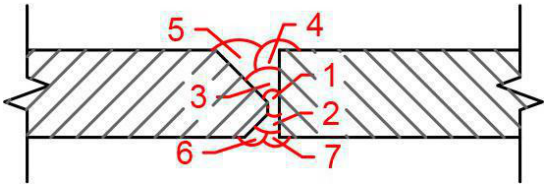
**PARAMETERS RECORD**

| 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 |

**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

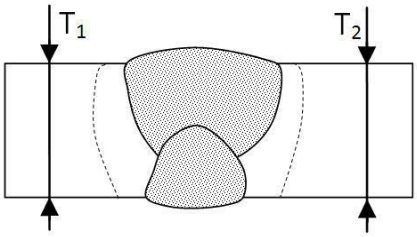
**ISSUED ON 21/06/2021**

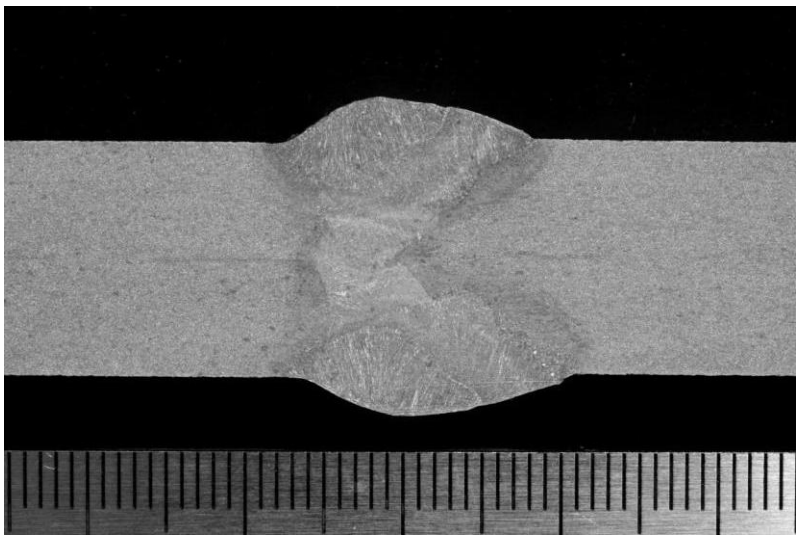
**This document replace the test report no. 21.0366 Rev.0**

## 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

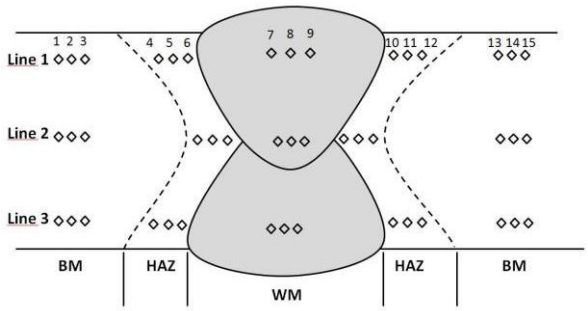
| Sample no. | Date | Type of test | Indentation | Position | Line 1 (HV) | Line 2 (HV) | Line 3 (HV) |
|---|---|---|---|---|---|---|---|
| 1236 Macro #1 | 03/06/2021 | HV10 | 1 | BM | 152 | 162 | 163 |
| | | | 2 | BM | 148 | 154 | 154 |
| | | | 3 | BM | 156 | 157 | 151 |
| | | | 4 | HAZ | 210 | 178 | 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.
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Certificate No: **N141X66X**

## Linked Type Approvals:

AMMM000010C Rev.1, Rolled Steel Products

## Surveyor Supplementary information:

For mechanical test results see manufacturer report No. 47645.

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CENTRO LAVORAZIONE LAMIERE

# 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 + 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

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 TEMPERATURE °C | TEMPERATURA INIZIO °C HEATING RATE | VELOCITA' RISCALDO C/h TEMPERATURE TREATMENT | TEMPERATURA TRATTAMENTO °C HOLDING TIME | PERMANENZA Min COOLING RATE | VELOCITA' RAFFREDDAMENTO °C/h END TEMPERATURE | TEMPERATURA FINE °C N° CICLI / CYCLES | C00 CAMPIONE Q+T SAMPLE | B05 Q+T TEMPERATURE (Q) °C | HOLDING TIME (Q) Min PERMANENZA 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~~ | ~~1590666~~ | ~~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 | 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) |
| 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 | PLATE THICKNESS SPESSORE LAMIERA | POSIZIONE (1) LOCATION | POSIZIONE (2) LOCATION | DIREZIONE (3) ORIENTATION | TEST TEMPERATURE TEMPERATURA [°C] | YIELD STRENGTH ReH [Mpa] | TENSILE STRENGTH Rm [Mpa] | ReH/Rm | A% ELONGATION | PROOF/YIELD STRENGTH Rp 0,2 [Mpa] SHAPE OF TEST PIECE FORMA PROVINO (4) | WIDTH LARGHEZZA [mm] | ORIENTATION DIREZIONE (3) | TEST TEMPERATURE TEMPERATURA [°C] | LOCATION POSIZIONE (2) | INDIVIDUAL VALUES SINGOLI VALORI [J] | MEAN VALUE MEDIA [J] | ORIENTATION DIREZIONE (3) | MANDREL MANDRINO [mm] | ANGLE ANGOLO [°] | RESULT ESITO (5) | LOCATION POSIZIONE (2) | METHOD METODO | INDIVIDUAL VALUES SINGOLI VALORI | MEAN VALUE MEDIA | Z% INDIVIDUAL VALUES Z% SINGOLI VALORI | Z% MEAN VALUE Z% VALORE MEDIO |
| 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 Bernl
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

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# 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)

## 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 |

## 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% |

## 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

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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 |
| | | | | | |
| | | | | | |
| | | | | |

# 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** |

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|---|---|---|---|---|---|
| Date | Signature | Position or title | Date | Signature | Position or title |
| | | | | | |
| | | | | | |
| | | | | |

# 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 |

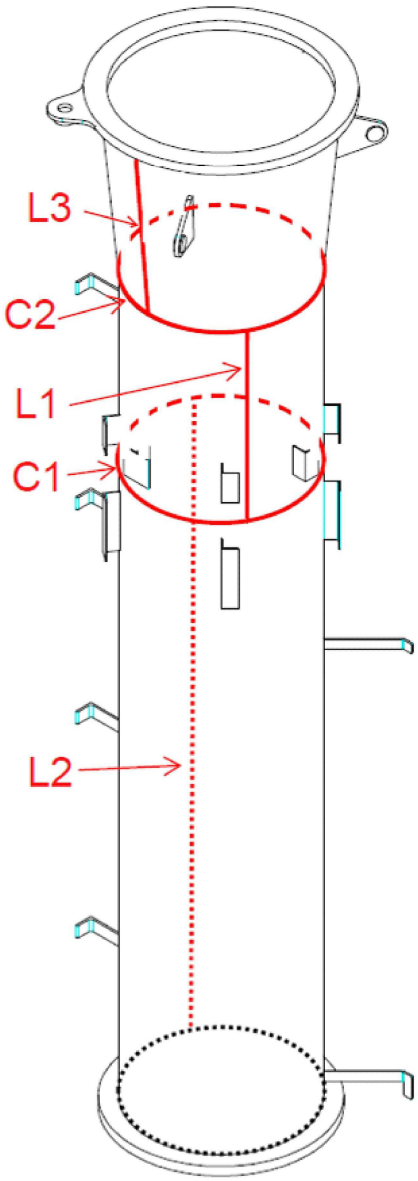
| **CLIENT DRAWING** | **REV.** |
|---|---|
| C09-0001-P0002 | D |
| | |

**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 | | | |

# DWG: C09-0001-P0002 Rev. D



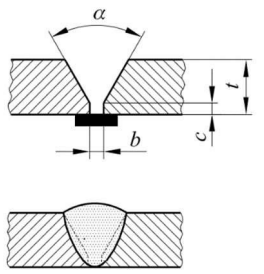

| Weld ID | WPQR | WPS | Process | Material | Thickness (mm) | VT | MT | UT | Notes |
|---|---|---|---|---|---|---|---|---|---|
| L1 | PROSAL-5160-2023 | 04E-23-01 | 135+121 | S355J2+N | 15 | 100% | 100% | 100% | |
| C1 | PROSAL-5160-2023 | 04E-23-01 | 135+121 | S355J2+N | 15 | 100% | 100% | 100% | |
| 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 DEPUTY

SIDERTAGLIO CALANDRATURA S.R.L.
Pipes Rolling & Welding

# WELDING PROCEDURE SPECIFICATION (WPS)
## ACCORDING TO EN ISO 15609-1
for welder/welding operator qualificated only

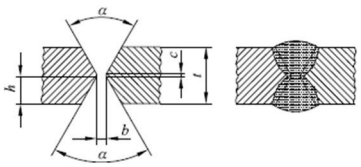
MANUFACTURER **SIDERTAGLIO CALANDRATURA S.R.L.**

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 DEPUTY

Form WPS EN ISO 15609-1 08-04

**TÜV Italia S.r.l. - TÜV SÜD Group**
Viale Fulvio Testi, 280/6
I-20126 Milano – www.tuvsud.com/it

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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: | | | | | |
| 8.4.1 8.5.2.2 | **Procedimento / Tipo:** Process - Schweißverfahren / Type – Sort: | **135**<br>☐ Manual<br>☒ Partly Mechanized<br>☐ Mechanized<br>☐ Automatic | **121**<br>☐ Manual<br>☐ Partly Mechanized<br>☒ Mechanized<br>☐ Automatic | ---<br>☐ Manual<br>☐ Partly Mechanized<br>☐ Mechanized<br>☐ 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)*<br>☒ **FW** *(qualified for)*<br>☒ TBW *(qualified for)*<br>☐ **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 | --- | *mm* |
| | **Campo di validità:** Validity range - Gültigkeitsbereich: | **≤ 8,0** | **≤ 50,0** | **---** | |
| 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<br>Location<br>Ort | Data di Emissione<br>Date of Issue<br>Datum der Ausstellung | Esaminatore<br>Examiner's Name and Signature<br>Name und Unterschrift des Zertifizierers | Esperto/Responsabile Tecnico<br>Name and Signature of expert / technical manager<br>Name und Unterschrift Sachverständiger | Rappresentante del costruttore<br>Name and Signature of Manufacturer's Representative<br>Name und Unterschrift des Uterschrift |
|---|---|---|---|---|
| **Milano** | **Rev.0 – 25/10/2023**<br>**Rev.1 – 27/10/2023**<br>**Rev.2 – 14/03/2024** | Ing. Enrico Albarelli | **Marco Serafini** | |

TÜV Italia Srl Industrie Service TÜV SÜD Italia

PSAL-01_M009_rev.07_ del 1/10/2022

**TÜV Italia S.r.l. - TÜV SÜD Group**
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# 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:



| **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 ($Ar\text{-}CO_2$ 82-18%) | --- | --- | *%* |
| | **Portata:** Flow rate - Fließrate: | 16 ÷ 18 | --- | --- | *lt/min* |
| **8.5.4** *15x* | **Plasma:** Plasma: | --- | --- | --- | *%* |
| | **Portata:** Flow rate - Fließrate: | --- | --- | --- | *lt/min* |
| *13x* **8.5.6** *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 verwend eten.<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 |

TÜV Italia Srl Industrie Service TÜV SÜD Italia

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# CERTIFICATO DI QUALIFICA PROCEDIMENTO DI SALDATURA

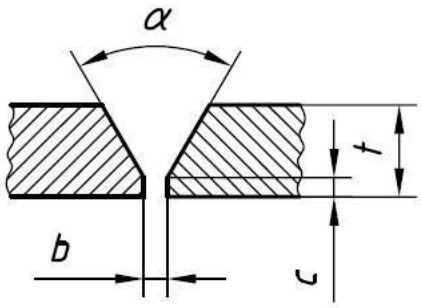
WELDING PROCEDURE RECORD TEST CERTIFICATE / ZERTIFIKAT ANERKENNUNG VON SCHWEISSVERFAHREN

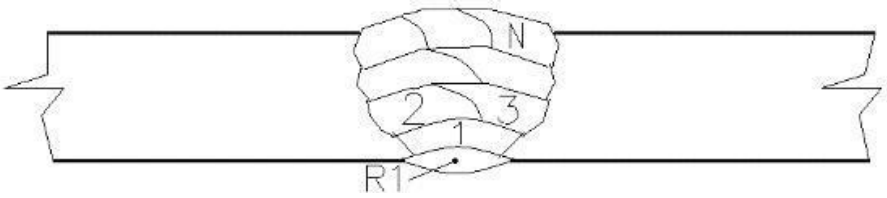
## WPQR

## PROSAL-5160-2023 Rev.1



| **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] | **Re** [MPa] | **Rp 0,2/1,0** [MPa] | **Rm** [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 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

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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:



### 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

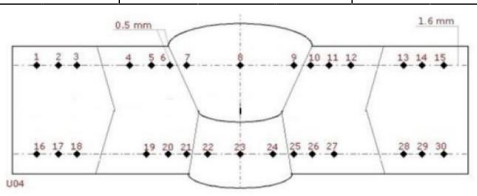
| N. No. Nr. | Posizione Location Lage | Dimensioni Dimensions Abmessungen [mm x mm] | Intaglio Notch Kerb | Temperatura Temperature Temperatur [°C] | Valore Value Wert [J] | Shear [%] | Exp lat Exp lat Sei Aus [mm] | Valore Value Wert [J] | Shear [%] | Exp lat Exp lat Sei Aus [mm] | Valore Value Wert [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 |

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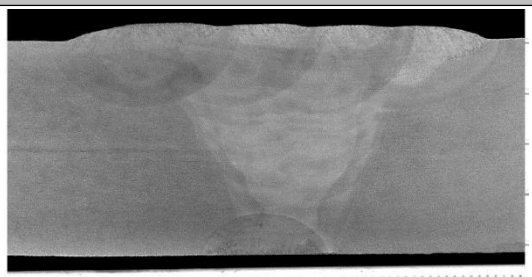
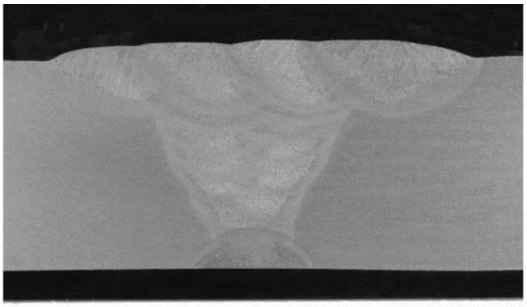
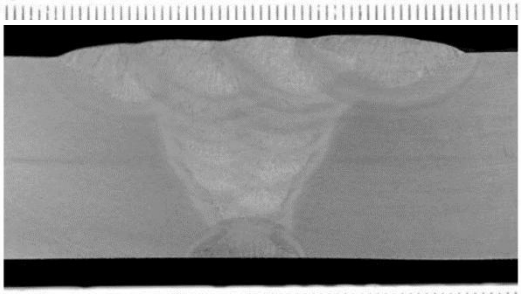
# CERTIFICATO DI QUALIFICA PROCEDIMENTO DI SALDATURA

WELDING PROCEDURE RECORD TEST CERTIFICATE / ZERTIFIKAT ANERKENNUNG VON SCHWEISSVERFAHREN

## WPQR

## PROSAL-5160-2023 Rev.1



| 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:**<br>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:**<br>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:**<br>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:**<br>The tests have been performed in accordance with the specifications - Die Prüfungen wurden entsprechend den Prüfgrundlagen durchgeführt: | UNI EN ISO 15614-1 liv.2 +<br>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 |

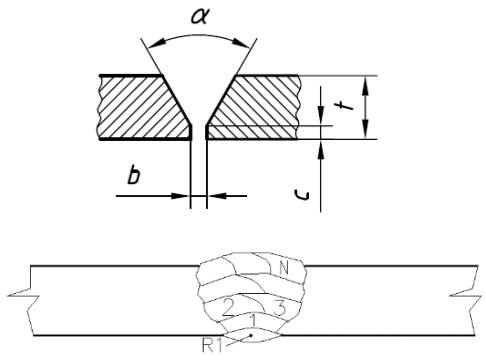
TÜV Italia Srl Industrie Service TÜV SÜD Italia

PSAL-01_M009_rev.07_ del 1/10/2022

# 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

Review
Witness
Date 06/10/23 Name:

MANUFACTURER

SIDERTAGLIO CALANDRATURA S.R.L.
Pipes Rolling & Welding

# RAPPORTO DI CONTROLLO VISIVO

VISUAL TEST CONTROL REPORT
mod. 006_r.0



| | | | |
|---|---|---|---|
| **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°

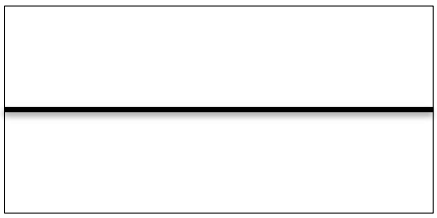
**Produttore** PRO NDT
Productor

**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 CALANDRATURA 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**
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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°

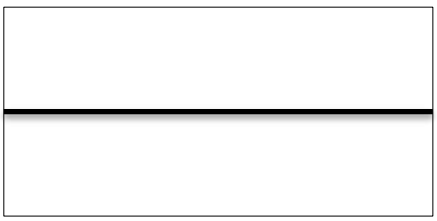
**Limite di Registrazione** -4 dB Curva DAC
Recording level Sonde angolate / Angular Probes

**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-TCIA / ISO 9712 | SIDERTAGLIO CALANDRATURA S.R.L. | ☒ Review ☐ Witness<br>Date: 20/10/23 Name: |

GLOBAL TEST srl

LAB N° 1230 L

**Seda A: legale, amministrativa e operativa**
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Tel 041923994 - E-mail: laboratorio@globaltest.it
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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. 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
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

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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. 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 |

**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

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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. 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 |

**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:

| 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 |

**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:

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 |

**Approvato da: RESPONSABILE LABORATORIO**
Marco Canato
GLOBAL TEST Srl

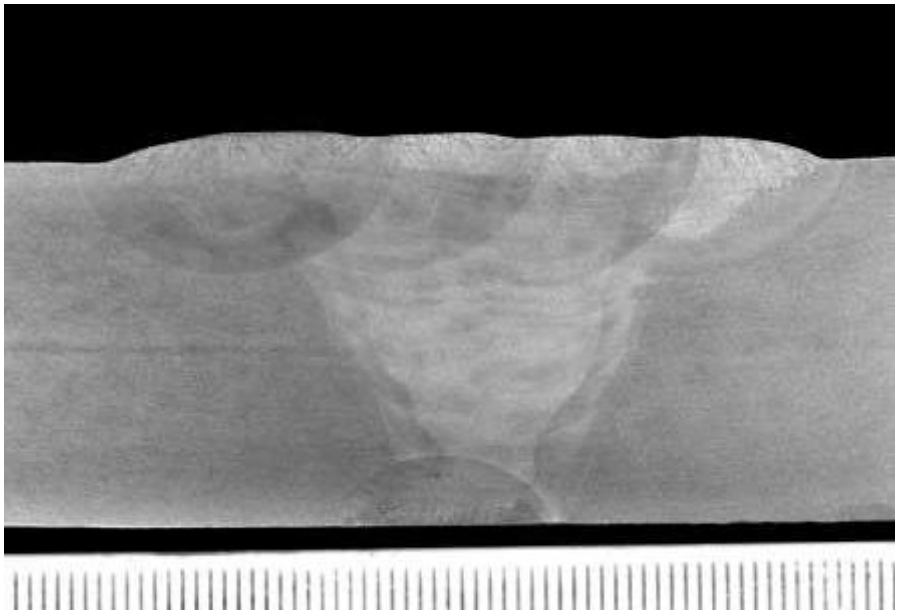
**Spazio riservato ad eventuali approvazioni esterne** / Space reserved for possible external approvals

☒ Review
☐ Witness
Date: 23/10/23 Name: .....

Prove eseguite e Normative di riferimento - Performed Tests and Reference Standards
Macrographic examination according to UNI EN ISO 17639:2022

Standards Correlati - Related Standards
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 |

**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

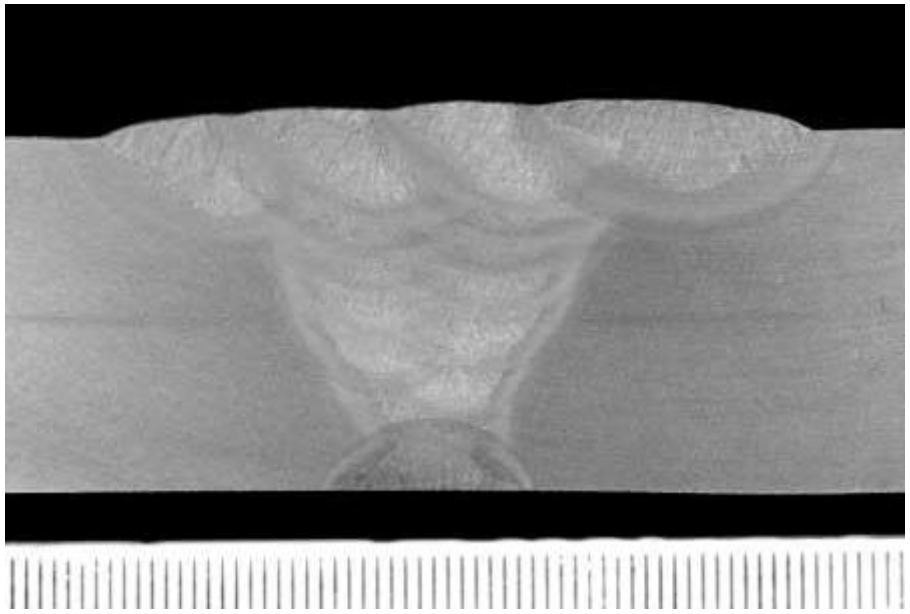
LAB N° 1230 L

**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° 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 |

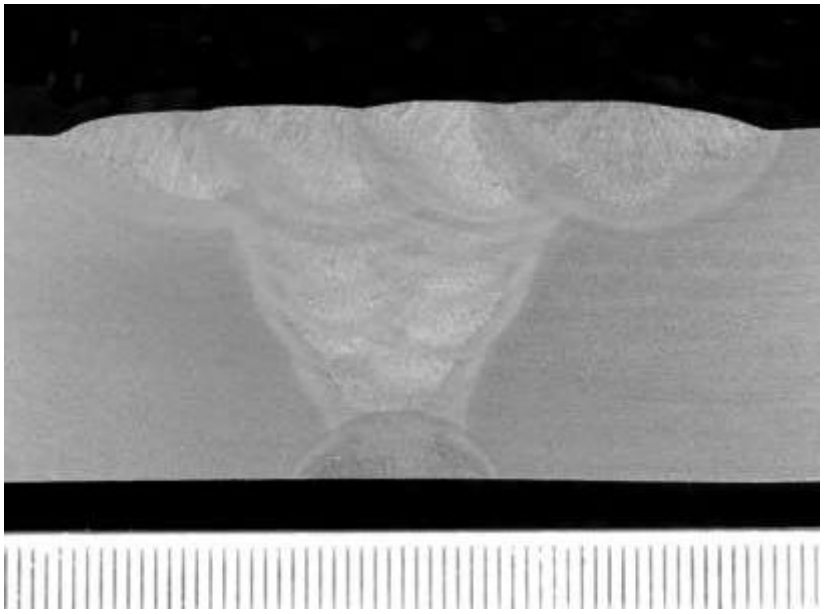
**Approvato da: RESPONSABILE LABORATORIO**
Marco Canato
GLOBAL TEST Srl

**Spazio riservato ad eventuali approvazioni esterne** / Space reserved for possible external approvals

☒ Review ☐ Witness
Date: 23/10/23 Name:

| 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 |

**Approvato da: RESPONSABILE LABORATORIO**
Marco Canato
GLOBAL TEST Srl

**Spazio riservato ad eventuali approvazioni esterne** / Space reserved for possible external approvals

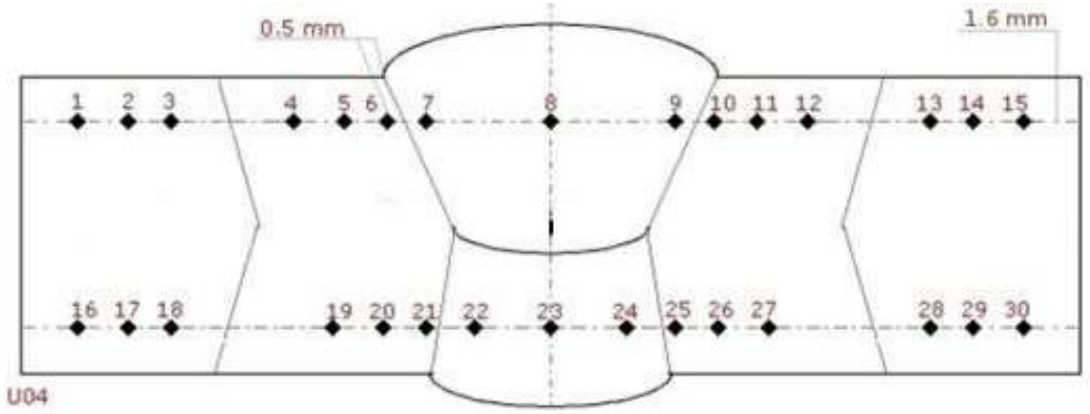
☒ Review ☐ Witness
Date: 23/10/23 Name:

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

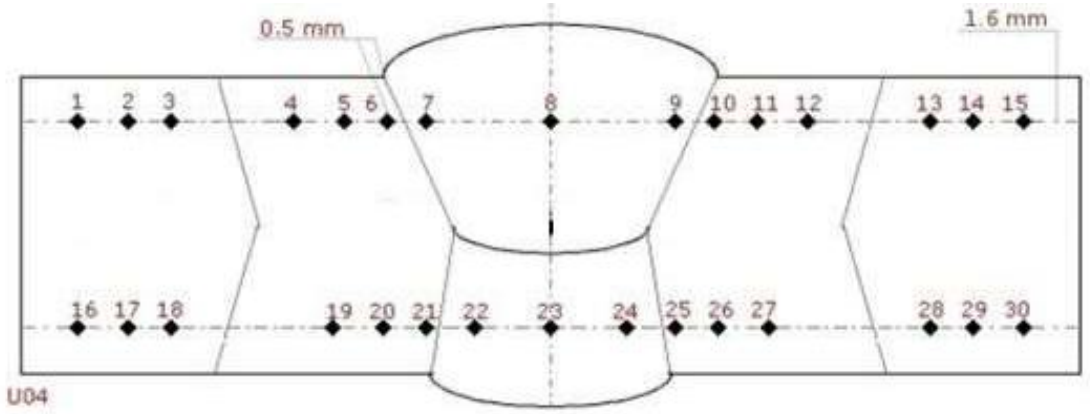
**Spazio riservato a eventuali approvazioni esterne** / Space reserved for possible external approvals

☒ Review ☐ Witness
Date: 23/10/23 Name:

| 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

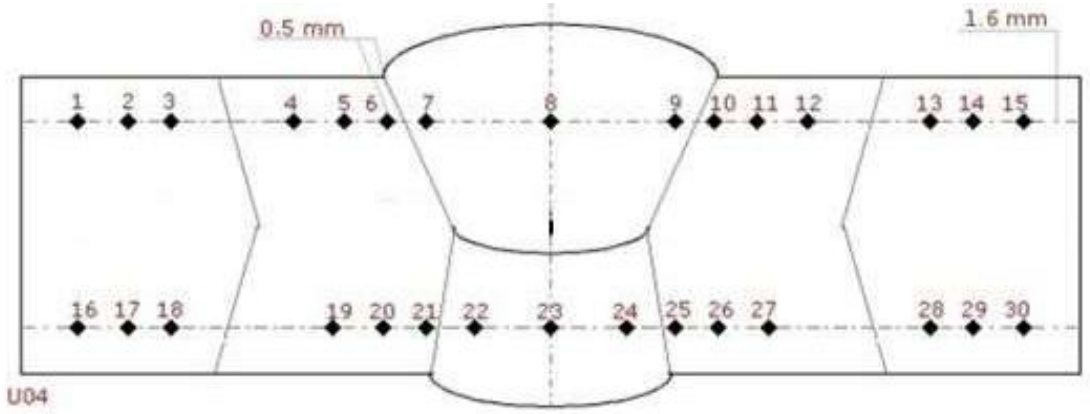
Review
Witness
Date: 23/10/23 Name:

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 / 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

(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

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

A06 Cliente / Customer

**SIDERURGICA LEONESSA S.R.L.**

**Via Don. Milani 13-19**
**25020 FLERO 25020 IT**
**BS ITALIA**

| A03 N° Certificato / Certificate no. | Z02 Data / Date |
|---|---|
| 553065 | 01/04/2022 |
| A08 N° Ordine Trametal / Works order | A07 N° Ordine cliente / Customer's order |
| 32200448 | 6-2022 |
| DDT | del / date |
| BOL 32205952 | 30/03/2022 |
| 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

Review ☒ Witness ☐
Date: 06/10/23 Name:

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 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 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 TEMPERATURA (Q) °C TEMPERATURE | PERMANENZA (Q) Min HOLDING TIME | RAFFREDDAMENTO COOLING | TEMPERATURA (T) °C TEMPERATURE | PERMANENZA (T) Min HOLDING TIME | RAFFREDDAMENTO COOLING |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 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 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 |

| | 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 | ORIENTATION (3) | TEMPERATURA [°C] TEST TEMPERATURE | YIELD STRENGTH ReH [Mpa] | TENSILE STRENGTH Rm [Mpa] | ReH/Rm | ELONGATION A% | PROOF/YIELD STRENGTH Rp 0.2 [Mpa] | SHAPE OF TEST PIECE FORMA PROVINO (4) | 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] | 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 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 | 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 |
| 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** Product Erzeugnis Produit: C1200196 FILO G9 INNOV-ARC Ø 1,20

**NORMATIVA** Standard: AWS A5.18 ER70S-6 / 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** Customer / Besteller / Client **051108**

AIRGAS NORDEST S.R.L.
VIA GLORIA 2, MARGHERA 30175 VENEZ

| COLATA N° Heat / Schmelze / Coulée | 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 |
| **13616/2022** | 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 Actual diameter | Larghezza effettiva Actual Width | Altezza Effettiva Actual Height | Resistenza snervamento Yield strength ReL (Rp0,2) | Resistenza rottura Tensile strength Rm | Allungamento Elongation A5 | Strizione Reduction Z | Resilienza KV Impact Test | | Durezza Hardness HRB |
| | mm | mm | mm | MPa | MPa | % | % | C° | J | |
| **SUL PRODOTTO** On product 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 CALAMORATURA 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

# 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

TÜV Italia — ☒ 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 ALL

# 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 | |

MEI SERVICE s.r.l.
Via Pascoli, 42/S
30020 QUARTO D'ALTINO (VE)
Tel. 0422 1628348
C.F. / P. IVA 03786710271

*Company stamp*

QCL 13/1/23
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

**Procedure complies:** IEC 60974-14

**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: | 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*

SIDERTAGLIO CALANDRATURA S.R.L.
23/03/23

ZAFFALON ALESSANDRO, 23/03/2023

*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 | 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

# 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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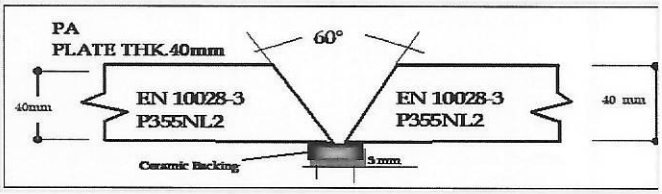
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## Details of Test Weld

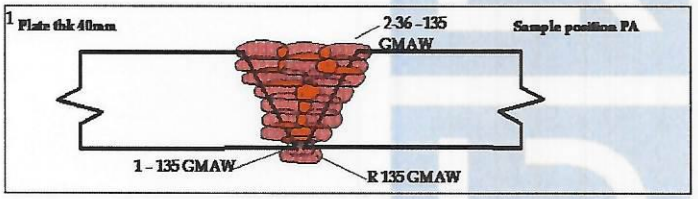
| | | | |
|---|---|---|---|
| Manufacturer's provisional Welding Procedure Specification Reference No. | **pWPS n 01E-22 rev.0** | Examining Body: Reference No: | -/ - |
| Manufacturer's Welding Procedure Qualification Record No.: | **01E-22** | | |
| Manufacturer: | **SIDERTAGLIO CALANDRATURA S.R.L** | 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. Pipes Rolling & Welding

IRQA verification ltd 0094
Witnessed Monitored Reviewed
MATTIA CRIVELLARI
Ref. No.:
Office: Milan 05/08/2022

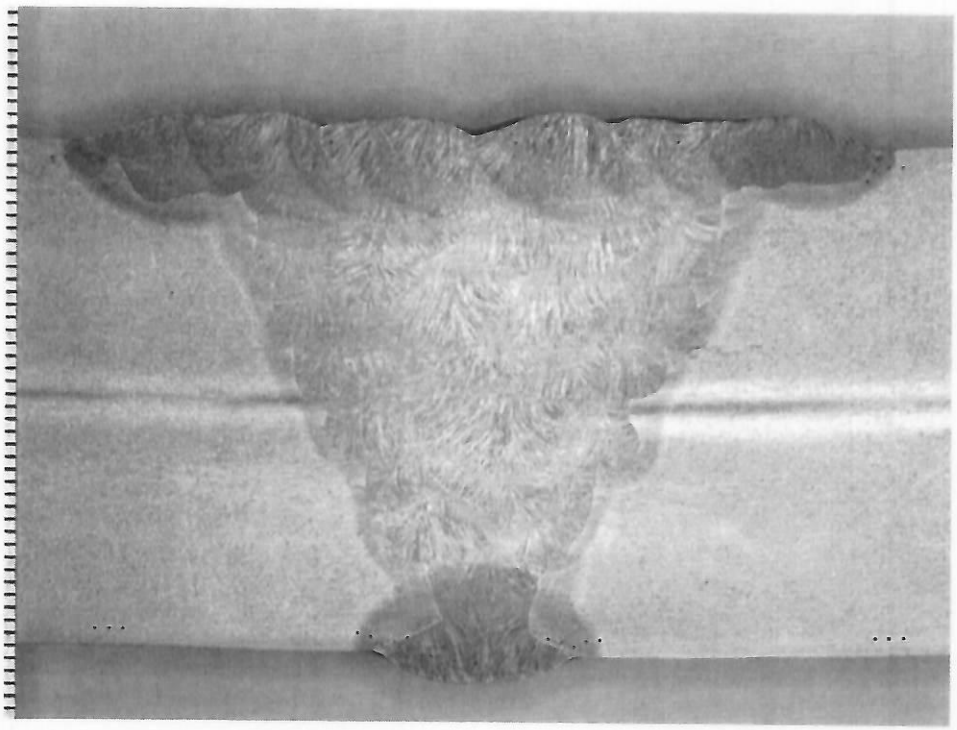


**LABORATORIO PROVE MATERIALI S. MARCO srl**
36015 Schio - VI - Via Lago di Alleghe, 30/32 - Tel. 0445 575623 - info@labsanmarco.it - C.F. e P.IVA IT01983950245

**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

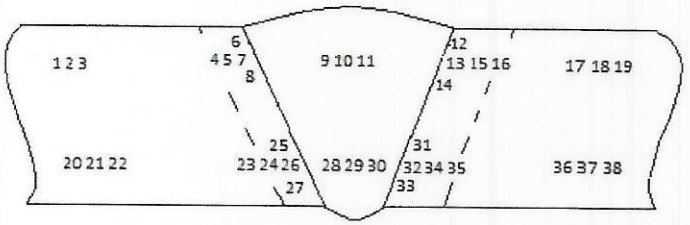
☐ LRQA verification ltd ☐ 0094 ☐
☐ Witnessed ☐ Monitored ☐ Reviewed
MATTIA CRIVELLARI
Ref. No.:
Office: Milan 05/08/2022

## 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 ltd ☐ 0094 ☐
☑ Witnessed ☐ Monitored ☐ Reviewed
MATTIA CRIVELLARI
Ref. No
Office: Milan 05/08/2022

# 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.***
Work stage — Material — Welding process

**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<br>Position | Esito<br>Result | Difetti<br>Defects | Disp. di rip.<br>Test. Arrang. | Densità<br>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 **RR = RIPETERE RX** - TO REPEAT RX

RESPONSABILE - WORD REFERENCE | OPERATORE - OPERATOR | ISPETTORE - ISPECTOR

SIDERTAGLIO CALANDRATURA S.R.L.

Esposito Maurizio

☐ LRQA verification nd ☐ 003 ☐
☐ Witnessed ☐ Monitored ☑ Reviewed
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
Test | No support | Test | Localized

**Strumenti di controllo**
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 | ☐ IRQA 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*** | **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 | **Colata* - Heat** | **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** UNI EN ISO 3452-1 | **Classe accettazione** UNI EN ISO 23277 CL. 2
Procedure | Specification | Acceptance criteria

**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 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** VELNET-SOLNET
surface cleaning Lotto - Batch L20/546 scad. 01/2023

**Penetrante** RED WW
Penetrant : Lotto - Batch L21/021 scad. 02/2023

**Applicazione penetrante con** Spray
Penetrant application by Spray

**Tempo minimo di penetrazione** Dwell time 10'
Penetration minimum time

**Rimozione penetrante con** Acqua - Panno
Penetrant removal Water - dust cloth

**Pressione acqua ≤ 3,5 bar** actual 1,3 bar
Water spray - pressure

**Rilevatore :** ROTRIVEL U
Developer : Lotto - Batch L 20/480 scad. 11/2022

**Tempo minimo di Sviluppo** Dwell time 15'
Developing minimun time

**Tempo interpretazione finale** > 10' ÷ < 60'
Final interpretation time

**Note :**
Notes :

■ **Conforme a Norma**
Acceptable

| RESPONSABILE - WORD REFERENCE | OPERATORE - OPERATOR | ISPETTORE - INSPECTOR | |
|---|---|---|---|
| SIDERTAGLIO CALANDRATURA S.R.L. | Fabio 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

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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 ; NO = 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 | A07 N° Ordine cliente / Customer's order |
| 32107033 | mail 29/10 |
| DDT | del / date |
| BOL 32200079 | 05/01/2022 |
| Pratica / File no. | |
| del / date | |

A05 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 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 C00 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 | HOLDING TIME PERMANENZA Min | 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 | RAFFREDDAMENTO COOLING | TEMPERATURA (T) °C TEMPERATURE | HOLDING TIME PERMANENZA (T) Min | 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 | 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 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 ☐ 0086 ☐
☐ Witnessed ☐ Monitored ☑ Reviewed
MATTIA CRIVELLARI
Ref. No..
Office: Milan 28/07/2022

LRQA

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 LOCATION (1) | POSIZIONE LOCATION (2) | DIREZIONE ORIENTATION (3) | TEMPERATURA TEST TEMPERATURE [°C] | 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 | ORIENTATION (3) | 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 (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 TEMPERATURA (Q) °C TEMPERATURE | HOLDING TIME (Q) Min PERMANENZA (Q) | RAFFREDDAMENTO COOLING | TEMPERATURA (T) °C TEMPERATURE | HOLDING TIME (T) Min PERMANENZA (T) | 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 | | | | | | | | | |
| 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
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

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
Erzeugnis
Produit
FILO G9 INNOV-ARC Ø 1,20

**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 ☐ 0064 ☐
☐ Witnessed ☐ Monitored ☑ Reviewed
MATTIA CRIVELLARI
Ref. No.
Office: Milan 27/07/2022

SIDERTAGLIO CALANDRATURA S.R.L.

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 0004
Witnessed Monitored Reviewed
MATTIA CRIVELLARI
Ref. No.
Office: Milan
27/07/2021

SIDERTAGLIO 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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PRS N° 077C
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<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** | **All but not Short** |
| 5.3 | **Tipo di prodotto:**<br>Product Type – Produkttyp: | **Round on plate** | **Round on plate** |
| 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) | **FM2** | **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]: | **40,0** | **---** |
| | **Spessore depositato [mm]:**<br>Deposited thickness [mm] - Schweißgutdicke[mm]: | **20,0**<br>**---** | **≥ 3,0**<br>**---** |
| | **Diametro esterno del tubo - ∅ [mm] :**<br>Tube-∅ (outside) - Rohr-∅ (außen) [mm]: | **20** | **20,0 ÷ 40,0** |
| 5.8 | **Posizione di saldatura (Tabelle 9-10):**<br>Welding position (Tab. 9-10) – Schweißpositionen (Tab. 9-10) : | **PB** | **PB** |
| 5.9 | **Dettagli di saldatura (Tabella 11):**<br>Weld Details (Tab.11) – Schweißnahteinzelheiten (Tab.11): | **bs** | **ss mb, bs** |
| | **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) – 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:**<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: |
|---|---|---|---|---|---|---|---|
| **01/07/2024 - Milano** | **Validità fino a**<br>Validity until<br>Gültigkeit | **09/05/2027** | **Validità fino a**<br>Validity until<br>Gültigkeit | **/** | **Validità fino a**<br>Validity until<br>Gültigkeit | **/** | **A.Carelli** |

C249606-1.007 (ex PSAL-07-M010)

# 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 |
|---|---|---|

**Note: /**

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

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Form 4125 (2018.10)

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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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**TÜV SÜD Group**
Viale Fulvio Testi 280/6 Milano
I-20126 www.tuvsud.com

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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-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:

welding procedure test (see 4.1a)) ☒

pre-production welding test (see 4.1b)) ☐

standard test piece (see 4.1c)) ☐

production test or production sample testing (see 4.1d)) ☐

Results of the qualification test see document No.:

1201/2023, UT 090-2023, 59128, VT 088-2023

Certification body: TÜV AUSTRIA CERT GMBH

Name and signature: Ing. Daniele Tempesti

Place of issue: Erbusco (BS)

Date of issue: 24/05/2023

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 | | QCM/WD | | | |
| 27/03/2024 | | QCM/WD | | | |
| 27/09/2024 | | QCM/WD | | | |
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TÜV SÜD Group
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I-20126 www.tuvsud.com

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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 -Schwelßanweisung: **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]**

**Datore di lavoro:**
Employer - Beschäftigt bei: **SIDERTAGLIO CALANDRATURA SRL**
via Marzotto, 9 – 36031 Povolaro di Dueville (VI)

**Foto (se richiesto)**
Photo (if required)
Fotografie (falls nötig)

**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** |

C249606-1.007 (ex PSAL-07-M010)

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**TÜV SÜD Group**
Viale Fulvio Testi 280/6 Milano
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## 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 | | **Maria Fernandez** |

C249606-1.007 (ex PSAL-07-M010)

# Base Load Power Hub (BLPH)

NDE PROCEDURE and OPERATORS LIST QUALIFICATIONS

For DAVIT CRANE

Document Number: 1724001010-NDT-PRO-00006

Document Class: 2

ROSETTI MARINO

| | |
|---|---|
| 1 | APPROVED - WORK MAY PROCEED |
| 2N | REVISE AND RE-SUBMIT - DO NOT PROCEED |
| 2Y | REVISE AND RE-SUBMIT - WORK MAY PROCEED |
| 3 | REJECTED |
| 4 | APPROVAL NOT REQUIRED |

*NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.*

| Sign | Date |
|---|---|
| Comandini Massimo Level III NDT EN - ISO9712 WI CSWIP 3.1 | 07-10-2024 |

| Rev. | Date | Description | Prepared | Reviewed | Approved |
|---|---|---|---|---|---|
| 03 | 04/10/2024 | Accepted for Construction (AFC) | CZB | MPU | MPU |
| 02 | 05/09/2024 | Accepted for Construction (AFC) | CZB | MPU | MPU |
| 01 | 21/08/2024 | Issue for Review (IFR) | CZB | MPU | MPU |
| 00 | 11/07/2024 | Issue for Review (IFR) | CZB | MPU | MPU |

REMAZEL ENGINEERING

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## Revision / Change Log

| Rev. | Description |
|---|---|
| 00 | Issue for Review (IFR) |
| 01 | Issue for Review (IFR) |
| 02 | Accepted for Construction (AFC) |
| 03 | Accepted for Construction (AFC) |
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## HOLDS LIST

| No. | Description |
|---|---|
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| 3 | |
| 4 | |

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# Table of contents


1 INTRODUCTION ..... 5

1.1 PROJECT OVERVIEW ..... 5

1.1.1 Project Location ..... 5

1.1.2 Project Concept ..... 6

2 DOCUMENT SCOPE ..... 8

2.1 REFERENCES ..... 8

2.2 DEFINITIONS AND ABBREVIATIONS ..... 8

3 NDT PROCEDURE ..... 9



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# List of Figures

Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map ..... 5
Figure 2 - Wind Park Details ..... 6
Figure 3 – BLPH Concept ..... 6

# List of tables

Table 1 - Reference Documents ..... 8
Table 2 - Definitions and Abbreviations ..... 8

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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.

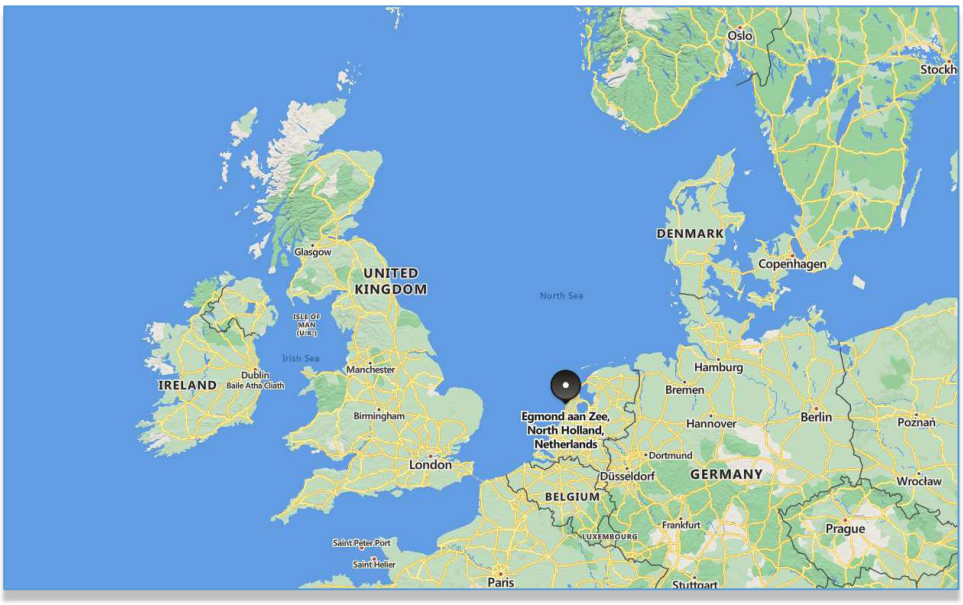



*Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map*




*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.

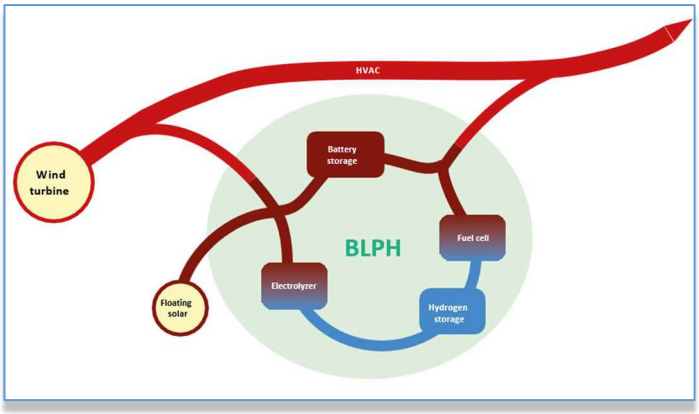



*Figure 3 – BLPH Concept*

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.

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# 2 DOCUMENT SCOPE

NDE PROCEDURE and OPERATORS LIST QUALIFICATIONS

## 2.1 REFERENCES

| Doc. No. | Description |
|---|---|
| **24-27012-ITP-001** | ITP |
| | |
| | |

*Table 1 - Reference Documents*

## 2.2 DEFINITIONS AND ABBREVIATIONS

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

*Table 2 - Definitions and Abbreviations*

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# 3 NDT PROCEDURE

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# Davit Crane

# NDT PROCEDURE
# 24-27012-NDE-001

| Rev | Date | Revision Description | Prepared | Checked | Approved |
|---|---|---|---|---|---|
| 02 | 05/09/2024 | IFR | CZB | MPU | ATR |
| 01 | 21/08/2024 | IFR | CZB | MPU | ATR |
| 00 | 11/07/2024 | IFR | CZB | MPU | ATR |

## SUMMARY OF REVISION

| Rev. | Revised chapters | Revision description | Reason for revision |
|---|---|---|---|
| 00 | /// | /// | IFR |
| 01 | 8.10 | Page Number / Block reference table | IFR |
| 02 | 2 | Corrected standard reference | IFR |
| | | | |

**INDEX**

**1 Purpose ..... 17**
**2 References ..... 17**
**3 Abbreviations ..... 17**
**4 Magnetic Test on Forged components and Weld Chamfer ..... 18**
4.1 Purpose ..... 18
4.2 Reference Documents ..... 18
4.3 Personnel Qualification ..... 18
4.4 Instruments ..... 18
4.5 Examination Medium ..... 19
4.6 Lighting Condition ..... 19
4.7 Surfaces preparation ..... 20
4.8 Magnetization ..... 20
4.9 Instruments ..... 21
4.10 Evaluation of Indications ..... 21
4.11 Acceptance Criteria ..... 22
4.12 Defect Removal ..... 23
4.13 Test report ..... 23
4.14 Test report Sample (Only for reference) ..... 24
4.15 Safety Instruction ..... 25
**5 Procedure for the Visual Control of Welds ..... 26**
5.1 Purpose ..... 26
5.2 Reference Documentation ..... 26
5.3 Extension Of Test ..... 26
5.4 Personnel Qualifications ..... 26
5.5 Inspection time ..... 26
5.6 Surface Preparation ..... 26
5.7 Test Condition ..... 27
5.8 Definition of Defects ..... 32
5.9 Acceptance Criteria ..... 32
5.10 Defect Removal ..... 39
5.11 Test Report ..... 39
5.12 Test Report Sample (Only for reference)

REMAZEL ENGINEERING

**RAPPORTO DI CONTROLLO VISIVO SALDATURE**

(Certificate Visual Control Weldings)

Certificate n°

**DATE** *Date*

page 1/1

| | | | |
|---|---|---|---|
| **FORNITORE** *Supplier* | | **ORDINE** *Order* | |
| **COMMESSA** *Job* | | **OGGETTO** *Object* | |
| **PROGETTO** *Project* | | **DISEGNO** *Drawing* | |
| **QCP N°** *Qcp N°* | | **Fase** *Phase* | |

| | |
|---|---|
| **Materiale:** *Material:* | |
| **Tipo di giunto:** *Type of joint:* | |
| **Spessore del materiale:** *Material thickness:* | |
| **Processo di saldatura:** *Welding process:* | |
| **Criterio di accettazione:** *Acceptance criteria:* | |
| **Mezzi usati:** *Examination devices used:* | |
| **Estensione dell'esame con riferimento al disegno:** The extent of examination with reference to drawings as appropriate: | |
| **Indicazioni che eccedono i limiti di accettazione:** Imperfections exceeding the acceptance criteria and their location: | |
| | |

| | | |
|---|---|---|
| RISULTATI / Results | CONFORME / Accepted | ☒ |
| | NON CONFORME / Not Accepted | ☐ |
| | SCARTO / Rejection | ☐ |

**NOTE** *(Notes):*

| Remazel Engineering | Enti Collaudatori *Inspect.Officials* | Ispettore Cliente *Customer Inspector* | |
|---|---|---|---|
| | | | |


.... 40

**6 Procedure for Dye Penetrant Check on Welds..... 41**

6.1 Purpose..... 41

6.2 Reference Documents ..... 41

6.3 Extension of Test ..... 41

6.4 Personnel Qualification ..... 41
6.5 Inspection time ..... 41
6.6 Inspection Temperature ..... 41
6.7 Inspection Condition ..... 42
6.8 Surfaces preparation ..... 42
6.9 Penetrant Materials ..... 42
6.10 Penetrant Application ..... 43
6.11 Dwell Time ..... 43
6.12 Excess Penetrant Removal ..... 43
6.13 Drying ..... 43
6.14 Developing Time ..... 44
6.15 Evaluation of Indications ..... 44
6.16 Acceptance Criteria ..... 44
6.17 Defect Removal ..... 45
6.18 Test Report ..... 45
6.19 Test Report Sample (Only for reference) ..... 47
6.20 Instruction for Safety ..... 48
**7 Procedure for Magnetic Test on Welds ..... 49**
7.1 Purpose ..... 49
7.2 Reference Documents ..... 49
7.3 Extension of Test ..... 49
7.4 Personnel Qualification ..... 49
7.5 Inspection time ..... 49
7.6 Instruments ..... 49
7.7 Examination Medium ..... 50
7.8 Lighting Condition ..... 51
7.9 Surfaces preparation ..... 51
7.10 Magnetization ..... 51
7.11 Evaluation of Indications ..... 52
7.12 Acceptance criteria ..... 52
7.13 Defect Removal ..... 53
7.14 Test report ..... 53
7.15 Test report Sample (Only for reference) ..... 55
7.16 Safety Instruction ..... 56
**8 Procedure for Ultrasonic Check on Welds ..... 57**
8.1 Purpose ..... 57
8.2 Reference Documents ..... 57
8.3 Extension Of Test ..... 57

8.4 Personnel Qualification ..... 57
8.5 Inspection time ..... 57
8.6 Surfaces Preparation ..... 57
8.7 Equipment ..... 58
8.8 Couplant ..... 58
8.9 Time Base Calibration ..... 59
8.10 Test Sensitivity ..... 59
8.11 Transfer Losses ..... 60
8.12 Calibration Verification ..... 60
8.13 Scanning Technique ..... 61
8.14 Characterization of Indications ..... 63
8.15 Acceptance and Record Criteria ..... 63
8.16 Defect Removal ..... 65
8.17 Test report ..... 65
8.18 Test report Sample (Only for reference) ..... 66
**8 Qualified operators list ..... 68**

| REMAZEL ENGINEERING | SISTEMA QUALITA' *QUALITY SYSTEM* | REU N° |
|---|---|---|
| | **RAPPORTO DI ESAME ULTRASUONI** *Ultrasonic test report* | COMM. *Job* |
| | | DATA *Date* |

| | | | |
|---|---|---|---|
| **CLIENTE** *Customer* | **ORDINE** *Order* | **DEL** *Of* | **COMM. CLIENTE** *Customer's job* |
| **OGGETTO** *Subject* | **DISEGNO RIF.** *Ref. Drw* | | **QUANTITA'** *Quantity* |

| | | | |
|---|---|---|---|
| **Stato di controllo** *Testing status* | ☐ **Preliminare** *Preliminary* | ☐ **Finale REMAZEL** *Final REMAZEL* | ☐ **Finale ufficiale** *Final official* |
| **Condizioni superficiali** *Surface conditions* | ☐ **Sabbiate** *Sandblasted* | ☐ **Lavoraz. meccanica** *Machined* | ☐ **Come fornito** *As delivery* |
| **Specifica** *Specification* | | | |
| **Mezzo di accoppiamento** *Coupling method* | | | |

| | | |
|---|---|---|
| **Calibrazione** *Calibration* | ☐ **AVG scala** *AVG scale* | ☐ **Blocco di riferimento V 1** *Reference block V 1* |
| | ☐ **DGS Diagramma** *DGS diagram* | ☐ **Blocco di riferimento V 2** *Reference block V 2* |
| | ☐ **Eco di riferimento** *Reference echo* | ☐ **Blocchi di calibrazione** *Calibration blocks* |

**SONDE** *Probes* — **REGOLAZIONE** *Adjustment*

| Tipo *Type* | Frequenza *Freq. MHz* | Dimensioni *Size mm* | Angolo *Angle* | Costruttore *Manifacture* | Potenza *Power* | Amplificazione *Amplification* | Note *Rermarks* |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

| | | | |
|---|---|---|---|
| **Apparecchiatura** *Apparatus* | **Costruttore** *Manufact.* | **Tipo** *Type* | **Matricola** *Serial N* |
| **Risultati** *Results* | ☐ **Conforme** *According to* | ☐ **Non conforme** *Not according to* | ☐ **Scarto** *Rejection* |

**Note** *Remarks*

| | | | |
|---|---|---|---|
| **Operatore** *Operator* | **Enti collaudatori** *Inspect. officials* | **Ispettore cliente** *Customer inspect.* | **Capo collaudo** *Inspect. Dept. manager* |

**MODULO - MD009 Rev.00**


..... 66

**9 Qualified operators list: ..... 67**

# 1 Purpose

The purpose of this document is to provide guidelines for the NDE of the components for the Offshore & Cargo Deck cranes.

# 2 References

| | |
|---|---|
| 24-27012-ITP-001_01 | Inspection and Test Plan |
| EN 10228-1 ED.2016 | Non-destructive testing of steel forgings – Magnetic particle inspection |
| EN 10228-3 ED.2016 | Non-destructive testing of steel forgings – Ultrasonic inspection |
| EN ISO 9712 ED.2022 | Non-destructive testing – Qualification and certification of NDT personnel |
| EN ISO 17637 ED.2017 | Non-destructive testing of welds – Visual testing of fusion-welded joints |
| EN ISO 23277 ED.2015 | Non-destructive testing of welds – Penetrant testing – Acceptance levels |
| EN ISO 17638 ED.2016 | Non-destructive testing of welds – Magnetic particle testing |
| EN ISO 23278 ED.2015 | Non-destructive testing of welds – Magnetic particle testing – Acceptance levels |
| EN ISO 17640 ED.2019 | Non-destructive testing of welds. Ultrasonic testing. Techniques, testing levels, and assessment |
| EN ISO 11666 ED.2018 | Non-destructive testing of welds. Ultrasonic testing. Acceptance levels |
| EN ISO 5817 ED.2023 | Welding – Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) – Quality levels for imperfections |
| EN ISO 3452 ED.2021 | Non-destructive testing of welds – Penetrant testing – General |
| UNI EN 10308 ED.2004 | Non-destructive testing of welds – Ultrasonic testing –steel bars |

# 3 Abbreviations

**QC:** Quality Control
**ITP:** Inspection and Test Plan
**Company:** Rosetti Marino
**Project** Davit Cranes
**Third Part:** /
**Sub-Supplier:** a company awared by Remazel to manufacture
**DAC Curve:** *Distance Amplitude Correction Curve.*
**DGS Curve:** *Distance Gain Size Curve.*
**FBH:** Flat Bottom Hole.
**EFBH:** Equivalent Flat Bottom Hole.
**ERS:** Equivalent Reflector Size.
**NDE:** Non Destructive Examination.
**VT:** Visual Test.
**MT:** Magnetic Test.
**PT:** Penetrant Test.
**UT:** Ultrasonic Test.

# 4 Magnetic Test on Forged components and Weld Chamfer

## 4.1 Purpose

This procedure prescribes the minimum requirements to apply during magnetic examination of Weld Chamfer (ferromagnetic material).

*Questa procedura prescrive i requisiti minimi da applicare durante il test magnetoscopico di cianfrini (materiale ferromagnetico).*

## 4.2 Reference Documents

EN ISO 9712 Non-destructive testing Qualification and certification of NDT personnel
EN 10228-1 Non-destructive testing of steel forgings. Magnetic particle inspection
EN ISO 9934-2 Non-destructive testing. Magnetic particle testing. Detection media
EN ISO 9934-3 Non-destructive testing. Magnetic particle testing. Equipment

## 4.3 Personnel Qualification

Operators shall be qualified according to EN ISO 9712 level II or III. NDT operators shall have Acuity test certificate, not older than one year, attesting that minimum requirements for `Near vision' and `Colour Vision' according to EN ISO 9712 Clause 7 are fulfilled.

*Tutto il personale che effettua il controllo accordo a questa procedura dovrà essere qualificato in accordo ai livelli II o III della EN ISO 9712. Gli operatori NDT devono avere la certificazione di acuità visiva, non più vecchia di un anno, attestante i requisiti minimi di vista da vicino e distinzione colori, in accordo alla EN ISO 9712 Clausola 7.*

## 4.4 Instruments

Alternate current yoke shall be used.
Yoke shall be endowed by jointed poles to test T-joint.
Equipment used shall be conforming according to EN ISO 9934-3 specification.
Equipment shall be calibrated every year and every time it is damaged or when it is considered necessary.
Calibration procedure foresees the lifting of a calibration block of 4.5 kg weight in alternating current.
The magnetizing power of yokes shall be verified prior to use each day the yoke is used. Each alternating current electromagnetic yoke shall have a lifting power of at least 4.5 kg at the maximum pole spacing, with contact similar to what will be used during the examination. Lifting test shall be repeated every time it is required by Company Inspector.
The following equipment can be used:

- Yoke PARKER.
- Yoke NDT ELITE.
- Yoke KARL DEUTSCH.
- Equivalent instruments

*Deve essere utilizzato un gioco magnetico con corrente alternata.*
*Il giogo deve essere dotato di poli snodabili per il controllo su giunti a "T".*
*Le apparecchiature devono essere conformi alla specifica EN ISO 9934-3*
*Le apparecchiature devono essere tarate ogni anno e ogni qualvolta subiscano un danneggiamento o quando fattori obiettivi lo rendano necessario.*
*La procedura di taratura prevede il sollevamento di un blocco campione del peso di 4.5 kg in corrente alternata.*
*La forza di magnetizzazione del giogo deve essere verificata prima di ogni utilizzo. Il giogo in corrente alternata deve essere verificato sollevando un peso di 4.5Kg con i puntali al massimo dell'estensione con*

*una superficie di contatto simile a quella che verrà utilizzata nel corso dell'ispezione. La prova di sollevamento deve essere eseguita ogni volta che l'Ispettore del cliente lo richiede.*
*Possono essere impiegate le seguenti apparecchiature:*

- *Giogo PARKER corrente alternata o continua.*
- *Giogo NDT ELITE corrente alternata o continua.*
- *Giogo KARL DEUTSCH corrente alternata o continua.*
- *Equivalenti.*

## 4.5 Examination Medium

Colour contrast or fluorescent (for welds can be used only after flushing) magnetic particles in suspension shall be used.
The magnetic particles supplied in spray cans shall be used.
Spray cans content concentration shall not be subjected to check.
Magnetic particles shall have high permeability, low retentively and such dimension to allow a high mobility on surface.
Magnetic particles to be used can be supplied by:

- CGM
- NDT Elite
- Equivalent suppliers

The temperatures of use are supplied directly by the manufacturer.

*Saranno utilizzate particelle magnetiche a contrasto di colore o fluorescenti (per le saldature possono essere utilizzati solo dopo lisciatura) in sospensione.*
*Le particelle magnetiche da utilizzare dovranno essere soluzioni già preparate in bombolette spray.*
*Nell'utilizzo di bombolette spray, non è richiesto il controllo della concentrazione.*
*Le particelle magnetiche da utilizzare devono avere elevata permeabilità, bassa retentività e dimensioni tali da consentire un'elevata mobilità sulla superficie.*
*Le particelle magnetiche da utilizzare possono essere:*

- *CGM*
- *NDT Elite*
- *Equivalenti*

*Le temperature di utilizzo sono fornite direttamente dal produttore.*

## 4.6 Lighting Condition

For colour contrast method the surface shall be illuminated with an intensity of minimum 1000 Lux.
For fluorescent method the surface shall be illuminated with an intensity of maximum 20 Lux while the intensity of the UV-A irradiation on the surface shall be minimum 1000 µW/cm$^2$.
Lightning intensity and UV-A irradiation shall be checked with a calibrated lux meter or radiometer.
Examiners shall be in a darkened area for at least 5 min prior to performing examinations to enable their eyes to adapt to dark viewing. Glasses or lenses worn by examiners shall not be photosensitive.

*Per il metodo a contrasto di colore la superfice deve essere illuminata con un'intensità minima di 1000 Lux.*
*Per il metodo fluorescente la superfice deve essere illuminata con un'intensità massima di 20 Lux mentre l'intensità dell'irradiazione UV-A deve essere minimo di 1000 µW/cm$^2$.*
*L'intensità dell'illuminazione e l'irradiazione UV-A devono essere controllate con un luxometro o un radiometro calibrati.*
*L'esaminatore, prima di eseguire l'ispezione, deve rimanere in un'area buia per almeno 5 minuti prima dell'ispezione per adattare la vista agli ambienti bui. Occhiali o lenti indossate dagli esaminatori non devono essere fotosensibili.*

## 4.7 Surfaces preparation

The surface under examination shall be dry and free of dust, grease, scale, oil or any other substances which could interfere with the examination.
The surfaces to be examined shall not be painted.
If is necessary to increase the contrast, a layer of lacquer can be applied by brush or spray.
The manufacturer of lacquer and magnetic particles shall be the same.
Surface temperature shall be in the range established by the magnetic particles supplier.
The surface shall be sandblasted, grinded or machined.
Surface roughness shall comply with the requirements of Table 1

*La superficie in esame dovrà essere asciutta e libera da polvere, grasso, incrostazioni, olio, scaglie o ogni altra sostanza estranea che possa interferire con l'esame.*
*Le superfici da esaminare non dovranno essere verniciate, tuttavia nel caso di controllo con giogo magnetico i poli dello stesso possono poggiare su superfici rivestite da vernice.*
*Nel caso di controllo con puntali, le aree di contatto non possono essere verniciate.*
*Se necessario, per aumentare il contrasto uno strato uniforme di lacca può essere applicato tramite spray o pennello.*
*Il fornitore della lacca di contrato deve essere lo stesso delle particelle magnetiche.*
*La superficie in esame deve avere una temperatura compresa entro i limiti stabiliti dal produttore delle particelle magnetiche.*
*La superficie può essere sabbiata, molata o lavorata.*
*La rugosità superficiale deve essere in accordo ai requisiti della Table 1.*

**Table 1 — Surface condition**

| Surface roughness parameter $R_a$ *), in µm | Quality classes[a] | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| $6,3 < R_a \leq 12,5$ | X | X | – | – |
| $R_a \leq 6,3$ | X | X | X[b] | X[c] |

a X signifies the quality class that can be achieved for the specified surface finish.

b Quality class not applicable to the testing of surfaces with a machining allowance greater than 3 mm per face.

c Quality class not applicable to the testing of surfaces with a machining allowance greater than 1 mm per face.

*) $R_a$ = arithmetical mean deviation of the profile.

## 4.8 Magnetization

Before starting the exam, is necessary to check the strength and direction of the magnetic field through a field indicator.
The test will be performed with the continuous method.
This provides that the magnetization is kept active during the application of the magnetic particles, during the removal of particles in excess and for the examination of the surface.
Each area will be examined at least twice.
During the second test, the flux lines of the magnetic field generated, have to be perpendicular to those obtained with the first control.

The examination shall be conducted following the techniques described in EN ISO 10228-1.
The temperatures within which the products are used, are defined by the manufacturer of the same.
The application of the particles shall be carried out by spray.
The entire area between two poles must be covered by the application of the magnetic liquid.
The removal of excess particles in the wet method, will be helped by the action of fluid drainage of the suspension.
The maximum distance between the poles of the yoke shall be the one verified with the calibration block.
For tests carried out according to this procedure, demagnetization is not necessary.

*Prima di iniziare l'esame, è necessario verificare l'intensità e la direzione del campo magnetico mediante un apposito indicatore di campo.*
*Il test sarà eseguito con il metodo continuo.*
*Questo prevede che la magnetizzazione sia tenuta attiva durante l'applicazione delle particelle magnetiche, durante la rimozione delle particelle in eccesso e durante l'esame della superficie.*
*Ogni area sarà esaminata almeno due volte, durante il secondo esame, le linee di flusso del campo magnetico generato, dovranno essere perpendicolari a quelle ottenute nel primo controllo.*
*L'esame sarà condotto seguendo le tecniche descritte nella* EN ISO 10228-1.
*Le temperature entro il quale i prodotti possono essere utilizzati, sono definite dal produttore degli stessi.*
*L'applicazione delle particelle deve essere spray.*
*L'intera area compresa tra in due poli deve essere coperta dall'applicazione del liquido magnetico.*
*La rimozione delle particelle in eccesso nel controllo in umido, sarà favorita dall'azione di drenaggio del fluido della sospensione.*
*La massima distanza tra i poli deve essere quella verificata con il blocco campione.*
*Per controlli effettuati secondo questa procedura, non è necessaria la smagnetizzazione.*
*In presenza di false indicazioni, il test deve essere rieseguito dopo le azioni di rimozione e pulizia.*

## 4.9 Instruments

Equipment used shall be conforming according to EN ISO 9934-3 specification.
Equipment shall be verified every year, if damaged or when an objective factor makes it necessary.
Before each inspection the lifting strength of joke shall be verified.
Calibration procedure foresees the lifting of a calibration block, of 4.5 kg (10 lbs) weight in alternating current.

*Le apparecchiature devono essere conformi alla specifica EN ISO 9934-3.*
*Le apparecchiature devono essere verificate ogni anno, se danneggiate o quando un fattore oggettivo lo rende necessario.*
*Prima di ogni ispezione deve essere verificata la forza di sollevamento del giogo.*
*La procedura di taratura prevede il sollevamento di un blocco campione del peso di 4.5 kg (10 lbs) in corrente alternata.*

## 4.10 Evaluation of Indications

Definitions:

- False indication: an indication is caused by a process error or technique, such as a poor cleaning, etc.
  Any surface discontinuity that may cause false indications shall be smoothly grind.
  In the presence of false indications, the test shall be re-executed after the removal and cleaning actions.
- Non relevant indication: is an indication that it is due to an accumulation of magnetic particles which is not caused by a significant discontinuity.
- Non relevant indications may be caused by geometric variations, machining etc.
- Linear indication: is an indication in which the length / width ratio is greater than 3.

- Round indication: is an indication in which the length / width ratio is lower than 3.

*Definizioni:*

- *Falsa indicazione: è un'indicazione causata da un errore di processo o di tecnica, come ad esempio una cattiva pulizia.*
  *Le discontinuità superficiali che possono causare false indicazioni devono essere molate.*
  *In presenza di false indicazioni, il test deve essere re eseguito dopo le azioni di rimozione e pulizia.*
- *Indicazione non rilevante: è un'indicazione che è causa di un accumulo di particelle magnetiche non provocato da una discontinuità significativa.*
- *Le indicazioni non rilevanti possono essere causate da variazioni geometriche, lavorazioni di macchina ecc.*
- *Indicazione lineare: è un'indicazione in cui il rapporto lunghezza / larghezza è maggiore di 3.*
- *Indicazione tondeggiante: è un'indicazione in cui il rapporto lunghezza / larghezza è minore di 3.*

## 4.11 Acceptance Criteria

For forged components and weld bevel, the acceptance criteria are defined in the EN ISO 10228-1, the Level 3.

*Per componenti forgiati e cianfrini di saldatura, i criteri di accettabilità sono definiti secondo la EN ISO 10228-1, il Livello 3.*

**Table 2 — Quality classes, recording levels and acceptance criteria[c]**

| Parameter | Quality class | | | |
|---|---|---|---|---|
| | 1 | 2 | 3[a] | 4[b] |
| Recording level: indication length (mm) | ≥ 5 | ≥ 2 | ≥ 2 | ≥ 1 |
| allowable length $L$ of isolated indications and allowable length $L_g$ of interacting indications (mm) | ≤ 20 | ≤ 8 | ≤ 4 | ≤ 2 |
| allowable cumulative length of indications in the reference surface (mm) | ≤ 75 | ≤ 36 | ≤ 24 | ≤ 5 |
| Maximum allowable number of indications in the reference surface | 15 | 10 | 7 | 5 |

[a] Quality class not applicable to the examination of areas with a machining allowance greater than 3 mm per face.

[b] Quality class not applicable to the examination of areas with a machining allowance greater than 1 mm per face.

[c] Reference surface = 148 mm × 105 mm (i.e. A6 format) For objects smaller than the reference surface, or if only an area is examined smaller than the reference surface. then the maximum allowable number of indications should be determined and agreed accordingly (the acceptance criteria for the dimensions remain unchanged).

## 4.12 Defect Removal

All the discontinuities that exceed the standards acceptance criteria have to be removed and/or repaired and re-checked according to this procedure.

*Tutte le discontinuità che superano gli standard di accettabilità devono essere rimosse e/o riparate e ricontrollate in accordo a questa procedura.*

## 4.13 Test report

The report should include at least the following information:

- Inspection date
- Name, qualification and signature of the operator
- Component identification
- Place and extension of the test
- Thermal treatment status
- Type of component
- Surface conditions
- Reference to the operating procedure and to the codes used
- Instrumentation used
- Possible mapping of defects to be registered and / or non-compliant
- Final result of the test with acceptability

*Il report dovrà includere almeno le seguenti informazioni:*

- *Data di ispezione*
- *Nome, qualifica e firma dell'operatore*
- *Identificazione del componente*
- *Luogo ed estensione del test*
- *Stato di trattamento termico*
- *Tipo di componente*
- *Condizioni superficiali*
- *Riferimento alla procedura operativa ed ai codici utilizzati*
- *Strumentazione utilizzata*
- *Eventuale mappatura di difetti da registrare e/o non conformi*
- *Risultato definitivo del test con accettabilità*

## 4.14 Test report Sample (Only for reference)

| REMAZEL ENGINEERING | SISTEMA QUALITA' *QUALITY SYSTEM*<br>RAPPORTO DI ESAME MAGNETOSCOPICO *Magnetoscopic test report* | REM N°<br>COMM. *Job*<br>DATA *Date* |
|---|---|---|

| | | | |
|---|---|---|---|
| **CLIENTE** *Customer* | **ORDINE** *Order* **DEL** *Of* | | **COMM. CLIENTE** *Customer's job* |
| **OGGETTO** *Subject* | **DISEGNO RIF.** *Ref. Drw* | | **QUANTITA'** *Quantity* |
| **Stato di controllo** *Testing status* | ☐ **Preliminare** *Preliminary* | ☐ **Finale REMAZEL** *Final REMAZEL* | ☐ **Finale ufficiale** *Final official* |
| **Condizioni superficiali** *Surface conditions* | ☐ **Sabbiate** *Sandblasted* | ☐ **Lavoraz. meccanica** *Machined* | ☐ **Come saldato** *As Welded* |
| **Specifica** *Specification* | | | |
| **Limiti di accettazione** *Acceptance standars* | | | |
| **Metodo** *Method* | ☐ **Puntali** *Pods* | ☐ **Giogo** *Yoke* | ☐ **Bobina** *Coil* |
| **Polvere** *Powder* | ☐ **Secco** *Dry* | ☐ **Umido** *Wet* | ☐ **Fluorescente** *Fluorescent* |
| **Tipo di polvere** *Type of powder* | ☐ **Grigia** *Grey* | ☐ **Blu** *Blue* | ☐ **Nera** *black* |
| **Sospensione** *Suspension* | ☐ **In olio** *In oil* | ☐ **In acqua** *In water* | ☐ **KEROSENOIL** |
| **Magnetizzazione** *Magnetization* | **Corrente** *Current*<br>**Amperspira** *Ampere turns* / | **Intensità** *Intensity*<br>**Flusso magnetico** *Magnetic flux* / | **Distanza** *Distance*<br>**Diametro** *Diameter mm* / |
| **Apparecchiatura** *Apparatus* | **Costruttore** *Manufacture* | **Tipo** *Type* | **Matricola** *Serial* |
| **Pulitura** *Cleaning method* | | | |
| **Smagnetizzazione** *Demagnetization* | / | | |
| **Risultati** *Results* | ☐ **Conforme** *According to* | ☐ **Non conforme** *Not according to* | ☐ **Scarto** *Rejection* |
| **Note** *Remarks* | | | |

| | | | |
|---|---|---|---|
| **Operatore** *Operator* | **Enti collaudatori** *Inspect. officials* | **Ispettore cliente** *Customer inspect.* | **Capo collaudo** *Inspect. Dept. manager* |

**MODULO - MD006 Rev.00**

## 4.15 Safety Instruction

The magnetic particles are not toxic however they can cause cutaneous irritations.
Therefore:

- Use the protection gloves having care to hold them clean inside.
- Use for all the time the protective mask.
- Wash the hands and the gloves with care at the end of the job.
- Is recommended the use of protective glasses during the job.

Spray cans contain FREON 12 so:

- Protect from sunlight.
- Don’t expose to a temperature higher than 50° C.
- Don’t pierce or burn after the use.
- Don’t spray on flames or on incandescent bodies.
- Don’t inhale or spray in the eyes.
- Bring away from the job place at the end of shift.

*Le particelle magnetiche non sono tossiche ma possono causare irritazioni cutanee.*
*Si raccomanda di:*

- *Usare i guanti di protezione avendo cura di tenerli puliti all'interno;*
- *Usare per tutta la durata del lavoro la maschera protettiva;*
- *Lavare con cura le mani ed i guanti a fine lavoro;*
- *L'uso di occhiali protettivi durante il lavoro.*

*Le bombolette spray contengono FREON 12 quindi:*

- *Proteggere dai raggi solari.*
- *Non esporre a temperature superiori a 50° C.*
- *Non forare o bruciare dopo l'uso.*
- *Non spruzzare su fiamme o su corpi incandescenti.*
- *Non inalare o spruzzare negli occhi.*
- *Portare via dal posto di lavoro a fine turno.*

# 5 Procedure for the Visual Control of Welds

## 5.1 Purpose

This procedure defines minimum requirements to be applied during visual test of welded joint in tubing and structures, when required by applicable Code.

*Questa procedura prescrive i requisiti minimi da applicare durante l'esame visivo di giunti saldati, strutture e tubazioni, quando richiesto dal Codice applicabile.*

## 5.2 Reference Documentation

EN ISO 9712 Non-destructive testing Qualification and certification of NDT personnel
EN ISO 6520 Classification of geometric imperfections in metallic materials
EN ISO 5817 Fusion-welded joints in steel, Quality levels for imperfections
EN ISO 17637 Non-destructive testing of welds. Visual testing of fusion-welded joints

## 5.3 Extension Of Test

The applicability of the test is defined in the drawings, extension shall be 100%.

*L'applicabilità del controllo è definita nel disegno l'estensione deve essere al 100%.*

## 5.4 Personnel Qualifications

The personnel carrying out the test according to this procedure shall be qualified according to EN ISO 9712 level II or III. NDT operators shall have Acuity test certificate, not older than one year, attesting that minimum requirements for `Near vision' and `Colour Vision' according to EN ISO 9712 Clause 7 are fulfilled.

*Tutto il personale che effettua il controllo accordo a questa procedura dovrà essere qualificato in accordo ai livelli II o III della EN ISO 9712. Gli operatori NDT devono avere la certificazione di acuità visiva, non più vecchia di un anno, attestante i requisiti minimi di vista da vicino e distinzione colori, in accordo alla EN ISO 9712 Clausola 7.*

## 5.5 Inspection time

The inspection shall be performed 48 hours after the complete welding cooling down, in case of PWHT the NDE shall be performed at the end of the heat treatment.

*I controlli andranno eseguiti 48 ore dopo il completo raffreddamento delle saldature, in caso di PWHT i controlli NDE devono essere eseguiti al termine del trattamento termico.*

## 5.6 Surface Preparation

The surface under examination can be machined, grinded, brushed, sandblasted or as welded.
The surface to be examined adjacent zone for at least 10mm shall be dry and free from dust, grease, scale, oil, weld spatter, defects of lamination, burning, tack, nicks made by lifting clamps or any substance that could interfere with the examination.

*La superfice da esaminare può essere lavorata di macchina, molata, spazzolata, sabbiata o saldata.*
*La superfice da esaminare e la zona adiacente per almeno 10mm deve essere asciutta e libera da polvere, grasso, calamina, spruzzi di saldatura, difetti di laminazione, bruciature, tratti di saldatura, segni di pinze per il sollevamento o qualsiasi altra sostanza che può interferire con l'esame.*

## 5.7 Test Condition

The minimum lighting on surface, shall be min. 500 lux and shall be measured by a calibrated lux meter.
The visual examination shall be performed at a maximum distance of 600 mm, with the direction of observation such that the angle of observation with the surface to be examined is not less than 30°.
Mirrors can be used to improve the viewing.
If it is not possible to comply with the direct method, the test can be performed using a suitable remotely controlled equipment (endoscopes, cameras, etc.), in any case, the resolving power of the equipment used shall be equivalent to that obtained with the direct visual examination.
A magnifying lens may also be used in case of doubt or for the analysis of small anomalies.
The size of bevels and welds shall be verified against the drawing and WPS requirements and shall be measured with gauges defined by EN ISO 17637 Annex A.

*L'illuminazione minima della superficie sotto esame, deve essere min. 500 lux e deve essere misurata con un luxmetro calibrato.*
*L'esame visivo dovrà essere eseguito ad una distanza massima di 600 mm, con direzione di osservazione tale che l'angolo di osservazione con la superficie da esaminare non risulti inferiore a 30°.*
*Potranno essere utilizzati degli specchietti per facilitare l'angolazione visiva.*
*Qualora non sia possibile eseguire l'esame con il metodo diretto, esso può essere eseguito ricorrendo a sistemi remoti (endoscopio, telecamere, ecc.) opportuni, in ogni caso, il potere risolutivo delle apparecchiature utilizzate e dovrà essere equivalente a quello ottenibile con l'esame visivo diretto.*
*Potrà anche essere usata una lente d'ingrandimento in caso di dubbio o per l'analisi di piccole anomalie.*
*La dimensione dei cianfrini e delle saldature deve essere verificata con i requisiti dei disegni o delle WPS misurati con calibri definiti in accordo alla EN ISO 17637 Annex A.*

**Table A.1 — Measuring instruments and weld gauges — Measuring ranges and reading accuracy**

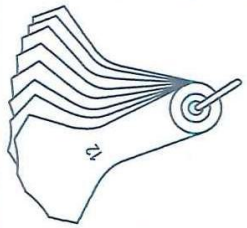
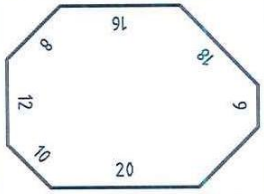
| Weld gauge | Description | Type of weld | | | | Measuring range | Reading accuracy | Included or fillet angle | Permissible deviation of included or fillet angle |
|---|---|---|---|---|---|---|---|---|---|
| | | Fillet weld | | | Butt weld | | | | |
| | | Flat weld | Concave weld | Convex weld | | mm | mm | degrees | |
|  | **Simple weld gauge**<br>a) Measures fillet weld from 3 mm to 15 mm thickness. The gauge is placed by the curved part in the fusion faces so as to have three points of contact with the work piece and the fillet weld.<br>b) Measures butt welds reinforcement with the straight part.<br>Because the gauges consist of relatively soft aluminium, they wear out rapidly. | x | x | — | x | 3 to 15 | ≈ 0,5 | 90 | Small |
|  | **Set of welding gauges**<br>Measures fillet welds from 3 mm to 12 mm thickness; from 3 mm to 7 mm: graduations of 0,5 mm; above 8 mm, 10 mm and 12 mm. The gauge measures by using the principle of three-point contact. | x | x | — | — | 3 to 12 | according to fan part | 90 | None |

Table A.1 (*continued*)

| Weld gauge | Description | Type of weld | | | | Measuring range | Reading accuracy | Included or fillet angle | Permissible deviation of included or fillet angle |
|---|---|---|---|---|---|---|---|---|---|
| | | Fillet weld | | | Butt weld | | | | |
| | | Flat weld | Concave weld | Convex weld | | mm | mm | degrees | |
|  | **Weld gauge with Vernier**<br>Measures fillet welds; also reinforcement of butt welds can be determined. The legs of the gauge are so formed that included angles of 60°, 70°, 80° and 90° of V- and single-V butt weld with broad face can be measured. Slight deviations from these lead to significant errors. | x | x | — | x | 0 to 20 | 0,1 | 90 | None |
|  | **Self made weld gauge**<br>Measures 7 throat thicknesses of fillet welds with an included angle of 90°. | x | — | — | — | 0 to 20 | 0,2 | 90 | None |
|  | **Three-scale weld gauge**<br>Measures throat thickness and leg length. Can also measure weld reinforcement of butt welds. Easy to use. Also appropriate for asymmetric fillet welds. | x | x | x | x | 0 to 15 | 0,1 | 90 | Small |

ISO 17637:2003(E)

Table A.1 (*continued*)

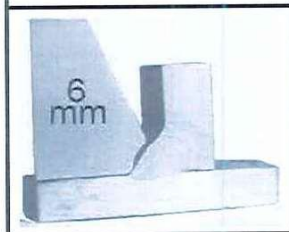
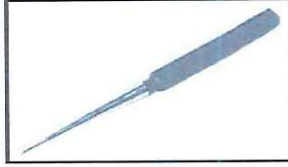
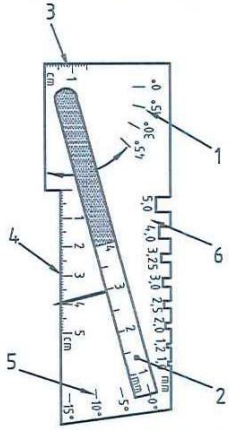
| Weld gauge | Description | Type of weld | | | | Measuring range | Reading accuracy | Included or fillet angle | Permissible deviation of included or fillet angle |
|---|---|---|---|---|---|---|---|---|---|
| | | Fillet weld | | | Butt weld | | | | |
| | | Flat weld | Concave weld | Convex weld | | mm | mm | degrees | |
|  | **Gauge for checking profile of fillet welds**<br>Checking the profile of one shape for one size of fillet welds. This type of gauge needs one model for each size of fillet weld. | — | — | — | — | — | — | — | — |
|  | **Multi-purpose gauge**<br>Measures angle of bevel, leg length of fillet weld, undercut, misalignment, throat thickness and weld reinforcement. | x | x | x | x | 0 to 50 | 0,3 | 0 to 45 (angle of bevel) | None |
|  | **Universal weld gauge**<br>Measurement tasks:<br>— fillet welds: shape and dimensions.<br>— butt welds: misalignment of plates, joint preparation (angle width), weld reinforcement, weld width, undercuts. | x | x | x | x | 0 to 30 | 0,1 | — | ± 25 % |
|  | **Gap gauge**<br>Measures the width of gaps. | — | — | — | x | 0 to 6 | 0,1 | — | — |

Table A.1 (*continued*)

| Weld gauge | Description | Type of weld | | | | Measuring range | Reading accuracy | Included or fillet angle | Permissible deviation of included or fillet angle |
|---|---|---|---|---|---|---|---|---|---|
| | | Fillet weld | | | Butt weld | | | | |
| | | Flat weld | Concave weld | Convex weld | | mm | mm | degrees | |
|  | **Hook gauge for misalignment**<br>Measures the misalignment of the preparation for butt welds on plates and pipes. | — | — | — | x | 0 to 100 | 0,05 | — | — |
|  | **Universal butt weld gauge**<br>Measures the preparation and the finished butt weld:<br>1 angle of bevel,<br>2 width of root gap,<br>3 weld reinforcement,<br>4 width of weld surface,<br>5 depth of undercut,<br>6 diameter of consumables. | x | x | x | x | 0 to 30 | 0,1 | — | ± 25 % |

ISO 17637:2003(E)

## 5.8 Definition of Defects

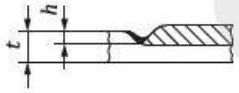
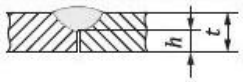
The defects shall be defined as per EN ISO 6520-1

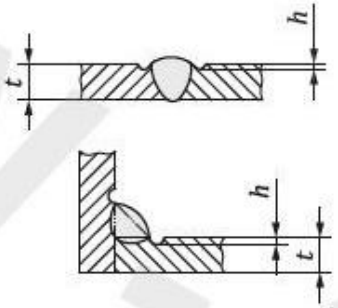
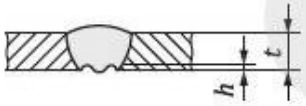
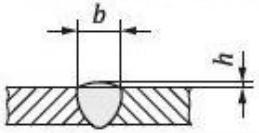
*I difetti devono essere definiti secondo la EN ISO 6520-1*

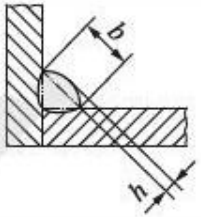
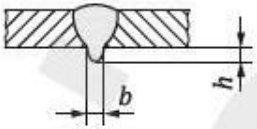
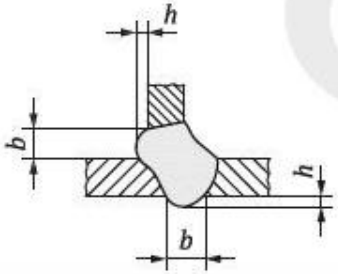
## 5.9 Acceptance Criteria

The acceptance criteria are the level C of the EN ISO 5817

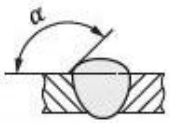
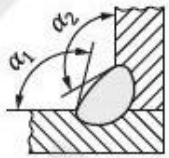
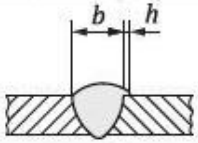
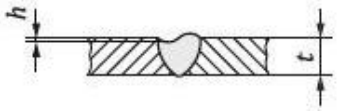
*I criteri di accettabilità sono quelli del livello C della EN ISO 5817*

| No. | Reference to ISO 6520-1 | Imperfection designation | Remarks | t mm | Limits for imperfections for quality levels | | |
|---|---|---|---|---|---|---|---|
| | | | | | D | C | B |
| 1 Surface imperfections | | | | | | | |
| 1.1 | 100 | Crack | | ≥ 0,5 | Not permitted | Not permitted | Not permitted |
| 1.2 | 104 | Crater crack | | ≥ 0,5 | Not permitted | Not permitted | Not permitted |
| 1.3 | 2017 | Surface pore | Maximum dimension of a single pore for<br>— butt welds<br>— fillet welds | 0,5 to 3 | <br>$d \le 0,3\ s$<br>$d \le 0,3\ a$ | Not permitted | Not permitted |
| | | | Maximum dimension of a single pore for<br>— butt welds<br>— fillet welds | > 3 | <br>$d \le 0,3\ s$, but max. 3 mm<br>$d \le 0,3\ a$, but max. 3 mm | <br>$d \le 0,2\ s$, but max. 2 mm<br>$d \le 0,2\ a$, but max. 2 mm | Not permitted |
| 1.4 | 2025 | End crater pipe |  | 0,5 to 3<br>> 3 | $h \le 0,2\ t$<br>$h \le 0,2\ t$, but max. 2 mm | Not permitted<br>$h \le 0,1\ t$, but max. 1 mm | Not permitted<br>Not permitted |
| 1.5 | 401 | Lack of fusion (incomplete fusion) | — | ≥ 0,5 | Not permitted | Not permitted | Not permitted |
| | | Micro lack of fusion | Only detectable by micro examination | ≥ 0,5 | Permitted | Permitted | Not permitted |
| 1.6 | 4021 | Incomplete root penetration | Only for single side butt welds<br>  | ≥ 0,5 | Short imperfections:<br>$h \le 0,2\ t$ but max. 2 mm | Not permitted | Not permitted |

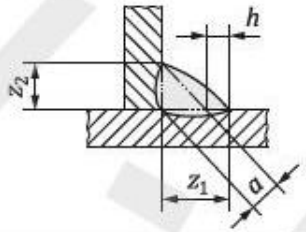
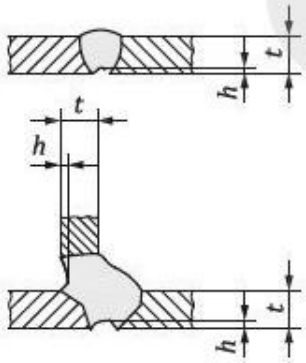
| No. | Reference to ISO 6520-1 | Imperfection designation | Remarks | $t$ mm | Limits for imperfections for quality levels | | |
|---|---|---|---|---|---|---|---|
| | | | | | D | C | B |
| 1.7 | 5011 | Continuous undercut | Smooth transition is required.<br>This is not regarded as a systematic imperfection. | 0,5 to 3 | Short imperfections:<br>$h \le 0{,}2\ t$ | Short imperfections:<br>$h \le 0{,}1\ t$ | Not permitted |
| | 5012 | Intermittent undercut |  | > 3 | $h \le 0{,}2\ t$, but max. 1 mm | $h \le 0{,}1\ t$, but max. 0,5 mm | $h \le 0{,}05\ t$, but max. 0,5 mm |
| 1.8 | 5013 | Shrinkage groove | Smooth transition is required.<br>  | 0,5 to 3<br>> 3 | Short imperfections:<br>$h \le 0{,}2$ mm + $0{,}1\ t$<br>Short imperfections:<br>$h \le 0{,}2\ t$, but max. 2 mm | Short imperfections:<br>$h \le 0{,}1\ t$<br>Short imperfections:<br>$h \le 0{,}1\ t$, but max.1 mm | Not permitted<br>Short imperfections:<br>$h \le 0{,}05\ t$, but max. 0,5 mm |
| 1.9 | 502 | Excess weld metal (butt weld) | Smooth transition is required.<br>  | ≥ 0,5 | $h \le 1$ mm + $0{,}25\ b$, but max. 10 mm | $h \le 1$ mm + $0{,}15\ b$, but max. 7 mm | $h \le 1$ mm + $0{,}1\ b$, but max. 5 mm |

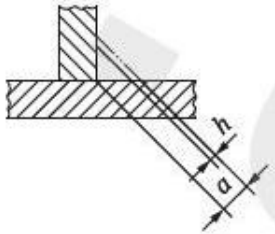
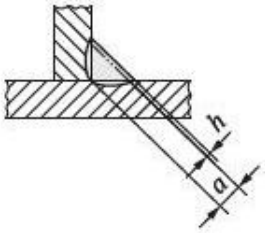
| No. | Reference to ISO 6520-1 | Imperfection designation | Remarks | $t$ mm | Limits for imperfections for quality levels | | |
|---|---|---|---|---|---|---|---|
| | | | | | D | C | B |
| 1.10 | 503 | Excessive convexity (fillet weld) |   | ≥ 0,5 | $h \leq 1$ mm + 0,25 $b$, but max. 5 mm | $h \leq 1$ mm + 0,15 $b$, but max. 4 mm | $h \leq 1$ mm + 0,1 $b$, but max. 3 mm |
| 1.11 | 504 | Excess penetration |     | 0,5 to 3<br>> 3 | $h \leq 1$ mm + 0,6 $b$<br>$h \leq 1$ mm + 1,0 $b$, but max. 5 mm | $h \leq 1$ mm + 0,3 $b$<br>$h \leq 1$ mm + 0,6 $b$, but max. 4 mm | $h \leq 1$ mm + 0,1 $b$<br>$h \leq 1$ mm + 0,2 $b$, but max. 3 mm |

FOR REVIEW ONLY

| No. | Reference to ISO 6520-1 | Imperfection designation | Remarks | t mm | Limits for imperfections for quality levels D | C | B |
|---|---|---|---|---|---|---|---|
| 1.12 | 505 | Incorrect weld toe | — butt welds   | ≥ 0,5 | $\alpha \geq 90°$ | $\alpha \geq 110°$ | $\alpha \geq 150°$ |
| | | | — fillet welds   $\alpha_1 \geq \alpha$ and $\alpha_2 \geq \alpha$ | ≥ 0,5 | $\alpha \geq 90°$ | $\alpha \geq 100°$ | $\alpha \geq 110°$ |
| 1.13 | 506 | Overlap |   | ≥ 0,5 | $h \leq 0,2\ b$ | Not permitted | Not permitted |
| 1.14 | 509 | Sagging | Smooth transition is required | 0,5 to 3 | Short imperfections: $h \leq 0,25\ t$ | Short imperfections: $h \leq 0,1\ t$ | Not permitted |
| | 511 | Incompletely filled groove |   | > 3 | Short imperfections: $h \leq 0,25\ t$, but max. 2 mm | Short imperfections: $h \leq 0,1\ t$, but max. 1 mm | Short imperfections: $h \leq 0,05\ t$, but max. 0,5 mm |

VIEW ONLY

| No. | Reference to ISO 6520-1 | Imperfection designation | Remarks | $t$ mm | Limits for imperfections for quality levels | | |
|---|---|---|---|---|---|---|---|
| | | | | | D | C | B |
| 1.15 | 510 | Burn through | — | ≥ 0,5 | Not permitted | Not permitted | Not permitted |
| 1.16 | 512 | Excessive asymmetry of fillet weld (excessive unequal leg length) | In cases where an asymmetric fillet weld has not been prescribed.   | ≥ 0,5 | $h \le 2$ mm + 0,2 $a$ | $h \le 2$ mm + 0,15 $a$ | $h \le 1,5$ mm + 0,15 $a$ |
| 1.17 | 515 | Root concavity | Smooth transition is required.   | 0,5 to 3<br>> 3 | $h \le 0,2$ mm + 0,1 $t$<br>Short imperfections: $h \le 0,2\ t$, but max. 2 mm | Short imperfections: $h \le 0,1\ t$<br>Short imperfections: $h \le 0,1\ t$, but max. 1 mm | Not permitted<br>Short imperfections: $h \le 0,05\ t$, but max. 0,5 mm |

| No. | Reference to ISO 6520-1 | Imperfection designation | Remarks | t mm | Limits for imperfections for quality levels | | |
|---|---|---|---|---|---|---|---|
| | | | | | D | C | B |
| 1.18 | 516 | Root porosity | Spongy formation at the root of a weld due to bubbling of the weld metal at the moment of solidification (e. g. lack of gas backing) | ≥ 0,5 | Locally permitted | Not permitted | Not permitted |
| 1.19 | 517 | Poor restart | — | ≥ 0,5 | Permitted<br>The limit depends on the type of imperfection occurred due to restart. | Not permitted | Not permitted |
| 1.20 | 5213 | Insufficient throat thickness | Not applicable to processes with proof of greater depth of penetration  | 0,5 to 3<br><br>> 3 | Short imperfections: $h \le 0{,}2$ mm + 0,1 $a$<br><br>Short imperfections: $h \le 0{,}3$ mm + 0,1 $a$, but max. 2 mm | Short imperfections: $h \le 0{,}2$ mm<br><br>Short imperfections: $h \le 0{,}3$ mm + 0,1 $a$, but max. 1 mm | Not permitted<br><br>Not permitted |
| 1.21 | 5214 | Excessive throat thickness | The actual throat thickness of the fillet weld is too large.  | ≥ 0,5 | Permitted | $h \le 1$ mm + 0,2 $a$, but max. 4 mm | $h \le 1$ mm + 0,15 $a$, but max. 3 mm |

VIEW ONLY

| No. | Reference to ISO 6520-1 | Imperfection designation | Remarks | t mm | Limits for imperfections for quality levels | | |
|---|---|---|---|---|---|---|---|
| | | | | | D | C | B |
| 1.22 | 601 | Stray arc | — | ≥ 0,5 | Permitted, if the properties of the parent metal are not affected. | Not permitted | Not permitted |
| 1.23 | 602 | Spatter | — | ≥ 0,5 | Acceptance depends on application, e.g. material, corrosion protection | Acceptance depends on application, e.g. material, corrosion protection | Acceptance depends on application, e.g. material, corrosion protection |
| 1.24 | 610 | Temper colour (Discolouration) | — | ≥ 0,5 | Acceptance depends on application, e.g. material, corrosion protection | Acceptance depends on application, e.g. material, corrosion protection | Acceptance depends on application, e.g. material, corrosion protection |

## 5.10 Defect Removal

All the discontinuities that exceed the standards acceptance criteria have to be removed and/or repaired and re-checked according to this procedure.

*Tutte le discontinuità che superano gli standard di accettabilità devono essere rimosse e/o riparate e ricontrollate in accordo a questa procedura.*

## 5.11 Test Report

The report should include at least the following information:

- Name of the Manufacturer
- Name of the Examining Company
- Identification of the tested component
- Material
- Type of Weld Joint
- Material Thickness
- Welding Process
- Acceptance Criteria
- Not Acceptable Indications (if any)
- Extension of the Exam
- Instrumentation used for the test
- Test Result
- Name, qualification and signature of the operator
- Inspection Date

The report shall be issued maximum 24 hours after the end of the inspection.

*Il report dovrà includere almeno le seguenti informazioni:*

- *Nome del Costruttore*
- *Nome della Società Esaminante*
- *Identificazione del componente testato*
- *Materiale*
- *Tipo di Giunto*
- *Spessore del materiale*
- *Processo di Saldatura*
- *Criteri di Accettabilità*
- *Indicazioni non Accettabili (se presenti)*
- *Estensione dell'esame*
- *Strumentazione Utilizzata*
- *Risultati di Prova*
- *Nome, Qualifica e Firma dell'Operatore*
- *Data di Ispezione*

*Il report deve essere redatto al massimo 24 ore dopo il termine dell'ispezione.*

## 5.12 Test Report Sample (Only for reference)

| REMAZEL ENGINEERING | RAPPORTO DI CONTROLLO VISIVO SALDATURE<br>(Certificate Visual Control Weldings) | Certificate n° |
|---|---|---|
| | | DATE *Date* |
| | | page 1/1 |

| | | | |
|---|---|---|---|
| **FORNITORE** *Supplier* | | **ORDINE** *Order* | |
| **COMMESSA** *Job* | | **OGGETTO** *Object* | |
| **PROGETTO** *Project* | | **DISEGNO** *Drawing* | |
| **QCP N°** *Qcp N°* | | **Fase** *Phase* | |

| | |
|---|---|
| **Materiale:** *Material:* | |
| **Tipo di giunto:** *Type of joint:* | |
| **Spessore del materiale:** *Material thickness:* | |
| **Processo di saldatura:** *Welding process:* | |
| **Criterio di accettazione:** *Acceptance criteria:* | |
| **Mezzi usati:** *Examination devices used:* | |
| **Estensione dell'esame con riferimento al disegno:** The extent of examination with reference to drawings as appropriate: | |
| **Indicazioni che eccedono i limiti di accettazione:** Imperfections exceeding the acceptance criteria and their location: | |
| | |

| | | |
|---|---|---|
| RISULTATI / Results | CONFORME / Accepted | ☒ |
| | NON CONFORME / Not Accepted | ☐ |
| | SCARTO / Rejection | ☐ |

**NOTE** *(Notes):*

| Remazel Engineering | Enti Collaudatori *Inspect.Officials* | Ispettore Cliente *Customer Inspector* | |
|---|---|---|---|
| | | | |

# 6 Procedure for Dye Penetrant Check on Welds

## 6.1 Purpose

This procedure prescribes the minimum requirements to apply during Dye Penetrant examination of welds.

*Questa procedura prescrive i requisiti minimi da applicare durante l'esame di saldature con Liquidi Penetranti a contrasto di colore.*

## 6.2 Reference Documents

EN ISO 9712 Non-destructive testing Qualification and certification of NDT personnel
EN ISO 3059 Non-destructive testing - Penetrant testing - Viewing conditions
EN ISO 3452-1 Non-destructive testing - Penetrant testing - Part 1: General principles
EN ISO 3452-2 Non-destructive testing - Penetrant testing - Part 2: Testing of penetrant materials
EN ISO 23277 Non-destructive testing of welds - Penetrant testing - Acceptance levels

## 6.3 Extension of Test

The minimum extent of inspection is defined per production drawings, the inspection shall be performed as per extent drawings indications.

*La minima estensione dell'esame deve essere in accordo ai disegni del progetto, l'ispezione deve essere eseguita in accordo all'estensione indicata a disegno.*

## 6.4 Personnel Qualification

Operators shall be qualified according to EN ISO 9712 level II or III. NDT operators shall have Acuity test certificate, not older than one year, attesting that minimum requirements for `Near vision' and `Colour Vision' according to EN ISO 9712 Clause 7 are fulfilled.

*Tutto il personale che effettua il controllo accordo a questa procedura dovrà essere qualificato in accordo ai livelli II o III della EN ISO 9712. Gli operatori NDT devono avere la certificazione di acuità visiva, non più vecchia di un anno, attestante i requisiti minimi di vista da vicino e distinzione colori, in accordo alla EN ISO 9712 Clausola 7.*

## 6.5 Inspection time

The inspection shall be performed 48 hours after the complete welding cooling down, in case of PWHT the NDE shall be performed at the end of the heat treatment.

*I controlli andranno eseguiti 48 ore dopo il completo raffreddamento delle saldature, in caso di PWHT i controlli NDE devono essere eseguiti al termine del trattamento termico.*

## 6.6 Inspection Temperature

The temperature of the materials, of the ambient and of the surface to be examined shall be between 10°C and 50°C.

*La temperatura dei materiali, dell'ambiente e della superficie da esaminare deve essere compresa tra 10°C e 50°C.*

## 6.7 Inspection Condition

For colour contrast method the surface shall be illuminated with an intensity of minimum 1000 Lux.
For fluorescent method the surface shall be illuminated with an intensity of maximum 20 Lux while the intensity of the UV-A irradiation on the surface shall be minimum 1000 µW/cm$^2$.
Lightning intensity and UV-A irradiation shall be checked with a calibrated lux meter or radiometer.

*Per il metodo a contrasto di colore la superfice deve essere illuminata con un'intensità minima di 1000 Lux.*
*Per il metodo fluorescente la superfice deve essere illuminata con un'intensità massima di 20 Lux mentre l'intensità dell'irradiazione UV-A deve essere minimo di 1000 µW/cm$^2$.*
*L'intensità dell'illuminazione e l'irradiazione UV-A devono essere controllate con un luxometro o un radiometro calibrati.*

## 6.8 Surfaces preparation

The surface under examination can be machined, grinded, brushed or as welded.
The surface to be examined with dye penetrant and the adjacent zone for at least 10mm shall be dry and free from dust, grease, scale, oil, weld spatter or any other substance that could interfere with the examination.
After cleaning, the area under examination shall be dried by normal evaporation for at least 5 minutes, before the application of the penetrant.
Surfaces under examination have to be cleaned by solvent.

*La superficie in esame può essere lavorata di macchina, molata, spazzolata, o come saldata.*
*La superfice da esaminare con liquidi penetranti e la zona ad essa adiacente per almeno 10mm deve essere asciutta e libera da polvere, grasso, incrostazioni, olio, spruzzi di saldatura o ogni altra sostanza estranea che possa interferire con l'esame.*
*Si dovrà utilizzare solvente per pulire le superfici da esaminare.*
*Dopo la pulizia delle superfici, l'area da esaminare dovrà essere asciugata per normale evaporazione per un periodo non inferiore a 5 minuti, prima dell'applicazione del penetrante.*

## 6.9 Penetrant Materials

With the term penetrant material we refer to all the penetrant, solvents, cleaning and development agents used in the examination process.
Color contrast or fluorescent (for welds can be used only after flushing) water washable dye penetrant shall be used, as per EN ISO 3452-1 Table 1, penetrant shall be type « III » and developer type shall be « form e ».
The penetrant materials have to be selected from the same supplier and they shall belong to the same type for every examination.
It is not permitted to mix the type of penetrant products.
The penetrant materials shall not contain mercury or halogens over the 200 ppm, the Sulphur shall not exceed the 200 ppm, every other element with low melting point shall not exceed the 100 ppm.
Material shall be certified according to international recognized standards.
The product manufacturer used for the test shall be:

- CGM
- NDT Elite
- Equivalent

*Con il termine materiali penetranti si intendono tutti i penetranti, solventi, agenti di pulizia e di rilevazione usati nel processo in esame.*

*Dovranno essere utilizzati liquidi penetranti a contrasto di colore o fluorescenti (per le saldature possono essere utilizzati solo dopo lisciatura) lavabili in acqua, come da* EN ISO 3452-1 Table 1, il penetrante deve essere di tipo « III » e lo sviluppatore di forma « e ».
*I materiali penetranti dovranno essere selezionati dallo stesso produttore e devono appartenere alla stessa famiglia.*
*Non è permesso mescolare le famiglie di penetranti.*
*I materiali penetranti non dovranno contenere mercurio o alogeni oltre le 200 ppm, lo zolfo non dovrà eccedere le 200 ppm, ogni altro elemento a basso punto di fusione non dovrà eccedere le 100 ppm.*
*Il materiale dovrà essere certificato in accordo a standard riconosciuti a livello internazionale.*
*I produttori di prodotti per l'esecuzione dei controlli sono:*

- *CGM*
- *NDT Elite*
- *Equivalenti*

## 6.10 Penetrant Application

The penetrant can be applied by brush, by roll, by spray or by immersion.

*Il penetrante può essere applicato a pennello, a rullo, a spruzzo o per immersione.*

## 6.11 Dwell Time

The penetrant shall remain on the surface under examination in a time interval between 10 to 30 minutes. Care shall be taken when the surface under examination exceed the 30°, in this case the penetrant shall be frequently monitored and if necessary revived to avoid drying

*Il penetrante dovrà rimanere sulla superficie in esame per un tempo compreso tra 10 e 30 minuti.*
*Si dovrà prestare attenzione quando la temperatura della superfice eccede i 30°, in questo caso il penetrante deve essere frequentemente monitorato e se necessario ravvivato per evitare l'essicazione.*

## 6.12 Excess Penetrant Removal

After dwell time, the excess of penetrant shall be removed by spray water taking care to avoid mechanical removal of penetrant from discontinuity.
The water pressure shall not exceed 3.4 Bar (50 PSI), and the water temperature shall not exceed 43°C.
A proper washing is obtained when visible traces of penetrant are not evident.

*Dopo il tempo di penetrazione il penetrante andrà rimosso con spruzzi d'acqua evitando la rimozione meccanica del penetrante dalle discontinuità.*
*La pressione dell'acqua non deve eccedere i* 3.4 Bar (50 PSI)*, la temperatura dell'acqua non deve eccedere i 43°C.*
*Un lavaggio adeguato è ottenuto quanto non vi sono più tracce visibili di penetrante.*

## 6.13 Drying

For the water washable penetrant liquids, the drying of the surfaces can be made by clean rags or using low pressure air, provided the temperature of the surface is not raised above 50°C
The drying shall be performed at maximum 10 minutes.

*Per i liquidi penetranti lavabili in acqua, l'asciugatura della superficie può essere fatta utilizzando stracci puliti o utilizzando aria a bassa pressione, assicurandoci che la superfice non ecceda i 50°C.*
*L'asciugatura deve essere eseguita in un intervallo di tempo non più lungo di 10 minuti.*

## 6.14 Developing Time

The examination of the surface will be performed after developing time (10 to 30 minutes) after the complete drying of the developer.
To help the final interpretation, the surface under examination shall be kept under observation during the developing period to monitor the nature of the indications.

*L'esame della superficie sarà eseguito dopo aver atteso la fuoriuscita del penetrante da 10 a 0 minuti dopo la completa asciugatura dello sviluppatore.*
*Per aiutare l'interpretazione finale, la superficie in esame sarà tenuta sotto osservazione durante lo sviluppo per monitorare la natura delle indicazioni.*

## 6.15 Evaluation of Indications

Discontinuities of the surface will be indicated from the bleeding of penetrant; however, local imperfections of the surface, can produce false indications not related to not acceptable discontinuities.
In case of doubtful indications, upon agreement between the parts, the surface can be grinded to level the surface, the test shall be repeated.
False indications and wide areas of pigmentation, that could hide indications, are not acceptable.
These areas have to be smoothly grinded, other method for the removal of the defects shall be authorized by the client.
After cleaning, the surfaces shall be re-examined.
The real indications are the ones produced by mechanical discontinuities.
Linear indications are those which the length is greater than three times the width.
Round indications are those with the length less than three times the width.
The dimension of the indications (and not the type of discontinuity) it is the criteria for the rejection of the component under examination.

*Le discontinuità della superficie saranno indicate dalla fuoriuscita di penetrante; comunque, imperfezioni locali della superficie, possono produrre false indicazioni non relative a discontinuità non accettabili.*
*In caso di indicazioni dubbie, in accordo con le parti, la superfice dovrà essere raccordata in modo da uniformare la superficie, il test dovrà essere ripetuto.*
*Le false indicazioni ed ampie aree di pigmentazione, che potrebbero mascherare indicazioni, non sono accettabili.*
*Tali aree dovranno essere uniformate tramite molatura, altri metodi per la rimozione dovranno essere autorizzati dal cliente.*
*Dopo la pulizia le superfici andranno ri-esaminate.*
*Le indicazioni utili sono quelle prodotte da discontinuità meccaniche.*
*Le indicazioni lineari sono quelle in cui la lunghezza è maggiore di 3 volte la larghezza.*
*Le indicazioni tondeggianti sono quelle con la lunghezza inferiore a tre volte la larghezza.*
*La dimensione delle indicazioni (e non il tipo di discontinuità) è la base per l'accettabilità del componente in esame*.

## 6.16 Acceptance Criteria

The acceptance criteria are ones for the level 1 of the EN ISO 23277.

*I criteri di accettabilità sono quelli del livello 1 della EN ISO 23277*

| Tipi di indicazione | Livelli di accettabilità[a] | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| Indicazione lineare<br>$l$ = Lunghezza dell'indicazione | $l \leq 2$ | $l \leq 4$ | $l \leq 8$ |
| Indicazione non lineare<br>$d$ = Dimensione dell'asse principale | $d \leq 4$ | $d \leq 6$ | $d \leq 8$ |

a) I livelli di accettabilità 2 e 3 possono essere specificati con un suffisso, "X", che denota che tutte le indicazioni lineari rilevate devono essere valutate al livello 1. Tuttavia, la probabilità di rilevamento di indicazioni più piccole di quelle denotate dal livello di accettabilità originario può essere bassa.

## 6.17 Defect Removal

All the discontinuities that exceed the standards acceptance criteria have to be removed and/or repaired and re-checked according to this procedure.

*Tutte le discontinuità che superano gli standard di accettabilità devono essere rimosse e/o riparate e ricontrollate in accordo a questa procedura.*

## 6.18 Test Report

The report should include at least the following information:

- Name of the Manufacturer
- Name of the Examining Company
- Identification of the tested component
- Material
- Type of Weld Joint
- Material Thickness
- Welding Process
- Acceptance Criteria
- Not Acceptable Indications (if any)
- Extension of the Exam
- Instrumentation used for the test
- Test Result
- Name, qualification and signature of the operator
- Inspection Date

The report shall be issued maximum 24 hours after the end of the inspection.

*Il report dovrà includere almeno le seguenti informazioni:*

- *Nome del Costruttore*
- *Nome della Società Esaminante*
- *Identificazione del componente testato*
- *Materiale*
- *Tipo di Giunto*
- *Spessore del materiale*
- *Processo di Saldatura*
- *Criteri di Accettabilità*
- *Indicazioni non Accettabili (se presenti)*
- *Estensione dell'esame*
- *Strumentazione Utilizzata*

- *Risultati di Prova*
- *Nome, Qualifica e Firma dell'Operatore*
- *Data di Ispezione*

*Il report deve essere redatto al massimo 24 ore dopo il termine dell'ispezione.*

## 6.19 Test Report Sample (Only for reference)

REMAZEL

**RAPPORTO DI CONTROLLO LIQUIDI PENETRANTI**

PENETRANT TEST REPORT

N°
DATA
Date
FOGLIO
Sheet

**DATI GENERALI general data**

| CLIENTE / Client | LUOGO / Place | COMMESSA / Job | |
|---|---|---|---|
| DESCRIZIONE ESAME / Test Details | | ORD / order | Q.TA' / Q.ty |
| DOC. DI RIFERIMENTO / Reference Documents | | ACCETTABILITA' / Acceptance Criteria | |
| COSTRUTTORE / Manufacturer | | ENTE DI COLLAUDO / Inspecting Authority | - |

**COMPONENTE ESAMINATO examined part**

| NUMERO DI FABBRICA / Serial Number | COLATA / Heat N. | MATERIALE / Material | DIS. / Dwg |
|---|---|---|---|
| | | | |

ESECUZIONE DEL TEST / Test Carried Out: ☐ PRIMA PWHT / Before PWHT ☐ DOPO HT / After HT ☐ PRIMA PROVA IDRAULICA / Before Hydraulic Test ☐ DOPO PROVA IDRAULICA / After Hydraulic Test

SUPERFICIE / Surface: ☐ LAMINATA / As Rolled ☐ GREZZA / Rough ☐ MOLATA / Ground ☐ SABBIATA / Sand Blasted ☐ LAVORATA DI MACCHINA / Machined

SOVRAMETALLO SALDATURA / Welding Reinforcement: ☐ COME SALDATO / As Welded ☐ LAVORATO DI MACCHINA / Machined ☐ MOLATO / Ground ☐ RACCORDATO / Blended

**TECNICA Tecnique**

LIQUIDO PENETRANTE: ELITE K71B2 / Penetrant: ☐ ROSSO A CONTRASTO DI COLORE / Red, colour contrast ☐ GIALLO FLUORESCENTE / Yellow fluorescent ☐ POST EMULSIONABILE / Post emulsionable

RIMOZIONE PENETRANTE / Penetrant removal: ☐ ACQUA / Water ☐ SOLVENTE / Solvent

SVILUPPATORE: ELITE D 112A / Developper: ☐ ACQUOSO / Watery ☐ NON ACQUOSO / Dry

TEMPO DI PENETRAZIONE / Penetration time

TEMPO DI SVILUPPO / Developing time

CONDIZIONI DI ILLUMINAMENTO / Lighting conditions: ☐ LUCE NERA / Black light ☐ LUCE BIANCA / Light ☐ NATURALE / Natural ☐ ARTIFICIALE / Artificial

**INDICAZIONI DA REGISTRARE Indications to be Recorded**

| COMPONENTE / Item | NOTE / Remarks |
|---|---|
| | |
| | |
| | |
| | |

**NOTE Remarks**

☐ RISULTATI CONFORMI AI REQUISITI / Results Conforming to the Specified Requirements

☐ RISULTATI NON CONFORMI AI REQUISITI / Results Not Conforming to the Specified Requirements

| DATA / Date | LUOGO / Place | OPERATORI / Operators | Oprandi Matteo |
|---|---|---|---|
| II LEVEL | CLIENTE Customer | ENTE DI COLLAUDO Inspecting Authority | |
| | | | |

## 6.20 Instruction for Safety

The penetrant liquids are not toxic however they can cause cutaneous irritations therefore:
Use the protection gloves having care to hold them clean inside.
Use for all the time the protective mask.
Wash the hands and the gloves with care at the end of the job.
Is recommended the use of protective glasses (UVEX) during the job.

Spray cans contain FREON 12 so:
Protect from sunlight.
Don’t expose to a temperature higher than 50° C.
Don’t pierce or burn after the use.
Don’t spray on flames or on incandescent bodies.
Don’t inhale or spray in the eyes.
Bring away from the job place at the end of shift.

*I liquidi penetranti non sono tossici ma possono causare irritazioni cutanee.*
*Si raccomanda di:*
*Usare i guanti di protezione avendo cura di tenerli puliti all'interno;*
*Usare per tutta la durata del lavoro la maschera protettiva;*
*Lavare con cura le mani ed i guanti a fine lavoro;*
*L'uso di occhiali protettivi (UVEX) durante il lavoro.*

*Le bombolette spray contengono FREON 12 quindi:*
*Proteggere dai raggi solari.*
*Non esporre a temperature superiori a 50° C.*
*Non forare o bruciare dopo l'uso.*
*Non spruzzare su fiamme o su corpi incandescenti.*
*Non inalare o spruzzare negli occhi.*
*Portare via dal posto di lavoro a fine turno.*

# 7 Procedure for Magnetic Test on Welds

## 7.1 Purpose

This procedure prescribes the minimum requirements to apply during Magnetic Particles Test examination of welds (ferromagnetic materials).

*Questa procedura prescrive i requisiti minimi da applicare durante l'esame con Particelle Magnetiche su saldature (materiale ferromagnetico).*

## 7.2 Reference Documents

EN ISO 9712 Non-destructive testing Qualification and certification of NDT personnel
EN ISO 3059 Non-destructive testing - Magnetic testing - Viewing conditions
EN ISO 9934-3 Non-destructive testing - Magnetic particle testing - Part 3: Equipment
EN ISO 17638 Non-destructive testing of welds - Magnetic particle testing
EN ISO 23278 Non-destructive testing of welds - Magnetic particle testing - Acceptance levels

## 7.3 Extension of Test

The minimum extent of inspection is defined per production drawings, the inspection shall be performed as per extent drawings indications.

*La minima estensione dell'esame deve essere in accordo ai disegni di progetto, l'ispezione deve essere eseguita in accordo all'estensione indicata a disegno.*

## 7.4 Personnel Qualification

Operators shall be qualified according to EN ISO 9712 level II or III. NDT operators shall have Acuity test certificate, not older than one year, attesting that minimum requirements for `Near vision' and `Colour Vision' according to EN ISO 9712 Clause 7 are fulfilled.

*Tutto il personale che effettua il controllo accordo a questa procedura dovrà essere qualificato in accordo ai livelli II o III della EN ISO 9712. Gli operatori NDT devono avere la certificazione di acuità visiva, non più vecchia di un anno, attestante i requisiti minimi di vista da vicino e distinzione colori, in accordo alla EN ISO 9712 Clausola 7.*

## 7.5 Inspection time

The inspection shall be performed 48 hours after the complete welding cooling down, in case of PWHT the NDE shall be performed at the end of the heat treatment.

*I controlli andranno eseguiti 48 ore dopo il completo raffreddamento delle saldature, in caso di PWHT i controlli NDE devono essere eseguiti al termine del trattamento termico.*

## 7.6 Instruments

Alternate current yoke shall be used.
Yoke shall be endowed by jointed poles to test T-joint.
Equipment used shall be conforming according to EN ISO 9934-3 specification.
Equipment shall be calibrated every year and every time it is damaged or when it is considered necessary.
Calibration procedure foresees the lifting of a calibration block of 4.5 kg weight in alternating current.
The magnetizing power of yokes shall be verified prior to use each day the yoke is used. Each alternating current electromagnetic yoke shall have a lifting power of at least 4.5 kg at the maximum pole spacing, with

contact similar to what will be used during the examination. Lifting test shall be repeated every time it is required by Company Inspector.
The following equipment can be used:

- Yoke PARKER.
- Yoke NDT ELITE.
- Yoke KARL DEUTSCH.
- Equivalent instruments

*Deve essere utilizzato un gioco magnetico con corrente alternata.*
*Il giogo deve essere dotato di poli snodabili per il controllo su giunti a "T".*
*Le apparecchiature devono essere conformi alla specifica EN ISO 9934-3*
*Le apparecchiature devono essere tarate ogni anno e ogni qualvolta subiscano un danneggiamento o quando fattori obiettivi lo rendano necessario.*
*La procedura di taratura prevede il sollevamento di un blocco campione del peso di 4.5 kg in corrente alternata.*
*La forza di magnetizzazione del giogo deve essere verificata prima di ogni utilizzo. Il giogo in corrente alternata deve essere verificato sollevando un peso di 4.5Kg con i puntali al massimo dell'estensione con una superficie di contatto simile a quella che verrà utilizzata nel corso dell'ispezione. La prova di sollevamento deve essere eseguita ogni volta che l'Ispettore del cliente lo richiede.*
*Possono essere impiegate le seguenti apparecchiature:*

- *Giogo PARKER corrente alternata o continua.*
- *Giogo NDT ELITE corrente alternata o continua.*
- *Giogo KARL DEUTSCH corrente alternata o continua.*
- *Equivalenti.*

## 7.7 Examination Medium

Colour contrast or fluorescent (for welds can be used only after flushing) magnetic particles in suspension shall be used.
The magnetic particles supplied in spray cans shall be used.
Spray cans content concentration shall not be subjected to check.
Magnetic particles shall have high permeability, low retentively and such dimension to allow a high mobility on surface.
Magnetic particles to be used can be supplied by:

- CGM
- NDT Elite
- Equivalent suppliers

The temperatures of use are supplied directly by the manufacturer.

*Saranno utilizzate particelle magnetiche a contrasto di colore o fluorescenti (per le saldature possono essere utilizzati solo dopo lisciatura) in sospensione.*
*Le particelle magnetiche da utilizzare dovranno essere soluzioni già preparate in bombolette spray.*
*Nell'utilizzo di bombolette spray, non è richiesto il controllo della concentrazione.*
*Le particelle magnetiche da utilizzare devono avere elevata permeabilità, bassa retentività e dimensioni tali da consentire un'elevata mobilità sulla superficie.*
*Le particelle magnetiche da utilizzare possono essere:*

- *CGM*
- *NDT Elite*
- *Equivalenti*

*Le temperature di utilizzo sono fornite direttamente dal produttore.*

## 7.8 Lighting Condition

For colour contrast method the surface shall be illuminated with an intensity of minimum 1000 Lux.
For fluorescent method the surface shall be illuminated with an intensity of maximum 20 Lux while the intensity of the UV-A irradiation on the surface shall be minimum 1000 µW/cm$^2$.
Lightning intensity and UV-A irradiation shall be checked with a calibrated lux meter or radiometer.
Examiners shall be in a darkened area for at least 5 min prior to performing examinations to enable their eyes to adapt to dark viewing. Glasses or lenses worn by examiners shall not be photosensitive.

*Per il metodo a contrasto di colore la superfice deve essere illuminata con un'intensità minima di 1000 Lux.*
*Per il metodo fluorescente la superfice deve essere illuminata con un'intensità massima di 20 Lux mentre l'intensità dell'irradiazione UV-A deve essere minimo di 1000 µW/cm$^2$.*
*L'intensità dell'illuminazione e l'irradiazione UV-A devono essere controllate con un luxometro o un radiometro calibrati.*
*L'esaminatore, prima di eseguire l'ispezione, deve rimanere in un'area buia per almeno 5 minuti prima dell'ispezione per adattare la vista agli ambienti bui. Occhiali o lenti indossate dagli esaminatori non devono essere fotosensibili.*

## 7.9 Surfaces preparation

The surface under examination can be machined, grinded, brushed or as welded.
The surface to be examined with dye penetrant and the adjacent zone for at least 10mm shall be dry and free from dust, grease, scale, oil, weld spatter or any other substance that could interfere with the examination.

*La superficie in esame può essere lavorata di macchina, molata, spazzolata, o come saldata.*
*La superfice da esaminare con liquidi penetranti e la zona ad essa adiacente per almeno 10mm deve essere asciutta e libera da polvere, grasso, incrostazioni, olio, spruzzi di saldatura o ogni altra sostanza estranea che possa interferire con l'esame.*

## 7.10 Magnetization

Before starting the exam, is necessary to check the strength and direction of the magnetic field through a field indicator, in accordance with EN ISO 9934-3.
The test will be performed with the continuous method.
This provides that the magnetization is kept active during the application of the magnetic particles, during the removal of particles in excess and for the examination of the surface.
Each area will be examined at least twice.
During the second test, the flux lines of the magnetic field generated, have to be perpendicular to those obtained with the first control.
The examination shall be conducted following the techniques described in EN ISO 17638.
The temperatures within which the products are used, are defined by the manufacturer of the same.
The application of the particles shall be carried out by spray.
The entire area between two poles must be covered by the application of the magnetic liquid.
The removal of excess particles in the wet method, will be helped by the action of fluid drainage of the suspension.
The maximum distance between the poles of the yoke shall be the one verified with the calibration block.
For tests carried out according to this procedure, demagnetization is not necessary.

*Prima di iniziare l'esame, è necessario verificare l'intensità e la direzione del campo magnetico mediante un apposito indicatore di campo, in accordo alla* EN ISO 9934-3.
*Il test sarà eseguito con il metodo continuo.*

*Questo prevede che la magnetizzazione sia tenuta attiva durante l'applicazione delle particelle magnetiche, durante la rimozione delle particelle in eccesso e durante l'esame della superficie.*
*Ogni area sarà esaminata almeno due volte, durante il secondo esame, le linee di flusso del campo magnetico generato, dovranno essere perpendicolari a quelle ottenute nel primo controllo.*
*L'esame sarà condotto seguendo le tecniche descritte nella* EN ISO 17638.
*Le temperature entro il quale i prodotti possono essere utilizzati, sono definite dal produttore degli stessi.*
*L'applicazione delle particelle deve essere spray.*
*L'intera area compresa tra in due poli deve essere coperta dall'applicazione del liquido magnetico.*
*La rimozione delle particelle in eccesso nel controllo in umido, sarà favorita dall'azione di drenaggio del fluido della sospensione.*
*La massima distanza tra i poli deve essere quella verificata con il blocco campione.*
*Per controlli effettuati secondo questa procedura, non è necessaria la smagnetizzazione.*

## 7.11 Evaluation of Indications

Definitions:

- False indication: an indication is caused by a process error or technique, such as a poor cleaning, etc.
  Any surface discontinuity that may cause false indications shall be smoothly grind.
  In the presence of false indications, the test shall be re-executed after the removal and cleaning actions.
- Non relevant indication: is an indication that it is due to an accumulation of magnetic particles which is not caused by a significant discontinuity.
  Non relevant indications may be caused by geometric variations, machining etc.
- Linear indication: is an indication in which the length / width ratio is greater than 3.
- Round indication: is an indication in which the length / width ratio is lower than 3.

*Definizioni:*

- *Falsa indicazione: è un'indicazione causata da un errore di processo o di tecnica, come ad esempio una cattiva pulizia.*
  *Eventuali disomogeneità che possono causare false indicazioni dovranno essere raccordate.*
  *In presenza di false indicazioni, il test deve essere rieseguito dopo le azioni di rimozione e pulizia.*
- *Indicazione non rilevante: è un'indicazione che è causa di un accumulo di particelle magnetiche non provocato da una discontinuità significativa.*
  *Le indicazioni non rilevanti possono essere causate da variazioni geometriche, lavorazioni di macchina ecc.*
- *Indicazione lineare: è un'indicazione in cui il rapporto lunghezza / larghezza è maggiore di 3.*
- *Indicazione tondeggiante: è un'indicazione in cui il rapporto lunghezza / larghezza è minore di 3.*

## 7.12 Acceptance criteria

The acceptance criteria are the level 2 of the EN ISO 23278.
*I criteri di accettabilità sono quelli del livello 2 della EN ISO 23278.*

Dimensions in millimetres

| Type of indication | Acceptance level[a] | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| Linear indication<br>$l$ = length of indication | $l \leqslant 1{,}5$ | $l \leqslant 3$ | $l \leqslant 6$ |
| Non-linear indication<br>$d$ = major axis dimension | $d \leqslant 2$ | $d \leqslant 3$ | $d \leqslant 4$ |

[a] Acceptance levels 2 and 3 may be specified with a suffix "X", which denotes that all linear indications detected shall be assessed to level 1. However, the probability of detection of indications smaller than those denoted by the original acceptance level can be low.

## 7.13 Defect Removal

All the discontinuities that exceed the standards acceptance criteria have to be removed and/or repaired and re-checked according to this procedure.

*Tutte le discontinuità che superano gli standard di accettabilità devono essere rimosse e/o riparate e ricontrollate in accordo a questa procedura.*

## 7.14 Test report

The report should include at least the following information:

- Name of the Manufacturer
- Name of the Examining Company
- Identification of the tested component
- Material
- Type of Weld Joint
- Material Thickness
- Welding Process
- Acceptance Criteria
- Not Acceptable Indications (if any)
- Extension of the Exam
- Instrumentation used for the test
- Test Result
- Name, qualification and signature of the operator
- Inspection Date

The report shall be issued maximum 24 hours after the end of the inspection.

*Il report dovrà includere almeno le seguenti informazioni:*

- *Nome del Costruttore*
- *Nome della Società Esaminante*
- *Identificazione del componente testato*
- *Materiale*
- *Tipo di Giunto*
- *Spessore del materiale*
- *Processo di Saldatura*
- *Criteri di Accettabilità*
- *Indicazioni non Accettabili (se presenti)*
- *Estensione dell'esame*

- *Strumentazione Utilizzata*
- *Risultati di Prova*
- *Nome, Qualifica e Firma dell'Operatore*
- *Data di Ispezione*

*Il report deve essere redatto al massimo 24 ore dopo il termine dell'ispezione.*

## 7.15 Test report Sample (Only for reference)

| REMAZEL ENGINEERING | SISTEMA QUALITA' *QUALITY SYSTEM*<br>RAPPORTO DI ESAME MAGNETOSCOPICO *Magnetoscopic test report* | REM N°<br>COMM. *Job*<br>DATA *Date* |
|---|---|---|

| | | | |
|---|---|---|---|
| **CLIENTE** *Customer* | **ORDINE** *Order* **DEL** *Of* | | **COMM. CLIENTE** *Customer's job* |
| **OGGETTO** *Subject* | **DISEGNO RIF.** *Ref. Drw* | | **QUANTITA'** *Quantity* |
| **Stato di controllo** *Testing status* | ☐ **Preliminare** *Preliminary* | ☐ **Finale REMAZEL** *Final REMAZEL* | ☐ **Finale ufficiale** *Final official* |
| **Condizioni superficiali** *Surface conditions* | ☐ **Sabbiate** *Sandblasted* | ☐ **Lavoraz. meccanica** *Machined* | ☐ **Come saldato** *As Welded* |
| **Specifica** *Specification* | | | |
| **Limiti di accettazione** *Acceptance standars* | | | |
| **Metodo** *Method* | ☐ **Puntali** *Pods* | ☐ **Giogo** *Yoke* | ☐ **Bobina** *Coil* |
| **Polvere** *Powder* | ☐ **Secco** *Dry* | ☐ **Umido** *Wet* | ☐ **Fluorescente** *Fluorescent* |
| **Tipo di polvere** *Type of powder* | ☐ **Grigia** *Grey* | ☐ **Blu** *Blue* | ☐ **Nera** *black* |
| **Sospensione** *Suspension* | ☐ **In olio** *In oil* | ☐ **In acqua** *In water* | ☐ **KEROSENOIL** |
| **Magnetizzazione** *Magnetization* | **Corrente** *Current*<br>- | **Intensità** *Intensity* | **Distanza** *Distance* |
| | **Amperspira** *Ampere turns*<br>/ | **Flusso magnetico** *Magnetic flux*<br>/ | **Diametro** *Diameter mm*<br>/ |
| **Apparecchiatura** *Apparatus* | **Costruttore** *Manufacture* | **Tipo** *Type* | **Matricola** *Serial* |
| **Pulitura** *Cleaning method* | | | |
| **Smagnetizzazione** *Demagnetization* | / | | |
| **Risultati** *Results* | ☐ **Conforme** *According to* | ☐ **Non conforme** *Not according to* | ☐ **Scarto** *Rejection* |
| **Note** *Remarks* | | | |

| | | | |
|---|---|---|---|
| **Operatore** *Operator* | **Enti collaudatori** *Inspect. officials* | **Ispettore cliente** *Customer inspect.* | **Capo collaudo** *Inspect. Dept. manager* |

**MODULO - MD006 Rev.00**

## 7.16 Safety Instruction

The magnetic particles are not toxic however they can cause cutaneous irritations therefore:
Use the protection gloves having care to hold them clean inside.
Use for all the time the protective mask.
Wash the hands and the gloves with care at the end of the job.
Is recommended the use of protective glasses (UVEX) during the job.

Spray cans contain FREON 12 so:
Protect from sunlight.
Don’t expose to a temperature higher than 50° C.
Don’t pierce or burn after the use.
Don’t spray on flames or on incandescent bodies.
Don’t inhale or spray in the eyes.
Bring away from the job place at the end of shift.

*Le particelle magnetiche non sono tossiche ma possono causare irritazioni cutanee.*
*Si raccomanda di:*
*Usare i guanti di protezione avendo cura di tenerli puliti all'interno;*
*Usare per tutta la durata del lavoro la maschera protettiva;*
*Lavare con cura le mani ed i guanti a fine lavoro;*
*L'uso di occhiali protettivi (UVEX) durante il lavoro.*

*Le bombolette spray contengono FREON 12 quindi:*
*Proteggere dai raggi solari.*
*Non esporre a temperature superiori a 50° C.*
*Non forare o bruciare dopo l'uso.*
*Non spruzzare su fiamme o su corpi incandescenti.*
*Non inalare o spruzzare negli occhi.*
*Portare via dal posto di lavoro a fine turno.*

# 8 Procedure for Ultrasonic Check on Welds

## 8.1 Purpose

This procedure prescribes the minimum requirements to apply during Ultrasonic Test examination of welded joint in carbon steel or low-alloy steel.

*Questa procedura prescrive i requisiti minimi da applicare durante l'esame con Ultrasuoni di giunti saldati in acciaio basso legato o al carbonio.*

## 8.2 Reference Documents

UNI EN ISO 9712 Non-destructive Testing  Qualification and Certification of NDT Personnel
EN ISO 17640 Non-destructive testing of welds - Ultrasonic testing - Techniques, testing levels, and assessment
EN ISO 16811 Non-destructive testing - Ultrasonic testing - Sensitivity and range setting
EN 12668-1 Characterization and verification of ultrasonic examination Equipment - Part 1: Instruments
EN 12668-2 Characterization and verification of ultrasonic examination equipment - Part 2: Probes
EN ISO 11666 Non-destructive Testing of Welds - Ultrasonic testing - Acceptance Levels
EN ISO 23279 Non-destructive Testing of Welds - Ultrasonic testing – Charaterization of discontinuities in welds

## 8.3 Extension Of Test

The minimum extent of inspection is defined per production drawings, the inspection shall be performed as per extent drawings indications.

*La minima estensione dell'esame deve essere in accordo ai disegni di produzione, l'ispezione deve essere eseguita in accordo all'estensione indicata a disegno.*

## 8.4 Personnel Qualification

Operators shall be qualified according to EN ISO 9712 level II or III. NDT operators shall have Acuity test certificate, not older than one year, attesting that minimum requirements for `Near vision' and `Colour Vision' according to EN ISO 9712 Clause 7 are fulfilled.

*Tutto il personale che effettua il controllo accordo a questa procedura dovrà essere qualificato in accordo ai livelli II o III della EN ISO 9712. Gli operatori NDT devono avere la certificazione di acuità visiva, non più vecchia di un anno, attestante i requisiti minimi di vista da vicino e distinzione colori, in accordo alla EN ISO 9712 Clausola 7.*

## 8.5 Inspection time

The inspection shall be performed 48 hours after the complete welding cooling down, in case of PWHT the NDE shall be performed at the end of the heat treatment.

*I controlli andranno eseguiti 48 ore dopo il completo raffreddamento delle saldature, in caso di PWHT i controlli NDE devono essere eseguiti al termine del trattamento termico.*

## 8.6 Surfaces Preparation

Scanned areas shall be free of loose dirt, scale, weld spatter and any surface irregularities which can interfere with the exam.

Scanned areas can be machined, ground, brushed or sandblasted.
The surface roughness shall be such that allow a good ultrasonic waves transmission and free movement of transducer.

*Le superfici interessate dalla scansione devono essere libere da sporcizia, scaglie, spruzzi di saldatura e qualsiasi irregolarità superficiale che possa interferire con l'esame.*
*Le superfici interessate dalla scansione possono essere lavorate di macchina, molate, spazzolate o sabbiate.*
*La rugosità superficiale deve essere tale da consentire una buona trasmissione degli ultrasuoni e il libero movimento del trasduttore.*

## 8.7 Equipment

A pulse-echo type of ultrasonic instrument shall be used. The instrument shall be capable of operation at frequencies over the range of at least 1 MHz to 5 MHz.
The instrument and the probes have to meet the requirements of the EN 12668.
A nominal 2 MHz or 4 MHz beam will be used.
Other frequencies may be used if desirable for better resolution, penetrability, or detectability of flaws.
Transducer to be used are in following table.
In case of using an angle beam, it's necessary verify the angle and the emission point with calibration block V1 or V2.
The equipment (also calibration blocks) shall conform to EN 12668.
The probe shall conform to EN 12668.

*L'apparecchiatura sarà del tipo impulso-eco con frequenza d'eccitazione compresa tra 1 MHz e 5 MHz.*
*Lo strumento e le sonde devono rispettare i requisiti della EN 12668.*
*Verranno utilizzati trasduttori aventi frequenza pari a 2 MHz o 4 MHz.*
*E' comunque consentito l'uso di altre frequenza per ottenere un miglioramento di risoluzione, penetrabilità o rilevabilità dei difetti.*
*È necessario utilizzare i blocchi tipo V1 e V2 per la verifica del trasduttore utilizzato.*
*Ogni apparecchio (anche i blocchi di calibrazione) impiegato deve essere conforme ai requisiti della norma EN 12668.*
*Ogni trasduttore impiegato deve essere conforme ai requisiti della norma EN 12668.*

## 8.8 Couplant

A coupling consisting of oil, glycerine, water-based paste, water-based cellulose paste or specific gel couplant will be interposed between the transducer and the test material. The same coupling shall be used for calibration and examination.
Redidues of couplant shall be removed after the completion of the inspection in order to avoid to affect the further operations

*Tra il trasduttore e il materiale in esame, sarà interposto un mezzo di accoppiamento costituito da olio, glicerina, pasta a base di acqua, colla per carta da parati oppure gel specifico. Sarà utilizzato lo stesso mezzo di accoppiamento per effettuare la calibrazione e l'esame.*
*I residui di accoppiante devono essere rimossi dopo completamento dell'ispezione per non influenzare le attività successive.*

## 8.9 Time Base Calibration

The time axis shall be calibrated using reference blocks type V1 or V2
Time base calibration shall guarantee the coverage of the entire weld volume and the heat affected zone per each transducer used.

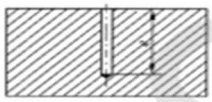
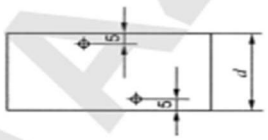
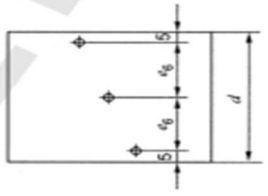
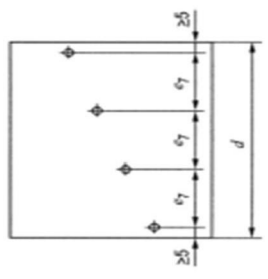
*La taratura dell'asse dei tempi deve essere eseguita utilizzando i blocchi tipo V1 o V2.*
*La taratura dell'asse dei tempi dovrà in ogni caso garantire la copertura al 100% del volume di saldatura e della zona termicamente alterata per ciascun trasduttore da impiegare.*

## 8.10 Test Sensitivity

Test sensitivity shall be established using the Technique 1 with reference block as per Table 2.
These blocks shall be made of same material and shall have same heat treatment of the joint under examination, furthermore shall have same surface condition of the component to be tested.

*La sensibilità di controllo sarà stabilita utilizzando la Tecnica 1 con blocchi di riferimento come in Tabella 2 .*
*Tali blocchi dovranno essere dello stesso materiale del giunto da esaminare dovranno possedere lo stesso trattamento termico, inoltre le condizioni superficiali dovranno essere comparabili a quelle della superficie di scansione del componente in esame*

**Blocchi di riferimento e riflettori di riferimento per oggetti di classe 1**

| Spessore della parete, $d$, in mm | Blocchi di riferimento e riflettori di riferimento | Condizioni |
|---|---|---|
| |  | |
| $10 \le d \le 15$ |  | |
| $15 < d \le 20$ |  | $e > \frac{2\lambda s}{D_{eq}}$ |
| $20 < d \le 40$ |  | $D_{SDH} \ge 1{,}5\ \lambda$<br>$e_6 = \frac{d-10}{2}$ |
| $d > 40$ |  | $e_7 \le \frac{d-10}{2}$ |

VISUALIZZAZIONE

Sensitivity level will be established by DAC curve built using described blocks.
First point shall be placed at an amplitude of 80% of full screen height.
Curve will be built by at minimum three point.

*La sensibilità sarà stabilita dalla curva DAC costruita utilizzando i suddetti blocchi.*
*Il primo punto della curva DAC dovrà essere portato ad un'ampiezza compresa tra il 80% dello schermo. La curva sarà costruita utilizzando almeno tre punti.*

## 8.11 Transfer Losses

To measure transfer losses will be used two transducers of the same type, one as a transmitter and one as a receiver.
They will be placed on the block facing each other at a pitch of distance.
The resulting signal will be brought to the DAC height setting the gain.
Without modifying the gain, the probes will be positioned on the joint to be checked, possibly in the scanning direction.
The resulting echo must be brought up to the DAC curve. The gain difference, performing this operation, represents the transfer losses which must be added or subtracted to the level of amplification of the DAC construction.
The level of amplification so corrected, represents the reference level.
For transfer loss minor equal to 2dB no correction Is needed.
For transfer loss between 2dB and minor equal to 12dB the correction have to be compensated.
For transfer loss major than 12dB special consideration about surface and material condition shall be made.

*Per misurare le perdite di trasferimento saranno utilizzati due trasduttori dello stesso tipo, uno come trasmittente ed uno come ricevente.*
*Essi saranno disposti sul blocco uno di fronte all'altro ad un passo di distanza.*
*Il segnale risultante sarà portato all'altezza della DAC agendo sul guadagno.*
*Senza modificare quest'ultimo, le sonde saranno posizionate sul giunto da controllare, possibilmente nella direzione di scansione. L'eco risultante dovrà essere portato all'altezza della curva DAC.*
*La differenza nel guadagno rilevato nell'eseguire questa operazione, rappresenta la perdita di trasferimento che deve essere aggiunta o sottratta al livello di amplificazione della costruzione della DAC.*
*Il livello di amplificazione così corretto, rappresenta il livello di riferimento.*

## 8.12 Calibration Verification

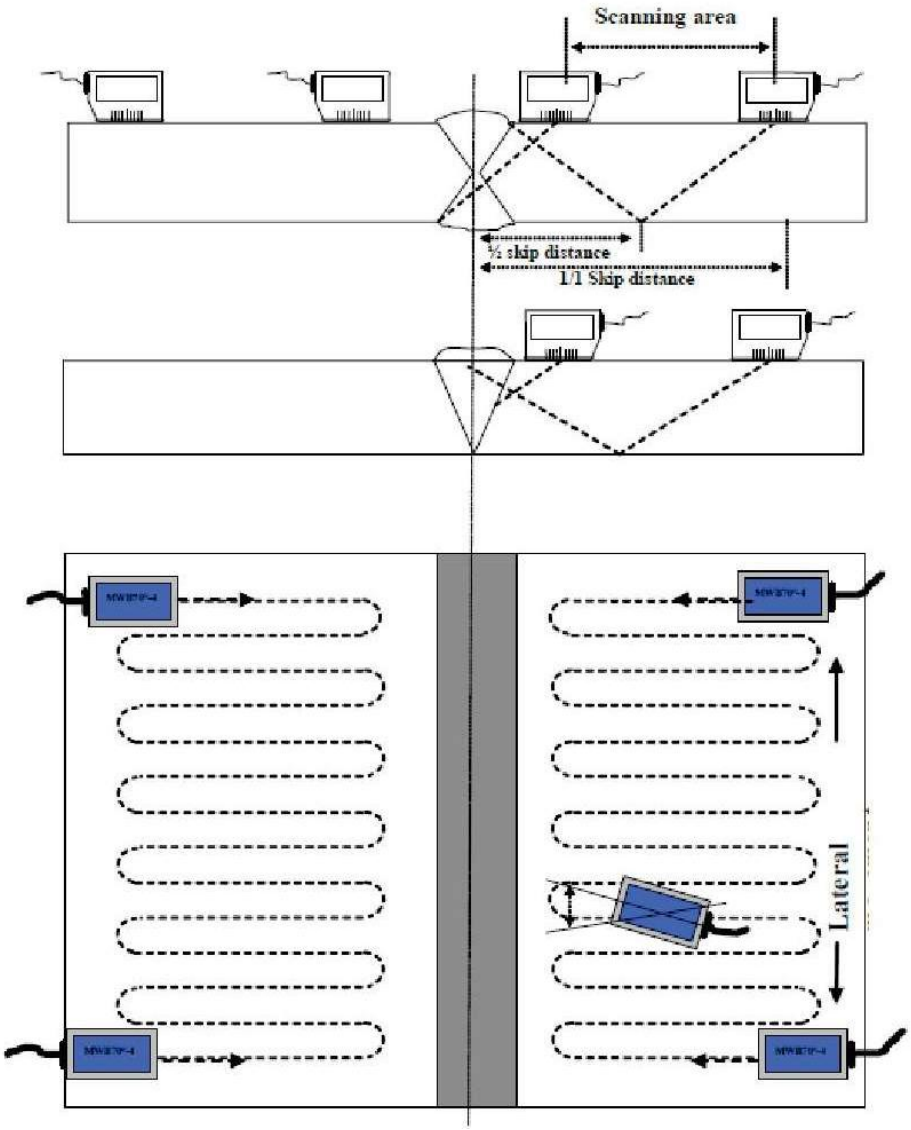
Calibration will be checked at the end of each shift and whenever operator, transducer or coaxial cable has been changed or when the operator deems it necessary.
If during calibration verification, the sensitivity is found more than 2 dB different from the established initial level, the calibration shall be repeated.

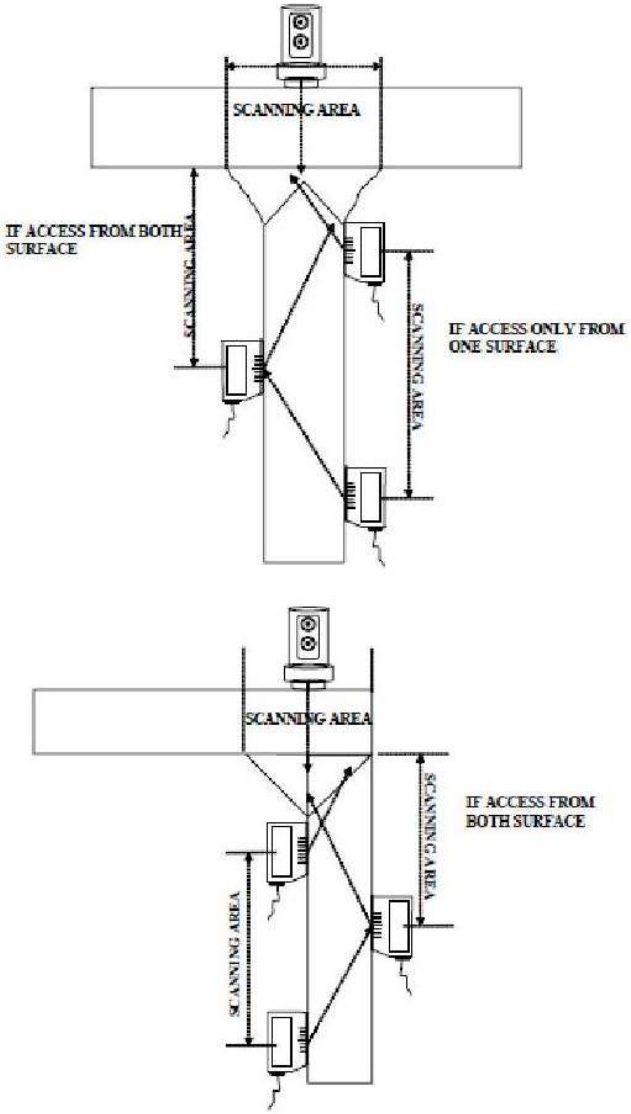
*La calibrazione sarà verificata alla fine di ogni turno di lavoro e ogni qual volta dovesse cambiare operatore, trasduttore o cavo coassiale, oppure quando l'operatore lo ritenga opportuno.*
*Se durante la verifica della calibrazione la sensibilità di riferimento varia di oltre 2 dB rispetto a quella iniziale, la calibrazione dovrà essere ripetuta.*

## 8.13 Scanning Technique

Before carrying out the test a check of the base material shall be performed with a normal probe, to ensure that there are no indications that could interfere with the angled beams to be used during the welding check.
Before proceed with the test the amplification of the system shall be raised of 6dB
The examination shall be performed on the entire volume of the weld and 10 mm of the base material adjacent to it on both sides.
The scan shall be made in compliance with EN ISO 17640:2018 Annex A, where due to the geometry of the joint is not possible follow the requirements of the norm the deviations shall be reported in the final test report.
The welding shall be examined, if possible, by two sides and internally and externally.
The minimum overlap between two consecutive scans must be 10% of the diameter of the transducer, while the speed of execution must not exceed 150 mm/s.
During the examination, the equipment shall be calibrated every 4 hours and whenever it is replaced operator, cable or transducer.
At least two angles must be used for each of the planes where the probes lie.
One of the beam angles used shall ensure that the weld fusion faces are tested at, or as near as possible to, normal incident.
The difference of the two nominal beam angles shall be 10° or greater.
Depending on the thickness and the shape of the joint, the operator can choose the most suitable probes.

*Prima di eseguire il test il materiale base deve essere controllato con una sonda ortogonale, per verificare che non vi siano indicazioni che possano interferire con i fasci angolati che si dovranno utilizzare durante il controllo della saldatura.*
*Prima di procedere con il controllo l'amplificazione del sistema deve essere aumentata di 6dB.*
*L'esame deve essere eseguito sull'intero volume della saldatura e sui 10 mm di materiale base adiacenti ad essa da entrambi i lati.*
*La scansione deve essere fatta in accordo con la EN ISO 17640 Annex A, quando data la geometria del pezzo non è possibile seguire i requisiti della norma le deviazioni devono essere riportate nel rapporto di prova.*
*La sovrapposizione minima fra due scansioni consecutive deve essere del 10% del diametro del trasduttore, mentre la velocità d'esecuzione non deve eccedere i 150 mm/s.*
*Durante l'esame, l'apparecchiatura deve essere tarata ogni 4 ore e comunque ogni volta che venga sostituito operatore, cavo o trasduttore stesso.*
*Si dovranno utilizzare almeno due angoli per ciascuno dei piani in cui le sonde giacciono.*
*Uno dei fasci angolati deve assicurare che le facce di saldature siano sottoposte a prova a un'incidenza normale, o quanto più vicina ad essa.*
*La differenza dei due angoli selezionati deve essere di almeno 10°*
*In base allo spessore ed alla conformazione del giunto, l'operatore potrà scegliere le sonde più consone.*


Scanning area
½ skip distance
1/1 Skip distance
Lateral




## 8.14 Characterization of Indications

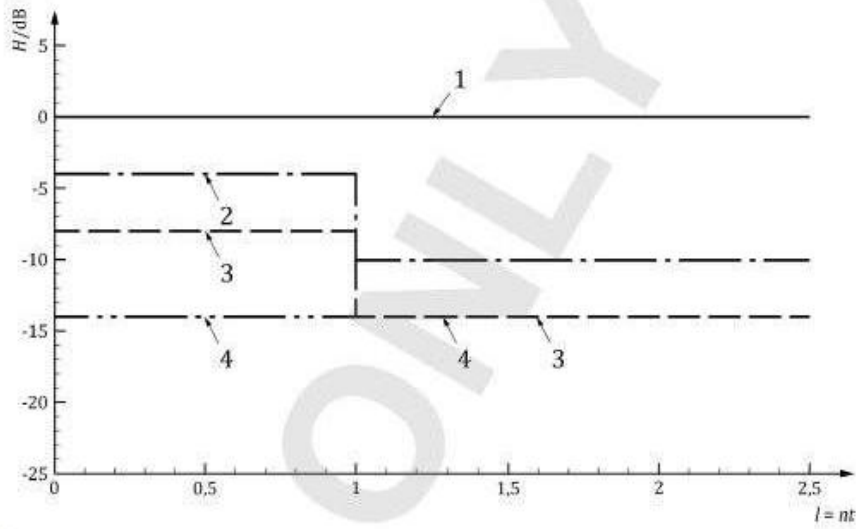
The indications shall be characterized in compliance with EN ISO 23279

*La caratterizzazione delle indicazioni dovrà essere eseguita in accordo alla EN ISO 23279*

## 8.15 Acceptance and Record Criteria

The acceptance and recording criteria are the ones for the level 2 of the EN ISO 11666

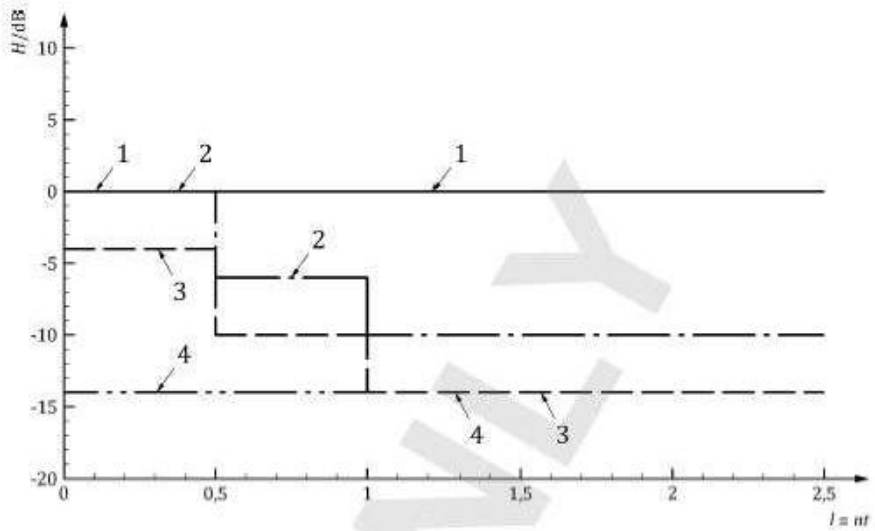
*I criteri di accettabilità e di registrazione sono quelli del livello 2 della EN ISO 11666*




**Key**

| | |
|---|---|
| 1 | reference level |
| 2 | acceptance level 2 |
| 3 | recording level |
| 4 | evaluation level |
| *H* | amplitude |
| *l* | length of discontinuities |
| *n* | multiplier of *t* |
| *t* | thickness |

**Figure A.1 — Levels for techniques 1 and 3 for thicknesses 8 mm to 15 mm — Acceptance level 2**




**Key**

| | |
|---|---|
| 1 | reference level |
| 2 | acceptance level 2 |
| 3 | recording level |
| 4 | evaluation level |
| *H* | amplitude |
| *l* | length of discontinuities |
| *n* | multiplier of *t* |
| *t* | thickness |

**Figure A.3 — Levels for technique 1 for thicknesses 15 mm to 100 mm — Acceptance level 2**

IN - ONLY

## 8.16 Defect Removal

All the discontinuities that exceed the standards acceptance criteria have to be removed and/or repaired and re-checked according to this procedure.

*Tutte le discontinuità che superano gli standard di accettabilità devono essere rimosse e/o riparate e ricontrollate in accordo a questa procedura*

## 8.17 Test report

The report should include at least the following information:

- name of supplier
- order number
- Inspection date
- Name, qualification and signature of the operator
- Component identification
- scope of examination: examination zones and applicable quality classes
- technique(s) used to set sensitivity;
- Place and extension of the test
- Thermal treatment status
- Type of component / welded joint and configuration
- Surface conditions
- Reference to the operating procedure and to the codes used
- Instrumentation used (flaw detector, probes, calibration and reference blocks)
- Possible mapping of defects to be registered and / or non-compliant (location, classification and amplitude in terms of FBH-equivalent diameter, or in percent of SDH)
- Final result of the test

*Il report dovrà includere almeno le seguenti informazioni:*

- *Nome del fornitore*
- *Numero d'ordine*
- *Data di ispezione*
- *Nome, qualifica e firma dell'operatore*
- *Identificazione del componente*
- *Scopo dell'esame: zone esaminate e livello di qualità*
- *Technica utilizzata per il settaggio della sensibilità*
- *Luogo ed estensione del test*
- *Stato di trattamento termico*
- *Tipo di componente/giunto saldato e configurazione*
- *Condizioni superficiali*
- *Riferimento alla procedura operativa ed ai codici utilizzati*
- *Strumentazione utilizzata (strumento, sonde, blocchi di calibrazione e di riferimento)*
- *Eventuale mappatura di difetti da registrare e/o non conformi (localizzazione, classificazione e altezza echo di riferimento come FBH o SDH)*
- *Risultato definitivo del test*

## 8.18 Test report Sample (Only for reference)

| REMAZEL ENGINEERING | SISTEMA QUALITA' *QUALITY SYSTEM*<br>RAPPORTO DI ESAME ULTRASUONI *Ultrasonic test report* | REU N°<br>COMM. *Job*<br>DATA *Date* |
|---|---|---|

| | | | |
|---|---|---|---|
| **CLIENTE** *Customer* | **ORDINE** *Order* **DEL** *Of* | | **COMM. CLIENTE** *Customer's job* |
| **OGGETTO** *Subject* | **DISEGNO RIF.** *Ref. Drw* | | **QUANTITA'** *Quantity* |
| **Stato di controllo** *Testing status* | ☐ **Preliminare** *Preliminary* | ☐ **Finale REMAZEL** *Final REMAZEL* | ☐ **Finale ufficiale** *Final official* |
| **Condizioni superficiali** *Surface conditions* | ☐ **Sabbiate** *Sandblasted* | ☐ **Lavoraz. meccanica** *Machined* | ☐ **Come fornito** *As delivery* |
| **Specifica** *Specification* | | | |
| **Mezzo di accoppiamento** *Coupling method* | | | |
| **Calibrazione** *Calibration* | ☐ **AVG scala** *AVG scale* | ☐ **Blocco di riferimento V 1** *Reference block V 1* | |
| | ☐ **DGS Diagramma** *DGS diagram* | ☐ **Blocco di riferimento V 2** *Reference block V 2* | |
| | ☐ **Eco di riferimento** *Reference echo* | ☐ **Blocchi di calibrazione** *Calibration blocks* | |

**SONDE** *Probes* — **REGOLAZIONE** *Adjustment*

| Tipo *Type* | Frequenza *Freq. MHz* | Dimensioni *Size mm* | Angolo *Angle* | Costruttore *Manifacture* | Potenza *Power* | Amplificazione *Amplification* | Note *Rermarks* |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

| | | | |
|---|---|---|---|
| **Apparecchiatura** *Apparatus* | **Costruttore** *Manufact.* | **Tipo** *Type* | **Matricola** *Serial N* |
| **Risultati** *Results* | ☐ **Conforme** *According to* | ☐ **Non conforme** *Not according to* | ☐ **Scarto** *Rejection* |
| **Note** *Remarks* | | | |
| **Operatore** *Operator* | **Enti collaudatori** *Inspect. officials* | **Ispettore cliente** *Customer inspect.* | **Capo collaudo** *Inspect. Dept. manager* |

**MODULO - MD009 Rev.00**

# 9 Qualified operators list:

In attached:

**CICPND**
**CENTRO ITALIANO**
**DI COORDINAMENTO**
**PER LE PROVE NON DISTRUTTIVE**

Via C. Pisacane, 46
20025 Legnano (MI)
PEC: info@pec.cicpnd.it
C.F. e P.I. 09510020150

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO
PRS N° 012C
Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
*Signatory of EA, IAF and ILAC Mutual Recognition Agreement*

# *CERTIFICATO DI LIVELLO 2*
## *LEVEL 2 CERTIFICATE*

**N° 38625/PND/C**

Si certifica la qualificazione per esami in Prove Non Distruttive al **LIVELLO 2**
*This is to certify qualification by examinations in Non-Destructive Testing at the **LEVEL 2***

***di / of***

**Natale Estevan**

nato a / *born in* **Trieste (TS)**

il / *on* **15 dicembre 1981**

per il metodo / *for the method:*

**Esame Visivo (VT)**

per i settori / *for the sectors:*

**Collaudi pre e in servizio che comprendono la fabbricazione**

**(c; f; w; t; wp)**

Il presente certificato viene rilasciato in conformità alla Norma UNI EN ISO 9712:2022.
*This certificate is issued according to UNI EN ISO 9712:2022.*

Direttore Generale
*General Manager*

Reggiani Michael
*M. Reggiani*

Data Delibera: 20/05/2024
*Approval Date*

Data Scadenza: 27/03/2029 R
*Expiry Date*

AIPnD

**CICPND**
**CENTRO ITALIANO**
**DI COORDINAMENTO**
**PER LE PROVE NON DISTRUTTIVE**

Via C. Pisacane, 46
20025 Legnano (MI)
PEC: info@pec.cicpnd.it
C.F. e P.I. 09510020150

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO
PRS N° 012C
Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
*Signatory of EA, IAF and ILAC Mutual Recognition Agreement*

# *CERTIFICATO DI LIVELLO 2*
## *LEVEL 2 CERTIFICATE*

**N° 38624/PND/C**

Si certifica la qualificazione per esami in Prove Non Distruttive al **LIVELLO 2**
*This is to certify qualification by examinations in Non-Destructive Testing at the **LEVEL 2***

***di / of***

**Natale Estevan**

nato a / *born in* **Trieste (TS)**

il / *on* **15 dicembre 1981**

per il metodo / *for the method:*

**Magnetoscopia (MT)**

per i settori / *for the sectors:*

**Collaudi pre e in servizio che comprendono la fabbricazione**

**(c; f; w; t; wp)**

Il presente certificato viene rilasciato in conformità alla Norma UNI EN ISO 9712:2022.
*This certificate is issued according to UNI EN ISO 9712:2022.*

Direttore Generale
*General Manager*

Reggiani Michael
*M. Reggiani*

Data Delibera: 20/05/2024
*Approval Date*

Data Scadenza: 27/03/2029 R
*Expiry Date*

Approvazione per l'esecuzione di prove non distruttive secondo l'Allegato I paragrafo 3.1.3 della **Direttiva attrezzature in pressione 2014/68/UE/PED** (CEM/TR 15589 Route A).

AIPnD

# NDT OPERATOR QUALIFICATION CERTIFICATE

No. **22TO00081PN2/RN**

| | | | |
|---|---|---|---|
| Operator | **PELLIS MICHELE** | | |
| Born in | **TRIESTE (TS)** | on | **17/03/1984** |
| Employed by | **MICHELE PELLIS** | | |
| Located in | **Trieste (TS)** | | |

THIS IS TO CERTIFY that the non destructive test operator is qualified by examinations at the LEVEL 2 according to UNI EN ISO 9712:2012 standard and to RINA Rule RC/C 14

in the method:

**VISUAL**

for the sectors:

**Pre-service and in service testing of equipment, plants and structures**

| | | | |
|---|---|---|---|
| This certificate is valid from | **5 December 2021** | to | **4 December 2026** |
| Issued at | **GENOVA** | on | **5 December 2021** |

Filippo Lago
(Italy Welding & Pressure Equipments, Personnel Certification & Laboratories, Director)

**Operator**

**RINA Services S.p.A.**
**Via Corsica 12 - 16128 Genova**

This certificate consist of 1 page

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*

# NDT OPERATOR QUALIFICATION CERTIFICATE

No. **22TO00081PN1/RN**

| | | | |
|---|---|---|---|
| Operator | **PELLIS MICHELE** | | |
| Born in | **TRIESTE (TS)** | on | **17/03/1984** |
| Employed by | **MICHELE PELLIS** | | |
| Located in | **Trieste (TS)** | | |

THIS IS TO CERTIFY that the non destructive test operator is qualified by examinations at the LEVEL 2 according to UNI EN ISO 9712:2012 standard and to RINA Rule RC/C 14

in the method:

**DYE PENETRANT**

for the sectors:

**Pre-service and in service testing of equipment, plants and structures**

| | | | |
|---|---|---|---|
| This certificate is valid from | **5 December 2021** | to | **4 December 2026** |
| Issued at | **GENOVA** | on | **5 December 2021** |

Filippo Lago
(Italy Welding & Pressure Equipments, Personnel Certification & Laboratories, Director)

**Operator**

**RINA Services S.p.A.**
**Via Corsica 12 - 16128 Genova**

This certificate consist of 1 page

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*

# NDT OPERATOR QUALIFICATION CERTIFICATE

No. **20VE00614PN1**

| | | | |
|---|---|---|---|
| Operator | **PELLIS MICHELE** | | |
| Born in | **TRIESTE (TS)** | on | **17/03/1984** |
| Employed by | **MICHELE PELLIS** | | |
| Located in | **Trieste (TS)** | | |

THIS IS TO CERTIFY that the non destructive test operator is qualified by examinations at the LEVEL 3 according to UNI EN ISO 9712:2012 standard and to RINA Rule RC/C 14

in the method:

**MAGNETIC PARTICLE**

for the sectors:

**Pre-service and in service testing of equipment, plants and structures**

| | | | |
|---|---|---|---|
| This certificate is valid from | **7 August 2020** | to | **6 August 2025** |
| Issued at | **GENOVA** | on | **7 August 2020** |

Filippo Lago
(Italy Welding & Pressure Equipment Certification Head)

**Operator**

**RINA Services S.p.A.**
**Via Corsica 12 - 16128 Genova**

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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*

# NDT OPERATOR QUALIFICATION CERTIFICATE

No. **21TO00389PN1/RN**

Validity renewal of certificate n° 16VE00823PO7

| | | | |
|---|---|---|---|
| Operator | **PELLIS MICHELE** | | |
| Born in | **TRIESTE (TS)** | on | **17/03/1984** |
| Employed by | **MICHELE PELLIS** | | |
| Located in | **Trieste (TS)** | | |

THIS IS TO CERTIFY that the non destructive test operator is qualified by examinations at the LEVEL 2 according to UNI EN ISO 9712:2012 standard and to RINA Rule RC/C 14

in the method:

**ULTRASONIC**

for the sectors:

**Pre-service and in service testing of equipment, plants and structures**

| | | | |
|---|---|---|---|
| This certificate is valid from | **29 June 2021** | to | **29 June 2026** |
| Issued at | **GENOVA** | on | **5 July 2021** |

Filippo Lago
(Italy Welding & Pressure Equipments, Personnel Certification & Laboratories, Director)

**Operator**

**RINA Services S.p.A.**
**Via Corsica 12 - 16128 Genova**

This certificate consist of 1 page

**PRS N° 066 C**

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

# CERTIFICATO DI LIVELLO 2
# *LEVEL 2 CERTIFICATE*

## *n° DTC-CND-A01649-22*

Si certifica la qualificazione per esami in Prove Non Distruttive al Livello 2
*This is to certify qualification by examination in Non Destructive Testing Level 2*

di / *of*

## *Giuliano Segato*

Nato a / *born in: Trieste (TS)*

Il */ on: 21 Marzo 1994*

Per i seguenti metodi */ for the following methods:*

## VT
## (Esame Visivo - Visual Testing)

Per i settori industriali / for the industrial sectors:

## MM, P/S

Il presente certificato viene rilasciato in conformità alla norma UNI EN ISO 9712 e Allegato I, P.to 3.1.3 Dir. 2014/68 UE
*This certificate is issued according to UNI EN ISO 9712 and Annex I, 3.1.3 Dir. 2014/68 EU*

Antonio Fimiani
*Consigliere Delegato*

Data di emissione/*issue date* : 01/07/2022
Data di scadenza/*expiry date* : 30/06/2027

Certificato conforme ai Regolamenti DEKRA Testing and Certification / *Certificate in compliance with the Regulations DEKRA Testing and Certification:*
Regolamento generale per la certificazione del personale/ *General Rules for the certification of personnel*
Regolamento per la certificazione del personale addetto PND / *Regulations for the qualification of NTD personnel*
Regolamento Generale per la Direttiva 2014/68/UE e D.Lgs n° 26 del 15/02/2016 / *General Rules for Directive 2014/68 EU and D.Lgs. n°26 os 15/02/2016*

**DEKRA Testing and Certification S.r.l.**
*Via Fratelli Gracchi 27 – 20092 Cinisello Balsamo (MI) – ITALY*
*Phone : +39 02 899.29090 / Fax +39 02 899.29200*
*info@dekra-certification.it* *www.dekra.it*

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO
*PRS091C PRD198B*
*Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC*

Form 1207PED Rev. 02 09/01/2019

# CERTIFICATO DI LIVELLO 2
# *LEVEL 2 CERTIFICATE*

## *n° DTC-CND-A01648-22*

Si certifica la qualificazione per esami in Prove Non Distruttive al Livello 2
*This is to certify qualification by examination in Non Destructive Testing Level 2*

di / *of*

## *Giuliano Segato*

Nato a / *born in: Trieste (TS)*

Il */ on: 21 Marzo 1994*

Per i seguenti metodi */ for the following methods:*

## MT
## (Particelle Magnetiche – Magnetic Testing)

Per i settori industriali / for the industrial sectors:

## MM, P/S

Il presente certificato viene rilasciato in conformità alla norma UNI EN ISO 9712 e Allegato I, P.to 3.1.3 Dir. 2014/68 UE
*This certificate is issued according to UNI EN ISO 9712 and Annex I, 3.1.3 Dir. 2014/68 EU*

Antonio Fimiani
*Consigliere Delegato*

Data di emissione/*issue date* : 01/07/2022
Data di scadenza/*expiry date* : 30/06/2027

Certificato conforme ai Regolamenti DEKRA Testing and Certification / *Certificate in compliance with the Regulations DEKRA Testing and Certification:*
Regolamento generale per la certificazione del personale/ *General Rules for the certification of personnel*
Regolamento per la certificazione del personale addetto PND / *Regulations for the qualification of NTD personnel*
Regolamento Generale per la Direttiva 2014/68/UE e D.Lgs n° 26 del 15/02/2016 / *General Rules for Directive 2014/68 EU and D.Lgs. n°26 os 15/02/2016*

**DEKRA Testing and Certification S.r.l.**
*Via Fratelli Gracchi 27 – 20092 Cinisello Balsamo (MI) – ITALY*
*Phone : +39 02 899.29090 / Fax +39 02 899.29200*
*info@dekra-certification.it* *www.dekra.it*

ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO
*PRS091C PRD198B*
*Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC*

Form 1207PED Rev. 02 09/01/2019

# NDT OPERATOR QUALIFICATION CERTIFICATE

No. **23TO00821PN2**

| | | | |
|---|---|---|---|
| Operator | **SEGATO GIULIANO** | | |
| Born in | **TRIESTE (TS)** | on | **21/03/1994** |
| Employed by | **SGP TESTING S.R.L.** | | |
| Located in | **San Dorligo Della Valle (TS)** | | |

this is to certify that the non destructive test operator is qualified by examinations at the level 2 according to ISO 9712:2021 standard and to RINA Rule RC/C 14

in the method:

**DYE PENETRANT**

in the following product sectors:

**CASTINGS (c)**
**FORGINGS (f)**
**WELDS (w)**
**WROUGHT PRODUCTS (wp)**
**TUBES AND PIPES (t)**

for the following industrial sectors:

**PRE AND IN-SERVICE TESTING (s)**

| | | | |
|---|---|---|---|
| This certificate is valid from | **30 October 2023** | to | **29 October 2028** |
| Issued at | **GENOVA** | on | **30 October 2023** |

The above mentioned Operator is approved for the Method and Level specified, according to Par. 3.1.3 of Annex I 2014/68/EU Directive (CEN/TR 15589 Route A)

Filippo Lago
(Italy Welding & Pressure Equipments, Personnel Certification & Laboratories, Director)

**Operator**

This certificate consist of 1 page

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO

**PRS N° 066 C**

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

**RINA Services S.p.A.**
**RTPO 2014/68/EU Directive, Art. 20**
**Via Corsica 12 - 16128 Genova**

# NDT OPERATOR QUALIFICATION CERTIFICATE

No. **21TO00456PN3**

| | | | |
|---|---|---|---|
| Operator | **SEGATO GIULIANO** | | |
| Born in | **TRIESTE (TS)** | on | **21/03/1994** |
| Employed by | **SGP TESTING S.R.L.** | | |
| Located in | **San Dorligo Della Valle (TS)** | | |

THIS IS TO CERTIFY that the non destructive test operator is qualified by examinations at the LEVEL 2 according to UNI EN ISO 9712:2012 standard and to RINA Rule RC/C 14

in the method:

**ULTRASONIC**

for the sectors:

**Pre-service and in service testing of equipment, plants and structures**

| | | | |
|---|---|---|---|
| This certificate is valid from | **1 September 2021** | to | **31 August 2026** |
| Issued at | **GENOVA** | on | **1 September 2021** |

Filippo Lago
(Italy Welding & Pressure Equipments, Personnel Certification & Laboratories, Director)

**Operator**

**RINA Services S.p.A.**
**Via Corsica 12 - 16128 Genova**

This certificate consist of 1 page

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*

# CERTIFICATO DI LIVELLO 2
# *LEVEL 2 CERTIFICATE*

## *n° DTC-CND-A01970-22*

Si certifica la qualificazione per esami in Prove Non Distruttive al Livello 2
*This is to certify qualification by examination in Non Destructive Testing Level 2*

di / *of*

## *Eric Marini*

Nato a / *born in: Trieste (TS)*

Il */ on: 25 Luglio 1994*

Per i seguenti metodi */ for the following methods:*

## VT
## (Esame Visivo - Visual Testing)

Per i settori industriali / for the industrial sectors:

## MM, P/S

Il presente certificato viene rilasciato in conformità alla norma UNI EN ISO 9712 e Allegato I, P.to 3.1.3 Dir. 2014/68 UE
*This certificate is issued according to UNI EN ISO 9712 and Annex I, 3.1.3 Dir. 2014/68 EU*

Antonio Fimiani
*Consigliere Delegato*

Data di emissione/*issue date* : 21/11/2022
Data di scadenza/*expiry date* : 17/11/2027

Certificato conforme ai Regolamenti DEKRA Testing and Certification / *Certificate in compliance with the Regulations DEKRA Testing and Certification:*
Regolamento generale per la certificazione del personale/ *General Rules for the certification of personnel*
Regolamento per la certificazione del personale addetto PND / *Regulations for the qualification of NTD personnel*
Regolamento Generale per la Direttiva 2014/68/UE e D.Lgs n° 26 del 15/02/2016 / *General Rules for Directive 2014/68 EU and D.Lgs. n°26 os 15/02/2016*

**DEKRA Testing and Certification S.r.l.**
*Via Fratelli Gracchi 27 – 20092 Cinisello Balsamo (MI) – ITALY*
*Phone : +39 02 899.29090 / Fax +39 02 899.29200*
*info@dekra-certification.it* *www.dekra.it*

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO

*PRS091C PRD198B*
*Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC*

Form 1207PED Rev. 02 09/01/2019

# CERTIFICATO DI LIVELLO 2
# *LEVEL 2 CERTIFICATE*

## *n° DTC-CND-A02681-23*

Si certifica la qualificazione per esami in Prove Non Distruttive al Livello 2
*This is to certify qualification by examination in Non Destructive Testing Level 2*

di / *of*

## *Eric Marini*

Nato a / *born in: Trieste (TS)*

Il */ on: 25 Luglio 1994*

Per i seguenti metodi */ for the following methods:*

## PT
## (Liquidi Penetranti - Penetrant Testing)

Per i settori industriali / for the industrial sectors:

## MM, P/S

Il presente certificato viene rilasciato in conformità alla norma UNI EN ISO 9712 e Allegato I, P.to 3.1.3 Dir. 2014/68 UE
*This certificate is issued according to UNI EN ISO 9712 and Annex I, 3.1.3 Dir. 2014/68 EU*

Antonio Fimiani
*Consigliere Delegato*

Data di emissione/*issue date* : 06/06/2023
Data di scadenza/*expiry date* : 05/06/2028

Certificato conforme ai Regolamenti DEKRA Testing and Certification / *Certificate in compliance with the Regulations DEKRA Testing and Certification:*
Regolamento generale per la certificazione del personale/ *General Rules for the certification of personnel*
Regolamento per la certificazione del personale addetto PND / *Regulations for the qualification of NTD personnel*
Regolamento Generale per la Direttiva 2014/68/UE e D.Lgs n° 26 del 15/02/2016 / *General Rules for Directive 2014/68 EU and D.Lgs. n°26 os 15/02/2016*

**DEKRA Testing and Certification S.r.l.**
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*info@dekra-certification.it* *www.dekra.it*

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO
0091PRS
Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC

Form 1207PED Rev. 02 09/01/2019

# CERTIFICATO DI RINNOVO LIVELLO 2
## *LEVEL 2 RENEWAL CERTIFICATE*

## *n° DTC-CND-A02489-23*

Si certifica il possesso dei requisiti per il rinnovo del Certificato in Prove Non Distruttive al Livello 2

*This is to certify the mastery of requirements for renewal of Certificate in Non Destructive Testing Level 2*

di / *of*

## *Eric Marini*

Nato a / *born in: Trieste (TS)*

Il / *on: 25 Luglio 1994*

Per i seguenti metodi / *for the following methods:*

**MT**
**(Particelle Magnetiche - Magnetic Testing)**

Per i settori industriali / for the industrial sectors:

**MM, P/S**

Il presente certificato viene rilasciato in conformità alla norma UNI EN ISO 9712 e Allegato I, P.to 3.1.3 Dir. 2014/68 UE
*This certificate is issued according to UNI EN ISO 9712 and Annex I, 3.1.3 Dir. 2014/68 EU*

Antonio Fimiani
*Consigliere Delegato*

Data di emissione/*issue date* : 19/04/2023 R
Data di scadenza/*expiry date* : 18/04/2028 R

Certificato conforme ai Regolamenti DEKRA Testing and Certification / *Certificate in compliance with the Regulations DEKRA Testing and Certification:*
Regolamento generale per la certificazione del personale/ *General Rules for the certification of personnel*
Regolamento per la certificazione del personale addetto PND / *Regulations for the qualification of NTD personnel*
Regolamento Generale per la Direttiva 2014/68/UE e D.Lgs n° 26 del 15/02/2016 / *General Rules for Directive 2014/68 EU and D.Lgs. n°26 os 15/02/2016*

**DEKRA Testing and Certification S.r.l.**
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*Phone : +39 02 899.29090 / Fax +39 02 899.29200*
*info@dekra-certification.it* *www.dekra.it*

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO

*PRS091C PRD198B*
*Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC*

Form 1207PED Rev. 02 09/01/2019

# CERTIFICATO DI LIVELLO 2
# *LEVEL 2 CERTIFICATE*

## *n° DTC-CND-A01969-22*

Si certifica la qualificazione per esami in Prove Non Distruttive al Livello 2
*This is to certify qualification by examination in Non Destructive Testing Level 2*

di / *of*

## *Eric Marini*

Nato a / *born in: Trieste (TS)*

Il */ on: 25 Luglio 1994*

Per i seguenti metodi */ for the following methods:*

## UT
## (Ultrasuoni - Ultrasonic Testing)

Per i settori industriali / for the industrial sectors:

## MM, P/S

Il presente certificato viene rilasciato in conformità alla norma UNI EN ISO 9712 e Allegato I, P.to 3.1.3 Dir. 2014/68 UE
*This certificate is issued according to UNI EN ISO 9712 and Annex I, 3.1.3 Dir. 2014/68 EU*

Antonio Fimiani
*Consigliere Delegato*

Data di emissione/*issue date* : 21/11/2022
Data di scadenza/*expiry date* : 17/11/2027

Certificato conforme ai Regolamenti DEKRA Testing and Certification / *Certificate in compliance with the Regulations DEKRA Testing and Certification:*
Regolamento generale per la certificazione del personale/ *General Rules for the certification of personnel*
Regolamento per la certificazione del personale addetto PND / *Regulations for the qualification of NTD personnel*
Regolamento Generale per la Direttiva 2014/68/UE e D.Lgs n° 26 del 15/02/2016 / *General Rules for Directive 2014/68 EU and D.Lgs. n°26 os 15/02/2016*

**DEKRA Testing and Certification S.r.l.**
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*Phone : +39 02 899.29090 / Fax +39 02 899.29200*
*info@dekra-certification.it* *www.dekra.it*

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO
*PRS091C PRD198B*
*Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC*

Form 1207PED Rev. 02 09/01/2019

# CERTIFICATO DI LIVELLO 2
## *LEVEL 2 CERTIFICATE*

## *n° DTC-CND-A02680-23*

Si certifica la qualificazione per esami in Prove Non Distruttive al Livello 2
*This is to certify qualification by examination in Non Destructive Testing Level 2*

di / *of*

## ***Oliver De Iaco***

Nato a / *born in: Francoforte Sul Meno (Germania)*

Il / *on: 04 Agosto1973*

Per i seguenti metodi */ for the following methods:*

**PT**
**(Liquidi Penetranti - Penetrant Testing)**

Per i settori industriali / for the industrial sectors:

**MM, P/S**

Il presente certificato viene rilasciato in conformità alla norma UNI EN ISO 9712 e Allegato I, P.to 3.1.3 Dir. 2014/68 UE
*This certificate is issued according to UNI EN ISO 9712 and Annex I, 3.1.3 Dir. 2014/68 EU*

Antonio Fimiani
*Consigliere Delegato*

Data di emissione/*issue date* : 06/06/2023
Data di scadenza/*expiry date* : 05/06/2028

Certificato conforme ai Regolamenti DEKRA Testing and Certification / *Certificate in compliance with the Regulations DEKRA Testing and Certification:*
Regolamento generale per la certificazione del personale/ *General Rules for the certification of personnel*
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Form 1207PED Rev. 02 09/01/2019

# CERTIFICATO DI LIVELLO 2
## *LEVEL 2 CERTIFICATE*

## *n° DTC-CND-A02126-23*

Si certifica la qualificazione per esami in Prove Non Distruttive al Livello 2
*This is to certify qualification by examination in Non Destructive Testing Level 2*

di / *of*

## *Oliver De Iaco*

Nato a / *born in: Francoforte sul Meno (Germania)*

Il / *on: 04 Agosto 1973*

Per i seguenti metodi / *for the following methods:*

## MT
## (Particelle Magnetiche – Magnetic Testing)

Per i settori industriali / for the industrial sectors:

## MM

Il presente certificato viene rilasciato in conformità alla norma UNI EN ISO 9712 e Allegato I, P.to 3.1.3 Dir. 2014/68 UE
*This certificate is issued according to UNI EN ISO 9712 and Annex I, 3.1.3 Dir. 2014/68 EU*

Antonio Fimiani
*Consigliere Delegato*

Data di emissione/*issue date* : 30/01/2023
Data di scadenza/*expiry date* : 25/01/2028

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# Base Load Power Hub (BLPH)

## DAVIT CRANE

PAINTING PROCEDURE

Document Number: 1724001010-MAT-PRO-00007

Document Class: 2

ROSETTI MARINO

| | |
|---|---|
| 1 | NO COMMENTS - APPROVED - WORK MAY PROCEED |
| 2 | MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED |
| 3 | MAJOR COMMENTS – REJECTED – DO NOT PROCEED |
| 4 | APPROVAL NOT REQUIRED |

*NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.*

| Sign | Date |
|---|---|
| Michele Sacchi | 10-12-2024 |

| Rev. | Date | Description | Prepared | Reviewed | Approved |
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REMAZEL ENGINEERING

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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) / added Paint system for safety equipment |
| 04 | Accepted for construction ( AFC) |
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# Table of contents

1 INTRODUCTION ..... 5
1.1 PROJECT OVERVIEW ..... 5
1.1.1 Project Location ..... 5
1.1.2 Project Concept ..... 6
2 DOCUMENT SCOPE ..... 8
2.1 DEFINITIONS AND ABBREVIATIONS ..... 8
3 PAINTING PROCEDURE ..... 9

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# List of Figures

Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map ..... 5
Figure 2 - Wind Park Details ..... 6
Figure 3 – BLPH Concept ..... 6

# List of tables

Table 2 - Definitions and Abbreviations ..... 8

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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.

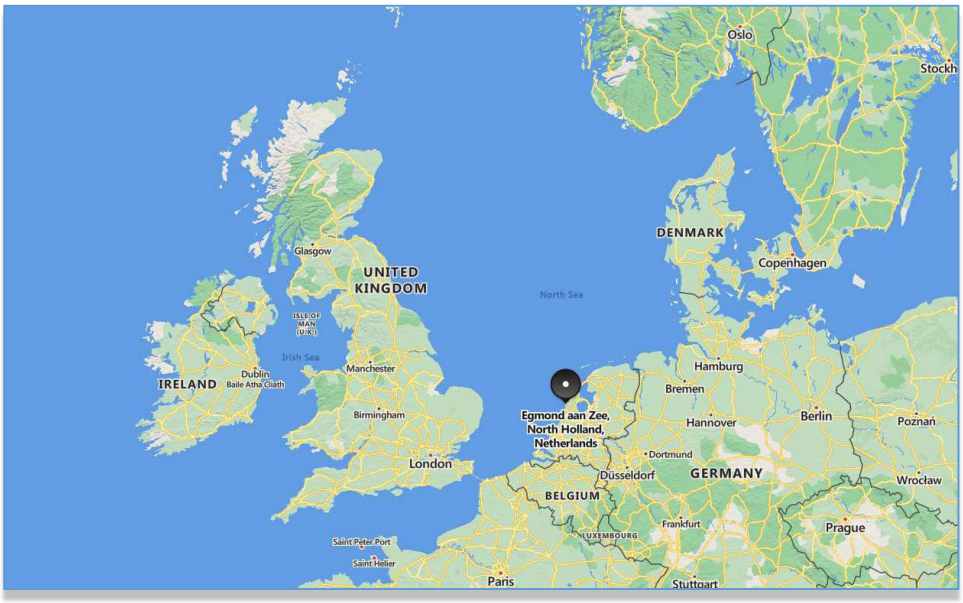



*Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map*




*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.

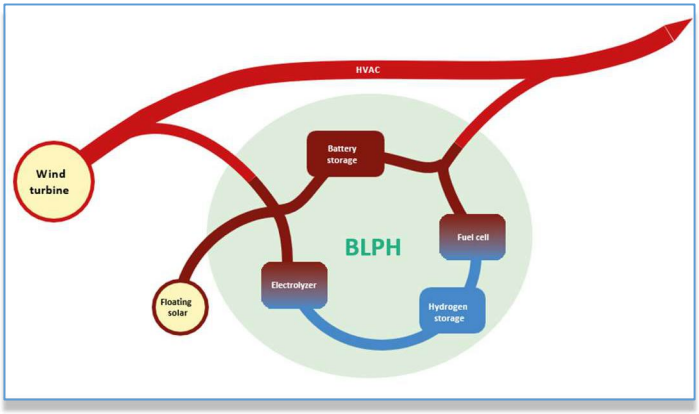



*Figure 3 – BLPH Concept*

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.

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# 2 DOCUMENT SCOPE

This document explains in detail the "working procedure" for surface preparation, paint application, inspection, testing and repair of Davit Crane

## 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 1 - Definitions and Abbreviations*

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# 3 PAINTING PROCEDURE

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# Davit Crane

# PAINTING PROCEDURE
# 24-27012-PP-001

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## SUMMARY OF REVISION

| Rev. | Revised chapters | Revision description | Reason for revision |
|---|---|---|---|
| 00 | /// | /// | IFR |
| 01 | Document Scope;Standard Reference; Surface preparation | Added year revision of normative; change salt concentration | IFR |
| 02 | / | Accepted for construction | AFC |
| 03 | / | Added paint System safety equipment RAL 1023 | AFC |
| 04 | / | Accepted for construction | AFC |

**INDEX**


1. Scope ..... 4
2. Reference Documents ..... 4
3. Definitions ..... 4
4. Standard ..... 4
5. Responsabilities ..... 5
5.1. VENDOR ..... 5
5.2. Paint Manufacturer ..... 5
5.3. Paint Applicator ..... 5
6. Qualification of Paint Operators ..... 6
7. Safety ..... 6
8. Ambient Conditions ..... 6
9. Unpainted Surfaces ..... 7
10. Pre-Blasting Preparation ..... 7
11. Surface Preparation ..... 7
12. Paint Application ..... 8
13. Paint Systems ..... 9
14. Inspection and Testing ..... 10
15. Coating Repairs ..... 13
16. Handling and Storage ..... 13
17. Technical datasheet ..... 13

# 1. Scope

This document explains in detail the “working procedure” for surface preparation, paint application, inspection, testing and repair of Davit Crane.
This document is applicable to structural steel; the commercial items such as gearboxes, motors, brake, filters, slewing ring and other minor commercial items will be purchased painted according to international recognized painting cycle C5 or CX suitable for offshore environmental.

# 2. Reference Documents

- 1724001010-QC-ITP-00002 Inspection test plan

# 3. Definitions

- CONTRACTOR: Rosetti Marino
- SUPPLIER: Remazel Engineering SpA.
- PAINT MANUFACTURER: Jotun
- PAINT APPLICATOR: a company awarded by REMAZEL

# 4. Standard

- ASTM D 4285_2018: Standard Test Method for Indicating Oil or Water in Compressed Air.
- ISO 4624_2023: Standard Test Method for Pull-Off.
- ISO 2808_2019: Paints and Varnishes - Determination of film thickness.
- ISO 8501-1_2007: Preparation of steel substrates before application of paints and related products - Visual assessment of surface cleanliness - Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings.
- ISO 8501-3_2006: Preparation of steel substrates before application of paints and related products – Visual assessment of surface cleanliness – Part 3: Preparation grades of welds, edges and other areas with surface imperfections.
- ISO 8502-3_2017: Preparation of steel substrates before application of paints and related products - Test for the assessment of surface cleanliness - Part 3: Assessment of dust on steel surfaces prepared for painting (pressure sensitive tape method).
- ISO 8502-4_2017: Preparation of steel substrates before application of paint and related products - Test for the assessment of surface cleanliness - Part 4: Guidance on the estimation of the probability of condensation prior to paint application.
- ISO 8502-6_2020: Preparation of steel substrates before application of paint and related products - Test for the assessment of surface cleanliness - Part 6: Extraction of soluble contaminants for analysis - The Bresle method.
- ISO 8502-9_2020: Preparation of steel substrates before application of paint and related products - Test for the assessment of surface cleanliness - Part 9: Field method for the conduct metric determination of water-soluble salts.
- ISO 8503-1_2012: Preparation of steel substrates before application of paint and related products - Surface roughness characteristics of blast-cleaned steel substrates - Part 1: Specification and definitions for ISO surface profile comparators for the assessment of abrasive blast-cleaned surfaces.
- ISO 8504-2_2019: Preparation of steel substrates before application of paint and related products - Surface preparation methods – Part 2: Abrasive blast-cleaning.

- ISO 11124-1_2018: Preparation of steel substrates before application of paints and related products – Specifications for metallic blast-cleaning abrasives – Part 1: General introduction and classification.
- ISO 11124-3_2018: Preparation of steel substrates before application of paints and related products – Specifications for metallic blast-cleaning abrasives – Part 3: High-carbon cast steel shot and grit.
- ISO 11126-1_2018: Preparation of steel substrates before application of paints and related products – Specifications for non-metallic blast-cleaning abrasives – Part 1: General introduction and classification.
- ISO 11126-10_2017: Preparation of steel substrates before application of paints and related products - Specifications for non-metallic blast-cleaning abrasives – Part 10: Almandite garnet.
- ISO 19840_2012: Paints and varnishes - Corrosion protection of steel structures by protective paint systems - Measurement of, and acceptance criteria for, the thickness of dry films on rough surfaces.
- NACE SP0188: Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.
- SSPC-SP 1: Solvent cleaning.

# 5. Responsabilities

## 5.1. VENDOR

- Quality control (Q.C.) – Quality Assurance (Q.A.).
- Make sure that all the CONTRACTOR 'S prescriptions shall be fully understood and respected.
- Perform intermediate and final checks to verify works acceptability.
- Perform (in the fabrication shop prior to release to Paint Applicator) accurate checks to assure that
    - The preparation grades of welds, edges and other areas with surface imperfections shall be according to grade P3 of ISO 8501-3 except for weld profile smoothing that shall follow grade P2.
- Collaborate with the Certified Coating Inspector for the checking and recording of all work stages.
- Handle and store the coated material, after its release from the Paint Applicator, with proper care in order to avoid mechanical damage.

## 5.2. Paint Manufacturer

- Supply all the paint required in unopened containers clearly marked with the following details: name of manufacturer, material identification, color reference number and batch number. Other details to be supplied shall include: date of manufacture, quantity, shelf life, safety and technical data sheet.

## 5.3. Paint Applicator

- Paint application and Quality Control.
- Verify the integrity of the items received by the Vendor and make sure they shall be conformed to what is requested and specified.
- Verify the integrity of all the incoming abrasive, paint, equipment, etc., rejecting material without documentation, label, batch number, expiration and manufacturing dates or proper packaging.
- Record the batch number of all materials received on suitable forms.

- Availability of suitable equipment to blast-clean and to apply the paint along with sets of spare parts.
- Availability of suitable instruments to perform the specified inspection and testing, knowledge of their use and reference standards. All instruments shall have valid calibration certificate issued by their manufacturers or by an acknowledged body.
- Guarantee tradesman level workmanship as regards surface preparation and paint application.
- Provide an environment that protects the painting / curing process and the operators from dust, wind, rain and fumes.
- Grant CLIENT, CONTRACTOR and SUPPLIER Coating Inspector free access and assistance to inspect all work performed.
- Grant CLIENT, CONTRACTOR and VENDOR Coating Inspector availability of testing and inspection instrument, properly calibrated and maintained, while conducting surveillance of the work.
- Carry out all work stages in strict accordance whit this working procedure.
- Fill in daily report detailing the work carried out in collaboration with Q.C.
- Arrange the storage of painted items in suitable areas well protected against damage.
- As regard the storage of the coating material and solvents, the Paint Manufacturer's instruction shall be followed.
- Supply the Paint Applicator one test panel, for each production batch, which shall be used to perform the Adhesion test. Minimum dimensions of the test panels are 300 x 300 x 4 mm.

# 6. Qualification of Paint Operators

Paint Applicator Company selected to carry out the coating works described in this Procedure may be required to comply with the provisions SSPC QP 1 for Field Coating Application and SSPC QP 3 for Shop Coating Application. Operators employed in abrasive blast cleaning and coating operations shall be qualified according to tradesman level as Blaster or Painter. Personnel performing controls, inspections and tests shall be individually certified by a recognized association or organization NACE Coating Inspector level II or NS 476 FROSIO Inspector level III.

# 7. Safety

Any blast-cleaning and coating phase shall be carried out and any paint, thinner, abrasive, material or equipment shall be used in accordance to all applicable local, national and international safety regulations. Product Safety Data Sheets (PSDS) shall be available for review at shops where coating is applied.
All operators shall be provided with suitable safety personal equipment. Used solvents, paint, waste materials and cleaning materials shall be handled in strict accordance with PSDS requirements and applicable local and national disposal procedures.

# 8. Ambient Conditions

Blast cleaning, coating application and paint curing shall not be allowed to take place:

- When the ambient and steel temperature is below 5°C and above 52°C.
- When the relative humidity is greater than 85%.
- When steel temperature is less than 3°C above dew-point temperature.

The Paint Manufacturer shall specify the maximum and minimum application and curing temperature and other relevant limitations regarding application and curing conditions for each product.

# 9. Unpainted Surfaces

The following surfaces shall not be blast-cleaned and painted:

- RF Flanges, unless otherwise specified.
- Machined surfaces.
- Name Plate

All these surfaces shall be properly protected with tape, rubber, plastic caps, etc. before blast-cleaning and painting.

# 10. Pre-Blasting Preparation

All the incoming items shall be thoroughly inspected to assure that sharp, edges, fillets and corners have been dressed to achieve a grade P3 of ISO 8501-3 except for weld profile smoothing that shall follow grade P2.
Special attention shall be given to all weld's areas for removal of weld flux, fumes, slivers, welding spatter and other foreign objects. Any surfaces defects, particularly surface laminations or scrubs, likely to be detrimental to protective coating system, shall be smoothened. Spot and discontinue welds shall not be allowed.
Surface contaminants such as oil and grease shall be solvent cleaned as per SSPC-SP 1. Soluble salt deposits, soil and any exogenous compounds shall be removed by steam cleaning and brushing in combination with detergent. The degreased surfaces shall be further washed with fresh water to remove all traces of the degreaser chemicals.

# 11. Surface Preparation

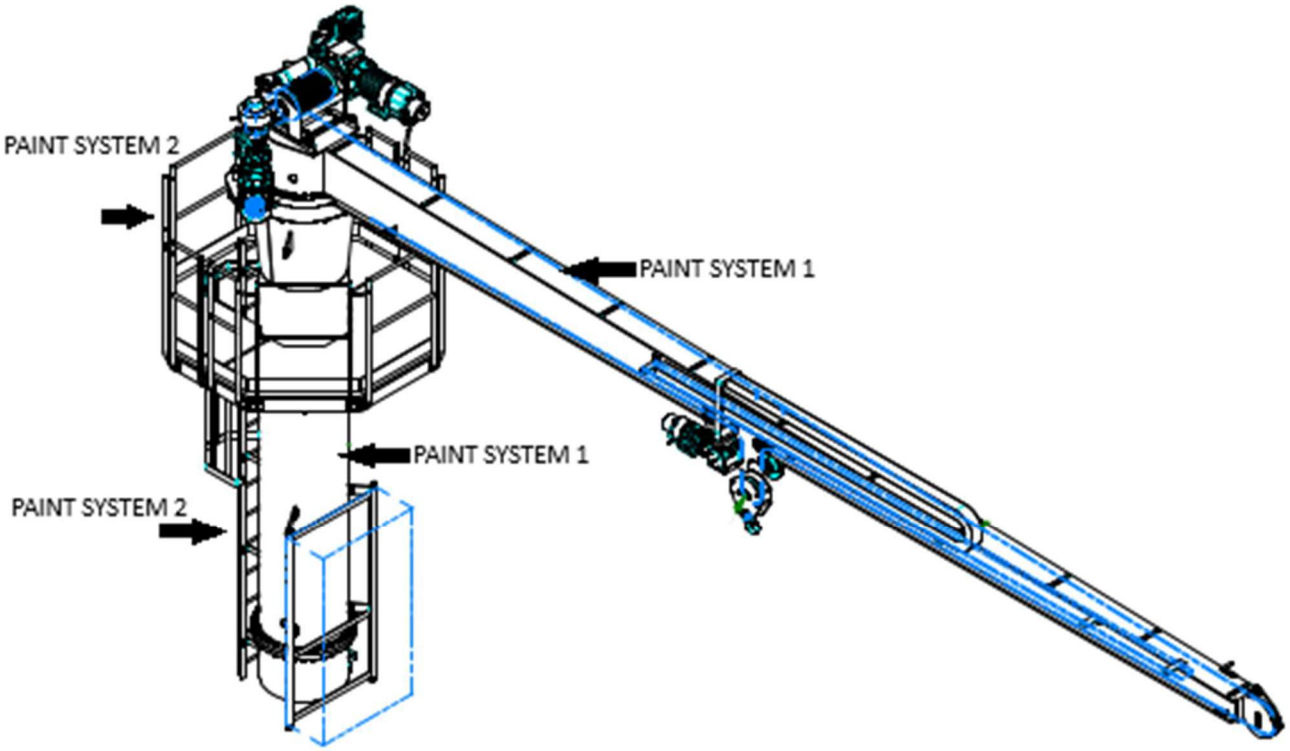
All abrasive material selected (STEEL GRIT or GARNET) shall be dry, clean and free from oil, grease and other contaminants that could be detrimental to long term coating performance.
Conductivity of abrasive shall not exceed 250 µS/cm at 20°C as per ISO 11127-6.
The compressed air used for blast-cleaning shall be free from water and oil. Adequate separators and traps shall be provided and these shall be kept emptied of water and oil. Control of the compressed air cleanliness shall be done according to Standard ASTM D 4285.

- Carbon Steel blasted surfaces, cleaned to ISO 8501-1 SA 2 1/2 shall have a roughness between 50÷85 µm and Medium G.
- Stainless Steel blasted surfaces, cleaned to SSPC-SP17 shall have a roughness between 30÷50 µm.

Blast profile measurement shall be carried out in accordance with ISO 8503-5 Replica tape method and with ISO 8503-2 Comparator Procedure.
Welding spatter, slivers, laminations and underlying mill scale removed during fabrication but still visible after blast cleaning operations shall be dressed and the edges smoothed or rendered flush.
After preparation of the surface any grit, dust, etc. shall be removed. The residual particle quantity and particle size shall not exceed dust quantity rating 2 and dust size class 2 of ISO 8502-3.
The salt concentration (chlorides) tested on the blast cleaned surfaces shall not exceed 20 mg/m² NaCl when measured per ISO 8502-6 and ISO 8502-9.
The test panels, supplied by the VENDOR for each production batch and for each PAINT SYSTEM, shall receive the same surface preparation of the items. Minimum dimensions of the test panels are 300 x 300 x 5 mm.
Final blast-cleaning shall not be done on any surface that are moist, or that may become moist, before the application of primer.

# 12. Paint Application

All paint furnished shall be in unopened, clearly identifiable containers. No paint shall be used whose shelf life has expired. Containers shall remain unopened until required for use.
Coating application shall be carried out after completion of blast cleaning and before any rusting occurs. The blast-cleaned surface shall be vacuum cleaned or blown free of dust and other loose contaminants.
All application data shall be in accordance with the PTDS of the Paint Manufacturer. The type of thinner used shall comply with the Manufacturer's recommendation. Airless or conventional spray pumps shall be used. Stripe-coating with brush of edges, welds, corners and all irregular surfaces shall be performed to obtain the specified film thickness and to avoid holidays.
All blast cleaned surfaces shall be painted with primed before rust bloom occurs, usually within 4 hours and depending upon the ambient conditions.
The blast-cleaned test panels shall be painted contemporaneously with the same paint system as per the items. In the period between coating and curing, the freshly applied coating shall not come into contact with handling equipment or any other items that may impact coating quality and shall be held in a covered facility protected from dust, wind and rain. Over-coating time shall be recommended by the Paint Manufacturer in the PTDS.



# 13. Paint Systems

**PAINT SYSTEM 1- SANDBLASTED CARPENTRY-STRUCTURAL STEEL**

| | |
|---|---|
| SURFACE PREPARATION | ISO 8501-1 SA 2 1/2<br>Profile between 50 µm and 85 µm |
| 1st Coat | JOTAMASTIC 90 Alu<br>D.F.T. 150 µm |
| 2nd Coat | JOTAMASTIC 90<br>D.F.T. 150 µm |
| 3rd Coat | HARDTOP XP<br>Color Gray RAL 7038<br>D.F.T. 60 µm |
| T.D.F.T. | 360 µm |

**PAINT SYSTEM 2- SANDBLASTED HANDRAILS AND STAIRS**

| | |
|---|---|
| SURFACE PREPARATION | ISO 8501-1 SA 2 1/2<br>Profile between 50 µm and 85 µm |
| 1st Coat | JOTAMASTIC 90 Alu<br>D.F.T. 150 µm |
| 2nd Coat | JOTAMASTIC 90<br>D.F.T. 150 µm |
| 3rd Coat | HARDTOP XP<br>Color Yellow RAL 1023<br>D.F.T. 60 µm |
| T.D.F.T. | 360 µm |

# 14. Inspection and Testing

| Test Type | Method | Frequency | Acceptance Criteria | Corrective Action In Case Of N.C. |
|---|---|---|---|---|
| **Blotter Test** | White adsorbent paper ASTM D 4285 | Before start and end of each shift. | A piece of clean white absorbent paper shall be positioned at the air-outlet. After about 1 min. of air discharge there shall be no trace of water and oil on the paper. | Any accumulated moisture and oil in the traps, separators and filters shall be emptied. The air supply shall then be checked once again until conformity is achieved. |
| **Temperature** | Thermo hygrometer ISO 8502-4 | Before start and end of each shift. | Ambient and Steel Temperature min. 5°C and max. 52°C. The paint manufacturer shall specify the maximum and minimum application and curing temperature and other relevant limitations regarding application and curing conditions for each product. | Unless these parameters are met the operations shall not proceed. |
| **Relative Humidity** | | | 85% max. | |
| **Dew point** | | | Steel Temperature min. 5°C, and 3°C or more above Dew Point Temperature. | |

| Test Type | Method | Frequency | Acceptance Criteria | Corrective Action In Case Of N.C. |
|---|---|---|---|---|
| **Visual Examination** | Visual | All surfaces. | Sharp, edges, fillets, corners and welds are properly dressed to achieve a minimum preparation grade P3 of ISO 8501-3 except for weld profile smoothing that shall follow grade P2. | Out of conformity items shall be kept aside. Vendor shall be notified. |
| **Pre-cleaning of surfaces** | Steam jet cleaner SSPC-SP 1 | All surfaces. | Surface contaminants such as oil and grease shall be solvent cleaned as per SSPC-SP 1. Soluble salt deposits, soil and any exogenous compounds shall be removed by steam cleaning and brushing in combination with detergent. The degreased surfaces shall be further washed with fresh water to remove all traces of the degreaser chemicals. | If oil, grease and any exogenous compound is still visible on the surface the operations shall be repeated until conformity is achieved. |
| **Conductivity of abrasive** | ASTM D 4940 | Before start of each shift. | Conductivity of abrasive soaked in reagent water shall not exceed 250 µS/cm at 20°C. | Replace the abrasive with a new lot and re-testing until acceptable. |
| **Surface Preparation Cleanliness** | Blasting booth ISO 8501-1 and SSPC-VIS | All surfaces. | For Carbon Steel surfaces the required visual standard of blast cleaning shall correspond to ISO 8501-1 SA 2 1/2 Very Thorough Blast Cleaning. | Re-blasting and retesting until acceptable. |
| **Blasted Surface Roughness** | Replica tape NACE SP0287 | Once per production batch. | For Carbon steel surfaces the required surface profile shall between 50 µm and 75 µm. | Re-blasting. |
| **Water Soluble Salts** | Bresle-kit ISO 8502-6 ISO 8502-9 | Once per production batch. | The salt concentration (chlorides) tested on the blast cleaned surface shall not exceed 20 mg/m² NaCl like single point | Washing with potable water and retesting until acceptable. |

| Test Type | Method | Frequency | Acceptance Criteria | Corrective Action In Case Of N.C. |
|---|---|---|---|---|
| **Surface Dust Cleanliness** | Transparent adhesive tape<br>ISO 8502-3 | Once per production batch. | After surface preparation any grit, dust, etc. shall be removed. The residual particle quantity and particle size shall be class 2, rating 2. | Re-cleaning and retesting until acceptable. |
| **Wet Film Thickness** | Comb type<br>ISO 2808<br>Method 1A | Spot checks. | As indicate in PTDS. | Additional coat |
| **Visual Inspection** | Visual | During all phases of coating application. | The coating shall be smooth, of uniform color, free of runs, sags, visible holidays, blisters, orange peel, scratches, dust inclusions, solvent retention or any other irregularities. | Repair and retesting. |
| **Dry Film Thickness** | Electromagnetic thickness gauge<br>ISO 19840 | ISO 19840<br>After each coat and before application of next coat. | The arithmetic mean of all the individual DFT shall be equal to or greater than the NDFT.<br>All individual dry film thicknesses shall be equal to or above 90% of the NDFT.<br>Individual DFT between 80% of the NDFT and the NDFT are acceptable provided that the number of these measurements is less than 20% of the total number of individual measurements taken.<br>Max of 150% of NDFT or as per manufacturers maximum recommended DFT | Repair, additional coats or recoating as appropriate. |
| **Adhesion Test** | Automatic centered pulling force equipment<br>ISO 4624 | One test panel for each batch production. | Performed on the coated test panels when the coating system is fully cured.<br>Minimum acceptable adhesion value: 5 MPa. | In case of poor adhesion, the test is repeated on the coated surfaces of the items. It fails again the items shall be blast-cleaned and re-coated. |

# 15. Coating Repairs

| TOTAL DAMAGED COATING WITH EXPOSED METAL SUPPORT | DAMAGED COATING WITHOUT EXPOSED METAL SUPPORT |
|---|---|
| **SURFACE PREPARATION**<br>The damaged area shall be re-cleaned as originally specified for the item and the complete coating system reapplied.<br>The re-cleaning shall carry over on to the secure surroundings coating for not less than 30 mm all around and the edges feathered using a method approved by the Contractor. | **SURFACE PREPARATION**<br>The coating around the damaged area shall be feathered using an approved method to ensure continuity of the patch coating. The full coating system shall then be reapplied strictly in accordance with this Painting Procedure. |
| **COATING APPLICATION**<br>See Original Paint System | **COATING APPLICATION**<br>See Original Paint System |
| The D.F.T. of each single layer and the final D.F.T. shall be as per original application. | |

Areas with inadequate coating thickness shall be thoroughly cleaned and, if necessary abraded and additional compatible coats applied until they meet this specification. These additional coats shall blend in with the final coating on adjoining areas.

# 16. Handling and Storage

Finished painted items shall be handled and/or stored in a manner to protect the coating from damage. They shall not be dropped or impacted against other objects. Use of ropes, hooks, chains or cables are not permitted. Only rubber or nylon belts shall be allowed for lifting, lowering or suspending the items. Coated items shall be stored off the ground on sufficiently padded skids, properly leveled and spaced.
Once loaded for transport, they are arranged to avoid scratches and to prevent hitting. Non-abrasive and non-metallic supports, wooden board, pallets, mats or rubber strips shall be used.

# 17. Technical datasheet

# Jotamastic 90

## Product description

This is a two component polyamine cured epoxy mastic coating. It is a surface tolerant, abrasion resistant, high solids, high build product. This product is tintable in a wide range of colours in Jotun's Multicolor Industry (MCI) system. Specially designed for areas where optimum surface preparation is not possible or required. Provides long lasting protection in environments with high corrosivity. Can be used as primer, mid coat, finish coat or as single coat system in atmospheric and immersed environments. Suitable for properly prepared carbon steel, galvanised steel, stainless steel, aluminium, concrete and a range of aged coating surfaces. It can be applied at sub zero surface temperatures.

### Typical use

General:
Primarily designed for maintenance and repair.

Marine:
Outside hulls, exterior and interior areas.

Protective:
Recommended for offshore environments, including splash zones, refineries, power plants, bridges, buildings, mining equipment and general structural steel.

### Approvals and certificates

This product contributes to the Green Buildings Standard credits. Please see section Green Building Standards.

Certified in accordance with IMO Res.288(87) – PSPC Crude Oil Tanks **(Valid for Standard Grade only)**
Pre-qualified in accordance with NORSOK M-501 in selected systems
Grain, Newcastle Occupational Health

When used as part of an approved scheme, this material has the following certification:
- Low Flame Spread in accordance with EU Directive for Marine Equipment. Approved in accordance with parts 5 and 2 of Annex 1 of IMO 2010 FTP Code, or Parts 5 and 2 of Annex 1 of IMO FTPC when in compliance with IMO 2010 FTP Code Ch. 8

Consult your Jotun representative for details.

Additional certificates and approvals may be available on request.

### Other variants available

Jotamastic 90 Aluminium
Jotamastic 90 GF

Refer to separate TDS for each variant.

### Colours

black, white and according to Multicolor Industry tinting system (MCI)



This Technical Data Sheet supersedes those previously issued.
The Technical Data Sheet (TDS) is recommended to be read in conjunction with the Safety Data Sheet (SDS) and the Application Guide (AG) for this product. For your nearest local Jotun office, please visit our website at www.jotun.com

# Product data

| Property | Test/Standard | Description |
|---|---|---|
| **STANDARD GRADE** | | |
| Solids by volume | ISO 3233 | 80 ± 2 % |
| Gloss level (GU 60 °) | ISO 2813 | semi gloss (35-70) |
| Flash point | ISO 3679 Method 1 | 35 °C |
| Density | calculated | 1.4 kg/l |

| Region | Regulation | Test Standard | VOC Value |
|---|---|---|---|
| US | CARB(SCM)2020 / SCAQMD rule 1113 | Calculated | 234 g/l |
| Hong Kong | Air Pollution Control (VOC) Regulation | Calculated | 234 g/l |
| EU | European Paint Directive 2004/42/CE | Calculated | 234 g/l |
| EU IED | Industrial Emission Directive 2010/75/EU | Calculated | 234 g/l |
| Korea | Korea Clean Air Conservation Act | KS M ISO 11890-1 | 224 g/l |
| China | GB 30981-2020 Limit of harmful substances of industrial protective coatings | GB/T 23985-2009 8.3 | 243 g/l |

| | | |
|---|---|---|
| **WINTER GRADE** | | |
| Solids by volume | ISO 3233 | 80 ± 2 % |
| Flash point | ISO 3679 Method 1 | 36 °C |
| Density | calculated | 1.4 kg/l |

| Region | Regulation | Test Standard | VOC Value |
|---|---|---|---|
| US | CARB(SCM)2020 / SCAQMD rule 1113 | Calculated | 213 g/l |
| Hong Kong | Air Pollution Control (VOC) Regulation | Calculated | 213 g/l |
| EU | European Paint Directive 2004/42/CE | Calculated | 213 g/l |
| EU IED | Industrial Emission Directive 2010/75/EU | Calculated | 213 g/l |
| Korea | Korea Clean Air Conservation Act | KS M ISO 11890-1 | 232 g/l |
| China | GB 30981-2020 Limit of harmful substances of industrial protective coatings | GB/T 23985-2009 8.3 | 208 g/l |

The provided data is typical for factory produced products, subject to slight variation depending on colour.

Gloss description: According to Jotun Performance Coatings' definition.

Small colour variations may occur when changing between the two curing agents. If exposed to weathering without topcoat, the Wintergrade (WG) version will yellow at a faster rate than the same colour in Standard grade.

The VOC values refer to grey colour.



This Technical Data Sheet supersedes those previously issued.
The Technical Data Sheet (TDS) is recommended to be read in conjunction with the Safety Data Sheet (SDS) and the Application Guide (AG) for this product. For your nearest local Jotun office, please visit our website at www.jotun.com

# Film thickness per coat

**Typical recommended specification range**

**STANDARD GRADE**

| | | | | |
|---|---|---|---|---|
| Dry film thickness | 100 | - | 300 | µm |
| Wet film thickness | 125 | - | 375 | µm |
| Theoretical spreading rate | 8 | - | 2.7 | m²/l |

**WINTER GRADE**

| | | | | |
|---|---|---|---|---|
| Dry film thickness | 100 | - | 300 | µm |
| Wet film thickness | 125 | - | 375 | µm |
| Theoretical spreading rate | 8 | - | 2.7 | m²/l |

# Surface preparation

### Surface preparation summary table

| Substrate | Surface preparation | |
|---|---|---|
| | Minimum | Recommended |
| Carbon steel | St 2 (ISO 8501-1) | Sa 2 (ISO 8501-1) |
| Stainless steel | The surface shall be hand or machine abraded with non-metallic abrasives or bonded fibre machine or hand abrasive pads to impart a scratch pattern to the surface. | Abrasive blast cleaning to achieve a surface profile using non-metallic abrasive media which is suitable to achieve a sharp and angular surface profile. |
| Aluminium | The surface shall be hand or machine abraded with non-metallic abrasives or bonded fibre machine or hand abrasive pads to impart a scratch pattern to the surface. | Abrasive blast cleaning to achieve a surface profile using non-metallic abrasive media which is suitable to achieve a sharp and angular surface profile. |
| Galvanised steel | The surface shall be clean, dry and appear with a rough and dull profile. | Sweep blast-cleaning using non-metallic abrasive leaving a clean, rough and even pattern. |
| Shop primed steel | Clean, dry and undamaged shop primer (ISO 12944-4 5.4) | Sa 2 (ISO 8501-1) |
| Coated surfaces | Clean, dry and undamaged compatible coating | Clean, dry and undamaged compatible coating |
| Concrete | Low pressure water washing to a rough, clean, dry and laitance free surface. | Minimum 4 weeks curing. Moisture content maximum 5 %. Prepare the surface by means of enclosed blast shot or diamond grinding and other appropriate means to abrade the surrounding concrete and to remove laitance. |

Optimum performance, including adhesion, corrosion protection, heat resistance and chemical resistance is achieved with recommended surface preparation.



This Technical Data Sheet supersedes those previously issued.
The Technical Data Sheet (TDS) is recommended to be read in conjunction with the Safety Data Sheet (SDS) and the Application Guide (AG) for this product. For your nearest local Jotun office, please visit our website at www.jotun.com

# Application

## Application methods

The product can be applied by

| | |
|---|---|
| Spray: | Use airless spray. |
| Brush: | Recommended for stripe coating and small areas. Care must be taken to achieve the specified dry film thickness. |
| Roller: | May be used for small areas. Not recommended for first primer coat. Care must be taken to achieve the specified dry film thickness. |

## Product mixing ratio (by volume)

**STANDARD GRADE**

| | |
|---|---|
| Jotamastic 90 Comp A | 3.5 part(s) |
| Jotamastic 90 Standard Comp B | 1 part(s) |

**WINTER GRADE**

| | |
|---|---|
| Jotamastic 90 Comp A | 3.5 part(s) |
| Jotamastic 90 Wintergrade Comp B | 1 part(s) |

Independent on substrate temperature the minimum temperature of the mixed base and curing agent is 10 °C. Lower temperature may require additional thinner to reach correct application viscosity. Additional thinner gives lower sag resistance and slower curing. If addition of thinner is required, this shall be done after mixing of the two components.

## Thinner/Cleaning solvent

Thinner: Jotun Thinner No. 17

Thinning is not normally required. Consult the local representative for advice during application in extreme conditions. Do not thin more than allowed by local environmental legislation.

## Guiding data for airless spray

| | |
|---|---|
| Nozzle tip (inch/1000): | 19-25 |
| Pressure at nozzle (minimum): | 150 bar/2100 psi |

# Drying and Curing time

| Substrate temperature | -5 °C | 0 °C | 5 °C | 10 °C | 23 °C | 40 °C |
|---|---|---|---|---|---|---|
| **STANDARD GRADE** | | | | | | |
| Surface (touch) dry | | | 20 h | 12 h | 4 h | 1.5 h |
| Walk-on-dry | | | 40 h | 20 h | 6 h | 3 h |
| Dry to over coat, minimum | | | 30 h | 10 h | 3 h | 1.5 h |
| Dried/cured for service | | | 28 d | 14 d | 7 d | 2 d |



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| WINTER GRADE | | | | | |
|---|---|---|---|---|---|
| Surface (touch) dry | 24 h | 18 h | 12 h | 8 h | 3.5 h |
| Walk-on-dry | 72 h | 30 h | 20 h | 12 h | 4 h |
| Dry to over coat, minimum | 54 h | 20 h | 10 h | 6 h | 2 h |
| Dried/cured for service | 21 d | 14 d | 10 d | 5 d | 3 d |

For maximum overcoating intervals, refer to the Application Guide (AG) for this product.

Drying and curing times are determined under controlled temperatures and relative humidity below 85 %, and at average of the DFT range for the product.

Surface (touch) dry: The state of drying when slight pressure with a finger does not leave an imprint or reveal tackiness.

Walk-on-dry: Minimum time before the coating can tolerate normal foot traffic without permanent marks, imprints or other physical damage.

Dry to over coat, minimum: The recommended shortest time before the next coat can be applied.

Dried/cured for service: Minimum time before the coating can be permanently exposed to the intended environment/medium.

# Induction time and Pot life

| **Paint temperature** | **23 °C** |
|---|---|
| **STANDARD GRADE** | |
| Pot life | 2 h |
| **WINTER GRADE** | |
| Pot life | 45 min |

# Heat resistance

| | **Temperature** | |
|---|---|---|
| | **Continuous** | **Peak** |
| Dry, atmospheric | 90 °C | - |
| Immersed, sea water | 50 °C | 60 °C |
| Immersed, crude oil | 80 °C | 90 °C |

WINTER GRADE
Dry, atmospheric, continuous: 120 °C
Dry, atmospheric, Peak: -

Peak temperature duration max. 1 hour.

The temperatures listed relate to retention of protective properties. Aesthetic properties may suffer at these temperatures.

Note that the coating will be resistant to various immersion temperatures depending on the specific chemical and whether immersion is constant or intermittent. Heat resistance is influenced by the total coating system. If used as part of a system, ensure all coatings in the system have similar heat resistance.



This Technical Data Sheet supersedes those previously issued.
The Technical Data Sheet (TDS) is recommended to be read in conjunction with the Safety Data Sheet (SDS) and the Application Guide (AG) for this product. For your nearest local Jotun office, please visit our website at www.jotun.com

# Product compatibility

Depending on the actual exposure of the coating system, various primers and topcoats can be used in combination with this product. Some examples are shown below. Contact Jotun for specific system recommendation.

| | |
|---|---|
| Previous coat: | epoxy shop primer, inorganic zinc silicate shop primer, zinc epoxy, epoxy, epoxy mastic, inorganic zinc silicate |
| Subsequent coat: | polyurethane, polysiloxane, epoxy, acrylic, vinyl epoxy |

# Packaging (typical)

| | Volume (litres) | Size of containers (litres) |
|---|---|---|
| Jotamastic 90 Comp A | 3.55/15.6 | 5/20 |
| Jotamastic 90 Standard Comp B | 1/4.4 | 1/5 |
| Jotamastic 90 Wintergrade Comp B | 1/4.4 | 1/5 |

The volume stated is for factory made colours. Note that local variants in pack size and filled volumes can vary due to local regulations.

# Storage

The product must be stored in accordance with national regulations. Keep the containers in a dry, shaded, cool, well-ventilated space and away from sources of heat and ignition. Containers must be kept tightly closed. Handle with care.

## Shelf life at 23 °C

| | |
|---|---|
| Jotamastic 90 Comp A | 48 month(s) |
| Jotamastic 90 Standard Comp B | 24 month(s) |
| Jotamastic 90 Wintergrade Comp B | 24 month(s) |

In some markets commercial shelf life can be dictated shorter by local legislation. The above is minimum shelf life, thereafter the paint quality is subject to re-inspection.

# Green Building Standards

This product contributes to Green Building Standard credits by meeting the following specific requirements:

LEED®v4 (2013)
EQ credit: Low emitting materials
- Healthcare and schools, Exterior applied products: VOC content for Industrial Maintenance Coatings (250 g/l) (CARB(SCM)2007).
MR credit: Building product disclosure and optimization
- Material Ingredients, Option 2: Material Ingredient Optimization, International Alternative Compliance Path - REACH optimization: Fully inventoried chemical ingredients to 100 ppm and not containing substances on the REACH Authorization list – Annex XIV, the Restriction list – Annex XVII and the SVHC candidate list.
- Environmental Product Declarations. Product-specific Type III EPD (ISO 14025;21930, EN 15804).

BREEAM® International (2016)
- Mat 01: Product-specific Type III EPD (ISO 14025;21930, EN 15804).

BREEAM® International (2013)



This Technical Data Sheet supersedes those previously issued.
The Technical Data Sheet (TDS) is recommended to be read in conjunction with the Safety Data Sheet (SDS) and the Application Guide (AG) for this product. For your nearest local Jotun office, please visit our website at www.jotun.com

- Hea 02: VOC content for Binding Primers SB (750 g/l) (EU Directive 2004/42/CE).

The EPDs are available at www.epd-norge.no

## Caution

This product is for professional use only. The applicators and operators shall be trained, experienced and have the capability and equipment to mix/stir and apply the coatings correctly and according to Jotun's technical documentation. Applicators and operators shall use appropriate personal protection equipment when using this product. This guideline is given based on the current knowledge of the product. Any suggested deviation to suit the site conditions shall be forwarded to the responsible Jotun representative for approval before commencing the work.

## Health and safety

Please observe the precautionary notices displayed on the container. Use under well ventilated conditions. Do not inhale spray mist. Avoid skin contact. Spillage on the skin should immediately be removed with suitable cleanser, soap and water. Eyes should be well flushed with water and medical attention sought immediately.

## Colour variation

When applicable, products primarily meant for use as primers or antifoulings may have slight colour variations from batch to batch. Such products and epoxy based products used as a finish coat may chalk when exposed to sunlight and weathering.

Colour and gloss retention on topcoats/finish coats may vary depending on type of colour, exposure environment such as temperature, UV intensity etc., application quality and generic type of paint. Contact your local Jotun office for further information.

## Disclaimer

The information in this document is given to the best of Jotun's knowledge, based on laboratory testing and practical experience. Jotun's products are considered as semi-finished goods and as such, products are often used under conditions beyond Jotun's control. Jotun cannot guarantee anything but the quality of the product itself. Minor product variations may be implemented in order to comply with local requirements. Jotun reserves the right to change the given data without further notice.

Users should always consult Jotun for specific guidance on the general suitability of this product for their needs and specific application practices.

If there is any inconsistency between different language issues of this document, the English (United Kingdom) version will prevail.

# Hardtop XP

## Product description

This is a two component chemically curing aliphatic acrylic polyurethane coating. It has a glossy finish with very good gloss retention. It is a high solids product. The product has good application properties with low dry spray. To be used as topcoat in atmospheric environments.

### Typical use

Marine:
Recommended for topside, deck and superstructure.

Protective:
Recommended for offshore environments, refineries, power plants, bridges and buildings. Suitable for a wide range of industrial structures. Used as a topcoat in pre-qualified NORSOK systems.

### Approvals and certificates

This product contributes to the Green Buildings Standard credits. Please see section Green Building Standards.

Pre-qualified in accordance with NORSOK M-501 in selected systems
Grain, Newcastle Occupational Health
Food, Compliant with USA, FDA Title 21, Part 175.300 for dry solids

When used as part of an approved scheme, this material has the following certification:
- Low Flame Spread in accordance with EU Directive for Marine Equipment. Approved in accordance with parts 5 and 2 of Annex 1 of IMO 2010 FTP Code, or Parts 5 and 2 of Annex 1 of IMO FTPC when in compliance with IMO 2010 FTP Code Ch. 8

Consult your Jotun representative for details.

Additional certificates and approvals may be available on request.

### Other variants available

Hardtop XP Alu
Hardtop XPL
Hardtop XPF (Winter grade version)

Refer to separate TDS for each variant.

### Colours

according to colour card and Multicolor Industry tinting system (MCI)

## Product data

| Property | Test/Standard | Description |
|---|---|---|
| Solids by volume | ISO 3233 | 63 ± 2 % |
| Gloss level (GU 60 °) | ISO 2813 | gloss (70-85) |
| Flash point | ISO 3679 Method 1 | 30 °C |
| Density | calculated | 1.4 kg/l |



This Technical Data Sheet supersedes those previously issued.
The Technical Data Sheet (TDS) is recommended to be read in conjunction with the Safety Data Sheet (SDS) and the Application Guide (AG) for this product. For your nearest local Jotun office, please visit our website at www.jotun.com

| Region | Regulation | Test Standard | VOC Value |
|---|---|---|---|
| US | CARB(SCM)2020 / SCAQMD rule 1113 | Calculated | 320 g/l |
| Hong Kong | Air Pollution Control (VOC) Regulation | Calculated | 320 g/l |
| EU | European Paint Directive 2004/42/CE | Calculated | 320 g/l |
| EU IED | Industrial Emission Directive 2010/75/EU | Calculated | 320 g/l |
| Korea | Korea Clean Air Conservation Act | KS M ISO 11890-1 | 385 g/l |
| China | GB 30981-2020 Limit of harmful substances of industrial protective coatings | GB/T 23985-2009 8.3 | 330 g/l |

The provided data is typical for factory produced products, subject to slight variation depending on colour.

Gloss description: According to Jotun Performance Coatings' definition.

The VOC values refer to white colour.

# Film thickness per coat

**Typical recommended specification range**

| | | | | |
|---|---|---|---|---|
| Dry film thickness | 50 | - | 100 | µm |
| Wet film thickness | 80 | - | 160 | µm |
| Theoretical spreading rate | 12.6 | - | 6.3 | m²/l |

Bright colours may need film thickness in the high end of the recommended specification range to achieve opacity.

Special effect colours may have diverging specification range. Refer to the Application Guide (AG) for additional information or contact your nearest Jotun office.

# Surface preparation

### Surface preparation summary table

| Substrate | Surface preparation | |
|---|---|---|
| | Minimum | Recommended |
| Coated surfaces | Clean, dry and undamaged compatible coating | Clean, dry and undamaged compatible coating |

# Application



This Technical Data Sheet supersedes those previously issued.
The Technical Data Sheet (TDS) is recommended to be read in conjunction with the Safety Data Sheet (SDS) and the Application Guide (AG) for this product. For your nearest local Jotun office, please visit our website at www.jotun.com

## Application methods

The product can be applied by

| | |
|---|---|
| Spray: | Use air spray or airless spray. |
| Brush: | Recommended for stripe coating and small areas. Care must be taken to achieve the specified dry film thickness. |
| Roller: | May be used. Care must be taken to achieve the specified dry film thickness. |

## Product mixing ratio (by volume)

| | |
|---|---|
| Hardtop XP Comp A | 10 part(s) |
| Hardtop XP Comp B | 1 part(s) |

## Thinner/Cleaning solvent

Thinner: Jotun Thinner No. 10 / Jotun Thinner No. 26

Jotun Thinner No. 26 is supplied and used in USA due to legislation.

Jotun Thinner No 63 can be used for faster curing. Max addition; 5%. Please note that addition of Thinner No 63 will give reduced polife depending on ambient temperature.

## Guiding data for airless spray

| | |
|---|---|
| Nozzle tip (inch/1000): | 13-19 |
| Pressure at nozzle (minimum): | 150 bar/2100 psi |

## Guiding data for air spray

| | |
|---|---|
| Nozzle tip: | HVLP: 11-19 (inch/1000) / Pressure pot: 1.1-1.9 (mm) |
| Pressure at nozzle (minimum): | HVLP: 2.1 bar/30 psi / Pressure pot: 2.1 bar/30 psi |

# Drying and Curing time

| Substrate temperature | 5 °C | 10 °C | 23 °C | 40 °C |
|---|---|---|---|---|
| Surface (touch) dry | 16 h | 6 h | 3.5 h | 2 h |
| Walk-on-dry | 24 h | 14 h | 7 h | 4 h |
| Dry to over coat, minimum | 24 h | 14 h | 7 h | 4 h |
| Dried/cured for service | 21 d | 14 d | 7 d | 3 d |

For maximum overcoating intervals, refer to the Application Guide (AG) for this product.

Drying and curing times are determined under controlled temperatures and relative humidity below 85 %, and at average of the DFT range for the product.

Surface (touch) dry: The state of drying when slight pressure with a finger does not leave an imprint or reveal tackiness.

Walk-on-dry: Minimum time before the coating can tolerate normal foot traffic without permanent marks, imprints or other physical damage.



This Technical Data Sheet supersedes those previously issued.
The Technical Data Sheet (TDS) is recommended to be read in conjunction with the Safety Data Sheet (SDS) and the Application Guide (AG) for this product. For your nearest local Jotun office, please visit our website at www.jotun.com

Dry to over coat, minimum: The recommended shortest time before the next coat can be applied.

Dried/cured for service: Minimum time before the coating can be permanently exposed to the intended environment/medium.

## Induction time and Pot life

| Paint temperature | 23 °C | 40 °C |
|---|---|---|
| Pot life | 1.5 h | 50 min |

## Heat resistance

| | Temperature | |
|---|---|---|
| | Continuous | Peak |
| Dry, atmospheric | 120 °C | 140 °C |

Peak temperature duration max. 1 hour.

The temperatures listed relate to retention of protective properties. Aesthetic properties may suffer at these temperatures.

## Product compatibility

Depending on the actual exposure of the coating system, various primers and topcoats can be used in combination with this product. Some examples are shown below. Contact Jotun for specific system recommendation.

Previous coat: epoxy, zinc epoxy, epoxy mastic, polyurethane

## Packaging (typical)

| | Volume (litres) | Size of containers (litres) |
|---|---|---|
| Hardtop XP Comp A | 4.55 / 18.2 | 5 / 20 |
| Hardtop XP Comp B | 0.45 / 1.8 | 1 / 3 |

The volume stated is for factory made colours. Note that local variants in pack size and filled volumes can vary due to local regulations.

## Storage

The product must be stored in accordance with national regulations. Keep the containers in a dry, shaded, cool, well-ventilated space and away from sources of heat and ignition. Containers must be kept tightly closed. Handle with care.

### Shelf life at 23 °C



This Technical Data Sheet supersedes those previously issued.

The Technical Data Sheet (TDS) is recommended to be read in conjunction with the Safety Data Sheet (SDS) and the Application Guide (AG) for this product. For your nearest local Jotun office, please visit our website at www.jotun.com

| | |
|---|---|
| Hardtop XP Comp A | 48 month(s) |
| Hardtop XP Comp B | 48 month(s) |

In some markets commercial shelf life can be dictated shorter by local legislation. The above is minimum shelf life, thereafter the paint quality is subject to re-inspection.

## Green Building Standards

This product contributes to Green Building Standard credits by meeting the following specific requirements:

LEED®v4 (2013)
MR credit: Building product disclosure and optimization
- Material Ingredients, Option 2: Material Ingredient Optimization, International Alternative Compliance Path - REACH optimization: Fully inventoried chemical ingredients to 100 ppm and not containing substances on the REACH Authorization list – Annex XIV, the Restriction list – Annex XVII and the SVHC candidate list.
- Environmental Product Declarations. Product-specific Type III EPD (ISO 14025;21930, EN 15804).

BREEAM® International (2016)
- Mat 01: Product-specific Type III EPD (ISO 14025;21930, EN 15804).

BREEAM® International (2013)
- Hea 02: VOC content for Two-pack performance Coatings SB (500 g/l) (EU Directive 2004/42/CE).

The EPDs are available at www.epd-norge.no

## Caution

This product is for professional use only. The applicators and operators shall be trained, experienced and have the capability and equipment to mix/stir and apply the coatings correctly and according to Jotun's technical documentation. Applicators and operators shall use appropriate personal protection equipment when using this product. This guideline is given based on the current knowledge of the product. Any suggested deviation to suit the site conditions shall be forwarded to the responsible Jotun representative for approval before commencing the work.

## Health and safety

Please observe the precautionary notices displayed on the container. Use under well ventilated conditions. Do not inhale spray mist. Avoid skin contact. Spillage on the skin should immediately be removed with suitable cleanser, soap and water. Eyes should be well flushed with water and medical attention sought immediately.

## Colour variation

When applicable, products primarily meant for use as primers or antifoulings may have slight colour variations from batch to batch. Such products and epoxy based products used as a finish coat may chalk when exposed to sunlight and weathering.

Colour and gloss retention on topcoats/finish coats may vary depending on type of colour, exposure environment such as temperature, UV intensity etc., application quality and generic type of paint. Contact your local Jotun office for further information.

## Disclaimer

The information in this document is given to the best of Jotun's knowledge, based on laboratory testing and practical experience. Jotun's products are considered as semi-finished goods and as such, products are often used under conditions beyond Jotun's control. Jotun cannot guarantee anything but the quality of the product itself. Minor product variations may be implemented in order to comply with local requirements. Jotun reserves the right to change the given data without further notice.

Users should always consult Jotun for specific guidance on the general suitability of this product for their needs and specific application practices.

If there is any inconsistency between different language issues of this document, the English (United Kingdom) version will prevail.

# MANUFACTURER RECORD BOOK

# DAVIT CRANE Tag.no.X-99001

# 24-27012

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| 01 | First issue | CZB | MPU | 19/09/2024 |
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**Summary**


1 Scope ..... 4

2 Boom ..... 5

3 Column ..... 6

4 Pedestal ..... 7

5 Slewing Ring ..... 8

6 Trolley ..... 9

7 Winch Box ..... 10

8 Chassis Winch Carpentry ..... 11

9 Pin/Shaft/Wheel/Pulley ..... 12

10 Commercial items ..... 13

11 Certification List & Material Test Certificates ..... 14

12 Ndt Reports & dimensional ..... 15

13 Painting reports ..... 16

14 Test certificates ..... 17

## 1 Scope

The purpose of this document is to collect all information in one document for easy and quick reference.
The document is divided into main and commercial components.

| Client | Hull/Project | Society |
|---|---|---|
| ROSETTI MARINO | X-99001 | / |

The supplier included the following items:

| Order position | Equipment | Description | Q.ty | S/N |
|---|---|---|---|---|
| 001 | C09-0001 | DAVIT CRANE | 1 | 4366 |

## Main Items

### 2 Boom

| Part Number | Description | Rev | Q.ty | Assembly |
|---|---|---|---|---|
| C09-0001-P0004 | Boom | C | 1 | C09-0001-A0003 |

**MATERIAL**

| ID | Material | Description | Pos. | Qt.y | Heat/ID plate | Certificates 3.1 | Other mechanical test |
|---|---|---|---|---|---|---|---|
| 24T003 | S355J2+N | Sheet 8 mm | 1 | 2 | 487237 | 709265 5352 001 | N.A. |
| | | | 16 | 1 | | | |
| | | | 17 | 1 | | | |
| | | | 18 | 1 | | | |
| 24T169 | S355J2+N | Sheet 15 mm | 2 | 2 | Q20592 | HPL/TC/D/2010/18044 | N.A. |
| | | | 6 | 2 | | | |
| | | | 8 | 1 | | | |
| | | | 9 | 1 | | | |
| | | | 14 | 2 | | | |
| | | | 19 | 1 | | | |
| 20T409 | S355J2+N | Sheet 50 mm | 3 | 1 | P38608 | 20170910-PS-003-043 | N.A. |
| 24T194 | S355J2+N | Sheet 20 mm | 4 | 1 | P24134 | HPL/TC/D/2010/19363 | N.A. |
| | | | 5 | 1 | | | |
| 24T176 | S355J2+N | Sheet 12 mm | 10 | 2 | SU99873 | 230412-FP01KS-0011A1-0003 | N.A. |
| 21T018 | S355J2+N | Sheet 10 mm | 7 | 1 | 1628104 | 496293 | N.A. |
| | | | 11 | 2 | | | |
| | | | 13 | 1 | | | |
| | | | 15 | 1 | | | |
| | | | 20 | 1 | | | |
| | | | 21 | 1 | | | |
| | | | 22 | 1 | | | |
| 24C077 | S355J2+N | Sheet 6 mm | 12 | 1 | 410436 | 1003494977 | N.A. |
| 23C227 | S355J2+N | Sheet 5 mm | 24 | 1 | 730324314 | 730/0291248 | N.A. |
| 20T409 | S355J2+N | Round Bar 80mm / Sheet 5mm | 25 | 1 | P38608 | 20170910-PS-003-043 | N.A. |
| 19T081 | S355J2+N | Round Bar 60mm / Sheet 30mm | 26 | 4 | A1/02808469 | 107725 | N.A. |

**NDE TEST**

| ITP | NDE type | NDE operator | Certificates N. | Date |
|---|---|---|---|---|
| 4.06 | VT Welds | Michele Pellis | 274/24 | 14/10/2024 |
| 4.07 | MT Welds | Michele Pellis | 381/24 | 14/10/2024 |
| 1.02 | UT Plates | Michele Pellis | 370/24 | 14/10/2024 |

| DIMENSIONAL CHECK | | | PAINTING CHECK | | |
|---|---|---|---|---|---|
| ITP | Certificates N. | Date | ITP | Certificates N. | Date |
| 6.01 | DimAM001 | 18/10/2024 | 7.01 | 32/2024 | 22/10/2024 |

## 3 Column

| Part Number | Description | Rev | Q.ty | Assembly |
|---|---|---|---|---|
| C09-0001-P0002 | Column | E | 1 | C09-0001-A0006 |

**MATERIAL**

| ID | Material | Description | Pos. | Qt.y | Heat/ID plate | Certificates 3.1 | Other mechanical test |
|---|---|---|---|---|---|---|---|
| 16F.5953.01 | S355J2+N | Sheet 40 mm | 1 | 1 | 441908 | 16624400805 | N.A. |
| 24C.609.01 | | | 2 | 1 | 2461219 | 16624563335 | |
| 16F.6119.01/B<br>16F.6119.01/A | S355J2+N | Sheet 15 mm | 3 | 1 | 442151<br>442151 | 16624421397 | N.A. |
| | | | 4 | 1 | | | |
| | | | 5 | 1 | | | |
| | | | 8 | 1 | | | |
| | | | 9 | 3 | | | |
| | | | 10 | 1 | | | |
| 24R.366.02/A | S355J2+N | Sheet 10 mm | 6 | 4 | 2377353 | 16624421397 | N.A. |
| | | | 7 | 2 | | | |
| 712277111-400071315 | S355J2+N | Sheet 5 mm | 11 | 2 | 122771 | 664290 | N.A. |
| 8748646 | S355J2+N | Sheet 10 mm | 12 | 8 | 565503 | 5394/3016 | N.A. |
| 712277111-400071315 | S355J2+N | Sheet 5 mm | 13 | 5 | 122771 | 664290 | N.A. |
| 712277111-400071315 | S355J2+N | Sheet 5 mm | 14 | 4 | 122771 | 664290 | N.A. |
| 24LT004258 | S355J2+N | Sheet 30 mm | 15 | 1 | 322347 | 240000004290 | N.A. |
| 24LT004258 | S355J2+N | Sheet 30 mm | 16 | 4 | 322347 | 240000004290 | N.A. |

**NDE TEST**

| ITP | NDE type | NDE operator | Certificates N. | Date |
|---|---|---|---|---|
| 1.02 | UT plates | Michele Pellis | 380/24 | 28/10/2024 |
| 4.06 | VT Welds | Michele Pellis | 287/24 | 28/10/2024 |
| 4.06 | VT Welds | Davide Righetto | 1260/24 | 22/10/2024 |
| 4.07 | MT Welds | Michele Pellis | 392/24 | 28/10/2024 |
| 4.07 | MT Welds | Davide Righetto | 786/24 | 22/10/2024 |
| 4.08 | UT Welds | Michele Pellis | 379/24 | 28/10/2024 |
| 4.08 | UT Welds | Davide Righetto | 782/24 | 22/10/2024 |

| DIMENSIONAL CHECK | | | PAINTING CHECK | | |
|---|---|---|---|---|---|
| ITP | Certificates N. | Date | ITP | Certificates N. | Date |
| 6.01 | DimAM004 | 31/10/2024 | 7.01 | 40/2024 | 11/11/2024 |

## 4 Pedestal

| Part Number | Description | Rev | Q.ty | Assembly |
|---|---|---|---|---|
| C09-0001-P0001 | Pedestal Carpenry | D | 1 | C09-0001-A0006 |

**MATERIAL**

| ID | Material | Description | Pos. | Qt.y | Heat/ID plate | Certificates 3.1 | Other mechanical test |
|---|---|---|---|---|---|---|---|
| 24C.609.01 | S355J2+N | Sheet 40 mm | 1 | 1 | 2461219 | 16624563335 | N.A. |
| 24LT005170 | S355J2+N | Sheet 20 mm | 2 | 1 | 316829 | 240000005205 | N.A. |
| 8748646 | S355J2+N | Sheet 10 mm | 3 | 2 | 565503 | 5394/3016 | N.A. |
| 712277111-400071315 | S355J2+N | Sheet 5 mm | 4 | 2 | 122771 | 664290 | N.A. |
| | | | 6 | 2 | | | |
| 151872201 | S355J2+N | Sheet 8 mm | 5 | 1 | 180235 | 2022/002212/01 | N.A. |

**NDE TEST**

| ITP | NDE type | NDE operator | Certificates N. | Date |
|---|---|---|---|---|
| 4.06 | VT Welds | Michele Pellis | 272/24 | 14/10/2024 |
| 4.07 | MT Welds | Michele Pellis | 349/27 | 14/10/2024 |
| 4.08 | UT Welds | Michele Pellis | 371/24 | 14/10/2024 |
| 1.02 | UT Plates | Michele Pellis | 368/24 | 14/10/2024 |

**DIMENSIONAL CHECK**

| ITP | Certificates N. | Date |
|---|---|---|
| 6.01 | DimAM003 | 18/10/2024 |

**PAINTING CHECK**

| ITP | Certificates N. | Date |
|---|---|---|
| 7.01 | 31/2024 | 22/10/2024 |

## 5 Slewing Ring

| Part Number | Description | Rev | Q.ty | Assembly |
|---|---|---|---|---|
| V41-0979-013-COMM | Slewing Ring | 1 | 1 | C09-0001-A0003 |

**MATERIAL**

| ID | Material | Description | Pos. | Qt.y | Heat/ID plate | Certificates 3.1 | Other mechanical test |
|---|---|---|---|---|---|---|---|
| 001/001-003 | 42CrMo4 | Ring Ø979 | 1 | 1 | 145018/56A | 24/006307 | N.A. |
| 001/001-006 | 42CrMo4 | Ring Ø811 | 2 | 1 | 145018/56A | 24/006308 | N.A. |

**NDE TEST**

| ITP | NDE type | NDE operator | Certificates N. | Date |
|---|---|---|---|---|
| 2.02 | MT control | Simone Tengattini | 240413-001 mt001 | 14/11/2024 |
| 2.03 | UT control | Simone Tengattini | 240413-001 us001 | 28/10/2024 |

| DIMENSIONAL CHECK | | | PAINTING CHECK | | |
|---|---|---|---|---|---|
| ITP | Certificates N. | Date | ITP | Certificates N. | Date |
| 2.04 | 240413-001 d001 | 15/11/2024 | 7.01 | 240413-001 p001 | 21/11/2024 |

## 6 Trolley

| Part Number | Description | Rev | Q.ty | Assembly |
|---|---|---|---|---|
| C09-0001-P0006 | Trolley | D | 1 | C09-0004-A0005 |

**MATERIAL**

| ID | Material | Description | Pos. | Qt.y | Heat/ID plate | Certificates 3.1 | Other mechanical test |
|---|---|---|---|---|---|---|---|
| 19T081 | S355J2+N | Sheet 30 mm | 1 | 1 | A1/02808469 | 107725 | N.A. |
| 24T176 | S355J2+N | Sheet 12 mm | 2 | 4 | SU99873 | 230412-FP01KS-0011A1-0003 | N.A. |
| 24T169 | S355J2+N | Sheet 15 mm | 3 | 1 | Q20592 | HPL/TC/D/2010/18044 | N.A. |
| | | | 4 | 1 | | | |
| | | | 5 | 2 | | | |
| | | | 6 | 2 | | | |
| | | | 7 | 2 | | | |
| | | | 8 | 4 | | | |

**NDE TEST**

| ITP | NDE type | NDE operator | Certificates N. | Date |
|---|---|---|---|---|
| 4.06 | VT Welds | Michele Pellis | 273/24 | 14/10/2024 |
| 4.07 | MT Welds | Michele Pellis | 380/24 | 14/10/2024 |
| 1.02 | UT plates | Michele Pellis | 369/24 | 14/10/2024 |

**DIMENSIONAL CHECK**

| ITP | Certificates N. | Date |
|---|---|---|
| 6.01 | DimAM002 | 18/10/2024 |

**PAINTING CHECK**

| ITP | Certificates N. | Date |
|---|---|---|
| 7.01 | 32/2024 | 22/10/2024 |

## 7 Winch Box

| Part Number | Description | Rev | Q.ty | Assembly |
|---|---|---|---|---|
| C09-0001-P0085 | Winch Box | A | 1 | C09-0001-A0004 |

**MATERIAL**

| ID | Material | Description | Pos. | Qt.y | Heat/ID plate | Certificates 3.1 | Other mechanical test |
|---|---|---|---|---|---|---|---|
| 24P092 | S355J2+N | Sheet 21 mm (Pipe 279x35) | 1 | 1 | 1240905 | 1154/4 | N.A. |
| 24P093 | S355J2+N | Rod bar Ø 125 (Pipe 127x30) | 2 | 1 | 1241244 | 1253/3 | N.A. |
| L2403769 | S355J2+N | Sheet 15 mm | 3 | 2 | NLK-2466898 | 2440 | N.A. |
| L2403765 | S355J2+N | Sheet 20 mm | 4 | 1 | EUS/420526 | 2443 | UT PLATES |
| L2403765 | S355J2+N | Sheet 20 mm | 5 | 1 | EUS/420526 | 2443 | UT PLATES |

**NDE TEST**

| ITP | NDE type | NDE operator | Certificates N. | Date |
|---|---|---|---|---|
| 4.06 | VT Welds | Estevan Natale | 24-27012-004 | 14/11/2024 |
| 4.07 | MT Welds | Eric Marini | 445/24 | 18/11/2024 |

| DIMENSIONAL CHECK | | | PAINTING CHECK | | |
|---|---|---|---|---|---|
| ITP | Certificates N. | Date | ITP | Certificates N. | Date |
| 6.01 | DimAM005 | 18/11/2024 | 7.01 | 49/2024 | 22/11/2024 |

## 8 Chassis Winch Carpentry

| Part Number | Description | Rev | Q.ty | Assembly |
|---|---|---|---|---|
| C09-0001-P0005 | Chassis Winch Carpentry | A | 1 | C09-0001-A0004 |

**MATERIAL**

| ID | Material | Description | Pos. | Qt.y | Heat/ID plate | Certificates 3.1 | Other mechanical test |
|---|---|---|---|---|---|---|---|
| LNAA780802A | S355J2+N | Sheet 45 mm | 1 | 1 | LNAA78 | 619669 | UT PLATES |
| LA2403769 | S355J2+N | Sheet 15 mm | 2 | 1 | NLK-2466898 | 2440 | N.A. |
| | | | 3 | 1 | | | |
| | | | 5 | 1 | | | |
| | | | 6 | 1 | | | |
| L.S355.030.2450.GS | S355J2+N | Sheet 30 mm | 7 | 1 | SHA-2472001126 | 1347 | UT PLATES |
| 16F.71200.03 | S355J2+N | Sheet 25 mm | 4 | 2 | 340928 | 16624648524 | UT PLATES |

**NDE TEST**

| ITP | NDE type | NDE operator | Certificates N. | Date |
|---|---|---|---|---|
| 4.06 | VT Welds | Estevan Natale | 24-27012-003 | 14/11/2024 |
| 4.07 | MT Welds | Eric Marini | 443/24 | 18/11/2024 |
| 4.08 | UT Welds | Eric Marini | 445/24 | 18/11/2024 |

**DIMENSIONAL CHECK**

| ITP | Certificates N. | Date |
|---|---|---|
| 6.01 | DimAM006 | 18/11/2024 |

**PAINTING CHECK**

| ITP | Certificates N. | Date |
|---|---|---|
| 7.01 | 49/2024 | 22/11/2024 |

## 11 Certification List

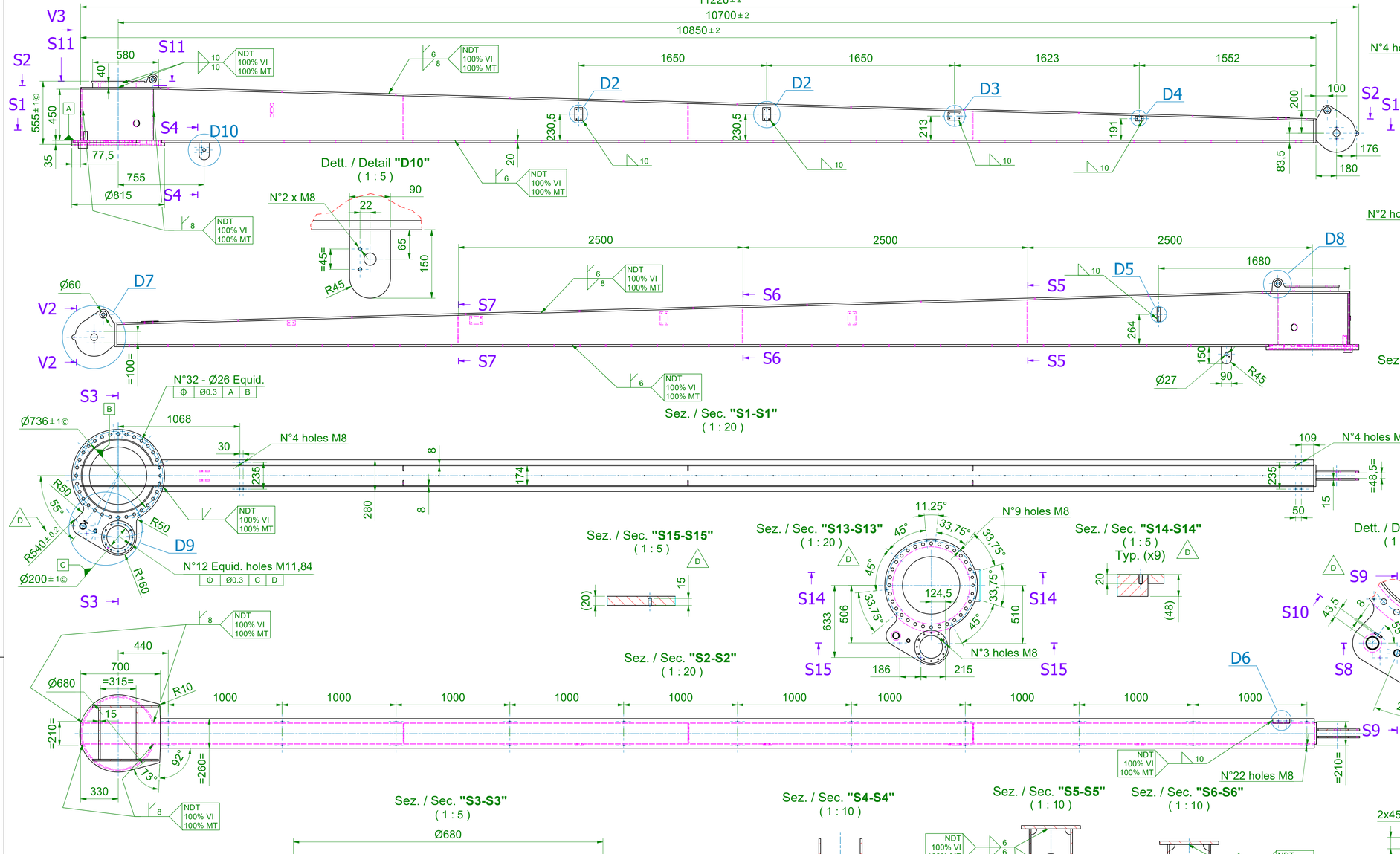
| REMAZEL | CERTIFICATION LIST | Certificate Nr.: 1<br>Date: 23/09/2024 |
|---|---|---|

| Final Customer: | Order Customer: | Object: | Description: | Quantity: | Inspection and Test Plan (ITP): | Our job: |
|---|---|---|---|---|---|---|
| ROSETTI MARINO | 24005170 | BOOM + TROLLEY | C09-0001-P0004 Rev.D & C09-0001-P0006 Rev.C | | 1724001010-QC-ITP-00002 | 24-27012 |

# MATERIAL

| Drawing | Pos. | Q.ty | Description | Material | Certificates 3.1 | Manufacturer | Heat/Plate ID | Additional Mechanical Test | UT Certificates | Nesting |
|---|---|---|---|---|---|---|---|---|---|---|
| C09-0001-P004_REV.C | 24 | 1 | Sheet 5 mm | S355 J2+N | 23C227 | 730/0291248 | 730324314 | | | |
| C09-0001-P004_REV.C | 12 | 1 | Sheet 6 mm | S355 J2+N | 24C077 | 1003494977 | 410436 | | | |
| C09-0001-P004_REV.C | 13 | 1 | Sheet 10 mm | S355 J2+N | 21T018 | 496293 | 1628104 | | | |
| C09-0001-P004_REV.C | 1 | 2 | Sheet 8mm | S355 J2+N | 24T003 | 709265 5352 001 | 487237 | | | L54439 |
| C09-0001-P004_REV.C | 16 | 1 | Sheet 8mm | S355 J2+N | 24T003 | 709265 5352 001 | 487237 | | | L54439 |
| C09-0001-P004_REV.C | 17 | 1 | Sheet 8mm | S355 J2+N | 24T003 | 709265 5352 001 | 487237 | | | L54439 |
| C09-0001-P004_REV.C | 18 | 1 | Sheet 8mm | S355 J2+N | 24T003 | 709265 5352 001 | 487237 | | | L54439 |
| C09-0001-P004_REV.C | 23 | 1 | Sheet 8mm | S355 J2+N | 24T003 | 709265 5352 001 | 487237 | | | L54439 |
| C09-0001-P004_REV.C | 11 | 2 | Sheet 10 mm | S355 J2+N | 21T018 | 496293 | 1628104 | | | |
| C09-0001-P004_REV.C | 20 | 1 | Sheet 10 mm | S355 J2+N | 21T018 | 496293 | 1628104 | | | |
| C09-0001-P004_REV.C | 21 | 1 | Sheet 10 mm | S355 J2+N | 21T018 | 496293 | 1628104 | | | |
| C09-0001-P004_REV.C | 10 | 2 | Sheet 12 mm | S355 J2+N | 24T176 | 230412-FP01KS-0011A1- | SU99873 | | | |
| C09-0001-P006_REV.A | 2 | 4 | Sheet 12 mm | S355 J2+N | 24T176 | 230412-FP01KS-0011A1- | SU99873 | | | |
| C09-0001-P004_REV.C | 2 | 2 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P004_REV.C | 6 | 2 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P004_REV.C | 8 | 1 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P004_REV.C | 9 | 1 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P004_REV.C | 19 | 1 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P004_REV.C | 14 | 2 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| C09-0001-P006_REV.A | 3 | 1 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P006_REV.A | 4 | 1 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P006_REV.A | 5 | 2 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P006_REV.A | 6 | 2 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P006_REV.A | 7 | 2 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P006_REV.A | 8 | 4 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P004_REV.C | 4 | 1 | Sheet 20mm | S355 J2+N | 24T194 | HPL/TC/D/2010/19363 | P24134 | | | L54435 |
| C09-0001-P004_REV.C | 5 | 1 | Sheet 20mm | S355 J2+N | 24T194 | HPL/TC/D/2010/19363 | P24134 | | | L54435 |
| C09-0001-P006_REV.A | 1 | 1 | Sheet 30mm | S355 J2+N | 19T081 | 107725 | A1/02808469 | | SGP | |
| C09-0001-P004_REV.C | 3 | 1 | Sheet 50mm | S355 J2+N | 20T409 | 20170910-PS-003-043 | P38608 | | SGP | L54436 |
| C09-0001-P004_REV.C | 7 | 1 | Sheet 10 mm | S355 J2+N | 21T018 | 496293 | 1628104 | | | |
| C09-0001-P004_REV.C | 15 | 1 | Sheet 10 mm | S355 J2+N | 21T018 | 496293 | 1628104 | | | |
| C09-0001-P004_REV.C | 22 | 1 | Sheet 10 mm | S355 J2+N | 21T018 | 496293 | 1628104 | | | |




| | | | | |
|---|---|---|---|---|
| 26 | Metal profile | Rod Bar Ø60 - S 355 J2+N UNI EN 10025_Cert. 3.1 | 4 | 0,62 kg |
| 25 | Metal profile | Rod Bar Ø80 - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 1,98 kg |
| 24 | Sheet metal | Thk = 5 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 0,6 kg |
| 23 | Sheet metal | Thk = 8 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 0,19 kg |
| 22 | Sheet metal | Thk = 10 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 28,73 kg |
| 21 | Sheet metal | Thk = 10 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 0,22 kg |
| 20 | Sheet metal | Thk = 10 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 0,63 kg |
| 19 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 310,65 kg |
| 18 | Sheet metal | Thk = 8 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 1,61 kg |
| 17 | Sheet metal | Thk = 8 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 2,13 kg |
| 16 | Sheet metal | Thk = 8 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 2,64 kg |
| 15 | Sheet metal | Thk = 10 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 6,23 kg |
| 14 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 2 | 2,14 kg |
| 13 | Sheet metal | Thk = 10 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 0,28 kg |
| 12 | Sheet metal | Thk = 6 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 0,17 kg |
| 11 | Sheet metal | Thk = 10 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 2 | 0,63 kg |
| 10 | Sheet metal | Thk = 12 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 2 | 1,14 kg |
| 9 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 16,82 kg |
| 8 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 47,62 kg |
| 7 | Sheet metal | Thk = 10 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 28,73 kg |
| 6 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 2 | 11,95 kg |
| 5 | Sheet metal | Thk = 20 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 6,27 kg |
| 4 | Sheet metal | Thk = 20 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 444,59 kg |
| 3 | Sheet metal | Thk = 50 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 176,16 kg |
| 2 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 2 | 3,11 kg |
| 1 | Sheet metal | Thk = 8 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 2 | 218,86 kg |
| EL. | DESCRIPTION | DESCRIPTION ADDITIONAL | Q.TY | WEIGHT |

**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 *Area* | 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. |

**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**

**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

**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

| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| D | 19/09/2024 | Aggiornamento Item 3 / Update Item 3 | riccardo.sobani | Sobani R. | De Fazio F. | – |
| C | 12/09/2024 | Aggiornamento BoM / Update BoM | riccardo.sobani | Sobani R. | De Fazio F. | – |
| B | 05/09/2024 | Aggiornamento Generale / General Update | riccardo.sobani | Sobani R. | De Fazio F. | – |
| A | 17/07/2024 | Prima emissione / First issued | riccardo.sobani | Sobani R. | De Fazio F. | – |

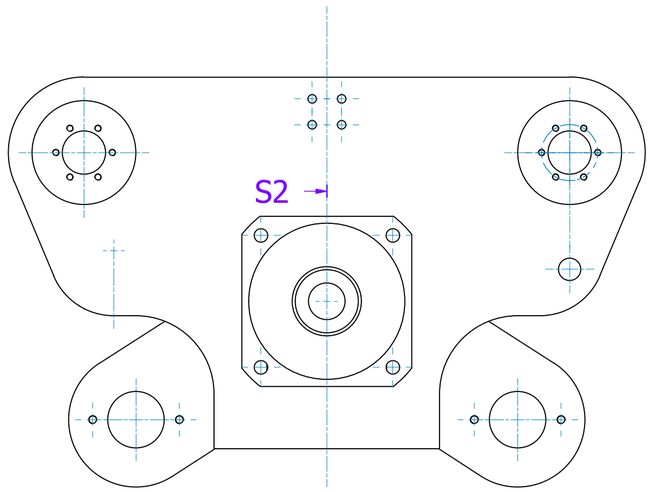

REMAZEL ENGINEERING
Chiuduno (BG) - 24060 - ITALY
Phone : +39-035-68.44.14 - Fax : +39-035-68.78.23
e-mail : info@remazel.com / website : www.remazel.com

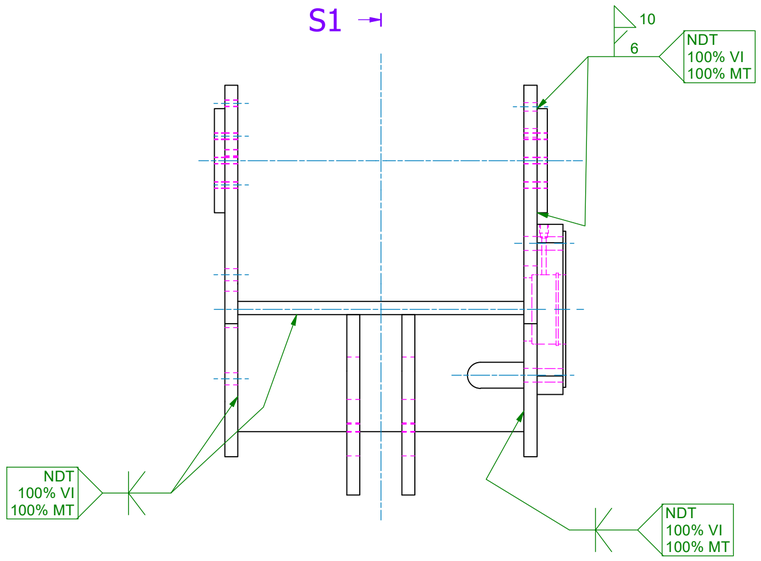

Drawing State: **Work in Progress** — **FOR CONSTRUCTION**
Q.C.L. : C1

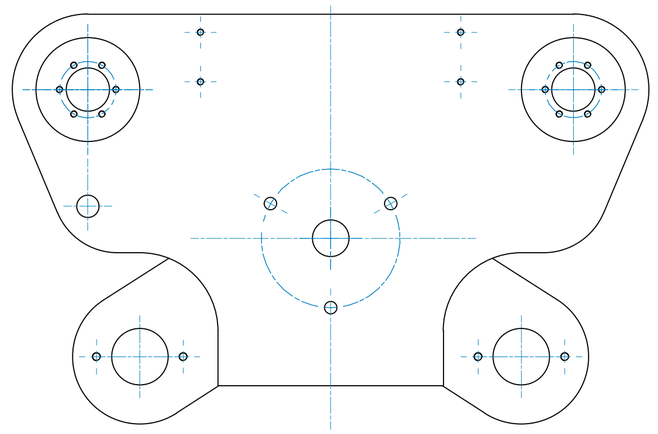
Project / Equipment : **C09-0001**
Weight : 1489,6 kg
Title : Carpenteria Braccio / Boom Carpentry
Scale : 1 : 20
Sheet : 1 of 4
A1
Drawing N° : C09-0001-P0004
Revision : D


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.

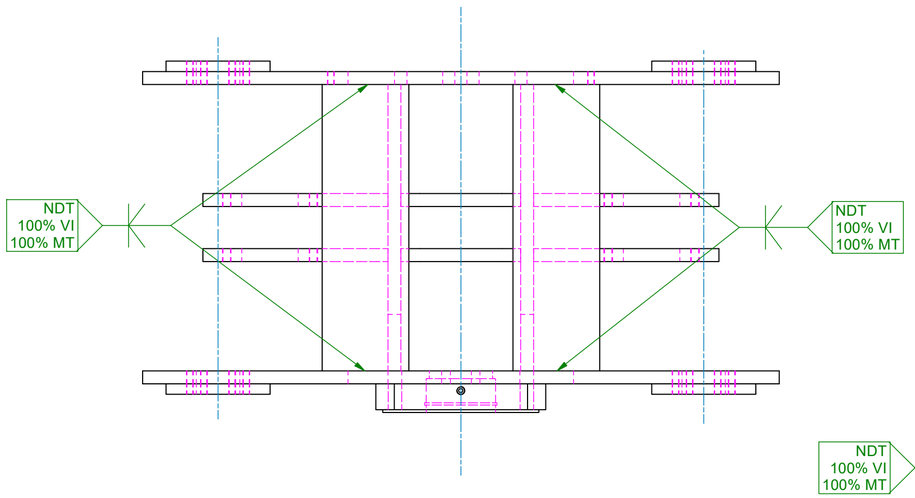
Vista da / View from **"S3"**
( 1 : 5 )



S2 →



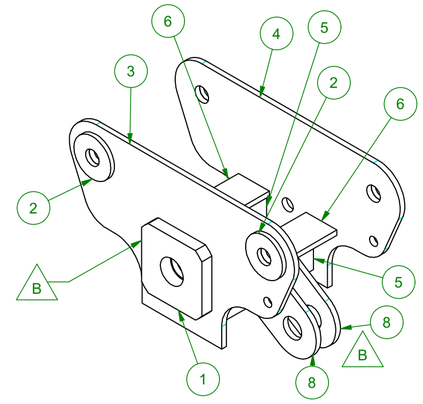

S1 →

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




Vista da / View from **"S1"**
( 1 : 5 )




| | | | | |
|---|---|---|---|---|
| 8 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 4 | 3,51 kg |
| 7 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 2 | 1,54 kg |
| 6 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 2 | 3,89 kg |
| 5 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 2 | 5,03 kg |
| 4 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 26,44 kg |
| 3 | Sheet metal | Thk = 15 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 26,15 kg |
| 2 | Sheet metal | Thk = 12 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 4 | 0,92 kg |
| 1 | Sheet metal | Thk = 33 mm - S 355 J2+N UNI EN 10025_Cert. 3.1 | 1 | 8,63 kg |
| EL. | DESCRIPTION | DESCRIPTION ADDITIONAL | Q.TY | WEIGHT |

Eliminare spigoli vivi
*Remove all edges*

**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. |

**SALDATURA CONTINUA**
*CONTINUOUS WELDING*

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

**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* |

**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**




| REV | DATE | DESCRIPTION | DRAFTMAN | DESIGNER | CALCULATION ENG. | P.E. |
|---|---|---|---|---|---|---|
| C | 08/10/2024 | Corretta lavorazione macchina Item 1 e aggiornamento controllo quote / Correct machining item1 and update check dimension | riccardo.sobani | Sobani R. | De Fazio F. | – |
| B | 04/10/2024 | Modificato foro Item 8 aggiunta lavorazione macchina Item 1 / Update Item 8 and add machining Item 1 | riccardo.sobani | Sobani R. | De Fazio F. | – |
| A | 05/09/2024 | Prima emissione / First issued | riccardo.sobani | Sobani R. | De Fazio F. | – |


GENERAL TOLERANCES ACCORDING TO ISO 2768-mK
WELDING ACCORDING TO ISO 5817 - CLASS C
PAINTING ACCORDING TO ISO 12944-5 - C3 - HIGH
SURFACE PREPARATION ACCORDING TO ISO 8501-1 - Sa 2½
SURFACE PREPARATION ACCORDING TO ISO 8501-3 - P3
Lavorazioni meccaniche secondo UNI EN ISO 13920 - classe C
Verniciatura secondo UNI EN ISO 12944-5 - C3 - Alta
Preparazione superficie secondo UNI EN ISO 8501-1 - Sa 2½
Preparazione superficie secondo UNI EN ISO 8501-3 - P3


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 :
98,0 kg

Title :
Carpenteria Carrello Traslazione
Traveling Trolley Carpentry

Scale :
1 : 5

Sheet :
1 of 2

**A2**

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

Q.C.L. :
C1

Drawing N° :
C09-0001-P0006

Revision :
C


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MAKSTIL
16 Makedonska Brigada 18,
1000 Skopje,
Republic of North Macedonia
www.makstil.com
A01

Customer A06: DUFERCO COMMERCIALE SPA
Customer's order no. A07: SO4201010862
Order No. / Lot No. A08 : / 5352
Manufacturer's symbol A04 ŻSK
Delivered conditions B04 NR - normalizing rolling

# INSPECTION CERTIFICATE No. 709265 5352 001

A02 A03

According to EN 10204 / 2004 : 3.1
Issued in electronic form

Technical delivery conditions B02 : EN 10025-2:2019; EN 10029:2010 cl.A; cl.N; EN 10163-1-2:2004 cl.A/1

FM ML.03.40

Pages : 1/ 1

Issued : 01.09.2021

## HOT ROLLED STEEL PLATES (B01) / CHEMICAL COMPOSITION

| Heat No. (B07) | Steel grade (B02) | Item no. (A07) | Pieces (B08) | Dimensions (mm) Thickness (B09) | Width (B10) | Length (B11) | Weight (kg) | C $10^{-2}$ % (C71) | Si $10^{-2}$ % (C72) | Mn $10^{-2}$ % (C73) | P $10^{-3}$ % (C74) | S $10^{-3}$ % (C75) | Al $10^{-3}$ % (C76) | N $10^{-3}$ % (C77) | Cr $10^{-2}$ % (C78) | Cu $10^{-2}$ % (C79) | Ni $10^{-2}$ % (C80) | Ti $10^{-3}$ % (C81) | V $10^{-3}$ % (C82) | Nb $10^{-3}$ % (C83) | Mo $10^{-3}$ % (C84) | B $10^{-4}$ % (C85) | Ca $10^{-4}$ % (C85) | CEV $10^{-2}$ % (C93) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 487179 | S355J2+N | 9 | 2 | 8.00 | 2500 | 12000 | 3840 | 16 | 21 | 105 | 15 | 10 | 46 | 8 | 9 | 36 | 10 | 1 | 1 | 1 | 1 | | | 39 |
| 487180 | " | 9 | 4 | 8.00 | 2500 | 12000 | 7680 | 17 | 20 | 106 | 17 | 10 | 36 | 7 | 16 | 36 | 10 | 1 | 1 | 1 | 1 | | | 41 |
| 487207 | " | 9 | 2 | 8.00 | 2500 | 12000 | 3840 | 20 | 23 | 106 | 11 | 7 | 45 | 8 | 13 | 31 | 10 | 1 | 1 | 1 | 1 | | | 43 |
| 487237 | " | 9 | 4 | 8.00 | 2500 | 12000 | 7680 | 17 | 30 | 110 | 20 | 4 | 38 | 7 | 17 | 37 | 12 | 1 | 1 | 1 | 1 | | | 42 |

**Total :** 12 23040 MANUFACTURING PROCESS: EAF C70

## PRODUCT IDENTIFICATION / TENSILE TEST / IMPACT TEST / SUPPLEMENTARY REQUIREMENTS

| Heat No. (B07) | Plate No. (B07) | Plate No. (B07) | Test No. (C00) | Location 2) (C01) | Direction 1) (C02) | Reh N/mm² (C11) | Rm N/mm² (C12) | A % (C13) | Direction 1) (C02) | Type (C40) | Individual values J 1 (C42) | 2 (C42) | 3 (C42) | Mean value J (C43) | At °C (C03) | Width of tests piece (C41) | Direction 1) (C02) | | (B03) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~487179~~ | ~~55612-01~~ | ~~55612-02~~ | 55612 | 1 | T | 408 | 541 | 28.9 | L | ISO-V | 124 | 128 | 123 | 125 | -20 | 10X8.0 | | | |
| ~~487180~~ | ~~55599-02~~ | ~~55600-01~~ | 55572 | 1 | T | 428 | 576 | 28.9 | L | ISO-V | 89 | 81 | 85 | 85 | -20 | 10X8.0 | | | |
| ~~"~~ | ~~55600-02~~ | ~~55601-02~~ | | | | | | | | | | | | | | | | | 56 |
| ~~487207~~ | ~~55576-01~~ | ~~55576-02~~ | 55569 | 1 | T | 419 | 563 | 28.9 | L | ISO-V | 132 | 130 | 124 | 129 | -20 | 10X8.0 | | | 09012024 |
| 487237 | ~~55602-01~~ | 55603-01 | 55602 | 1 | T | 422 | 573 | 28.9 | L | ISO-V | 99 | 92 | 101 | 97 | -20 | 10X8.0 | | | |
| " | ~~55604-01~~ | ~~55604-02~~ | 24T003 | | | | | | | | | | | | | | | | |

**Bend test** C50:

**Ultra-sonic test** D02 :

Visual and dimensional inspection : without objection
We hereby certify, that the delivered material complies with the terms of the order. Z01

1)Direction of the test piece : L - longitudinal; T - transverse; Z - in the thickness direction
2)Location of the test sample : 1 - top; 2 - bottom

**Die-stamp marking :**
**Makstil's symbol / Grade / Heat No. / Plate No./CS mark** B06

CE Z04
0036-CPR-M-02-2006
DoP No.302-CPR-01/07/2013

Q.D. 'MAKSTIL' A.D
QM.dip.eng I.BOGESKI A05

JOINT STOCK COMPANY FOR PRODUCTION AND TRADE WITH METALLURGICAL PRODUCTS MAKSTIL QA Skopje

RZ TECHNICAL CONTROL A.D. - SKOPJE
tech.manager dipl.Eng.E.Ugrinovska Z02

Certificazione valida per materiale fornitoVi con ns. DDT nr. C4001380 del 23/09/2024 relativo a:

PZ. 2 PARTICOLARE: C09-0001-P004_REV.C SP. 8mm POS. 1
PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 8mm POS. 16
PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 8mm POS. 17
PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 8mm POS. 18
PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 8mm POS. 23
RIF. VS. ORD. 24005170 DEL 11/09/2024 - RIF. VS. COMM. 24-27012

# ArcelorMittal Nippon Steel India Limited

HAZIRA - 394270, DIST.SURAT, GUJARAT, INDIA
CIN : U27100GJ1976FLC013787

## MILL TEST AND INSPECTION CERTIFICATE

Test Certificate No. : HPL/TC/D/2010/18044
Material Specification : EN 10025-2 : 2019 S355 J2+N
Sales Order No. : 2110090961

Date : 25.08.2023

M AND S GLOBAL INVESTMENTS SA,
VIA NASSA 29, 6900 LUGANO,
SWITZERLAND

WE CERTIFY THAT THE PLATES HAVE BEEN MANUFACTURED, INSPECTED AND TESTED IN ACCORANCE WITH THE REQUIEREMENT OF EN 10025-2 : 2019 S355 J2+N.

| Sr. No. | Plate No. | Heat No. | Size in mm T_W_L | Theoretical Weight (Mt.) | Mechanical Properties | | | | | | | | Chemical Analysis (%) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | YS | UTS | %EL | Impact in Joules at '-20°C' | | | | | | C# | Mn | S | P | Si | Cr | Ni | Cu | Ti | V | Nb | Mo | Al | N | Nb+V+Ti | CE *** |
| | | | | | MPa | MPa | GL= 5.65√S0 | 1 | 2 | 3 | Avg. | LA/ PA | 0.200 | 1.600 | 0.025 | 0.025 | 0.150-0.250 | ~ | ~ | 0.550 | 0.050 | 0.130 | 0.050 | ~ | 0.020 | 0.0120 | 0.200 | 0.450 | |
| | | | | | 355 Min * | 470-630 | 20 Min ** | 27 J Min | | | | | | Max | Max | Max | Max | | | | Max | Max | Max | Max | | Min | Max | Max | Max | |
| 173 | JV4162211D | Q20590 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Q20590 Total | | 84.780 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 174 | JV4091111D | Q20592 | 15_2500_12000 | 3.533 | 396 | 525 | 37 | 176 | 198 | 138 | 171 | LA | 0.175 | 1.295 | 0.002 | 0.011 | 0.191 | 0.026 | 0.046 | 0.040 | 0.002 | 0.047 | 0.004 | 0.005 | 0.037 | 0.0063 | 0.052 | 0.413 | | |
| 175 | JV4091112D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | PA | 0.171 | 1.300 | 0.001 | 0.011 | 0.190 | 0.026 | 0.049 | 0.037 | 0.003 | 0.049 | 0.004 | 0.007 | 0.035 | 0.0072 | 0.056 | 0.410 | | |
| 176 | JV4091211D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 177 | JV4092111D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 178 | JV4092211D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 179 | JV4092212D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 180 | JV4093111D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 181 | JV4093112D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 182 | JV4093113D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 183 | JV4101111D | Q20592 | 15_2500_12000 | 3.533 | 391 | 542 | 35 | 192 | 148 | 198 | 179 | | | | | | | | | | | | | | | | | | | |
| 184 | JV4101112D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 185 | JV4101113D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 186 | JV4103111D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 187 | JV4103112D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 188 | JV4103211D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 189 | JV4104111D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 190 | JV4104211D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 191 | JV4104212D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 192 | JV4105111D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 193 | JV4105211D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 194 | JV4105212D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 195 | JV4106111D | Q20592 | 15_2500_12000 | 3.533 | 431 | 544 | 32 | 182 | 162 | 196 | 180 | | | | | | | | | | | | | | | | | | | |
| 196 | JV4106112D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 197 | JV4106211D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 198 | JV4107111D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 199 | JV4107112D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 200 | JV4107113D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 201 | JV4108111D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 202 | JV4108112D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 203 | JV4108113D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 204 | JV4109111D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 205 | JV4109211D | Q20592 | 15_2500_12000 | 3.533 | 435 | 525 | 36 | 130 | 144 | 160 | 145 | | | | | | | | | | | | | | | | | | | |
| 206 | JV4109212D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 207 | JV4110111D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 208 | JV4110112D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 209 | JV4110211D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |

24T169

COPIA CONFORME ALL'ORIGINALE
IL PRESENTE CERTIFICATO VALE PER
LA QUANTITA' DEL NS. DDT 946 DEL 05/04/2024
SETAL S.P.A.

HS Code: 72085110
Place of Melting: INDIA, Facility: AM/NS INDIA
Place of Hot-rolling: INDIA, Facility: AM/NS INDIA

Authorised Signatory (Quality Assurance)
ArcelorMittal Nippon Steel India Limited

# ArcelorMittal Nippon Steel India Limited

HAZIRA - 394270, DIST.SURAT, GUJARAT, INDIA
CIN : U27100GJ1976FLC013787

## MILL TEST AND INSPECTION CERTIFICATE

CE 0045 ArcelorMittal Nippon Steel India Limited 06 0045-CPR-0978

Test Certificate No. : HPL/TC/D/2010/18044
Material Specification : EN 10025-2 : 2019 S355 J2+N
Sales Order No. : 2110090961

Date : 25.08.2023

M AND S GLOBAL INVESTMENTS SA,
VIA NASSA 29, 6900 LUGANO,
SWITZERLAND

WE CERTIFY THAT THE PLATES HAVE BEEN MANUFACTURED, INSPECTED AND TESTED IN ACCORANCE WITH THE REQUIEREMENT OF EN 10025-2 : 2019 S355 J2+N.

| Sr. No. | Plate No. | Heat No. | Size in mm T_W_L | Theoretical Weight (Mt.) | Mechanical Properties | | | | | | | | Chemical Analysis (%) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | YS | UTS | %EL | Impact in Joules at '-20°C' | | | | | LA/ PA | C# | Mn | S | P | Si | Cr | Ni | Cu | Ti | V | Nb | Mo | Al | N | Nb+V+Ti | CE *** |
| | | | | | MPa | MPa | GL= 5.65√S0 | 1 | 2 | 3 | Avg. | | 0.200 | 1.600 | 0.025 | 0.025 | 0.150-0.250 | ~ | ~ | 0.550 | 0.050 | 0.130 | 0.050 | ~ | 0.020 | 0.0120 | 0.200 | 0.450 | |
| | | | | | 355 Min * | 470-630 | 20 Min ** | 27 J Min | | | | | | Max | Max | Max | Max | | | | Max | Max | Max | Max | | Min | Max | Max | Max | |
| 312 | JV4175212D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 313 | JV4176111D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 314 | JV4176112D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 315 | JV4176211D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 316 | JV4190111D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 317 | JV4190211D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 318 | JV4190311D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 319 | JV4191111D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 320 | JV4191211D | R19261 | 20_2500_12000 | 4.710 | 436 | 545 | 33 | 196 | 174 | 176 | 182 | | | | | | | | | | | | | | | | | | | |
| 321 | JV4191212D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 322 | JV4316111D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 323 | JV4316211D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 324 | JV4317111D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 325 | JV4317211D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 326 | JV4317311D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 327 | JV4318111D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 328 | JV4318211D | R19261 | 20_2500_12000 | 4.710 | 401 | 553 | 31 | 180 | 160 | 160 | 167 | | | | | | | | | | | | | | | | | | | |
| 329 | JV4318212D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **R19261 Total** | | 122.460 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 330 | JV4111111D | R19262 | 15_2500_12000 | 3.533 | 429 | 534 | 37 | 180 | 132 | 146 | 153 | LA | 0.172 | 1.289 | 0.003 | 0.011 | 0.196 | 0.020 | 0.014 | 0.010 | 0.002 | 0.045 | 0.004 | 0.002 | 0.036 | 0.0060 | 0.051 | 0.402 | | |
| 331 | JV4111112D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | PA | 0.169 | 1.293 | 0.002 | 0.013 | 0.193 | 0.018 | 0.016 | 0.011 | 0.004 | 0.047 | 0.005 | 0.005 | 0.034 | 0.0069 | 0.056 | 0.400 | | |
| 332 | JV4111113D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 333 | JV4112111D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 334 | JV4112112D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 335 | JV4112211D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 336 | JV4113111D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 337 | JV4113211D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 338 | JV4113212D | R19262 | 15_2500_12000 | 3.533 | 403 | 539 | 36 | 142 | 186 | 182 | 170 | | | | | | | | | | | | | | | | | | | |
| 339 | JV4114111D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 340 | JV4114112D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 341 | JV4114113D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 342 | JV4115111D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 343 | JV4115112D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 344 | JV4115113D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 345 | JV4116111D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 346 | JV4116112D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 347 | JV4116113D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 348 | JV4117111D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |

COPIA CONFORME ALL'ORIGINALE

IL PRESENTE CERTIFICATO VALE PER

LA QUANTITA' DEL NS. DDT 946 DEL 05/04/2024

Authorised Signatory (Quality Assurance)
ArcelorMittal Nippon Steel India Limited
AMNSIL/QAC-PMP/05/F
www.amns.in

HS Code: 7 2 0 8 5 1 9 0

Place of Melting & Casting: INDIA, Facility: AM/NS INDIA
Place of Hot-rolling: INDIA, Facility: AM/NS INDIA

SETAL S.P.A.

# ArcelorMittal Nippon Steel India Limited

HAZIRA - 394270, DIST.SURAT, GUJARAT, INDIA
CIN : U27100GJ1976FLC013787

## MILL TEST AND INSPECTION CERTIFICATE

CE 0045 ArcelorMittal Nippon Steel India Limited DB 0045-CPR-0975

Test Certificate No. : HPL/TC/D/2010/18044
Material Specification : EN 10025-2 : 2019 S355 J2+N
Sales Order No. : 2110090961

Date : 25.08.2023

M AND S GLOBAL INVESTMENTS SA,
VIA NASSA 29, 6900 LUGANO,
SWITZERLAND

WE CERTIFY THAT THE PLATES HAVE BEEN MANUFACTURED, INSPECTED AND TESTED IN ACCORANCE WITH THE REQUIEREMENT OF EN 10025-2 : 2019 S355 J2+N.

| Sr. No. | Plate No. | Heat No. | Size in mm T_W_L | Theoretical Weight (Mt.) | Mechanical Properties | | | | | | | | Chemical Analysis (%) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | YS | UTS | %EL | Impact in Joules at '-20°C' | | | | | | C# | Mn | S | P | Si | Cr | Ni | Cu | Ti | V | Nb | Mo | Al | N | Nb+V+Ti | CE *** |
| | | | | | MPa | MPa | GL= 5.65√S0 | 1 | 2 | 3 | Avg. | LA/ PA | 0.200 | 1.600 | 0.025 | 0.025 | 0.150-0.250 | ~ | ~ | 0.550 | 0.050 | 0.130 | 0.050 | ~ | 0.020 | 0.0120 | 0.200 | 0.450 | | |
| | | | | | 355 Min * | 470-630 | 20 Min ** | 27 J Min | | | | | | Max | Max | Max | Max | | | | Max | Max | Max | Max | | Min | Max | Max | Max | | |
| | | **S21512 Total** | | 76.539 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 416 | JV4479000G | S21537 | 50_2500_12000 | 11.775 | 410 | 528 | 34 | 152 | 152 | 138 | 147 | LA | 0.180 | 1.373 | 0.002 | 0.015 | 0.219 | 0.027 | 0.025 | 0.023 | 0.003 | 0.055 | 0.004 | 0.006 | 0.034 | 0.0072 | 0.062 | 0.430 | | |
| 417 | JV4480000G | S21537 | 50_2500_12000 | 11.775 | | | | | | | | PA | 0.178 | 1.374 | 0.001 | 0.014 | 0.216 | 0.026 | 0.024 | 0.023 | 0.002 | 0.056 | 0.006 | 0.008 | 0.032 | 0.0081 | 0.064 | 0.428 | | |
| 418 | JV4481000G | S21537 | 50_2500_12000 | 11.775 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 419 | JV4482000G | S21537 | 50_2500_12000 | 11.775 | 403 | 521 | 35 | 172 | 136 | 152 | 153 | | | | | | | | | | | | | | | | | | | |
| 420 | JV4483000G | S21537 | 50_2500_12000 | 11.775 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 421 | JV4484000G | S21537 | 50_2500_12000 | 11.775 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 422 | JV4485000G | S21537 | 50_2500_12000 | 11.775 | 418 | 553 | 37 | 168 | 152 | 164 | 161 | | | | | | | | | | | | | | | | | | | |
| 423 | JV4486000G | S21537 | 50_2500_12000 | 11.775 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **S21537 Total** | | 94.200 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **Grand Total** | | **2322.277** | | | | | | | | | | | | | | | | | | | | | | | | | | |

Note: (1) Test Certificate conforms to EN 10204:2004 Type 3.1
(2) Material conforms to standard rolling & weight tolerance.
(3) Supply condition : Plates in Normalizing rolled and trimmed edge condition.
(4) Process Route : Hot Metal/ HBI - EAF/Conarc - LF (Fully Killed steel) - VD- CCM - RHF - Plate Rolling (Normalizing Rolling).
(5) Orientation of Tensile test Specimen is Transverse and Impact test specimen is Longitudinal to the rolling direction.
(6) Tensile specimen size : 10 mm dia round specimen for thickness >20mm & full thickness flat specimen for thickness ≤20mm. Impact specimen size : 10x10x55mm for thickness ≥11mm & 7.5x10x55mm for thickness 8mm to <11mm.
(7) * Requirement of YS is 355 MPa min for thickness ≤16mm, 345 MPa min for thickness >16mm to ≤40mm, 335 MPa min for >40 to ≤63mm thicknes & 325 MPa min for >63 to ≤80mm thickness
** Requirement of %EL is 20min for thickness >3mm to ≤40mm, 19min for thickness >40mm to ≤63mm & 18min for thickness >63mm to ≤80mm.
*** Requirement of CE is 0.450 max for thickness ≤30mm & 0.470 max for thickness >30mm.
# Requirement of %C is 0.200 max for thickness ≤40mm & 0.220 max for thickness >40mm.
(8) Surface condition as per EN 10163-2 : 2004 Class B Sub class 3. Reconditioning / Repair of plates by welding on steel not performed.
(9) Ultrasonic Test found satisfactory as per EN10160_CLASS_S1E1.
(10) Stencilling marking details : Manufacturer Name, Plate No, Heat No, Size, Specification, UT code, CE Marking. Low stress steel die stamping details: Plate No, Heat No, Specification.
(11) Tolerance on Thickness as per EN 10029 Class A. Flatness as per EN 10029 Class N Type L Table 4:2010 & Camber as per EN 10029:2010 (0.2% max of actual length of the plate).
(12) Durability : No performance determined
(13) Regulated Substance : No performance determined
(14) Intended uses : Hot rolled steel plates for Building Construction or Civil Engineering.

Legend: LA: Ladle Analysis(%), PA: Product Analysis(%), T-Thickness, W-Width, L-Length, CE: C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15.
HBI - Hot Briquetted Iron, EAF- Electric Arc Furnace, LF- Ladle Furnace, VD- Vacuum Degassing, CCM- Continuous Casting Mill, RHF- Reheating Furnace.

COPIA CONFORME ALL'ORIGINALE
IL PRESENTE CERTIFICATO VALE PER
LA QUANTITA' DEL NS. DDT 946 DEL 05/04/2024
SETAL S.P.A.

HS Code: 7 2 0 6 9 1 1 0
Place of Melting & Casting: INDIA, Facility: AM/NS INDIA
Place of Hot-rolling: INDIA, Facility: AM/NS INDIA

Authorised Signatory (Quality Assurance)
ArcelorMittal Nippon Steel India Limited

Certificazione valida per materiale fornitoVi con ns. DDT nr. C4001380 del 23/09/2024 relativo a:
PZ. 2 PARTICOLARE: C09-0001-P004_REV.C SP. 15mm POS. 2
PZ. 2 PARTICOLARE: C09-0001-P004_REV.C SP. 15mm POS. 6
PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 15mm POS. 8
PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 15mm POS. 9
PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 15mm POS. 19
PZ. 2 PARTICOLARE: C09-0001-P004_REV.C SP. 15mm POS. 14
PZ. 1 PARTICOLARE: C09-0001-P006_REV.A SP. 15mm POS. 3
PZ. 1 PARTICOLARE: C09-0001-P006_REV.A SP. 15mm POS. 4
PZ. 2 PARTICOLARE: C09-0001-P006_REV.A SP. 15mm POS. 5
PZ. 2 PARTICOLARE: C09-0001-P006_REV.A SP. 15mm POS. 6
PZ. 2 PARTICOLARE: C09-0001-P006_REV.A SP. 15mm POS. 7
PZ. 4 PARTICOLARE: C09-0001-P006_REV.A SP. 15mm POS. 8
RIF. VS. ORD. 2400177 DEL 11/09/2024 - RIF. VS. COMM. 24-27012

AM/NS INDIA

# DECLARATION OF PERFORMANCE

No: PM/CE/2016/02

Unique identification code of the product-type:
**Plate S355J2 / 1.0577**

1. Type, batch or serial number or any other element allowing identification of the construction product as required under Article 11(4):

   **Plate S355J2 / 1.0577 according to EN 10025-2**

2. Intended use or uses of the construction product, in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer:

   **Welded, bolted and riveted structures**

3. Name, registered trade name or registered trade mark and contact address of the manufacturer as required pursuant Article 11(5):

   **ArcelorMittal Nippon Steel India Limited**
   **Address: 27th KM, Surat-Hazira Road, Hazira, Surat, India - 394270**

4. Name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2):

   **Not applicable**

5. System or systems of assessment and verification of constancy of performance of the construction product as set out in Annex V:

   **System 2+**

6. In case of the declaration of performance concerning a construction product covered by a harmonised standard:

7. Notified body TUV NORD System GmbH & Co KG, Germany performed the initial inspection of the manufacturing plant and of factory production control and the continuous surveillance, assessment and evaluation of factory production control under system 2+ and issued the certificate of conformity of the factory production control with no 0045-CPR-0978.

AM/NS INDIA

8. Declared performance:

| Essential characteristic | | | Performance | | Harmonised techn. specification |
|---|---|---|---|---|---|
| Tolerances on dimensions / shape | Thickness | | EN 10029 | | EN 10025-1:2004 |
| | Flatness | | EN 10029 | | |
| Yield strength | Nominal thickness (mm) > | ≤ | Values min (MPa) | | |
| | | 16 | 355 | | |
| | 16 | 40 | 345 | | |
| | 40 | 63 | 335 | | |
| | 63 | 80 | 325 | | |
| | 80 | 100 | 315 | | |
| | 100 | 150 | 295 | | |
| Tensile strength | Nominal thickness (mm) > | ≤ | Values min (MPa) | max (MPa) | |
| | | 100 | 470 | 630 | |
| | 100 | 400 | 450 | 600 | |
| Elongation | Nominal thickness (mm) > | ≤ | Values min (%) | | |
| | | 40 | 20 | | |
| | 40 | 63 | 19 | | |
| | 63 | 150 | 18 | | |
| | 150 | 400 | 17 | | |
| Impact strength | Nominal thickness (mm) > | ≤ | Values min (J) | | |
| | | 400 | 27 at -20°C | | |
| Weldability | Nominal thickness (mm) > | ≤ | Values max (CEV, %) | | |
| | | 40 | 0,43 | | |
| | 40 | 100 | 0,45 | | |
| Durability (chemical composition) | Nominal thickness (mm) > | ≤ | | min (%) | max (%) |
| | | 30 | C | | 0,20 |
| | | | Si | | 0,55 |
| | | | Mn | | 1,60 |
| | | | P | | 0,025 |
| | | | S | | 0,025 |
| | | | Cu | | 0,55 |
| | 30 | 400 | C | | 0,22 |
| | | | Si | | 0,55 |
| | | | Mn | | 1,60 |
| | | | P | | 0,025 |
| | | | S | | 0,025 |
| | | | Cu | | 0,55 |

9. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 8.

This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 3.
Signed for and on behalf of the manufacturer by:

Sumanta Dasgupta

(Quality Assurance)

Hazira-Surat, Date: 19.07.2023

PM/CE/2016/02

DUFERCO COMMERCIALE S.p.A.
COPIA CONFORME ALL'ORIGINALE

# 검 사 증 명 서
# MILL TEST CERTIFICATE

HYUNDAI STEEL
0038/07
당진제철소 : 충남 당진시 송악읍 북부산업로 1480
1480 Bukbusanup-Ro, Songak-Eup, Dangjin-Si, Chungnam, Korea

주문번호 Order No. : E170700075
품 명 Commodity : Hot Rolled Steel Plate
제품규격 Specification : EN 10025-2 S355J2+N
고객사 Customer : DUFERCO S.A.
주문자 Contractor : DUFERCO S.A.
증명서 번호 Certificate No. : 20170910-PS-003-043
발행일자 Date of Issue : 2017-09-28

| 제품치수 Dimension | 수량 Quantity | 중량 Weight (Kg) | 제강번호 Heat No. | 제품번호 Product No. | Position | 인장시험 Tensile Test YP (N/㎟) | TS | EL (%) | YP-EL (%) | RA (%) | YR (%) | YP Mtd | 충격시험 Impact Test V Notch -20.0℃ Energy (Joule) | SF (%) | LE (㎜) | Division | 화학성분 Chemical Composition(%) C | Si | Mn | P | S | Cr | Ni | Cu | Mo | Nb | Ti | V | CEQ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | 단위 Unit 2:x100 3:x1,000 4:x10,000 5:x100,000 | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | 4 | 3 | 3 | 4 | 4 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| 50 x 2000 x 6000 | 1 | 4,710 | P38608 | FA86078702 | T | 409.9 | 566.7 | 29 | | | | U | 1: 198 | | | L | 1,630 | 195 | 1,347 | 138 | 27 | 3 | 13 | 130 | 0 | 44 | 2 | 19 | 415 |
| | | | | | | | | | 20T409 | | | | 2: 212 | | | C | 1,598 | 200 | 1,376 | 141 | 22 | 3 | 12 | 132 | 0 | 45 | 2 | 20 | 416 |
| | | | | | | | | | | | | | 3: 188 | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | A: 199 | | | | | | | | | | | | | | | | |
| 50 x 2000 x 6000 | 1 | 4,710 | P39453 | FA86631101 | T | 404.8 | 522.1 | 27 | | | | U | 1: 299 | | | L | 1,089 | 177 | 1,492 | 109 | 36 | 3 | 9 | 82 | 0 | 31 | 15 | 2 | 375 |
| | | | | | | | | | | | | | 2: 286 | | | C | 1,084 | 181 | 1,493 | 114 | 35 | 2 | 8 | 83 | 0 | 30 | 16 | 1 | 372 |
| | | | | | | | | | | | | | 3: 296 | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | A: 294 | | | | | | | | | | | | | | | | |
| 50 x 2000 x 6000 | 1 | 4,710 | P39453 | FA86631102 | T | 404.8 | 522.1 | 27 | | | | U | 1: 299 | | | L | 1,089 | 177 | 1,492 | 109 | 36 | 3 | 9 | 82 | 0 | 31 | 15 | 2 | 375 |
| | | | | | | | | | | | | | 2: 286 | | | C | 1,084 | 181 | 1,493 | 114 | 35 | 2 | 8 | 83 | 0 | 30 | 16 | 1 | 372 |
| | | | | | | | | | | | | | 3: 296 | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | A: 294 | | | | | | | | | | | | | | | | |
| 50 x 2000 x 6000 | 1 | 4,710 | P39453 | FA86631103 | T | 404.8 | 522.1 | 27 | | | | U | 1: 299 | | | L | 1,089 | 177 | 1,492 | 109 | 36 | 3 | 9 | 82 | 0 | 31 | 15 | 2 | 375 |
| | | | | | | | | | | | | | 2: 286 | | | C | 1,084 | 181 | 1,493 | 114 | 35 | 2 | 8 | 83 | 0 | 30 | 16 | 1 | 372 |
| | | | | | | | | | | | | | 3: 296 | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | A: 294 | | | | | | | | | | | | | | | | |

NOTE
* Position – T:Top, M:Middle, B:Bottom
* Tensile test – Direction:Transverse, Gauge length:5.65√A。(Round), YP Mtd : 2 (0.2% off-set),5 (0.5% underload), U (Upper yield point), L (Lower yield point)
* Impact test – Direction:Longitudinal, Size:10mmX10mm, SF:Shear fracture, LE:Lateral Expansion
* Division – C:Check analysis, L:Ladle analysis

* THIS CERTIFICATE IS ISSUED ACCORDING TO EN 10204 3.1 AD2000W0(W1)
This Mill Test Certificate is issued in accordance with EN 10204 Type 3.1

상기의 제품은 검사의 결과 주문요구사항과 지정된 규격에 합격한 것을 증명합니다.
WE HEREBY CERTIFY THAT THE MATERIAL HEREIN HAS BEEN MADE AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF ORDER AND SPECIFICATION

Signature S. B. Park
Chief Of Quality Assurance Team


* 본 검사증명서는 원본인 전자문서(전자서명 정보 포함)로부터 출력된 사본입니다. 전자문서의 내용은 현대제철 고객포탈에서 확인하실 수 있습니다.(http://sm.hyundai-steel.com/cs/cm/login.jsp)
* This Mill Test Certificate is a copy that has been printed from original electronic document(with digital signing).
You are able to check an original electronic document at hyundaisteel's customer portal.( http://sm.hyundai-steel.com/cs/cm/login.jsp) * QRcode scanner App : 'QReal'
* [사용상 주의사항] 본 검사증명서에 명기된 규격 외 사용시 제품손상 및 안전상 문제가 발생할 수 있습니다.
* [Caution for Use] Damage on products and safety problems may arise if used other than to the spec stated in this Mill Test Certification.

DUFERCO COMMERCIALE S.p.A.
COPIA CONFORME ALL'ORIGINALE

# 검 사 증 명 서
# MILL TEST CERTIFICATE

HYUNDAI STEEL
0038/07 당진제철소 : 충남 당진시 송악읍 북부산업로 1480
1480 Bulbusanup-Ro, Songak-Eup, Dangjin-Si, Chungnam, Korea

주문번호 Order No. : E170700075
품 명 Commodity : Hot Rolled Steel Plate
제품규격 Specification : EN 10025-2 S355J2+N
고객사 Customer : DUFERCO S.A.
주문자 Contractor : DUFERCO S.A.
증명서 번호 Certificate No. : 20170910-PS-003-044
발행일자 Date of Issue : 2017-09-28

| 제품치수 Dimension | 수량 Quantity | 중량 Weight (Kg) | 제강번호 Heat No. | 제품번호 Product No. | Position | 인장시험 Tensile Test YP (N/mm²) | TS (N/mm²) | EL (%) | YP-EL (%) | RA (%) | YR (%) | YP Mtd | 충격시험 Impact Test V Notch -20.0 'C Energy (Joule) | SF (%) | LE (mm) | Division | C | Si | Mn | P | S | Cr | Ni | Cu | Mo | Nb | Ti | V | CEQ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | 4 | 3 | 3 | 4 | 4 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| 50 x 2000 x 6000 | 1 | 4,710 | P39449 | FA86631201 | T | 397.6 | 513.0 | 27 | | | | U | 1: 313 | | | L | 1,165 | 183 | 1,469 | 112 | 36 | 2 | 8 | 95 | 1 | 29 | 13 | 1 | 379 |
| | | | | | | | | | | | | | 2: 308 | | | C | 1,194 | 179 | 1,438 | 98 | 30 | 3 | 9 | 98 | 0 | 28 | 13 | 1 | 378 |
| | | | | | | | | | | | | | 3: 293 | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | A: 305 | | | | | | | | | | | | | | | | |
| 50 x 2000 x 6000 | 1 | 4,710 | P39449 | FA86631202 | T | 397.6 | 513.0 | 27 | | | | U | 1: 313 | | | L | 1,165 | 183 | 1,469 | 112 | 36 | 2 | 8 | 95 | 1 | 29 | 13 | 1 | 379 |
| | | | | | | | | | | | | | 2: 308 | | | C | 1,194 | 179 | 1,438 | 98 | 30 | 3 | 9 | 98 | 0 | 28 | 13 | 1 | 378 |
| | | | | | | | | | | | | | 3: 293 | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | A: 305 | | | | | | | | | | | | | | | | |

*** Sub Total(030) *** 6 28,260(Kg)

*** Condition of supply : Controlled Rolling (Normalzing Rolling).

Certificazione valida per materiale fornitoVi con ns. DDT nr. C4001381 del 23/09/2024 relativo a:

PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 50mm POS. 25
RIF. VS. ORD. 24005228 DEL 11/09/2024
RIF. VS. COMM. 24-27012

NOTE
- Position - T:Top, M:Middle, B:Bottom
- Tensile test - Direction:Transverse, Gauge length:5.65√A, (Round), YP Mtd : 2 (0.2% off-set),5 (0.5% underload), U (Upper yield point), L (Lower yield point)
- Impact test - Direction:Longitudinal, Size:10mmX10mm, SF:Shear fracture, LE:Lateral Expansion
- Division - C:Check analysis, L:Ladle analysis

- THIS CERTIFICATE IS ISSUED ACCORDING TO EN 10204 3.1 AD2000W0(W1)
This Mill Test Certificate is issued in accordance with EN 10204 Type 3.1

상기의 제품은 검사의 결과 주문요구사항과 지정된 규격에 합격한 것을 증명합니다.
WE HEREBY CERTIFY THAT THE MATERIAL HEREIN HAS BEEN MADE AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF ORDER AND SPECIFICATION

Signature S. B. Park
Chief Of Quality Assurance Team

* 본 검사증명서는 원본인 전자문서(전자서명 정보 포함)로부터 출력된 사본입니다. 전자문서의 내용은 현대제철 고객포탈에서 확인하실 수 있습니다.(http://sm.hyundai-steel.com/cs/cm/login.jsp)
* This Mill Test Certificate is a copy that has been printed from original electronic document(with digital signing).
You are able to check an original electronic document at hyundaisteel's customer portal( http://sm.hyundai-steel.com/cs/cm/login.jsp) * QRcode scanner App : 'QReal'
* [사용상 주의사항] 본 검사증명서에 명기된 규격 외 사용시 제품손상 및 안전상 문제가 발생할 수 있습니다.
* [Caution for Use] Damage on products and safety problems may arise if used other than to the spec stated in this Mill Test Certification.

원디렉/품번해외영림/2017-09-26 09:21 * 로 문서는 영대제철 정보자산입니다. 무단 전재배포만을할 수 없습니다.

HYUNDAI STEEL

## Declaration of Performance
(according to regulation EU No 305/2011)

DoP No. S355J2+N – 20170405 – PI – 001
SO No. 1101096066

**Plate S355J2+N / 1.0577 according EN 10025-2**

To be used for building constructions or civil engineering

HYUNDAI STEEL COMPANY
Dangjin Works
1480, Bukbusanupro,
Songak-eup, Dangjin-si,
Chungcheongnam-do, KOREA
Tel: +82 (41) 680 - 1681
Website : www.hyundai-steel.com

CE Marking Notified Body
Lloyds Register Verification Limited
71 Fenchurch Street, London, EC3M 4BS
Tel :+44 (0)207 423 2428
Email : ecdirectives@lr.org
Website : www.lr.org

System of assessment and verification of constancy of performance of the product
System 2+

Notified factory production control certification body No. 0038 performed the initial inspection of the manufacturing plant and of factory production control and the continuous surveillance, assessment, and evaluation of factory production control and issued the certificate of conformity of the factory production control

S. B. Park

S. B. Park – Manager, Quality Assurance team
HYUNDAI STEEL COMPANY

5TH, APR. 2017
Date

| Essential characteristic | Performance | | | | Harmonised technical specification |
|---|---|---|---|---|---|
| Tolerances on dimensions and shape | Dimensions<br>Flatness | | EN 10029<br>EN 10029 | | EN10025-1 2004 |
| Yield strength (transverse) | Nominal thickness (mm) | | Values Min (MPa) | | |
| | > | <= | | | |
| | - | 16 | 355 | | |
| | 16 | 40 | 345 | | |
| | 40 | 63 | 335 | | |
| | 63 | 80 | 325 | | |
| | 80 | 100 | 315 | | |
| | 100 | 150 | 295 | | |
| Tensile strength (transverse) | Nominal thickness (mm) | | Values (MPa) | | |
| | > | <= | Min | Max | |
| | - | 3 | 510 | 680 | |
| | 3 | 100 | 470 | 630 | |
| | 100 | 150 | 450 | 600 | |
| Elongation (transverse) | Nominal thickness (mm) | | Values min (%, 5.65√So) | | |
| | > | <= | | | |
| | 3 | 40 | 20 | | |
| | 40 | 63 | 19 | | |
| | 63 | 100 | 18 | | |
| | 100 | 150 | 18 | | |
| Impact strength (longitudinal) | J0 | | 27J at - 20°C | | |
| Weldability CEV | Nominal thickness (mm) | | Value max (%) | | |
| | > | <= | | | |
| | - | 30 | 0,45 | | |
| | 30 | 40 | 0,47 | | |
| | 40 | 150 | 0,47 | | |
| Durability | Nominal thickness (mm) | | Values max (%) | | |
| | - | 40 | C 0,20<br>Si: 0,55<br>Mn: 1,60<br>P: 0,025<br>S: 0,025<br>Cu: 0,55 | | |
| | 40 | - | C 0,22<br>Si: 0,55<br>Mn: 1,60<br>P: 0,025<br>S: 0,025<br>Cu: 0,55 | | |

CE

0038

HYUNDAI STEEL COMPANY
Dangjin Works
1480, Bukbusanupro,
Songak-eup, Dangjin-si,
Chungcheongnam-do, KOREA

07

Hot Rolled Steel Plate S355J2+N

EN 10025-1 – 2004

Hot Rolled Steel Plate S355J2+N / 1.0577

To be used for building constructions or civil engineering

Tolerances on dimensions : Plate EN10029
Elongation :
Tensile Strength :
Yield Strength : EN10025-2
Impact Strength :
Weldability :
Durability :

Dangerous Substances : No Performance Determined

HYUNDAI STEEL COMPANY

# ArcelorMittal Nippon Steel India Limited

HAZIRA - 394270, DIST.SURAT, GUJARAT, INDIA
CIN : U27100GJ1976FLC013787

## MILL TEST AND INSPECTION CERTIFICATE

Test Certificate No. : HPL/TC/D/2010/19363
Material Specification : EN 10025-2 : 2019 S355 J2+N & AD2000 Merkblatt W1
Sales Order No. : 2110094902

Date : 27.01.2024

SEAWAY SRL,
VIA TRIESTE 90-A, RAVENNA, ITALY

WE CERTIFY THAT THE PLATES HAVE BEEN MANUFACTURED, INSPECTED AND TESTED IN ACCORANCE WITH THE REQUIEREMENT OF EN 10025-2 : 2019 S355 J2+N.

| Sr. No. | Plate No. | Heat No. | Size in mm T_W_L | Theoretical Weight (Mt.) | Mechanical Properties | | | | | | | | Chemical Analysis (%) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | YS | UTS | %EL | Bend | Impact in Joules at '-20°C' | | | | LA/PA | C*** | Mn | S | P | Si | Cr | Ni | Cu | Ti | V | Nb | Mo | Al | N | Nb+V+Ti | CE |
| | | | | | MPa | MPa | GL= 5.65√S0 | M.R.= 2.0T | 1 | 2 | 3 | Avg. | | 0.200 | 1.600 | 0.025 | 0.025 | 0.150-0.250 | - | - | 0.550 | 0.050 | 0.130 | 0.050 | - | 0.020 | - | 0.200 | 0.430 |
| | | | | | 355 Min * | 470-630 | 20 Min ** | 180° | 27 J Min | | | | | Max | Max | Max | Max | | | | Max | Max | Max | Max | | Min | | Max | Max |
| 1 | PN1554111D | P24105 | 20_2500_12000 | 4.710 | 401 | 566 | 29 | OK | 184 | 136 | 178 | 166 | LA | 0.171 | 1.296 | 0.001 | 0.011 | 0.205 | 0.016 | 0.005 | 0.005 | 0.003 | 0.049 | 0.002 | 0.000 | 0.033 | 0.0069 | 0.054 | 0.400 |
| 2 | PN1554112D | P24105 | 20_2500_12000 | 4.710 | | | | | | | | | PA | 0.166 | 1.299 | 0.001 | 0.012 | 0.203 | 0.017 | 0.007 | 0.002 | 0.002 | 0.051 | 0.001 | 0.000 | 0.032 | 0.0082 | 0.054 | 0.397 |
| 3 | PN1554113D | P24105 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | P24105 Total | | 14.130 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | PN2143111D | P24133 | 20_2500_12000 | 4.710 | 406 | 547 | 30 | OK | 180 | 160 | 154 | 165 | LA | 0.170 | 1.284 | 0.002 | 0.010 | 0.199 | 0.016 | 0.005 | 0.005 | 0.003 | 0.046 | 0.003 | 0.000 | 0.032 | 0.0067 | 0.052 | 0.397 |
| 5 | PN2143112D | P24133 | 20_2500_12000 | 4.710 | | | | | | | | | PA | 0.167 | 1.288 | 0.001 | 0.010 | 0.196 | 0.017 | 0.006 | 0.007 | 0.003 | 0.047 | 0.005 | 0.000 | 0.030 | 0.0080 | 0.055 | 0.395 |
| 6 | PN2143211D | P24133 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | PN2144211D | P24133 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | PN2622111D | P24133 | 25_2500_12000 | 5.888 | 415 | 544 | 29 | OK | 168 | 188 | 144 | 167 | | | | | | | | | | | | | | | | | |
| 9 | PN2622112D | P24133 | 25_2500_12000 | 5.888 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | PN2623111D | P24133 | 25_2500_12000 | 5.888 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | PN2623112D | P24133 | 25_2500_12000 | 5.888 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | P24133 Total | | 42.392 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | PN2147111D | P24134 | 20_2500_12000 | 4.710 | 424 | 552 | 30 | OK | 168 | 136 | 172 | 159 | LA | 0.174 | 1.293 | 0.002 | 0.010 | 0.193 | 0.015 | 0.005 | 0.006 | 0.003 | 0.050 | 0.003 | 0.000 | 0.030 | 0.0061 | 0.056 | 0.404 |
| 13 | PN2147112D | P24134 | 20_2500_12000 | 4.710 | | | | | | | | | PA | 0.171 | 1.297 | 0.001 | 0.010 | 0.191 | 0.013 | 0.008 | 0.003 | 0.003 | 0.050 | 0.003 | 0.000 | 0.026 | 0.0071 | 0.056 | 0.401 |
| 14 | PN2147211D | P24134 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | PN2148111D | P24134 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | PN2148112D | P24134 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | PN2148211D | P24134 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | PN2624111D | P24134 | 25_2500_12000 | 5.888 | 391 | 538 | 35 | OK | 168 | 146 | 136 | 150 | | | | | | | | | | | | | | | | | |
| 19 | PN2624112D | P24134 | 25_2500_12000 | 5.888 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | PN2625111D | P24134 | 25_2500_12000 | 5.888 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | PN2625112D | P24134 | 25_2500_12000 | 5.888 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | P24134 Total | | 51.812 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | PN1891111D | Q22868 | 15_2000_12000 | 2.826 | 449 | 584 | 27 | OK | 164 | 170 | 136 | 157 | LA | 0.178 | 1.290 | 0.001 | 0.013 | 0.194 | 0.019 | 0.005 | 0.007 | 0.003 | 0.047 | 0.002 | 0.000 | 0.035 | 0.0067 | 0.052 | 0.406 |
| 23 | PN1891112D | Q22868 | 15_2000_12000 | 2.826 | | | | | | | | | PA | 0.174 | 1.294 | 0.001 | 0.016 | 0.196 | 0.018 | 0.004 | 0.004 | 0.005 | 0.048 | 0.004 | 0.000 | 0.032 | 0.0076 | 0.057 | 0.403 |
| 24 | PN1891113D | Q22868 | 15_2000_12000 | 2.826 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | PN1892111D | Q22868 | 15_2000_12000 | 2.826 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | PN1892112D | Q22868 | 15_2000_12000 | 2.826 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | PN1892113D | Q22868 | 15_2000_12000 | 2.826 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | PN1893212D | Q22868 | 15_2000_12000 | 2.826 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | PN1894111D | Q22868 | 15_2000_12000 | 2.826 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | PN1894112D | Q22868 | 15_2000_12000 | 2.826 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | PN1894113D | Q22868 | 15_2000_12000 | 2.826 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | PN1898111D | Q22868 | 15_2000_12000 | 2.826 | 428 | 541 | 32 | OK | 186 | 188 | 190 | 188 | | | | | | | | | | | | | | | | | |
| 33 | PN1898112D | Q22868 | 15_2000_12000 | 2.826 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | PN1898113D | Q22868 | 15_2000_12000 | 2.826 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | PN1924111D | Q22868 | 15_2000_12000 | 2.826 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | PN1924112D | Q22868 | 15_2000_12000 | 2.826 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | PN1924113D | Q22868 | 15_2000_12000 | 2.826 | | | | | | | | | | | | | | | | | | | | | | | | | |

24T194

HS Code: 72085110
Place of Melting & Casting: INDIA, Facility: AM/NS INDIA

AM/NS-5

Authorised Signatory (Quality Assurance)
ArcelorMittal Nippon Steel India Limited
AMNSIL/QAC-PMP/05/F

AM/NS INDIA

# ArcelorMittal Nippon Steel India Limited

HAZIRA - 394270, DIST.SURAT, GUJARAT, INDIA
CIN : U27100GJ1976FLC013787

## MILL TEST AND INSPECTION CERTIFICATE

CE 0045 ArcelorMittal Nippon Steel India Limited QS 0045-CPR-0570

Test Certificate No. : HPL/TC/D/2010/19363 Date : 27.01.2024
Material Specification : EN 10025-2 : 2019 S355 J2+N & AD2000 Merkblatt W1
Sales Order No. : 2110094902

SEAWAY SRL,
VIA TRIESTE 90-A, RAVENNA, ITALY

WE CERTIFY THAT THE PLATES HAVE BEEN MANUFACTURED, INSPECTED AND TESTED IN ACCORANCE WITH THE REQUIEREMENT OF EN 10025-2 : 2019 S355 J2+N.

| Sr. No. | Plate No. | Heat No. | Size in mm T_W_L | Theoretical Weight (Mt.) | Mechanical Properties | | | | | | | | | Chemical Analysis (%) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | YS | UTS | %EL | Bend | Impact in Joules at '-20°C' | | | | | | C*** | Mn | S | P | Si | Cr | Ni | Cu | Ti | V | Nb | Mo | Al | N | Nb+V+Ti | CE |
| | | | | | MPa | MPa | GL= 5.65√S0 | M.R.= 2.0T | 1 | 2 | 3 | Avg. | LA/ PA | 0.200 | 1.600 | 0.025 | 0.025 | 0.150-0.250 | - | - | 0.550 | 0.050 | 0.130 | 0.050 | - | 0.020 | - | 0.200 | 0.430 |
| | | | | | 355 Min * | 470-630 | 20 Min ** | 180° | 27 J Min | | | | | Max | Max | Max | Max | | | | Max | Max | Max | Max | | Min | | Max | Max |
| 189 | PN2918111D | S23880 | 20_2000_12000 | 3.768 | 418 | 562 | 30 | OK | 148 | 152 | 162 | 154 | | | | | | | | | | | | | | | | | |
| 190 | PN2918112D | S23880 | 20_2000_12000 | 3.768 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 191 | PN2918113D | S23880 | 20_2000_12000 | 3.768 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | S23880 Total | | 135.648 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 192 | PN2919111D | S23881 | 20_2000_12000 | 3.768 | | | | | | | | | LA | 0.170 | 1.280 | 0.002 | 0.011 | 0.196 | 0.016 | 0.005 | 0.005 | 0.003 | 0.045 | 0.003 | 0.000 | 0.028 | 0.0073 | 0.051 | 0.396 |
| 193 | PN2919211D | S23881 | 20_2000_12000 | 3.768 | | | | | | | | | PA | 0.166 | 1.281 | 0.001 | 0.012 | 0.193 | 0.013 | 0.004 | 0.002 | 0.002 | 0.044 | 0.005 | 0.000 | 0.026 | 0.0083 | 0.051 | 0.393 |
| 194 | PN2919311D | S23881 | 20_2000_12000 | 3.768 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 195 | PN2920111D | S23881 | 20_2000_12000 | 3.768 | 413 | 551 | 30 | OK | 166 | 172 | 132 | 157 | | | | | | | | | | | | | | | | | |
| 196 | PN2920112D | S23881 | 20_2000_12000 | 3.768 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 197 | PN2920113D | S23881 | 20_2000_12000 | 3.768 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 198 | PN2921111D | S23881 | 20_2000_12000 | 3.768 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 199 | PN2921211D | S23881 | 20_2000_12000 | 3.768 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 200 | PN2921311D | S23881 | 20_2000_12000 | 3.768 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 201 | PN2922111D | S23881 | 20_2000_12000 | 3.768 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 202 | PN2922112D | S23881 | 20_2000_12000 | 3.768 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 203 | PN2922113D | S23881 | 20_2000_12000 | 3.768 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 204 | PN2322111D | S23881 | 25_3000_12000 | 7.065 | 420 | 571 | 28 | OK | 150 | 158 | 136 | 148 | | | | | | | | | | | | | | | | | |
| 205 | PN2322112D | S23881 | 25_3000_12000 | 7.065 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | S23881 Total | | 59.346 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Grand Total | | 799.766 | | | | | | | | | | | | | | | | | | | | | | | | | |

Note: (1) Test Certificate conforms to EN 10204:2004 Type 3.1
(2) Material conforms to standard rolling & weight tolerance.
(3) Supply condition : Plates in Normalizing rolled and trimmed edge condition.
(4) Process Route : Hot Metal/ HBI - EAF/Conarc - LF (Fully Killed steel) - VD- CCM - RHF - Plate Rolling (Normalizing Rolling).
(5) Orientation of Tensile, Bend test Specimen is Transverse and Impact test specimen is Longitudinal to the rolling direction.
(6) Tensile specimen size : 10 mm dia round specimen for thickness >20mm & full thickness flat specimen for thickness ≤20mm. Impact specimen size : 10x10x55mm for thickness ≥11mm & 7.5x10x55mm for thickness 8mm to <11mm.
(7) * Requirement of YS is 355 MPa min for thickness ≤16mm, 345 MPa min for thickness >16mm to ≤40mm, 335 MPa min for >40 to ≤63mm thicknes & 325 MPa min for >63 to ≤80mm thickness
** Requirement of %EL is 20min for thickness >3mm to ≤40mm, 19min for thickness >40mm to ≤63mm & 18min for thickness >63mm to ≤80mm.
*** Requirement of %C is 0.200 max for thickness ≤40mm & 0.220 max for thickness >40mm.
(8) Surface condition as per EN 10163-2 : 2004 Class B Sub class 3. Reconditioning / Repair of plates by welding on steel not performed.
(9) Ultrasonic Test found satisfactory as per EN_10160_CLASS_S1E1.
(10) Stencilling marking details : Manufacturer Name, Plate No, Heat No, Size, Specification, UT code, CE Marking, AD 2000 W1. Low stress steel die stamping details: Plate No, Heat No, Specification.
(11) Tolerance on Thickness as per EN 10029 Class A. Flatness as per EN 10029 Class N Type L Table 4:2010 & Camber as per EN 10029:2010 (0.2% max of actual length of the plate).
(12) The declaration of performance (DOP) No: DOP NO: PM/CE/2016/02.
Legend: LA: Ladle Analysis(%), PA: Product Analysis(%), T-Thickness, W-Width, L-Length, CE: C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15.
HBI - Hot Briquetted Iron, EAF- Electric Arc Furnace, LF- Ladle Furnace, VD- Vacuum Degassing, CCM- Continuous Casting Mill, RHF- Reheating Furnace.

1550
07052024

Certificazione valida per materiale fornitoVi con ns. DDT nr. C4001380 del 23/09/2024 relativo a:

PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 20mm POS. 4
PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 20mm POS. 5
RIF. VS. ORD. 24005170 DEL 11/09/2024
RIF. VS. COMM. 24-27012

HS Code: 72085110
Place of Melting & Casting: INDIA, Facility: AM/NS INDIA
Place of Hot-rolling: INDIA, Facility: AM/NS INDIA

AM/NS-5

Authorised Signatory (Quality Assurance)
ArcelorMittal Nippon Steel India Limited
AMNSIL/QAC-PMP/05/F

Page 6 of 6

AM/NS INDIA

# DECLARATION OF PERFORMANCE

**No: PM/CE/2016/02**

Unique identification code of the product-type:
**Plate S355J2 / 1.0577**

1. Type, batch or serial number or any other element allowing identification of the construction product as required under Article 11(4):

   **Plate S355J2 / 1.0577 according to EN 10025-2**

2. Intended use or uses of the construction product, in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer:

   **Welded, bolted and riveted structures**

3. Name, registered trade name or registered trade mark and contact address of the manufacturer as required pursuant Article 11(5):

   **ArcelorMittal Nippon Steel India Limited**
   **Address: 27th KM, Surat-Hazira Road, Hazira, Surat, India - 394270**

4. Name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2):

   **Not applicable**

5. System or systems of assessment and verification of constancy of performance of the construction product as set out in Annex V:

   **System 2+**

6. In case of the declaration of performance concerning a construction product covered by a harmonised standard:

   Notified body TUV NORD System GmbH & Co KG, Germany performed the initial inspection of the manufacturing plant and of factory production control and the continuous surveillance, assessment and evaluation of factory production control under system 2+ and issued the certificate of conformity of the factory production control with no 0045-CPR-0978.

AM/NS INDIA

7. Declared performance:

| Essential characteristic | | | Performance | | | Harmonised techn. specification |
|---|---|---|---|---|---|---|
| Tolerances on dimensions / shape | Thickness | | EN 10029 | | | EN 10025-1:2004 |
| | Flatness | | EN 10029 | | | |
| Yield strength | Nominal thickness (mm) > | ≤ | Values min (MPa) | | | |
| | | 16 | 355 | | | |
| | 16 | 40 | 345 | | | |
| | 40 | 63 | 335 | | | |
| | 63 | 80 | 325 | | | |
| | 80 | 100 | 315 | | | |
| | 100 | 150 | 295 | | | |
| Tensile strength | Nominal thickness (mm) > | ≤ | Values min (MPa) | max (MPa) | | |
| | | 100 | 470 | 630 | | |
| | 100 | 400 | 450 | 600 | | |
| Elongation | Nominal thickness (mm) > | ≤ | Values min (%) | | | |
| | | 40 | 20 | | | |
| | 40 | 63 | 19 | | | |
| | 63 | 150 | 18 | | | |
| | 150 | 400 | 17 | | | |
| Impact strength | Nominal thickness (mm) > | ≤ | Values min (J) | | | |
| | | 400 | 27 at -20°C | | | |
| Weldability | Nominal thickness (mm) > | ≤ | Values max (CEV, %) | | | |
| | | 30 | 0,45 | | | |
| | 30 | 150 | 0,47 | | | |
| Durability (chemical composition) | Nominal thickness (mm) > | ≤ | Values | min (%) | max (%) | |
| | | 30 | C | | 0,20 | |
| | | | Si | | 0,55 | |
| | | | Mn | | 1,60 | |
| | | | P | | 0,025 | |
| | | | S | | 0,025 | |
| | | | Cu | | 0,55 | |
| | 30 | 400 | C | | 0,22 | |
| | | | Si | | 0,55 | |
| | | | Mn | | 1,60 | |
| | | | P | | 0,025 | |
| | | | S | | 0,025 | |
| | | | Cu | | 0,55 | |

8. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 7.

This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 3.
Signed for and on behalf of the manufacturer by:

ARCELORMITTAL NIPPON STEEL INDIA LTD. * HAZIRA * AM/NS INDIA

Authorised Signatory

(Quality Assurance)

Hazira-Surat, Date: 27.01.2024

**PM/CE/2016/02**

posco

# Mill Test Certificate

Certificate No. : 230412-FP01KS-0011A1-0003
Date of Issue : Apr., 17, 2023

Order No. : 01S6041044
PO No. : 2302-23021 (23021)
Supplier :
Commodity : PLATE
Customer :
Spec & Type : EN10025-2 S355J2+NR

| Size | Product No. | Quantity | Weight (kg) | Heat No. | Position | Tensile Test YP (MPa) | Tensile Test TS (MPa) | Tensile Test EL (%) | Impact Test V Notch -20 °C Energy (Joule) | Division | C (%) | Si (%) | Mn (%) | P (%) | S (%) | Cr (%) | Ni (%) | B (ppm) | Cu (%) | Mo (%) | N (ppm) | Nb (%) | Ti (%) | V (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12x2500x12000 | PP35062501-2504 | 4 | 11,304 | SU99872 | T | 444 | 562 | 25 | 1: 157<br>2: 120<br>3: 136<br>A: 138 | L<br>P | 0.1493<br>0.1457 | 0.203<br>0.193 | 1.517<br>1.528 | 0.0084<br>0.0071 | 0.0028<br>0.0028 | 0.020<br>0.039 | 0.020<br>0.017 | 2<br>1 | 0.019<br>0.020 | 0.005<br>0.004 | 36<br>33 | 0.024<br>0.024 | 0.0129<br>0.0124 | 0.001<br>0.002 |
| 12x2500x12000 | PP35062201-2204 | 4 | 11,304 | SU99872 | T | 450 | 564 | 27 | 1: 256<br>2: 216<br>3: 270<br>A: 247 | L<br>P | 0.1493<br>0.1457 | 0.203<br>0.193 | 1.517<br>1.528 | 0.0084<br>0.0071 | 0.0028<br>0.0028 | 0.020<br>0.039 | 0.020<br>0.017 | 2<br>1 | 0.019<br>0.020 | 0.005<br>0.004 | 36<br>33 | 0.024<br>0.024 | 0.0129<br>0.0124 | 0.001<br>0.002 |
| ~~12x2500x12000~~ | ~~PP35099301-9304~~ | ~~4~~ | ~~11,304~~ | ~~SU99873~~ | T | 445 | 564 | 29 | 1: 117<br>2: 178<br>3: 127<br>A: 141 | L<br>P | 0.1480<br>0.1490 | 0.199<br>0.195 | 1.530<br>1.536 | 0.0067<br>0.0074 | 0.0024<br>0.0031 | 0.042<br>0.037 | 0.020<br>0.014 | 1<br>1 | 0.020<br>0.020 | 0.004<br>0.004 | 38<br>35 | 0.026<br>0.024 | 0.0129<br>0.0122 | 0.002<br>0.002 |
| 12x2500x12000 | PP35099401-9404<br>24T176 | ~~4~~ 1 | 11,304 | SU99873 | T | 445 | 564 | 29 | 1: 117<br>2: 178<br>3: 127<br>A: 141 | L<br>P | 0.1480<br>0.1490 | 0.199<br>0.195 | 1.530<br>1.536 | 0.0067<br>0.0074 | 0.0024<br>0.0031 | 0.042<br>0.037 | 0.020<br>0.014 | 1<br>1 | 0.020<br>0.020 | 0.004<br>0.004 | 38<br>35 | 0.026<br>0.024 | 0.0129<br>0.0122 | 0.002<br>0.002 |
| ~~12x2500x12000~~ | ~~PP35099501-9504~~ | ~~4~~ | ~~11,304~~ | ~~SU99873~~ | T | 445 | 564 | 29 | 1: 117<br>2: 178<br>3: 127<br>A: 141 | L<br>P | 0.1480<br>0.1490 | 0.199<br>0.195 | 1.530<br>1.536 | 0.0067<br>0.0074 | 0.0024<br>0.0031 | 0.042<br>0.037 | 0.020<br>0.014 | 1<br>1 | 0.020<br>0.020 | 0.004<br>0.004 | 38<br>35 | 0.026<br>0.024 | 0.0129<br>0.0122 | 0.002<br>0.002 |
| ~~12x2500x12000~~ | ~~PP35099601-9604~~ | ~~4~~ | ~~11,304~~ | ~~SU99873~~ | T | 449 | 572 | 30 | 1: 178<br>2: 77<br>3: 204<br>A: 153 | L<br>P | 0.1480<br>0.1490 | 0.199<br>0.195 | 1.530<br>1.536 | 0.0067<br>0.0074 | 0.0024<br>0.0031 | 0.042<br>0.037 | 0.020<br>0.014 | 1<br>1 | 0.020<br>0.020 | 0.004<br>0.004 | 38<br>35 | 0.026<br>0.024 | 0.0129<br>0.0122 | 0.002<br>0.002 |

CE EN10025-2 S355J2
2814

* Position - T : Top, M : Middle, B : Bottom
* Tensile Test. Direction : Transversal, Gauge Length : 5.65 $\sqrt{A_o}$ (Rectangular), YP Method : Upper Point
* Impact Test. Direction : Surface Longitudinal, Full-Size : 10 mmX10 mm
* Division - L : Ladle Analysis, P : Products Analysis
* Supply Condition : As-Rolled unless otherwise Heat Treated.

This material has been fully killed and made by basic oxygen process. This material is fine grained steel.
This material has been made by vacuum degassing process.
No repair welding was performed to the products. Test Certificate is issued according to ISO 10474/EN 10204 3.1.
We hereby certify that the material herein has been made in accordance with the order and above specification.

Legal sanction can be imposed on forging. Improper use of product can cause safety issues.

Surveyor To :

Park, Junyoung

posco

# Mill Test Certificate

Certificate No. : 230412-FP01KS-0011A1-0003
Date of Issue : Apr., 17, 2023

Order No. : 01S6041044
PO No. : 2302-23021 (23021)
Supplier :
Commodity : PLATE
Customer :
Spec & Type : EN10025-2 S355J2+NR

| Product No. | Division | Sol-Al (%) | CEQ (%) |
|---|---|---|---|
| PP35062501-2504 | L | 0.032 | 0.41 |
| | P | 0.031 | |
| PP35062201-2204 | L | 0.032 | 0.41 |
| | P | 0.031 | |
| PP35099301-9304 | L | 0.030 | 0.42 |
| | P | 0.033 | |
| PP35099401-9404 | L | 0.030 | 0.42 |
| | P | 0.033 | |
| PP35099501-9504 | L | 0.030 | 0.42 |
| | P | 0.033 | |
| PP35099001-9004 | L | 0.030 | 0.42 |
| | P | 0.033 | |

Certificazione valida per materiale fornitoVi con ns. DDT nr. C4001380 del 23/09/2024 relativo a:

PZ. 2 PARTICOLARE: C09-0001-P004_REV.C SP. 12mm POS. 10
PZ. 4 PARTICOLARE: C09-0001-P006_REV.A SP. 12mm POS. 2
RIF. VS. ORD. 24005170 DEL 11/09/2024
RIF. VS. COMM. 24-27012

CE EN10025-2 S355J2
2814

This material has been fully killed and made by basic oxygen process. This material is fine grained steel.
This material has been made by vacuum degassing process.
No repair welding was performed to the products. Test Certificate is issued according to ISO 10474/EN 10204 3.1.
We hereby certify that the material herein has been made in accordance with the order and above specification.

Legal sanction can be imposed on forging. Improper use of product can cause safety issues.

Surveyor To :

Park, Junyoung

posco

# CE marking information

Certificate No. : 230412-FP01KS-0011A1-0003
Date of Issue : Apr., 17, 2023

Order No. : 01S6041044
PO No. : 2302-23021 (23021)
Supplier :
Commodity : PLATE
Customer :
Spec & Type : EN10025-2 S355J2+NR

| Product No. | CE 2814 | POSCO Co., Ltd - Gwangyang Works<br>20-26, Pokposarang-gil, Gwangyang-si, Jeollanam-do, 57807, Korea<br>12<br>2814/CPR/0038/CPR/M U M/1210003/1 |
|---|---|---|
| PP35099301-9304<br>PP35099401-9404<br>PP35099501-9504<br>PP35099001-9004<br>PP35099101-9104<br>PP35099201-9204<br>PP35061701-1704 | **EN 10025-1:2004**<br>**Types S355J2**<br>To be used in construction structural steels<br>Tolerances on dimensions and shape :EN 10029 | **Elongation :**<br>**Tensile strength :**<br>**Yield strength :** : **EN10025-2**<br>**Impact strength :**<br>**Weldability :**<br>**Durability :**<br>Dangerous Substances : No Performance Determind |

This material has been fully killed and made by basic oxygen process. This material is fine grained steel.
This material has been made by vacuum degassing process.
No repair welding was performed to the products. Test Certificate is issued according to ISO 10474/EN 10204 3.1.
We hereby certify that the material herein has been made in accordance with the order and above specification.

Legal sanction can be imposed on forging. Improper use of product can cause safety issues.

Surveyor To :

Park, Junyoung

posco

# Declaration of Performance

Issued in accordance with the
**CONSTRUCTION PRODUCTS REGULATIONS**
(EU Regulation No. 305/2011)

**EU DoP No. GY-S355J2-220805-001**

**Types S355J2 according EN 10025-2**
To be used in construction structural steels

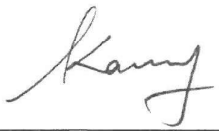

**POSCO Co., Ltd. - Gwangyang works**
20-26, Pokposarang-gil,
Gwangyang-si, Jeollanam-do, Korea
Tel : +82 (0)61 790 0114
Webside : www.posco.com


CE Marking Notified Body
**Lloyd's Register Verification B.V.**
K.P. Van der Mandelelaan 41 A Rotterdam
Country : Netherlands
Tel :+31 (0)10 4145088
Email : rotterdam@lr.org
Website : www.lr.org

system of assessment and verification of constancy of performance of the construction product as set out EN10025-1:2004
System 2+

Certificate No.
2814/CPR/0038/CPR/MUM/1210003/1

Lloyd's Register Verification B.V.(2814) performed initial inspection of the manufacturing plant and of factory. Production control and the continuous surveillance assessment and evaluation of factory production control under system 2+ and issued the certificate of conformity of the factory production control.



C.H. Kang / Head,
Quality Planning Group,
POSCO

05th August 2022
Date

| Essential characteristics | Perfomance | Harmonised technical specification |
|---|---|---|
| Tolerances on dimensions and shape | Acc. to EN10029 | EN10025-1 : 2004 |
| Minimum yield strength (MPa) | Threshold value in EN10025-2 for S355J2 | |
| Tensile strength (MPa) | | |
| Minimum percentage elongation after fracture (%) | | |
| Impact strength (longitudinal) | | |
| Weldability Maximum CEV (Ladle analysis) | | |
| Durability | | |

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, 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.: 496293

Z02 Data / Date: 10/06/2020

A08 N° Ordine Trametal / Works order: 32001784

A07 N° Ordine cliente / Customer's order: mail 21.05.20

DDT: BOL 32009739

del / date: 09/06/2020

Pratica / File no.:

del / date:

A06 Cliente / Customer

**DUFERCO COMMERCIALE SPA**

**Via di Sottoripa 7/13**
**16124 Genova 16124 IT**
**GE 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 | S355J2+N |
| Normativa / Specification | EN10025-2:2019 |

DUFERCO COMMERCIALE S.p.A.
COPIA CONFORME ALL'ORIGINALE

| 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 TEMPERATURA (Q) °C TEMPERATURE | PERMANENZA (Q) Min HOLDING TIME | RAFFREDDAMENTO COOLING | TEMPERATURA (T) °C TEMPERATURE | PERMANENZA (T) Min HOLDING TIME | RAFFREDDAMENTO COOLING |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~2~~ | ~~1TAR250705A~~ | ~~1628129~~ | ~~8.00X2450X12000~~ | ~~1,85~~ | ~~648115~~ | ~~BO~~ | ~~N*~~ | ~~[ZF059]~~ | | | | | | | | | | | | | | | | | |
| ~~2~~ | ~~1TAR250705B~~ | ~~1628129~~ | ~~8.00X2450X12000~~ | ~~1,85~~ | ~~648115~~ | ~~BO~~ | ~~N*~~ | ~~[ZF059]~~ | | | | | | | | | | | | | | | | | |
| ~~2~~ | ~~1TAR250706A~~ | ~~1628100~~ | ~~8.00X2450X12000~~ | ~~1,85~~ | ~~648115~~ | ~~BO~~ | ~~N*~~ | ~~[ZF059]~~ | | | | | | | | | | | | | | | | | |
| ~~2~~ | ~~1TAR250706B~~ | ~~1628100~~ | ~~8.00X2450X12000~~ | ~~1,85~~ | ~~648115~~ | ~~BO~~ | ~~N*~~ | ~~[ZF059]~~ | | | | | | | | | | | | | | | | | |
| 2 | 1TAR280907B | 1628148 | 8.00X2450X12000 | 1,85 | 651202 | BO | N* | ZG247 | | | | | | | | | | | | | | | | | |
| ~~4~~ | ~~1TAR160102A~~ | ~~1628076~~ | ~~10.00X2450X12000~~ | ~~2,31~~ | ~~651195~~ | ~~BO~~ | ~~N*~~ | ~~[ZG243]~~ | | | | | | | | | | | | | | | | | |
| ~~4~~ | ~~1TAR160102B~~ | ~~1628076~~ | ~~10.00X2450X12000~~ | ~~2,31~~ | ~~651195~~ | ~~BO~~ | ~~N*~~ | ~~[ZG243]~~ | | | | | | | | | | | | | | | | | |
| 4 | 1TAR160104A | 1628104 | 10.00X2450X12000 | 2,31 | 651195 | BO | N* | [ZG243] | | 21T018 | | | | | | | | | | | | | | | |
| ~~4~~ | ~~1TAR160104B~~ | ~~1628104~~ | ~~10.00X2450X12000~~ | ~~2,31~~ | ~~651195~~ | ~~BO~~ | ~~N*~~ | ~~[ZG243]~~ | | | | | | | | | | | | | | | | | |
| ~~4~~ | ~~1TAR160105A~~ | ~~1628092~~ | ~~10.00X2450X12000~~ | ~~2,31~~ | ~~651195~~ | ~~BO~~ | ~~N*~~ | ~~[ZG243]~~ | | | | | | | | | | | | | | | | | |
| ~~4~~ | ~~1TAR160105B~~ | ~~1628092~~ | ~~10.00X2450X12000~~ | ~~2,31~~ | ~~651195~~ | ~~BO~~ | ~~N*~~ | ~~[ZG243]~~ | | | | | | | | | | | | | | | | | |
| ~~4~~ | ~~1TAR160203A~~ | ~~1628071~~ | ~~10.00X2450X12000~~ | ~~2,31~~ | ~~651195~~ | ~~BO~~ | ~~N*~~ | ~~[ZG243]~~ | | | | | | | | | | | | | | | | | |
| ~~4~~ | ~~1TAR160204A~~ | ~~1628075~~ | ~~10.00X2450X12000~~ | ~~2,31~~ | ~~651195~~ | ~~BO~~ | ~~N*~~ | ~~[ZG243]~~ | | | | | | | | | | | | | | | | | |
| ~~4~~ | ~~1TAR160204B~~ | ~~1628075~~ | ~~10.00X2450X12000~~ | ~~2,31~~ | ~~651195~~ | ~~BO~~ | ~~N*~~ | ~~[ZG243]~~ | | | | | | | | | | | | | | | | | |

**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) |
| S355J2+N Min 0.00 - 30.00 | | | | | | | | | | | | | | | | | | | | | |
| S355J2+N Max 0.00 - 30.00 | 0,20 | 1,60 | 0,55 | 0,025 | 0,025 | 0,550 | | | | | | | | | | | | | | 0,45 | |
| | | | | | | | | | | | | | | | | | | | | | |
| 1TAR16 | 0,15 | 1,39 | 0,20 | 0,015 | 0,003 | 0,030 | 0,030 | 0,040 | 0,010 | 0,032 | <0.005 | <0.010 | <0.005 | <0.005 | 0,0000 | 0,0080 | <0.0005 | 0,0001 | 0,38 | 0,40 | 0,23 |
| 1TAR25 | 0,15 | 1,40 | 0,19 | 0,013 | 0,003 | 0,030 | 0,020 | 0,030 | <0.005 | 0,032 | <0.005 | <0.010 | <0.005 | <0.005 | 0,0000 | 0,0060 | <0.0005 | 0,0002 | 0,38 | 0,39 | 0,23 |
| 1TAR28 | 0,16 | 1,39 | 0,19 | 0,011 | 0,002 | 0,020 | 0,020 | 0,030 | 0,010 | 0,035 | <0.005 | <0.010 | <0.005 | <0.005 | 0,0000 | 0,0060 | <0.0005 | 0,0002 | 0,39 | 0,40 | 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 | 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 |
| S355J2+N Min 0.00 - 16.00 | | | | | 20 | 355 | 470 | | 22,0 | | | | | | | | | | | | | | | | | | |
| S355J2+N Max 0.00 - 16.00 | | | | | 20 | | 630 | | | | | | | | | | | | | | | | | | | | |
| S355J2+N Min 6.00 - 999.00 | | | | | | | | | | | | | L | -20 | | | 27 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ZF059 | 8,00 | 2 | P | T | 20 | 383 | 515 | 0,74 | 33,1 | | P | 7,50 | L | -20 | P | 119 115 103 | 112 | | | | | | | | | | |
| ZG243 | 10,00 | 2 | P | T | 20 | 385 | 513 | 0,75 | 27,2 | | P | 7,50 | L | -20 | P | 105 142 128 | 125 | | | | | | | | | | |
| ZG247 | 8,00 | 2 | P | T | 20 | 392 | 513 | 0,76 | 30,7 | | P | 7,50 | L | -20 | P | 218 210 203 | 210 | | | | | | | | | | |

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 |
|---|---|---|---|---|---|---|
| 2 | | EN 10029 CL.A | -0+100 MM | -0+200 MM | EN 10163/2 CL A1 | EN 10029 CL. N |
| 4 | | EN 10029 CL.A | -0+100 MM | -0+200 MM | EN 10163/2 CL A1 | 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 |
|---|---|---|
| | 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. C4001380 del 23/09/2024 relativo a:

PZ. 2 PARTICOLARE: C09-0001-P004_REV.C SP. 10mm POS. 11
PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 10mm POS. 20
PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 10mm POS. 21
PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 10mm POS. 7
(SV. 815,5 x 450 x 10)
PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 10mm POS. 15
(SV. 179 x 450 x 10)
PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 10mm POS. 22
(SV. 815,5 x 450 x 10)
RIF. VS. ORD. 24005170 DEL 11/09/2024
RIF. VS. COMM. 24-27012

METINVEST
METINVEST TRAMETAL SPA

Metinvest Trametal spa
Head Office:
Via XII Ottobre, 3 - 6° piano
16121 Genova - Italy
Tel. +39 010 5762911
Fax +39 010 5762990
trametal@trametal.it

**DICHIARAZIONE DI PRESTAZIONE (Reg. UE N. 305/2011)**

N.S355-2

Il sottoscritto Viktor Dembytskyy, rappresentante il produttore:
**METINVEST TRAMETAL SpA**
**Via XII Ottobre, 3 – 16121 Genova**
nello stabilimento produttivo di:
**Via E. Fermi, 44 – 33058 San Giorgio di Nogaro (UD)**
Dichiara qui di seguito che i prodotti:
Prodotti piani laminati a caldo in acciaio secondo EN10025-1:2004.

**DECLARATION OF PERFORMANCE (Reg . UE N. 305/2011)**

N.S355-2

I, the undersigned Viktor Dembytskyy, representing the manufacturer:
**METINVEST TRAMETAL SpA**
**Via XII Ottobre, 3 – 16121 Genova**
the production site:
**Via E. Fermi, 44 – 33058 San Giorgio di Nogaro (UD)**
Hereby declares that the products:
Hot-rolled flat products of steel according to EN10025-1: 2004.

| Qualità / Steel grade | Normativa / Specification |
|---|---|
| S355J2NZ15 | EN10025-2:2019 |
| S355JR+AR | EN10025-2:2019 |
| S355JR+N | EN10025-2:2019 |
| S355J0+AR | EN10025-2:2019 |
| S355J0+N | EN10025-2:2019 |
| S355J2+N | EN10025-2:2019 |
| S355K2+N | EN10025-2:2019 |
| S355J2NZ25 | EN10025-2:2019 |
| S355J2NZ35 | EN10025-2:2019 |
| S355K2NZ15 | EN10025-2:2019 |
| S355K2NZ25 | EN10025-2:2019 |
| S355K2NZ35 | EN10025-2:2019 |
| S355J0C+N | EN10025-2:2019 |
| S355J2C+N | EN10025-2:2019 |
| S355K2C+N | EN10025-2:2019 |

| Tipo prodotto / Product type | Qualità / Steel grade | Codice identificativo univoco prodotto/ Unique product identifier code | Numero interno/ Internal number | Specifica tecnica armonizzata / Harmonized techical specification |
|---|---|---|---|---|
| Lamiera/ Plate | S355J2+N | 1TAR250705A | 1628129 | EN10025-1:2004 |
| Lamiera/ Plate | S355J2+N | 1TAR250705B | 1628129 | EN10025-1:2004 |
| Lamiera/ Plate | S355J2+N | 1TAR250706A | 1628100 | EN10025-1:2004 |
| Lamiera/ Plate | S355J2+N | 1TAR250706B | 1628100 | EN10025-1:2004 |
| Lamiera/ Plate | S355J2+N | 1TAR280907B | 1628148 | EN10025-1:2004 |
| Lamiera/ Plate | S355J2+N | 1TAR160102A | 1628076 | EN10025-1:2004 |
| Lamiera/ Plate | S355J2+N | 1TAR160102B | 1628076 | EN10025-1:2004 |
| Lamiera/ Plate | S355J2+N | 1TAR160104A | 1628104 | EN10025-1:2004 |
| Lamiera/ Plate | S355J2+N | 1TAR160104B | 1628104 | EN10025-1:2004 |
| Lamiera/ Plate | S355J2+N | 1TAR160105A | 1628092 | EN10025-1:2004 |
| Lamiera/ Plate | S355J2+N | 1TAR160105B | 1628092 | EN10025-1:2004 |
| Lamiera/ Plate | S355J2+N | 1TAR160203A | 1628071 | EN10025-1:2004 |
| Lamiera/ Plate | S355J2+N | 1TAR160204A | 1628075 | EN10025-1:2004 |
| Lamiera/ Plate | S355J2+N | 1TAR160204B | 1628075 | EN10025-1:2004 |

Che i prodotti specificati nel presente documento sono destinati ad essere utilizzati nelle strutture saldate, bullonate e chiodate.

The products specified in this document are intended to be used in welded structures, bolted and riveted.

Che i prodotti specificati nel presente documento presentano le seguenti caratteristiche essenziali e prestazioni:

The products specified in this document have the following essential features and performance:

| **Caratteristiche Essenziali / Essential features** | **Prestazione / Performance** | **Norma Armonizzata / Harmonized specification** |
|---|---|---|
| Tolleranze dimensionali e forma /Tollerance on dimensions and shape | Conforme / Compliance | EN10025-1:2004 |
| Allungamento /Elongation | Conforme / Compliance | EN10025-1:2004 |
| Resistenza a Trazione/Tensile Strength | Conforme / Compliance | EN10025-1:2004 |
| Carico Unitario snervamento/Yield Strength | Conforme / Compliance | EN10025-1:2004 |
| Resilienza/Impact | Conforme / Compliance | EN10025-1:2004 |
| Saldabilità/Weldability | Conforme / Compliance | EN10025-1:2004 |
| Durabilità/Durability | NPD | |
| Sostanza Regolamentata/Regulated substance | NPD | |

Si dichiara inoltre che l'organismo notificato, TUV SUD - Italia [N. 0948] ha effettuato:
- ispezione iniziale dello stabilimento e del controllo della produzione in fabbrica
- sorveglianza, valutazione e verifica continua del controllo della produzione in fabbrica

secondo il sistema di valutazione e verifica della costanza della prestazione 2+ ed ha rilasciato il certificato di controllo della produzione in fabbrica numero 0948-CPR-0157 Rev.02

It also states that the notified body, TUV SUD - Italia [N. 0948], carried out:
- Initial inspection of factory and of factory production control
- Monitoring, evaluation and continuous assessment of factory production control

according to the system of assessment and verification of constancy of performance 2 + and released the certificate of factory production control number 0948-CPR-0157 Rev.02.

CE

**Lamiere conformi ai requisiti della marcatura CE. Certificato di conformità CE n° 0948-CPR-0157 Rev.02 emesso da TUV SUD - Italia in data 13/12/2019. Plates in compliance with CE marking requirements. Certificate of conformity N° 0948-CPR-0157 Rev.02 from TUV SUD - Italia on 13/12/2019.**

Si rilascia la presente dichiarazione di prestazione sotto la responsabilità esclusiva del fabbricante

This declaration of performance is made under the sole responsibility of the manufacturer

San Giorgio di Nogaro,

10/06/2020

Viktor Dembytskyy

Managing Director
Metinvest Trametal spa
Metinvest Group

**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**

A01 Nr rejestrowy BDO : 000012617
**ArcelorMittal Poland S.A. Oddział w Krakowie**
**ul. Tadeusza Sendzimira 1 31-752 Kraków**
Z02.1 Kraków, 21.02.2024

A02
# ŚWIADECTWO ODBIORU 3.1 / INSPECTION CERTIFICATE 3.1 ABNAHMEPRÜFZEUGNIS 3.1 EN 10204

A03
Nr: **1003494977**

ArcelorMittal

| | | | |
|---|---|---|---|
| A06.1 Zamawiający: Purchaser: Besteller: | A06.1 ARCELORMITTAL COMMERCIAL ITALY SRL 20139 MILANO, VIALE BRENTA 27/29 , Włochy / Italy / Italien | A07 Nr zamówienia klienta/No of purchase order/No der Bestellung **230209** | A08.3 LEVERAGE **GH40SID001** |
| | | A08.1 Nr zlecenia/Manuf. Order No/Auftrag No **11078927** | A08.2 Nr kontraktu/Contract No/Vertrag No **PL/277839653/23-11078927** |
| A06.3 Odbiorca dokumentu kontroli: Recipient of a certificate: Empfänger eines Zertifikates: | A06.3 SIDERURGICA ASTICO SPA 36030 FARA VICENTINO, VIA ASTICO 44 Włochy / Italy / Italien | A10 Dowód dostawy/Delivery Note/Lieferschein Nr **64208850** | A11 Nr środka transportu/Number of transport/Transportmittel-Nr **WGM35915/KRA300PF** |

B01, B04, B09-B11, B16

Blacha gorącowalcowana w kręgach grub.: 6,00 szer.: 2000,00 gat.stali: S355J2+N gładka czarna niewytrawiona zabezp.pow.: bez zabezpieczenia opakowanie: H04 Stan dostawy: walcowanie normalizujące +N Dokładność wykonania grubości - normalna (-0,360/+0,360)
Hot-rolled coils thickness: 6,00 width: 2000,00 steel grade: S355J2+N plain black not pickled surf.prot.: no protection packaging: H04 Delivery condition: normalizing rolling +N Tolerances on thickness - normal (-0,360/+0,360)

| B02 | Norma przedmiotowa / According / Nach | Norma klasyfikacyjna / Classification standards / Materialnorm | Norma wymiarowa / Tolerance standards / Massnorm | Gatunek / Steel grade / Marke | Kod wyrobu / Product code / Produkt-Code |
|---|---|---|---|---|---|
| | **EN 10025-1:2004** | **EN 10025-2:2019** | **EN 10051:2010** | **S355J2+N** | **HRCL** |

Specyfikacja Wyrobu - Product Specification - Produktdatenblatt : **S355J2+N-CAT_A EN10025-2:2019**

C70 Proces wytwarzania stali Steelmaking process Stahlherstellungsverfahren

Stal wytwarzana w procesie konwertorowym tlenowym Steel produced in BOF process Stahl hergestellt im Sauerstoffaufblasverfahren

24C077

| B07.1 Nr partii badanej - QM Batch No - WK Los Nr | B07.2 Numer partii - Batch No - Los Nr | B0.8 Ilość sztuk - Number of pieces - Stückzahl | B13 Tonaż- Weight - Gewicht |
|---|---|---|---|
| **040011056340** | **H009666** | **1** | **23,100 t** |

C71-C92 Skład chemiczny - Chemical composition
C93 = CEV Chemische Zusammensetzung

B07.3 Wytop - Heat - Schmelze **410436**

| C[%] | Mn[%] | Si[%] | P[%] | S[%] | Cu[%] | Cr[%] | Ni[%] | Al[%] | $Al_{sol}$[%] | V[%] | Mo[%] | Nb[%] | Co[%] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,15 | 1,40 | 0,020 | 0,010 | 0,004 | 0,03 | 0,02 | 0,014 | 0,047 | | 0,0020 | 0,006 | 0,0140 | 0,005 |

| Ti[%] | As[%] | $N_2$[%] | Ca[%] | Pb[%] | Sn[%] | Sb[%] | O[%] | $H_2$[%] | Zn[%] | W[%] | B[%] | Zr[%] | $C_{EV}$[%] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,0006 | | 0,0040 | 0,0032 | 0,0033 | 0,0020 | 0,0010 | | | 0,0015 | 0,0010 | 0,0003 | 0,0013 | 0,39 |

**Właściwości mechaniczne - Mechanical properties - Mechanische Eigenschaften**

| B07.1 Nr partii badanej QM Batch No WK Los Nr | C02.1 Własności mechaniczne - kierunek Mechanical properties - direction mechanische Eigenschaften - Richtung | C03 Temperatura_badania Test temperature Prüftemperatur | C11.1 Typ Re Re type Re Typ | C11.2 Re Re Re [MPa] | C12 Rm Rm Rm [MPa] | C13.1 A A A | C13.2 A[%] A[%] A[%] | C44 Temperatura testu udarności Impact test - temperature Schlagfestigkeit - Temperatur [°C] |
|---|---|---|---|---|---|---|---|---|
| 040011056340 | T | 23 | ReH | 496 | 554 | A5 | 27,7 | -20 |

| B07.1 Nr partii badanej QM Batch No | C41 Szerok. próbki width of probe | C02.2 Udarność - kierunek Impact test - direction | C40 Udarność - typ Impact test - type | C42.1 Praca łamania KVpróba 1 Work of fracture KVtest 1 | C42.2 Praca łamania KVpróba 2 Work of fracture KVtest 2 | C42.3 Praca łamania KVpróba 3 Work of fracture KVtest 3 | C43 Praca łamania KVpróba średnia Work of fracture KVaverage | |
|---|---|---|---|---|---|---|---|---|

Wystawił: BKGD01

ORYGINAŁ/ORIGINAL 21.02.2024 11:00:40



SIDASTICO Spa - Copia conforme all'originale - Valido per pz. 10 6,00x2000x6030 coils/lamiera n. H009666 colata n. 410436 DDT n. 2374 del 12/03/2024 vs.ord. C4000108 del 01/03/2024

A01 Nr rejestrowy BDO : 000012617
**ArcelorMittal Poland S.A. Oddział w Krakowie**
**ul. Tadeusza Sendzimira 1 31-752 Kraków**
Z02.1 Kraków, 21.02.2024

A02
# ŚWIADECTWO ODBIORU 3.1 / INSPECTION CERTIFICATE 3.1 ABNAHMEPRÜFZEUGNIS 3.1 EN 10204

A03
**Nr: 1003494977**

ArcelorMittal

| WK Los Nr | Probebreite | Kerbschlagversuch - richtung | Schlagfestigkeit - Typ | SchlagfestigkeitArb. 1 [J] | SchlagfestigkeitArb. 2 [J] | SchlagfestigkeitArb. 3 [J] | test SchlagfestigkeitArb. Mittelwert [J] | |
|---|---|---|---|---|---|---|---|---|
| 040011056340 | 5,0 | L | KV2 | 80,0 | 76,0 | 78,0 | 78,00 | |

T - Poprzeczny/ Transverse/Transversalen; L- Wzdłużny / Longitudinal/ Längslaufend; 1 - Po walcowaniu normalizującym / After normalizing rolling/Nach normalisierendes Walzen; 2 - Po normalizacji / After normalization /Nach Normalisierung; db - dobre / good / gut; P - Pozytywny/ Positive/ Positiv

Badany materiał nie wykazał radioaktywności. Pomiar został wykonany przy użyciu systemu GENIE 2000, produkcja Canberra-Packard.
The tested material did not show any signs of radioactivity. The measurement was performed with the application of GENIE 2000 system, manufactured by Canberra-Packard.
In dem untersuchten Material wurde keine Radioaktivität gefunden. Die Messung wurde mit dem GENIE-2000-System gemacht, Hersteller: Canberra-Packard.

Wyrób budowlany oznakowany znakiem CE zgodnie z rozporządzeniem nr 305/2011 Parlamentu Europejskiego i Rady UE..
Construction product CE marked in accordance with Regulation No 305/2011 of the European Parliament and of the Council of the EU
Ein Bauprodukt, das mit dem CE-Zeichen gemäß Verordnung 305/2011 des Europäischen Parlaments und des EU-Rates versehen ist.

D01 Powierzchnia i wymiary - Sprawdzono zgodność z zamówieniem
Surface and dimension - tested according to purchase order
Oberfläche und Masse - Geprüft entprechend der Bestellung

Z01 Na podstawie przeprowadzonych badań uznano, że wykonany wyrób jest zgodny z warunkami zamówienia.
On the basis of the tests it has been recognized that the product conforms with the order requirements.
Nach der durchgeführten Prüfungen wurde festgestellt, das des Erzeugnis den Anfrderungen der Bestellung entspricht.

A05 Zarządzanie Jakością Wyroby Płaskie
Quality Management Flat Products
Qualitätsmanagement Flachprodukte
Z02.2

Z.04 CE 0035 0035-CPR-A150

Z.14 UKCA 0120

Zarządzanie jakością
Wyroby Płaskie
Kierownik
Jakub Zalejski

ArcelorMittal

Certificazione valida per materiale fornitoVi con ns. DDT nr. C4001380 del 23/09/2024 relativo a:

PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 6mm POS. 12
PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 6mm POS. 13
RIF. VS. ORD. 24005170 DEL 11/09/2024
RIF. VS. COMM. 24-27012

Wystawił: BKGD01

# DECLARATION OF PERFORMANCE

**No.HR00017|CPR2013-07-01|KR|V010**

1. Unique identification code of the product-type:

1.0577

2. Intended use or uses of the construction product, in accordance with the applicable harmonised technical specification, as foreseen by the manufacturer:
to be used as cut to length plates in metal structures or in composite metal and concrete structures

3. Name, registered trade name or registered trade mark and contact address of the manufacturer as required pursuant to Article 11(5):

ArcelorMittal Poland SA
Unit in Kraków
ul. T. Sendzimira 1
31-752 Kraków
Tel: +48 784 319 928
Fax:
e-mail: dominika.macha1@arcelormittal.com

4. Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2): Non applicable

5. System or systems of assessment and verification of constancy of performance of the construction product as set out in Annex V:

System 2+

6a. In case of the declaration of performance concerning a construction product covered by a harmonised standard:

EN 10025-1: 2004

Notified factory production control certification body No. 0035 (TÜV Rheinland Industrie Service GmbH) performed the initial inspection of the manufacturing plant and of factory production control and the continuous surveillance, assessment and evaluation of factory production control and issued the certificate of conformity of the factory production control.

6b. In case of the declaration of performance concerning a construction product for which a European Technical Assessment has been issued: Non applicable

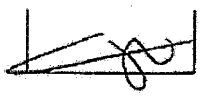
7. Declared performance

| Essential characteristic | Performance | | | | Harmonised technical specification |
|---|---|---|---|---|---|
| Tolerances on dimensions and shape | Thickness | | EN 10051/EN 10363 | | EN 10025-1: 2004 |
| | Flatness on cut to length plate | | EN 10051/EN 10363 | | |
| Yield Strength | Nominal thickness (mm) | | Values | | |
| | > | ≤ | $R_{eH}$ min (MPa) | | |
| | | 16 | 355 | | |
| | 16 | 30 | 345 | | |
| Tensile Strength | Nominal thickness (mm) | | Values | | |
| | > | ≤ | $R_m$ min (MPa) | max (MPa) | |
| | | 3 | 510 | 680 | |
| | 3 | 30 | 470 | 630 | |
| Elongation | Nominal thickness (mm) | | Values | | |
| | > | ≤ | min (%) | Samples | |
| | | 2 | 14 | A80 (%) | |
| | 2 | 2.5 | 15 | A80 (%) | |
| | 2.5 | 3 | 16 | A80 (%) | |
| | 3 | 30 | 20 | A 5.65√So (%) | |
| Impact Strength | Nominal thickness (mm) | | Values | | |
| | > | ≤ | KV2Lmin (J) | | |
| | | 30 | 27 at -20°C | | |
| Weldability CEV | Nominal thickness (mm) | | Values | | |
| | > | ≤ | % | | |
| | | 30 | ≤ 0.45 | | |
| | 30 | 100 | ≤ 0.47 | | |
| Durability | Nominal thickness (mm) | | Values | | |
| | > | ≤ | % | | |
| | | 40 | C : ≤ 0.20<br>Si : ≤ 0.55<br>Mn : ≤ 1.60<br>P : ≤ 0.025<br>S : ≤ 0.025 | Cu : ≤ 0.55 | |
| | 40 | 100 | C : ≤ 0.22<br>Si : ≤ 0.55<br>Mn : ≤ 1.60<br>P : ≤ 0.025<br>S : ≤ 0.025 | Cu : ≤ 0.55 | |

8. Appropriate Technical Documentation and/or Specific Technical Documentation: Non applicable

The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.
Signed for and on behalf of the manufacturer by:

Frederic Valingot
Kraków , 2022-02-28



# INSPECTION CERTIFICATE — NF EN 10204-3.1/DIN 50049-3.1.B/ISO 10474

N° 730/0291248 — Page 1 / FIN


ArcelorMittal
ARCELORMITTAL MEDITERRANEE Site de FOS
13776 FOS SUR MER CEDEX - FRANCE
T:+33(0)44247-3314 F:+33(0)44247-3231
E: un.scu(a)arcelormittal.com


Sigle du producteur / Mill's identification: **FOS**

T Re=355 MINI MPA Rm=470 -630 MPA A%(5,65 )=20 MINI (5)

CDC: Conforme cahier charges / According specifications
BL : Brut de laminage / As rolled
LN : Laminage normalisant / Normalization rolling
A : Revenu / Tempering
TE : Trempé à l'eau / Water quenching
LTC : Laminé temp. contrôlée / Control rolling
TH : Laminage thermomécanique / Thermo-mechanical forming
N : Normalisé / Normalizing
D : Détensionné / Stress relieving
G : Adouci par recuit / Soft annealing

| Organisme et/ou service de contrôle / Inspection organism | Client et/ou destinataire / Customer and/or consignee | N° Commande Courtier/Client / Customer's Order Nbr | N° Commande Usine / Mill's Order Nbr | Nuances et spécifications techniques / Grade and technical specifications | Etat de livraison / Delivery condition |
|---|---|---|---|---|---|
| RECEPTION USINE | EUR-ACCIAI S.P.A.<br>VIALE DELLE INDUSTRIE 1<br>I-20865 USMATE VELATE ITALIE | 244 | GH30EUR002 000012 | S355J2+N-CAT_A EN10025-2:2019<br>HOT ROLLED COIL, AS ROLLED | LTC : LN |
| A05 | A06 | A07 | A08 | B01 B02 | B04 |

Traitement de référence / Treatment of test samples: BL (B05)

| Identification du produit / Product identification | | Poste | Nombre de pièces | Dimensions / Sizes (mm) | | | Masse Weight | Empla. | Traction / Tensile requirements | | | | | | | | | | Empla. | Résilience / Impact testing | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Repère pièce / Plate number | Coulée / Heat | Item | Number of pieces | Epaisseur / Thickness | Largeur / Width | Longueur / Length | (kg) (7) | Loc. (2) | S (3) | Pos Z(4) | Type | Réf Ref (5) | Temp. | ReEH | Rm | A% | | | | Loc (2) | Réf Ref | Type | S (3) | Temp. | Pos. Z(4) | Valeurs individuelles / Individual values | Moyenne / Average |
| B07 | B07 | A07 | B08 | B09 | B10 | B11 | B13 | C01 | C02 | C062 | C10 | | C03 | C11 | C12 | C13 | <-C14-C29 | | C60-C69-> | C01 | | C40 | C02 | C08 | C62 | <- - - -C42- - - -> | C43 |
| ~~1916062~~ | ~~730324314~~ | ~~001~~ | ~~1~~ | ~~5,000~~ | ~~2000,00~~ | | ~~24136~~ | 1 | T | P | PRISM | BL | 20 | 500 | 609 | 24,4 | | | | | | | | | | | |
| 1936068 | 730324314 | 001 | 1 | 5,000 | 2000,00 | | 24056 | | | | | | | | | | | | | | | | | | | | |
| ~~1936071~~ | ~~730324314~~ | ~~001~~ | ~~1~~ | ~~5,000~~ | ~~2000,00~~ | | ~~24076~~ | | | | | | | | | | | | | | | | | | | | |

23C227

CLIENTE ... EURACCIAI ...
NS DDT NR. 4310 ... DEL 04/9/23 ...
FOTOCOPIA CONFORME ORIGINALE
EUR-ACCIAI SpA
UFF. COMMERCIALE

AC:C =0,20 MAXI MN=1,60 MAXI P =0,025 MAXI S =0,025 MAXI SI=0,03 MAXI AL=0,02 -0,29 CU=0,39 MAXI NI=0,42 MAXI CR=0,29 MAXI NB=0,06 MAXI V =0,10 MAXI
TI=0,05 MAXI B =,0007 MAXI MO=0,11 MAXI CO=0,29 MAXI CEQ02=C+MN/6+(CU+NI)/15+(CR+MO+V)/5 =0,47 MAXI CBN02=SI+2,5P =0,090 MAXI

| Meth. (6) of steel making | Repère Pièce / Plate number | N° Coulée / Heat number | * Analyse sur produit / Check analysis | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | C% | Mn% | P% | S% | Si% | AL% | B % | CR% | CU% | MO% | NB% | NI% | TI% | V % | | | | | CEQ02 | CBN02 | | | | % | |
| C70/93 O/YCC | B07 | B07 730324314 | C71 0,18 | C72 1,50 | C73 0,017 | C74 0,004 | C75 0,02 | C76 0,03 | C77 0,0001 | C78 0,08 | C79 0,01 | C80 0,00 | C81 0,01 | C82 0,02 | C83 0,01 | C84 0,00 | C85 | C86 | C87 | C88 | C89 0,45 | C90 0,059 | C91 | C92 | C96 | C97 | |

Emplacement/Location (2): 1 Tête / Head; 2 Pied / Bottom; 3 1/2 longueur / Length; X:Divers / Mix — C01

(3) Sens/Direction: L:Long / Longitudinal; T:Travers / Transverse; Z:Travers court / Through thick — C02

(4) Position: C:Coeur / Core sample; P:Peau / Rolled surface; D:1/3 Epais. / Thickness; Q:1/4 Epais. / Thickness; F:1/5 Epais. / Thickness; K:Divers / Mix — C62

(6)Mode élab.Meth.Coulée: T: Thomas M: Martin E: Electrique / Electric O/Y: Oxy.pur / Basic oxyg. CC: Coulée Continue / Continuous casting — C70/93

(7) Masse et nb pieces a titre indicatif. Mass and quantity of pieces as a rough guide

We hereby certify that the above cited shipment was produced according to the technical specifications of the contract and that, with inspection and tests completed, it meets those specifications as well as all norms and standards referred to in the contract.

Contrôle de marquage, d'aspect et de dimensions : satisfaisants
Inspection of markings, surface, sizes : satisfactory. — D01

Date 04/09/23
Agent / Receiving Agent
F. SIXDENIERS — Z02

247

ARCELORMITTAL MEDITERRANEE
13776 FOS SUR MER CEDEX

ArcelorMittal

# Documento di controllo basato su un controllo specifico
# Inspection document based on specific control
# EN 10204

UK CA CE

| Organismo di controllo<br>Inspection Organisme<br>Dipartimento Qualità<br>Quality department | Cliente<br>Customers<br>EUR-ACCIAI S.P.A. | Nr Ordine Cliente<br>Customer's order Nr | Nr Ordine Stabilimento<br>Mill's order Nr<br>GH30EUR002 | Specifica Tecnica<br>Technical specification<br>S355J2+N EN 10025-2:2019 |
|---|---|---|---|---|

| Identificazione Prodotto<br>Product identification | Organismo di Certificazione<br>Notified body<br>CE<br>0333 | Numero del certificato<br>Certificat number<br>HR00017_CPR2013-07-01_IT_V012<br>http://dop.arcelormittal.net/pdf/HR00017_CPR2013-07-01_IT_V012_IT_IT.pdf | Anno / Year<br>13 |
|---|---|---|---|
| | Organismo di Certificazione<br>Approved body<br>UKCA<br>8510 | Numero del certificato<br>Certificat number<br>HR00017_UKCA_IT_V002<br>http://dop.arcelormittal.net/pdf/HR00017_UKCA_IT_V002_EN_IT.pdf | Anno / Year<br>13 |

| Riferimento pezzo<br>Part Number | Colata<br>Heat | Riga<br>Item | EN 10025-1<br>Prodotti in acciao per costruzione laminati a caldo<br>Utilizzi previsti: Utilizzo previsto per strutture saldate, bullonate e rivettate | EN 10025-1<br>Hot rolled structural steel products.<br>Intended uses : Intended to be used in welded, bolted and riveted structures |
|---|---|---|---|---|
| 1916062 | 730324314 | 000012 | Tolleranze sulle dimensioni e forma:<br>prodotto secondo EN 10051 | Tolerances on dimensions and shape:<br>Conform to EN 10051 |
| 1936071 | 730324314 | 000012 | | |
| 1936068 | 730324314 | 000012 | | |

| | | | |
|---|---|---|---|
| Allungamento<br>Resistenza a trazione<br>Limite di snervamento<br>Resilienza<br>Saldabilita<br>Durata nel tempo | Acciaio<br>Espresso cosi indicato nel DoP | Elongation<br>Tensile strength<br>Yield strength<br>Impact strength<br>Weldability<br>Durability | Steel<br>Expressed as indicated in the DoP |

Certificazione valida per materiale fornitoVi con ns. DDT nr. C4001380 del 23/09/2024 relativo a:

PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 5mm POS. 26
RIF. VS. ORD. 24005170 DEL 11/09/2024
RIF. VS. COMM. 24-27012

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


METINVEST
FERRIERA VALSIDER SPA

A01 Società per azioni con socio unico soggetta a direzione e coordinamento di Metinvest B.V
Via Antonio Salieri, 36 · 37050 Vallese di Oppeano VR, Italy
Phone +39 045 7133311 · Fax +39 39 045 7133394
Cap. Soc. Euro 22.700.937,00 i.v. · P.IVA 03067420236
C.F. e Reg. Imp. n. 13120560159 · REA 306151/VR
http://valsider.metinvestholding.com


(A) PROCESSO DI ELABORAZIONE / STEELMAKING PROCESS: E = ELECTRIC ; BO = BASI
(B) STATO DI FORNITURA / DELIVERY CONDITION: AR = GREZZO DI LAMINAZIONE / AS
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 ;
M = LAMINAZIONE TERMOMECCANICA / Thermomechanical rolling
(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

MANNI SIPRE
STEEL ENGINEERING
UFFICIO CERTIFICATI - COPIA INFORMATICA CONFORME ORIGINALE
NS. CONFERMA: 0000006104
RIF. ORDINE: AGG.ORD. B9000100 DE
DDT: 0000101575
PLACCA/COLATA: 201840072A

A03 N° Certificato / Certificate no.: 107725
Z02 Data / Date: 22/01/2019
A08 N° Ordine / Works order: 95185698
A07 N° Ordine cliente / Customer's order: AM1S000795
DDT: BOL 1900858
del / date: 21/01/2019
Pratica / File no.:
del / date:

B01/B02/B03
Prodotto / Product: Lamiere / Hot rolled plates
Qualità / Steel grade: S355J2+N
Normativa / Specification: EN 10025-2:2004

A06 Cliente / Customer

**Manni Sipre S.P.A.**
**Via Righi 7**
**37135 VERONA**
**Italy**

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

| B07 ITEM | B07 IDENTIFICATIVO PRODOTTO / PRODUCT ID | B16 COLATA / HEAT | B09/B11 DIMENSIONI [mm] / DIMENSIONS | B12 PESO TEORICO [t] / THEORICAL WEIGHT | B07 LOTTO / BATCH NO. | C70 PROCESSO ELAB. (A) / STEELMAKING PROCESS | B04 STATO FORNITURA (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: TEMPERATURA (Q) °C / TEMPERATURE | PERMANENZA (Q) Min / HOLDING TIME | RAFFREDDAMENTO / COOLING | TEMPERATURA (T) °C / TEMPERATURE | PERMANENZA (T) Min / HOLDING TIME | RAFFREDDAMENTO / COOLING |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2018/39053A | A1/02808469 | 30.00X2450X12000 | 6,92 | 49946 | BO | N* | [ZD580] | | | | | | | | | | | | | | | | | |
| 1 | 2018/39187A | A1/02808611 | 30.00X2450X12000 | 6,92 | 49944 | BO | N* | [ZD583] | | | | | | | | | | | | | | | | | |
| 1 | 2018/39692A | A1/02810281 | 30.00X2450X12000 | 6,92 | 50047 | BO | N* | [ZD635] | | | | | | | | | | | | | | | | | |
| 1 | 2018/40072A | A1/02808469 | 30.00X2450X12000 | 6,92 | 49176 | BO | N* | [ZD033] | | 19T081 | | | | | | | | | | | | | | | |

## 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S355J2+N Min | | | | | | | | | | | | | | | | | | | | | |
| S355J2+N Max | 0,20 | 1,60 | 0,55 | 0,025 | 0,025 | 0,550 | | | | | | | | | | | | | | | |
| A1/02808469 | 0,16 | 1,48 | 0,22 | 0,010 | 0,003 | 0,060 | 0,040 | 0,040 | 0,01 | 0,033 | 0,005 | 0,023 | 0,005 | | | 0,0060 | 0,0005 | 0,0003 | 0,41 | 0,42 | 0,25 |
| A1/02808611 | 0,17 | 1,53 | 0,30 | 0,011 | 0,002 | 0,040 | 0,020 | 0,040 | 0,01 | 0,038 | 0,005 | 0,022 | 0,005 | | | 0,0070 | 0,0005 | 0,0002 | 0,43 | 0,44 | 0,26 |
| A1/02810281 | 0,17 | 1,46 | 0,27 | 0,014 | 0,002 | 0,040 | 0,020 | 0,030 | 0,01 | 0,035 | 0,005 | 0,023 | 0,005 | | | 0,0070 | 0,0005 | 0,0002 | 0,41 | 0,43 | 0,26 |

| C00 CAMPIONE / SAMPLE | C01 SPESSORE PRODOTTO / PRODUCT THICKNESS | 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 | C12 ReH/Rm | C13 A% / ELONGATION | C14 Rp 0,2 [Mpa] / PROOF 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 INDIVIDUAL VALUES [J] | C43 MEDIA [J] / MEAN VALUE SINGOLI VALORI | 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% INDIVIDUAL VALUES / Z% SINGOLI VALORI | C54 Z% VALORE MEDIO / Z% MEAN VALUE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S355J2+N Min 16.10 - 40.00 | | | | | | | | | | | | | L | -20 | | 27 | 0 | | | | | | | | | | | |
| S355J2+N Min 16.10 - 40.00 | | | | | 20 | 345 | 470 | | 20 | | | | | | | | | | | | | | | | | | | |
| S355J2+N Max 16.10 - 40.00 | | | | | 20 | 630 | 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 PRODOTTO PRODUCT 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 STRENGTH | FORMA PROVINO (4) SHAPE OF TEST PIECE | LARGHEZZA [mm] WIDTH | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | POSIZIONE (2) LOCATION | [J] INDIVIDUAL VALUES | MEDIA [J] SINGOLI VALORI MEAN VALUE | DIREZIONE (3) ORIENTATION | MANDREL MANDRINO [mm] | ANGOLO [°] ANGLE | ESITO (5) RESULT | POSIZIONE (2) LOCATION | METODO TEST METHOD | SINGOLI VALORI INDIVIDUAL VALUES | MEDIA MEAN VALUE | Z% INDIVIDUAL VALUES | Z% VALORE MEDIO Z% MEAN VALUE |
| ZD033 | 30,00 | 2 | P | T | 20 | 435 | 571 | 0,76 | 37 | | P | 10,00 | L | -20 | P | 175 176 166 | 173 | | | | | | | | | | |
| ZD580 | 30,00 | 2 | P | T | 20 | 416 | 570 | 0,73 | 34 | | P | 10,00 | L | -20 | P | 182 154 159 | 165 | | | | | | | | | | |
| ZD583 | 30,00 | 2 | P | T | 20 | 408 | 556 | 0,73 | 27 | | P | 10,00 | L | -20 | P | 156 173 169 | 166 | | | | | | | | | | |
| ZD635 | 30,00 | 2 | P | T | 20 | 418 | 544 | 0,77 | 78 | | P | 10,00 | L | -20 | P | 179 153 166 | 166 | | | | | | | | | | |

C10

UNI EN ISO 6892-1:2009/ UNI EN ISO 148-1:2011

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 10029:2010 CL.A | -0+100 MM | -0+200 MM | EN 10163/2:2004 CL A1 | EN 10029:2010 CL. N |

CERTIFICHIAMO che i prodotti elencati 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 products are consistent with the order prescriptions: marking, inspection and measurement without objection.
DICHIARIAMO CHE I PRODOTTI SONO STATI CONTROLLATI IN ACCORDO ALLA NORMATIVA VIGENTE E CHE LE RADIAZIONI IONIZZANTI NON ECCEDONO IL VALORE DEL FONDO NATURALE.
WE DECLARE THAT THE PRODUCTS WERE CONTROLLED ACCORDING TO STANDARD AND RADIATION DO NOT EXCEED THE NATURAL RADIATION.

Z06

| Z07 | Z03 ENTE COLLAUDO / INSPECTION BODY | Z02 |
|---|---|---|
| | TIMBRO DELL'ISPETTORE<br>STAMP OF THE INSPECTION<br>REPRESENTATIVE | Valsider CONTROLLO QUALITÀ |

| Z04 | |
|---|---|
| CE 0948 | **Prodotti conformi ai requisiti della marcatura CE. Certificato di conformità CE n° 0948-CPR-0015 emesso da TÜV Italia srl .**<br>**Products in compliance with CE marking requirements. Certificate of conformity N° 0948-CPR-0015 from TÜV Italia srl.** |

CERTIFICAZIONE DI SISTEMA QUALITÀ DNV·GL ISO 9001

AZIENDA CON SISTEMA DI GESTIONE QUALITÀ CERTIFICATO DA DNV GL = ISO 9001 =

Certificazione valida per materiale fornitoVi con ns. DDT nr. C4001380 del 23/09/2024 relativo a:

PZ. 1 PARTICOLARE: C09-0001-P006_REV.A SP. 30mm
POS. 1
RIF. VS. ORD. 24005170 DEL 11/09/2024
RIF. VS. COMM. 24-27012

METINVEST
FERRIERA VALSIDER SPA

**Ferrirera Valsider SPA**
Via Antonio Salieri, 36
37050 Vallese di Oppeano VR, Italy
Phone +39 045 7133311
Fax +39 39 045 7133394
http://valsider.metinvestholding.com

**DICHIARAZIONE DI PRESTAZIONE (Reg. UE N. 305/2011)**

N.S355-2

Il sottoscritto Viktor Dembytskyy, rappresentante il produttore:
**Ferriera Valsider spa**
**Via Antonio Salieri , 36 - 37050 - vallese di Oppeano (VR)**
nello stabilimento produttivo di:
**Via Antonio Salieri , 36 - 37050 - vallese di Oppeano (VR)**
Dichiara qui di seguito che i prodotti:
Prodotti piani laminati a caldo in acciaio secondo EN10025-1:2004.

**DECLARATION OF PERFORMANCE (Reg . UE N. 305/2011)**

N.S355-2

I, the undersigned, Viktor Dembytskyy, ,representing the manufacturer:
**Ferriera Valsider spa**
**Via Antonio Salieri , 36 - 37050 - vallese di Oppeano (VR)**
the production site:
**Via Antonio Salieri , 36 - 37050 - vallese di Oppeano (VR)**
Hereby declares that the products: Hot-rolled flat products of steel according to EN10025-1: 2004.
Hot-rolled flat products of steel according to EN10025-1: 2004.

| Qualità / Steel grade | Normativa / Specification |
|---|---|
| S355J2C+N+Z25 | EN 10025-2:2004 |
| S355JR+AR | EN 10025-2:2004 |
| S355JR+N | EN 10025-2:2004 |
| S355K2+AR | EN 10025-2:2004 |
| S355K2+N | EN 10025-2:2004 |
| S355K2+N+Z15 | EN 10025-2:2004 |
| S355K2+N+Z25 | EN 10025-2:2004 |
| S355K2+N+Z35 | EN 10025-2:2004 |
| S355K2C+N | EN 10025-2:2004 |
| S355J0+AR | EN 10025-2:2004 |
| S355J0+AR+Z25 | EN 10025-2:2004 |
| S355J0+N | EN 10025-2:2004 |
| S355J0+N+Z35 | EN 10025-2:2004 |
| S355J0C+AR | EN 10025-2:2004 |
| S355J0C+N | EN 10025-2:2004 |
| S355J2+AR | EN 10025-2:2004 |
| S355J2+N | EN 10025-2:2004 |
| S355J2+N+Z15 | EN 10025-2:2004 |
| S355J2+N+Z25 | EN 10025-2:2004 |
| S355J2+N+Z35 | EN 10025-2:2004 |
| S355J2C+N | EN 10025-2:2004 |

| Tipo prodotto / Product type | Qualità / Steel grade | Codice identificativo univoco prodotto/ Unique product identifier code | Numero interno/ Internal number | Specifica tecnica armonizzata / Harmonized techical specification |
|---|---|---|---|---|
| Lamiera/Plate | S355J2+N | 2018/39053A | 1839053 | EN10025-1:2004 |
| Lamiera/Plate | S355J2+N | 2018/39187A | 1839187 | EN10025-1:2004 |
| Lamiera/Plate | S355J2+N | 2018/39692A | 1839692 | EN10025-1:2004 |
| Lamiera/Plate | S355J2+N | 2018/40072A | 1840072 | EN10025-1:2004 |

Che i prodotti specificati nel presente documento sono destinati ad essere utilizzati nelle strutture saldate, bullonate e chiodate.

Che i prodotti specificati nel presente documento presentano le seguenti caratteristiche essenziali e prestazioni:

The products specified in this document are intended to be used in metal structures or mixed metal and concrete structures.

The products specified in this document have the following essential features and performance:

| Caratteristiche Essenziali / Essential features | Prestazione / Performance | Norma Armonizzata / Harmonized specification |
|---|---|---|
| Tolleranze dimensionali e forma /Tollerance on dimensions and shape | Conforme / Compliance | EN10025-1:2004 |
| Allungamento /Elongation | Conforme / Compliance | EN10025-1:2004 |
| Resistenza a Trazione/Tensile Strength | Conforme / Compliance | EN10025-1:2004 |
| Carico Unitario snervamento/Yield Strength | Conforme / Compliance | EN10025-1:2004 |
| Resilienza/Impact | Conforme / Compliance | EN10025-1:2004 |
| Saldabilità/Weldability | Conforme / Compliance | EN10025-1:2004 |
| Durabilità/Durability | NPD | |
| Sostanza Regolamentata/Regulated substance | NPD | |

Si dichiara inoltre che l'organismo notificato, TÜV Italia [N. 0948] ha effettuato:
- ispezione iniziale dello stabilimento e del controllo della produzione in fabbrica
- sorveglianza, valutazione e verifica continua del controllo della produzione in fabbrica

secondo il sistema di valutazione e verifica della costanza della prestazione 2+ ed ha rilasciato il certificato di controllo della produzione in fabbrica numero 0948-CPR-0015

It also states that the notified body, TÜV Italia [N. 0948], carried out:
- Initial inspection of factory and of factory production control
- Monitoring, evaluation and continuous assessment of factory production control

according to the system of assessment and verification of constancy of performance 2 + and released the certificate of factory production control number 0948-CPR-0015

CE 0948

**Lamiere conformi ai requisiti della marcatura CE. Certificato di conformità CE n° 0948-CPR-0015 emesso da TÜV Italia srl . Plates in compliance with CE marking requirements. Certificate of conformity N° 0948-CPR-0015 from TÜV Italia srl.**

Si rilascia la presente dichiarazione di prestazione sotto la responsabilità esclusiva del fabbricante

This declaration of performance is made under the sole responsibility of the manufacturer

Vallese di Oppeano,

22/01/2019

Viktor Dembytskyy

Managing Director
Ferriera Valsider s.p.a.
Metinvest Group

REMAZEL

# CERTIFICATION LIST

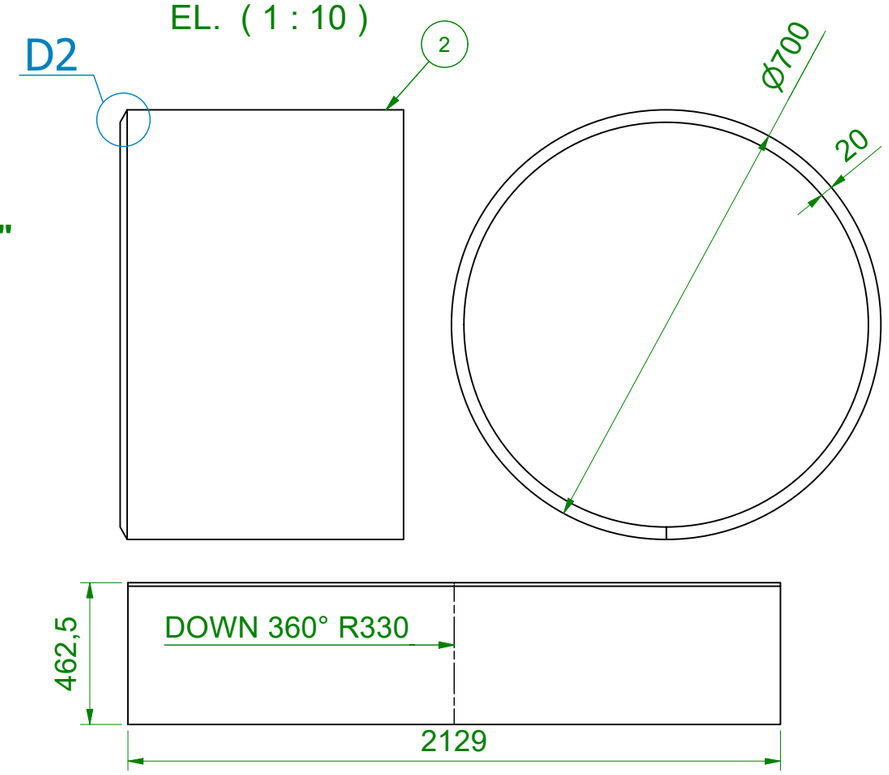
Certificate Nr.: 001/2024
Date:

| Final Customer: | Order Customer: | Object: | Description: | Quantity: | Inspection and Test Plan (ITP): | Our job: |
|---|---|---|---|---|---|---|
| ROSETTI MARINO | 24005073 SIDERTAGLIO | C09-0001-P0001+P0002 | PEDESTAL+COLUMN | | | |

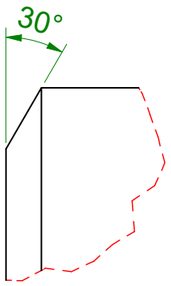
## MATERIAL

| Drawing | Pos. | Q.ty | Description | Material | Certificates 3.1 | Manufacturer | Heat/Plate ID | Additional Mechanical Test | UT Certificates | Nesting |
|---|---|---|---|---|---|---|---|---|---|---|
| C09-0001-P0001 | 1 | 1 | SHEET METAL 40mm | S355J2+N | 16624563335 | MARCEGAGLIA P&B | 2461219/24C .609.01 | | 920 | |
| C09-0001-P0001 | 2 | 1 | SHEET METAL 20mm | S355J2+N | 240000005205 | FABBRICA ITALIANA LAMIERE | 316829/24LT 005170 | 240898 | 267 | |
| C09-0001-P0001 | 3 | 2 | SHEET METAL 10mm | S355J2+N | 5394/3016 | GABRIELLI | 565503/8748 646 | 240899 | | |
| C09-0001-P0001 | 4 | 2 | SHEET METAL 5mm | S355J2+N | 664290 | ACCIAIERIA ARVEDI | 122771/7122 77111-400071315 | 240900 | | |
| C09-0001-P0001 | 5 | 1 | SHEET METAL | S355J2+N | 2022/002212/01 | ACCIAIERIA D'ITALIA | 180235-151872201 | | | |
| C09-0001-P0001 | 6 | 2 | SHEET METAL 5mm | S355J2+N | 664290 | ACCIAIERIA ARVEDI | 122771/7122 77111-400071315 | 240899 | | |
| C09-0001-P0002 | 1 | 1 | sheet metal 40mm | S355J2+N | 16624400805 | MARCEGAGLIA P&B | 441908/16F. 5953.01 | 240902 | 673 | |
| C09-0001-P0002 | 2 | 1 | SHEET METAL 40mm | S355J2+N | 16624563335 | MARCEGAGLIA P&B | 2461219/24C .609.01 | 240896 | 920 | |
| C09-0001-P0002 | 3A | 1 | SHEET METAL 15mm | S355J2+N | 16624421397 | MARCEGAGLIA P&B | 442151/16F. 6119.01/B | 240905 | | |
| C09-0001-P0002 | 3B | 1 | SHEET METAL 15mm | S355J2+N | 16624421397 | MARCEGAGLIA P&B | 442151/16F. 6119.01/A | 240906 | | |
| C09-0001-P0002 | 4 | 1 | SHEET METAL 15mm | S355J2+N | 16624421397 | MARCEGAGLIA P&B | 442151/16F. 6119.01/B | 240908 | | |
| C09-0001-P0002 | 6 | 4 | SHEET METAL 10mm | S355J2+N | 16624421397 | MARCEGAGLIA P&B | 2377353/24R .366.02/A | 240909 | | |
| C09-0001-P0002 | 7 | 2 | SHEET METAL 10mm | S355J2+N | 16624421397 | MARCEGAGLIA P&B | 2377353/24R .366.02/A | 240910 | | |
| C09-0001-P0002 | 8 | 1 | SHEET METAL 15mm | S355J2+N | 16624421397 | MARCEGAGLIA P&B | 442151/16F. 6119.01/A | 240911 | | |
| C09-0001-P0002 | 9 | 3 | SHEET METAL 15mm | S355J2+N | 16624421397 | MARCEGAGLIA P&B | 442151/16F. 6119.01/A | 240912 | | |
| C09-0001-P0002 | 10 | 1 | SHEET METAL 15mm | S355J2+N | 16624421397 | MARCEGAGLIA P&B | 442151/16F. 6119.01/A | 240913 | | |
| C09-0001-P0002 | 11 | 2 | SHEET METAL 5mm | S355J2+N | 664290 | ACCIAIERIA ARVEDI | 122771/7122 77111-400071315 | 240914 | | |
| C09-0001-P0002 | 12 | 8 | METAL PROFILE 10mm | S355J2+N | 5394/3016 | GABRIELLI | 565503/8748 646 | 240915 | | |
| C09-0001-P0002 | 13 | 5 | METAL PROFILE 5mm | S355J2+N | 664290 | ACCIAIERIA ARVEDI | 122771/7122 77111-400071315 | 240916 | | |
| C09-0001-P0002 | 14 | 4 | METAL PROFILE 5mm | S355J2+N | 664290 | ACCIAIERIA ARVEDI | 122771/7122 77111-400071315 | 240917 | | |
| C09-0001-P0002 | 15 | 1 | METAL PROFILE 30mm x D8 | S355J2+N | 240000004290 | FABBRICA ITALIANA LAMIERE | 322347/24LT 004258 | 240918 | 239 | |
| C09-0001-P0002 | 16 | 4 | METAL PROFILE 30mm x D8 | S355J2+N | 240000004290 | FABBRICA ITALIANA LAMIERE | 322347/24LT 004258 | 240919 | 239 | |

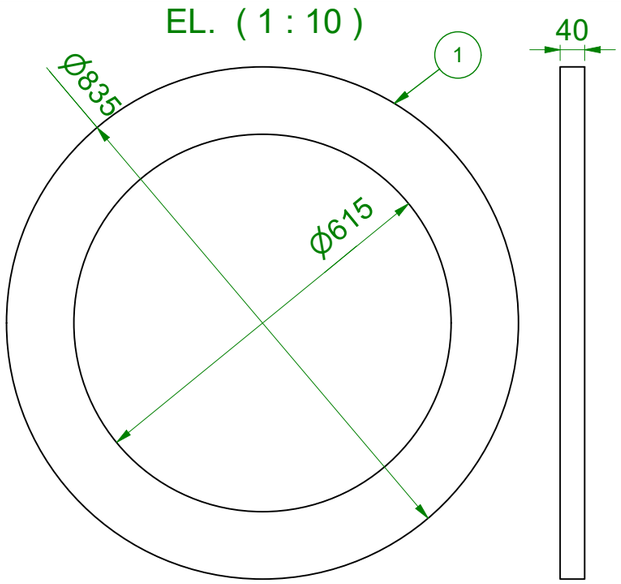
EL. ( 1 : 10 )



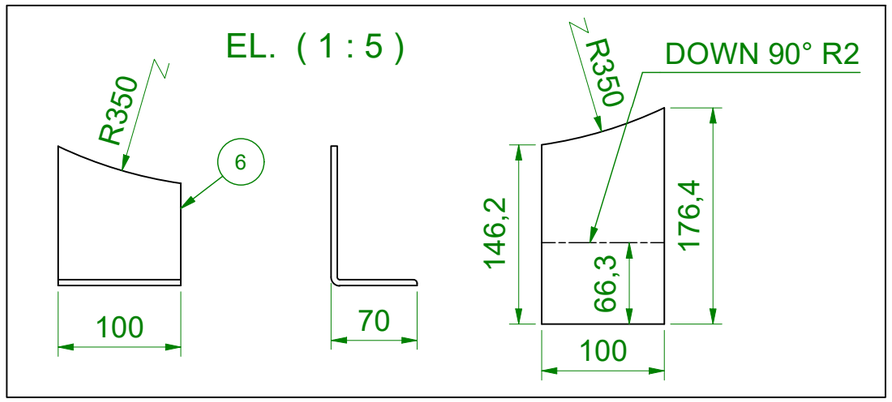

Dett. / Detail **"D2"**
( 1 : 2 )



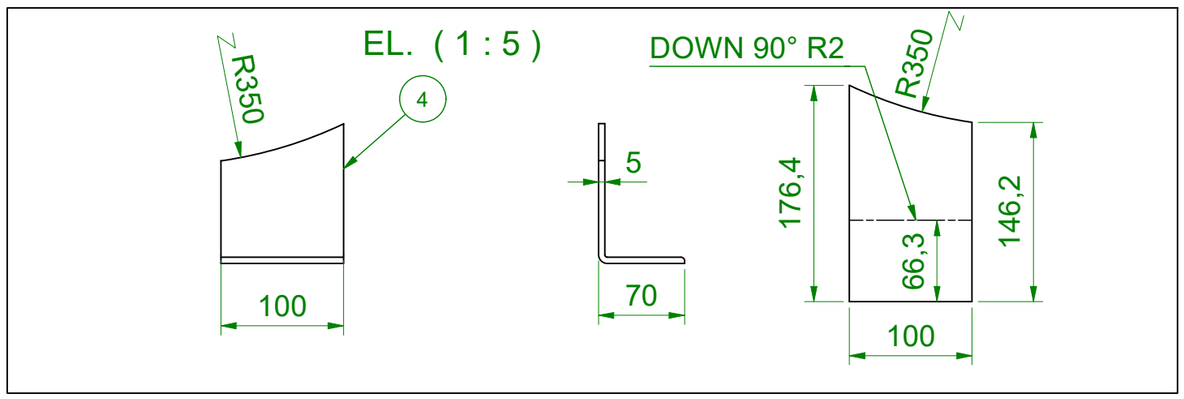

EL. ( 1 : 10 )



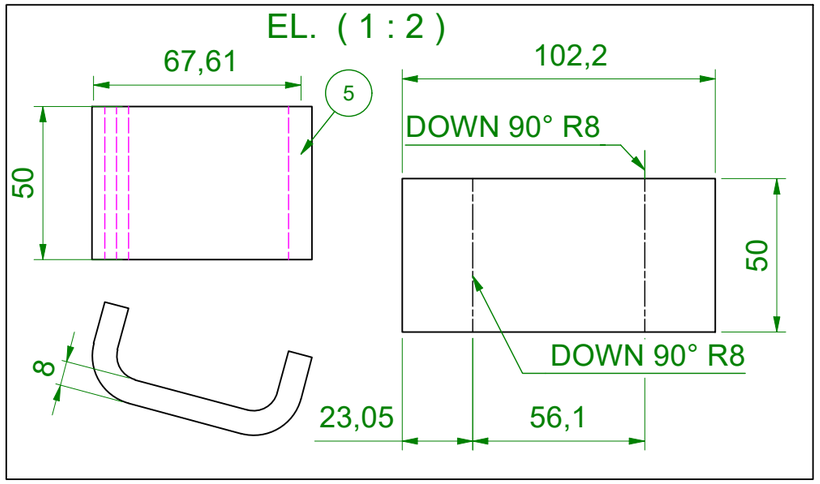

EL. ( 1 : 5 )

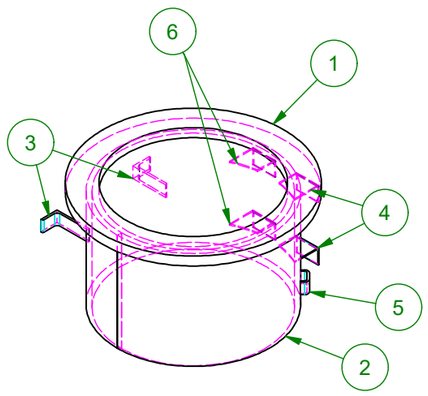



EL. ( 1 : 5 )




EL. ( 1 : 2 )




| | | | | |
|---|---|---|---|---|
| 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. | – |
| 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 | | | |

GRADO DI PRECISIONE PER QUOTE LINEARI E ANGOLARI NON TOLLERATE
DEGREE OF PRECISION FOR LINEAR AND ANGULAR DIMENSIONS WITHOUT TOLERANCE
LAVORAZIONI MECCANICHE / MECHANICALS MACHININGS
Lineari-Angolari / Linear-Angular : UNI EN 22768/1-1996 - m
Geometriche / Geometrical : UNI EN 22768/2-1996 - L
CARPENTERIA / WELDING STRUCTURE
Lineari-Angolari / Linear-Angular : UNI EN ISO 13920:2000 - A
Geometriche / Geometrical : UNI EN ISO 13920:2000 - E

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 :
236,5 kg

Title :
Carpenteria Pedestal
Pedestal Carpentry

Scale :
1 : 10

Sheet :
2 of 3

**A3**

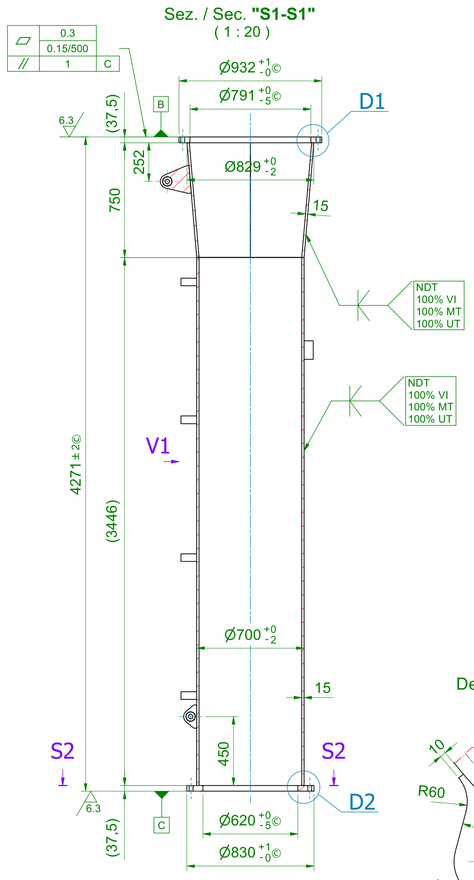
Drawing State:
**Released**
***FOR CONSTRUCTION***

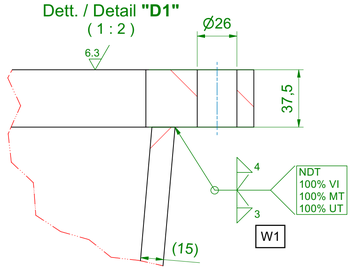
Q.C.L. :
C1

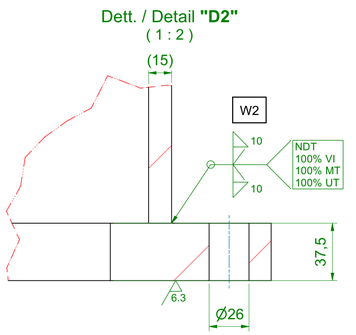
Drawing N° :
C09-0001-P0001

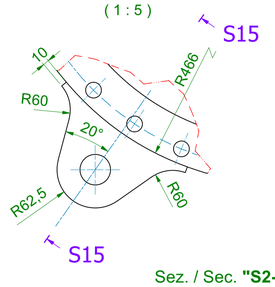
Revision :
D

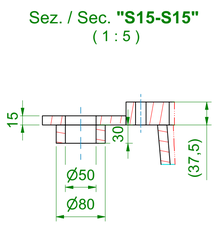
This drawing is property of REMAZEL ENGINEERING S.p.A. It is strictly forbidden to copy, reproduce, modify or distribute the drawing to third persons without owner's written permission.

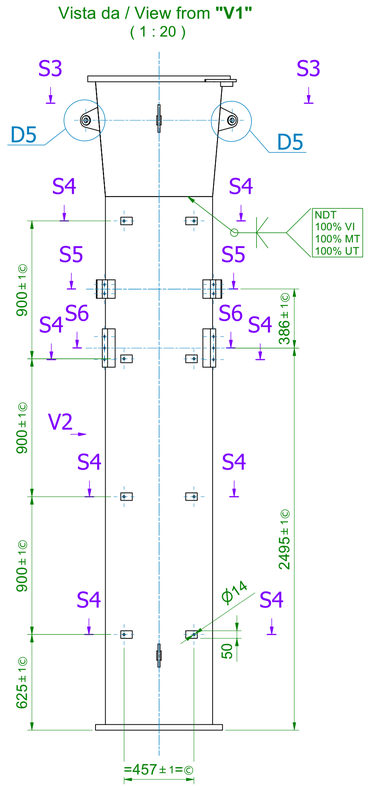


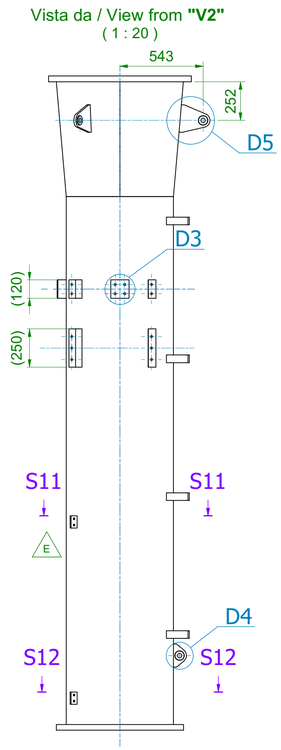



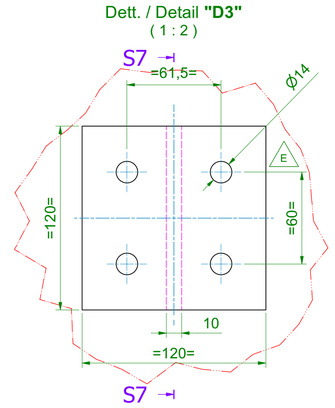



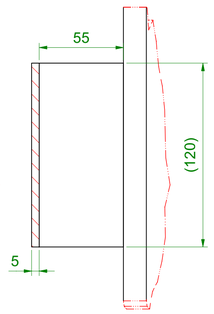



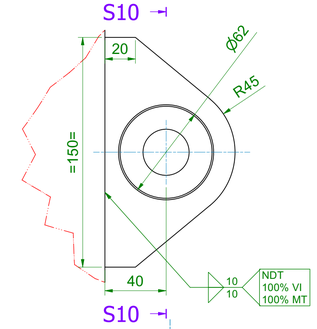



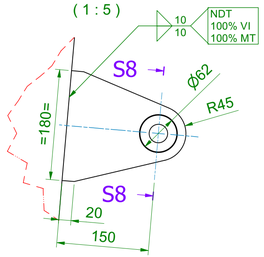



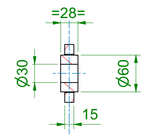



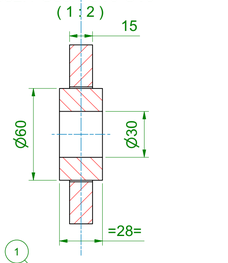



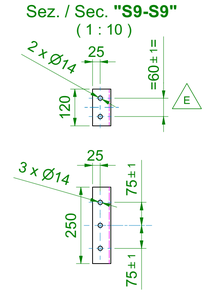



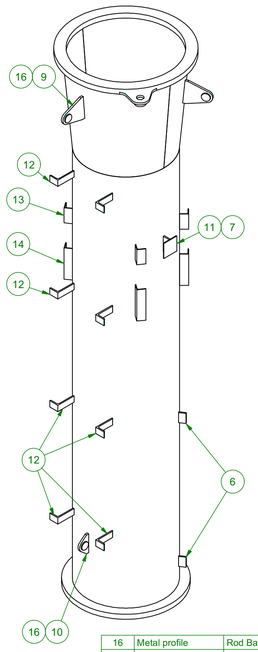



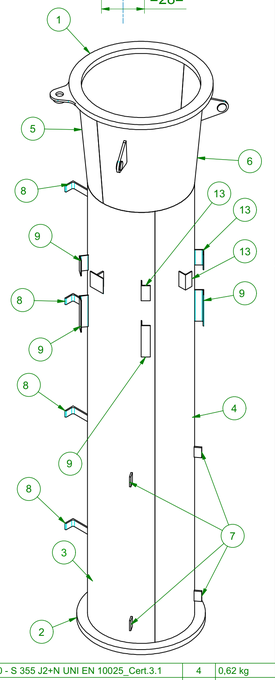



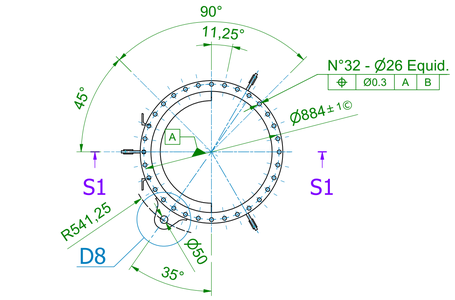



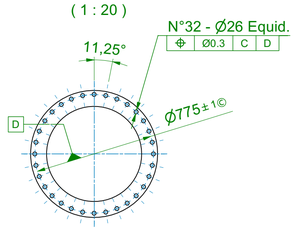



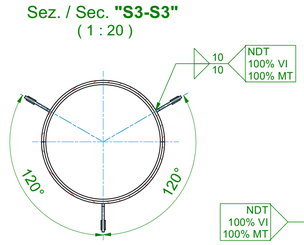



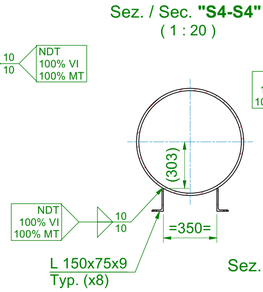



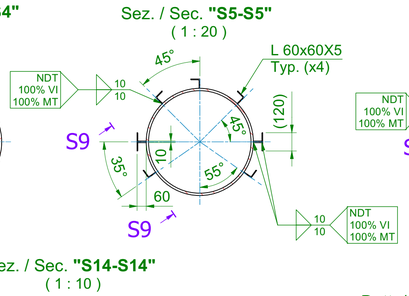



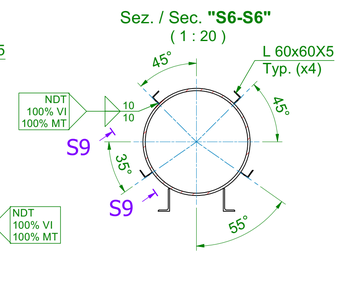



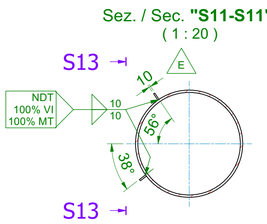



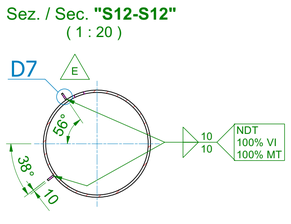



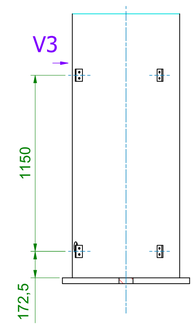



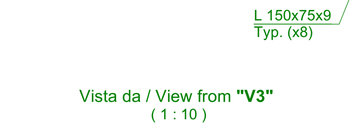



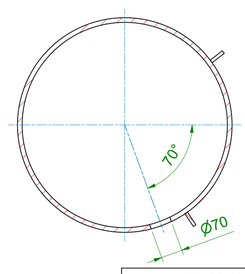



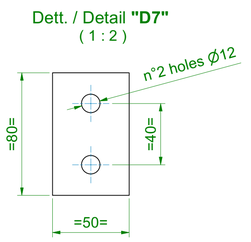




| | | | | |
|---|---|---|---|---|
| 16 | Metal profile | Rod Bar Ø60 - S 355 J2+N UNI EN 10025_Cert.3.1 | 4 | 0,62 kg |
| 15 | Metal profile | Rod Bar Ø60 - S 355 J2+N UNI EN 10025_Cert.3.1 | 1 | 1,19 kg |
| 14 | Metal profile | L 60x60x5 - S 355 J2+N UNI EN 10025_Cert.3.1 | 4 | 1,14 kg |
| 13 | Metal 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 |

6.3

| 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

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.

MARCEGAGLIA PALINI E BERTOLI

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tel +39 0431623111

Type/Tipo 3.1 CERTIFICATO DI COLLAUDO EN10204

questo documento è stato generato automaticamente ed è valido senza firma

Number/Numero 16624400805 Creato il 11/06/2024

**Product: Hot Rolled Heavy Plates**
**NormaCollaudoLamieraTreno: EN10025-2:2019**
**Steel grade:: S355J2+N**

Customer/Cliente
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Code: 0000028513

Del. Address/Destinatario Merci
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Delivery/N° Consegna 8920564442
Of/Del 11/06/2024
Delivery note nr/N° doc. di trasp. 1066007562

Quality Control/Controllo Qualità
Q.M.D./RESP. M.Rizzatti
Plant/Stab. Palini e Bertoli

Pages/Pagine 1/3

Material/Codice Materiale
**LTS**

Description/Descrizione
**70,00 X 2450,00 X 8000,00 S355J2+N**

**Surface Quality: EN10163-2 CL A1**
**Flatness: rif EN 10029 cl. N**
**Thickness tolerance: EN10029 CLASSE B**

Delivery Condition: NORMALIZING ROLLING
Steel Making Process: BO= Basic oxigen

Order Nr/ordine **1191769614/106**
Materiale Cliente

Client Order/Ordine cliente **ORD. 2L 00181 DEL 28/5**
Date/data cliente **28/05/2024**

| Item | Batch/N° Partita | ID Palini | Heat/Colata | Quantity/Q.tà KG | Quantity/Q.tà PZ |
|---|---|---|---|---|---|
| 1 | 24PZ003850 | 24C.369.02 | 2452508 | 10976 | 1 ***25977*** |
| 2 | 24PZ003851 | 24C.368.02 | 2452502 | 10976 | 1 ***25978*** |
| 3 | 24PZ003852 | 24C.368.01 | 2452502 | 10976 | 1 ***25979*** |

Remarks/Note:
LAMIERE SABBIATE in acc. ISO 8501:2012 SA 2 ½.
CE Marking Certificate N.0474-CPR-0033 last issued 14/09/2020 Rev.05. Hot rolled products of structural steels in compliance with Regulation n°305/2011/EU dated 09/03/2011. DOP available on https://www.quality.marcegaglia.com.
UKCA Marking Certificate N.1244-CPR-1051 last issued 01/01/2023. Hot rolled products of structural steels in compliance with the Construction Products Regulation 2011 (retained EU law EUR 305/2011). DOP available on https://www.quality.marcegaglia.com.

| Batch/N° Partita | C (%) | Mn (%) | Si (%) | S (%) | P (%) | Cr (%) | Ni (%) | Cu (%) | Al (%) | Mo (%) | Nb (%) | V (%) | Ti (%) | N (%) | H (%) | B (%) | Ceq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.1 | | | | | | 0.02 | | | | | | | | |
| | 0.22 | 1.6 | 0.55 | 0.025 | 0.025 | 0.29 | 0.42 | 0.55 | 0.3 | 0.11 | 0.06 | 0.1 | 0.05 | | | | 0.47 |
| 24PZ003850 | .157 | 1.443 | .176 | .0030 | .0100 | .017 | .009 | .013 | .044 | .0010 | .027 | .001 | .0010 | .0030 | .00050 | .0001 | .40 |
| 24PZ003851 | .168 | 1.462 | .183 | .0020 | .0110 | .021 | .008 | .012 | .044 | .0010 | .029 | .001 | .0020 | .0040 | .00050 | .0001 | .42 |
| 24PZ003852 | .168 | 1.462 | .183 | .0020 | .0110 | .021 | .008 | .012 | .044 | .0010 | .029 | .001 | .0020 | .0040 | .00050 | .0001 | .42 |

| Batch/N° Partita | Forma | (1) | (2) | (3) | Tst [°C] | Rm [N/mmq] | ReH [N/mmq] | A% (%) | (1) | (2) | (3) | (4) | T [°C] | Kv1 [J] | Kv2 [J] | Kv3 [J] | Kv[a] [J] | TESTN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20 | 470 | 325 | 18 | | | | | -20 | | | | 27 | |
| | | | | | 20 | 630 | | | | | | | | | | | | |
| 24PZ003850 | C | 1 | 1/4 | T | 20 | 557 | 398 | 35.7 | 1 | P | L | 10.0 | -20 | 148 | 146 | 151 | 148 | 24-P07983R |
| 24PZ003851 | C | 1 | 1/4 | T | 20 | 534 | 374 | 30.1 | 1 | P | L | 10.0 | -20 | 53 | 187 | 161 | 133 | 24-P08736R |
| 24PZ003852 | C | 1 | 1/4 | T | 20 | 534 | 374 | 30.1 | 1 | P | L | 10.0 | -20 | 53 | 187 | 161 | 133 | 24-P08736R |

SIDERTAGLIO LAMIERE S.r.l.
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Fax Amm. 0444 823364
Uff. Tec. 0444 823201
C. F. e Part. IVA 02510610245

Controllo ad ultrasuoni

| Apparecchiatura | Numero di serie | Condizioni di superficie | Accoppiante | Mod. operativie | Taratura |
|---|---|---|---|---|---|
| Gilardoni RDG2000 | 050858001 | As Rolled | Acqua | Secondo le specifiche | Secondo le specifiche |

| Item | Norma di riferimento | Classe accettabilità | Esito | Indicazioni | Reticolo | Bordi | Sonda | Frequenza | Angolo |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Firma
II Liv. EN/ISO 9712
Q.M.D. M.Rizzatti

MARCEGAGLIA Palini e Bertoli S.p.A. QUALITY CONTROL Rizzatti Marco

(1)Posizione:1=Testa;2=Piede.(2)Posizione:1/2=1/2 spessore;P=Pelle;1/4=1/4 spessore.(3)Direzione:L=Longitudinale;T=Trasversale;(4)Spessore provino

DescrizioneMarchi

UKCA 1244 22 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

CE 0474 06 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

- Material Free of radioactive contamination
- Dimensional check and visual examination of the surface condition: without objection
- We Declare that the above mentioned plates are in compliance with the order prescription
- We hereby declare that the above mentioned material have been rolled in Italy, thus of European Community origin

MARCEGAGLIA PALINI E BERTOLI

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tel +39 0431623111

Type/Tipo 3.1 CERTIFICATO DI COLLAUDO EN10204

questo documento è stato generato automaticamente ed è valido senza firma

Number/Numero 16624400805 Creato il 11/06/2024

**Product: Hot Rolled Heavy Plates**
**NormaCollaudoLamieraTreno: EN10025-2:2019**
**Steel grade:: S355J2+N**

Customer/Cliente
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Code: 0000028513

Del. Address/Destinatario Merci
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Delivery/N° Consegna 8920564442
Of/Del 11/06/2024
Delivery note nr/N° doc. di trasp. 1066007562

Quality Control/Controllo Qualità
Q.M.D./RESP. M.Rizzatti
Plant/Stab. Palini e Bertoli



Material/Codice Materiale
**LTS**

Description/Descrizione
**85,00 X 2450,00 X 6000,00 S355J2+N**

**Surface Quality: EN10163-2 CL A1**
**Flatness: rif EN 10029 cl. N**
**Thickness tolerance: EN10029 CLASSE B**

Delivery Condition: NORMALIZING ROLLING
Steel Making Process: BO= Basic oxigen

Order Nr/ordine **1191769614/111**
Materiale Cliente

Client Order/Ordine cliente **ORD. 2L 00181 DEL 28/5**
Date/data cliente **28/05/2024**

| Item | Batch/N° Partita | ID Palini | Heat/Colata | Quantity/Q.tà KG | Quantity/Q.tà PZ |
|---|---|---|---|---|---|
| 1 | 24PZ003849 | 24C.329.03 | 2452476 | 9996 | 1 ***25976*** |

Remarks/Note:
LAMIERE SABBIATE in acc. ISO 8501:2012 SA 2 ½.
CE Marking Certificate N.0474-CPR-0033 last issued 14/09/2020 Rev.05. Hot rolled products of structural steels in compliance with Regulation n°305/2011/EU dated 09/03/2011. DOP available on https://www.quality.marcegaglia.com.
UKCA Marking Certificate N.1244-CPR-1051 last issued 01/01/2023. Hot rolled products of structural steels in compliance with the Construction Products Regulation 2011 (retained EU law EUR 305/2011). DOP available on https://www.quality.marcegaglia.com.

| Batch/N° Partita | C (%) | Mn (%) | Si (%) | S (%) | P (%) | Cr (%) | Ni (%) | Cu (%) | Al (%) | Mo (%) | Nb (%) | V (%) | Ti (%) | N (%) | H (%) | B (%) | Ceq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.1 | | | | | | 0.02 | | | | | | | | |
| | 0.22 | 1.6 | 0.55 | 0.025 | 0.025 | 0.29 | 0.42 | 0.55 | 0.3 | 0.11 | 0.06 | 0.1 | 0.05 | | | | 0.47 |
| 24PZ003849 | .156 | 1.418 | .165 | .0040 | .0100 | .017 | .007 | .009 | .042 | .0010 | .027 | .001 | .0010 | .0040 | .00050 | .0001 | .40 |

| Batch/N° Partita | Forma | (1) | (2) | (3) | Tst [°C] | Rm [N/mmq] | ReH [N/mmq] | A% (%) | (1) | (2) | (3) | (4) | T [°C] | Kv1 [J] | Kv2 [J] | Kv3 [J] | Kv[a] [J] | TESTN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20 | 470 | 315 | 18 | | | | | -20 | | | | 27 | |
| | | | | | 20 | 630 | | | | | | | | | | | | |
| 24PZ003849 | C | 1 | 1/4 | T | 20 | 528 | 352 | 28.7 | 1 | P | L | 10.0 | -20 | 58 | 157 | 105 | 106 | 24-P09494R |

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Uff. Tec. 0444 823201
C. F. e Part. IVA 02510610245

Controllo ad ultrasuoni

| Apparecchiatura | Numero di serie | Condizioni di superficie | Accoppiante | Mod. operativie | Taratura |
|---|---|---|---|---|---|
| Gilardoni RDG2000 | 050858001 | As Rolled | Acqua | Secondo le specifiche | Secondo le specifiche |

Firma
II Liv. EN/ISO 9712
Q.M.D. M.Rizzatti

MARCEGAGLIA Palini e Bertoli S.p.A. QUALITY CONTROL Rizzatti Marco

| Item | Norma di riferimento | Classe accettabilità | Esito | Indicazioni | Reticolo | Bordi | Sonda | Frequenza | Angolo |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

(1)Posizione:1=Testa;2=Piede.(2)Posizione:1/2=1/2 spessore;P=Pelle;1/4=1/4 spessore.(3)Direzione:L=Longitudinale;T=Trasversale;(4)Spessore provino

- Material Free of radioactive contamination
- Dimensional check and visual examination of the surface condition: without objection
- We Declare that the above mentioned plates are in compliance with the order prescription
- We hereby declare that the above mentioned material have been rolled in Italy, thus of European Community origin

DescrizioneMarchi

UKCA 1244 22 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

CE 0474 06 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

MARCEGAGLIA PALINI E BERTOLI

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Marcegaglia Palini e Bertoli S.P.A.
via E.Fermi, 28 33058 San Giorgio di Nogaro, Udine - Italy
tel +39 0431623111

Type/Tipo 3.1 CERTIFICATO DI COLLAUDO EN10204

questo documento è stato generato automaticamente ed è valido senza firma

Number/Numero 16624400805 Creato il 11/06/2024

**Product: Hot Rolled Heavy Plates**
**NormaCollaudoLamieraTreno: EN10025-2:2019**
**Steel grade:: S355J2+N**

Customer/Cliente
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Code: 0000028513

Del. Address/Destinatario Merci
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Delivery/N° Consegna 8920564442
Of/Del 11/06/2024
Delivery note nr/N° doc. di trasp. 1066007562

Quality Control/Controllo Qualità
Q.M.D./RESP. M.Rizzatti
Plant/Stab. Palini e Bertoli

Pages/Pagine 3/3

Material/Codice Materiale
**LTS**

Description/Descrizione
**40,00 X 2450,00 X 12000,00 S355J2+N**

**Surface Quality: EN10163-2 CL A1**
**Flatness: rif EN 10029 cl. N**
**Thickness tolerance: EN10029 CLASSE B**

Delivery Condition: NORMALIZING ROLLING
Steel Making Process: BO= Basic oxigen

Order Nr/ordine **1191769614/80**
Materiale Cliente

Client Order/Ordine cliente **ORD. 2L 00181 DEL 28/5**
Date/data cliente **28/05/2024**

| Item | Batch/N° Partita | ID Palini | Heat/Colata | Quantity/Q.tà KG | Quantity/Q.tà PZZ |
|---|---|---|---|---|---|
| 1 | 24PZ003817 | 16F.5952.01 | 338222 | 9408 | 1 ***25980*** |
| 2 | 24PZ003818 | 16F.5988.01 | 336612 | 9408 | 1 ***25981*** |
| 3 | 24PZ003819 | 16F.5953.01 | 441908 | 9408 | 1 ***25982*** |

Remarks/Note:
LAMIERE SABBIATE in acc. ISO 8501:2012 SA 2 ½.
CE Marking Certificate N.0474-CPR-0033 last issued 14/09/2020 Rev.05. Hot rolled products of structural steels in compliance with Regulation n°305/2011/EU dated 09/03/2011. DOP available on https://www.quality.marcegaglia.com.
UKCA Marking Certificate N.1244-CPR-1051 last issued 01/01/2023. Hot rolled products of structural steels in compliance with the Construction Products Regulation 2011 (retained EU law EUR 305/2011). DOP available on https://www.quality.marcegaglia.com.

| Batch/N° Partita | C (%) | Mn (%) | Si (%) | S (%) | P (%) | Cr (%) | Ni (%) | Cu (%) | Al (%) | Mo (%) | Nb (%) | V (%) | Ti (%) | N (%) | H (%) | B (%) | Ceq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.1 | | | | | | 0.02 | | | | | | | | |
| | 0.22 | 1.6 | 0.55 | 0.025 | 0.025 | 0.29 | 0.42 | 0.55 | 0.3 | 0.11 | 0.06 | 0.1 | 0.05 | | | | 0.47 |
| 24PZ003817 | .150 | 1.450 | .220 | .0060 | .0120 | .010 | .010 | .010 | .024 | .0000 | .030 | .001 | .0040 | .0030 | .00000 | .0002 | .40 |
| 24PZ003818 | .150 | 1.480 | .220 | .0050 | .0180 | .020 | .010 | .010 | .043 | .0000 | .030 | .001 | .0010 | .0030 | .00000 | .0002 | .40 |
| 24PZ003819 | .160 | 1.470 | .220 | .0040 | .0140 | .010 | .010 | .010 | .037 | .0000 | .030 | .001 | .0040 | .0030 | .00000 | .0002 | .41 |

| Batch/N° Partita | Forma | (1) | (2) | (3) | Tst [°C] | Rm [N/mmq] | ReH [N/mmq] | A% (%) | (1) | (2) | (3) | (4) | T [°C] | Kv1 [J] | Kv2 [J] | Kv3 [J] | Kv[a] [J] | TESTN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20 | 470 | 345 | 20 | | | | | -20 | | | | 27 | |
| | | | | | 20 | 630 | | | | | | | | | | | | |
| 24PZ003817 | C | 1 | 1/4 | T | 20 | 548 | 422 | 31.1 | 1 | P | L | 10.0 | -20 | 178 | 175 | 194 | 182 | 24-P09453R |
| 24PZ003818 | C | 1 | 1/4 | T | 20 | 568 | 427 | 31.0 | 1 | P | L | 10.0 | -20 | 171 | 183 | 176 | 176 | 24-P07590R |
| 24PZ003819 | C | 1 | 1/4 | T | 20 | 541 | 408 | 30.0 | 1 | P | L | 10.0 | -20 | 137 | 149 | 139 | 141 | 24-P09455R |

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Uff. Tec. 0444 823201
C. F. e Part. IVA 02510610245

Controllo ad ultrasuoni

| Apparecchiatura | Numero di serie | Condizioni di superficie | Accoppiante | Mod. operativie | Taratura |
|---|---|---|---|---|---|
| Gilardoni RDG2000 | 050858001 | As Rolled | Acqua | Secondo le specifiche | Secondo le specifiche |

| Item | Norma di riferimento | Classe accettabilità | Esito | Indicazioni | Reticolo | Bordi | Sonda | Frequenza | Angolo |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Firma
II Liv. EN/ISO 9712
Q.M.D. M.Rizzatti

MARCEGAGLIA Palini e Bertoli S.p.A. QUALITY CONTROL Rizzatti Marco

(1)Posizione:1=Testa;2=Piede.(2)Posizione:1/2=1/2 spessore;P=Pelle;1/4=1/4 spessore.(3)Direzione:L=Longitudinale;T=Trasversale;(4)Spessore provino

DescrizioneMarchi

UKCA 1244 22 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

CE 0474 06 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

- Material Free of radioactive contamination
- Dimensional check and visual examination of the surface condition: without objection
- We Declare that the above mentioned plates are in compliance with the order prescription
- We hereby declare that the above mentioned material have been rolled in Italy, thus of European Community origin

# CERTIFICATO DI CONTROLLO ULTRASONORO
# ULTRASONIC INSPECTION CERTIFICATE

Controlli effettuati su lamiera ante-taglio
Checks carried out on pre-cutting Steel Plate

Documento Nr / Document No
673

11/06/2024

| Cliente / Customer | Vs Ordine / Order |
|---|---|
| **SIDERTAGLIO LAMIERE S.R.L.** | |

| Dimensioni / Dimension | Cod. Interno / Code |
|---|---|
| **12130X2470** | **25982** |
| Colata / Heat No | Cert. Nr. / Cert. No |
| **441908** | |
| Spessore / Thik | |
| **40** | |

| Materiale / Material | Oggetto / Object |
|---|---|
| **S355J2+N** | **Steel plate** |
| Stadio di Lavorazione / Working step | Particolare / Detail |
| **As conditions of supply** | |
| Posizione di controllo / Scanning position | Condizioni Superficiali / Surface condition |
| **100x100** | **As rolled** |

| Specifica di rif. / Specification Ref. | Classe accettabilità / Acceptance criterie |
|---|---|
| **EN 10160** | **S2E3** |
| Apparecchio Tipo / Instrument model | Mezzo accoppiamento / |
| **GILARDONI RDG 450** | **Water** |
| Blocco Campione / Reference Block | Perdite di trasferimento / Transfre lossee |
| **V1** | |

Taratura sensibilità d'esame / Sensibility range test

**Flat bottomed holes Ø 5 mm**

| **TRASDUTTORI** search units | **ONDE** waves | **TIPO** type | **FREQUENZA** | **SEZIONE (mm)** size (mm) | **ANGOLO** angle | **DIAMETRO** diameter | **FABBRICANTE** manufacturer |
|---|---|---|---|---|---|---|---|
| | **LONGIT** | **D25/4** | **4MHz** | | | **Ø25** | **IMG** |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

| **IDENTIFICAZIONE** identification | **AREA / TRATTO** Area/section | **TIPO DISCONT.** discontinuity | **AMPIEZZA** amplitude | **LUNGHEZZA** length | **PROFONDITA'** depth | **NOTE** remark | **RISULTATO** examination result |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

| | | |
|---|---|---|
| Risultato dell'esame | X | **Satisfactory / Conforme** |
| Examination result | | **Unsatisfactory / NON Conforme** |

Emesso da
Esaminatore

SIDERTAGLIO LAMIERE s.r.l.
Alessandro Callegari
UNI EN ISO 9712:2012 level II
Cert. Nr. DTC-END-A00562-14

| Ispettore Cliente / Ente terzo | Controllo qualità |
|---|---|
| | |

Sidertaglio Lamiere srl


**TAGLIO E COMMERCIO DI LAMIERE**

Via dell'Agricoltura 8/D - 36040 Meledo di Sarego (VI) - Tel. 0444 823059
Fax Amm. 0444 823364 - Uff. Tec. 0444 823201 - Email: info@sidertaglio.com - Web: www.sidertaglio.com
Reg. Imp. VI 33000/1996 - R.E.A. 236444 - Cod. Fisc. e P.IVA 02510610245


Taglio plasma
Ossitaglio
fino a 500mm

MARCEGAGLIA
PALINI E BERTOLI

Marcegaglia
46040 Via Bresciani, 16-Gazzolo degli Ippoliti Mantova-Italy
Tel. +39 - 0376 686 1 Fax. +39 - 0376 655 600
www.marcegaglia.com

Marcegaglia Palini e Bertoli S.P.A.
Via E.Fermi, 28 33058 San Giorgio di Nogaro, Udine - Italy
tel+39 0431623111

Type/Tipo 3.1 CERTIFICATO DI COLLAUDO EN10204 | questo documento è stato generato automaticamente ed è valido senza firma | Number/Numero 16624563335 | Creato il 05/09/2024

**Product: Hot Rolled Heavy Plates**
**NormaCollaudoLamieraTreno: EN10025-2:2019**
**Steel grade:: S355J2+N**

| Customer/Cliente | Code: 0000028587 | Del. Address/Destinatario Merci | Delivery/N° Consegna 8920635882<br>Of/Del 05/09/2024<br>Delivery note nr/N° doc. di trasp. 1066010892 | Quality Control/Controllo Qualità<br>Q.M.D./RESP. M.Rizzatti<br>Plant/Stab. Palini e Bertoli | Pages/Pagine 3/3 |
|---|---|---|---|---|---|

| Material/Codice Materiale | Surface Quality: - | Delivery Condition: NORMALIZING ROLLING | Order Nr/ordine | Client Order/Ordine cliente |
|---|---|---|---|---|
| LTS | Flatness: rif EN 10029 cl. N | Steel Making Process: BO= Basic oxigen | 1191787387/50 | 24*410 |
| Description/Descrizione | Thickness tolerance: EN10029 CLASSE B | | Materiale Cliente | Client Date/data cliente |
| 26200 40,00 X 3000,00 X 10000,00 S355J2+N | | | | 12/07/2024 |

| Item | Batch/N° Partita | ID Palini | Heat/Colata | Quantity/Q.tà KG | Quantity/Q.tà PZZ |
|---|---|---|---|---|---|
| 1 | 24KX018811 | 24C.609.01 | 2461219 | 9600 | 1 |

Remarks/Note:
CE Marking Certificate N.0474-CPR-0033 last issued 14/09/2020 Rev.05. Hot rolled products of structural steels in compliance with Regulation n°305/2011/EU dated 09/03/2011. DOP available on https://www.quality.marcegaglia.com.
UKCA Marking Certificate N.1244-CPR-1051 last issued 01/01/2023. Hot rolled products of structural steels in compliance with the Construction Products Regulation 2011 (retained EU law EUR 305/2011). DOP available on https://www.quality.marcegaglia.com.

| Batch/N° Partita | C (%) | Mn (%) | Si (%) | S (%) | P (%) | Cr (%) | Ni (%) | Cu (%) | Al (%) | Mo (%) | Nb (%) | V (%) | Ti (%) | N (%) | H (%) | B (%) | Ceq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.1 | | | | | | 0.02 | | | | | | | | |
| | 0.22 | 1.6 | 0.55 | 0.025 | 0.025 | 0.29 | 0.42 | 0.55 | 0.3 | 0.11 | 0.06 | 0.1 | 0.05 | | | | 0.47 |
| 24KX018811 | .156 | 1.447 | .184 | .0030 | .0090 | .032 | .017 | .021 | .043 | .0030 | .028 | .001 | .0020 | .0060 | .00040 | .0002 | .41 |

COPIA CONFORME ALL'ORIGINALE

IL PRESENTE CERTIFICATO VALE PER

LA QUANTITA' DEL NS. DDT

| Batch/N° Partita | Forma | (1) | (2) | (3) | Tst [°C] | Rm [N/mmq] | ReH [N/mmq] | A% (%) | (1) | (2) | (3) | (4) | T [°C] | Kv1 [J] | Kv2 [J] | Kv3 [J] | Kv* [J] | TESTN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20 | 470 | 345 | 20 | | | | | -20 | | | | 27 | |
| | | | | | 20 | 630 | | | | | | | | | | | | |
| 24KX018811 | C | 1 | 1/4 | T | 20 | 535 | 428 | 32.9 | 1 | P | L | 10.0 | -20 | 203 | 223 | 180 | 202 | 24-P14270R |

Controllo ad ultrasuoni

| Apparecchiatura | Numero di serie | Condizioni di superficie | Accoppiante | Mod. operativie | Taratura |
|---|---|---|---|---|---|
| Gilardoni RDG2000 | 050858001 | As Rolled | Acqua | Secondo le specifiche | Secondo le specifiche |

Firma
II Liv. EN/ISO 9712
Q.M.D. M.Rizzatti

MARCEGAGLIA Palini e Bertoli S.p.A. QUALITY CONTROL Rizzatti Marco

| Item | Norma di riferimento | Classe accettabilità | Esito | Indicazioni | Reticolo | Bordi | Sonda | Frequenza | Angolo |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

(1)Posizione:1-Testa;2-Piede,(2)Posizione:1/2-1/2 spessore;P-Pelle;1/4-1/4 spessore,(3)Direzione:L-Longitudinale;T-Trasversale;(4)Spessore provino

DescrizioneMarchi

UK CA 1244 22 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

CE 0474 06 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

- Material Free of radioactive contamination
- Dimensional check and visual examination of the surface condition: without objection
- We Declare that the above mentioned plates are in compliance with the order prescription
- We hereby declare that the above mentioned material have been rolled in Italy, thus of European Community origin

# DICHIARAZIONE DI PRESTAZIONE N°1.0577

1. Codice di identificazione unico del prodotto-tipo: **1.0577**
2. Numero di tipo: **S355J2**
3. Uso previsto del prodotto da costruzione, conformemente a **EN 10025-1:2004**
   **PRODOTTI LAMINATI A CALDO DI ACCIAIO PER IMPIEGHI STRUTTURALI DA UTILIZZARSI NELLE STRUTTURE METALLICHE O IN COMPOSITI METALLICI E STRUTTURE IN CALCESTRUZZO**
4. Nome e indirizzo del fabbricante:

**MARCEGAGLIA PALINI E BERTOLI S.P.A.**
Sede legale - **Via Bresciani, 16 – 46040 Gazoldo degli Ippoliti (MN)**
nello stabilimento di
**Via E. Fermi, 28 – 33058 San Giorgio di Nogaro (UD)**

6. Sistema di valutazione e verifica della costanza della prestazione del prodotto da costruzione: **2+**
7. L'organismo notificato:

**RINA Services S.p.A.**
**N° 0474**

Ha rilasciato il certificato di conformità del controllo della produzione in fabbrica fondandosi sui seguenti elementi:
i. Ispezione iniziale della fabbrica e del controllo della produzione in fabbrica;
ii. Esegue la sorveglianza continua, la valutazione e l'approvazione del controllo della produzione in fabbrica.

8. Nel caso di una dichiarazione di prestazione relativa ad un prodotto da costruzione per il quale è stata rilasciata una valutazione tecnica europea: **N.A.**
9. Prestazione dichiarata:

| Caratteristiche essenziali | Punti relativi ai requisiti della presente (o altra) norma europea | Prestazione | Specifica armonizzata |
|---|---|---|---|
| Tolleranza sulle dimensioni e tolleranze di forma | 7.7.1 | EN10029-2010 | EN 10025-2:2019 |
| Allungamento | 7.3.1 | CONFORME TABELLA 1 | |
| Resistenza alla trazione | 7.3.1 | | |
| Carico unitario di snervamento | 7.3.1 | | |
| Resilienza | 7.3.1+7.3.2 | | |
| Analisi chimica | 7.2.1 | CONFORME TABELLA 2 | |
| Saldabilità (composizione chimica) | 7.2+7.4.1 | NPD | |
| Durabilità (composizione chimica) | 7.2+7.4.3 | NPD | |

10. La prestazione del prodotto di cui ai punti 1 e 2 è conforme alla prestazione dichiarata di cui al punto 9.
Si rilascia la presente dichiarazione di prestazione sotto la responsabilità esclusiva del fabbricante di cui al punto 4.

In nome e per conto della MARCEGAGLIA PALINI E BERTOLI S.P.A.
San Giorgio di Nogaro, 10 marzo 2021

MARCEGAGLIA Palini e Bertoli S.p.A. Via E. Fermi, 28 33058 S. Giorgio di Nogaro, Ud - Italy P. I. 03217150983

## ➢ TABELLA 1- CARATTERISTICHE IN ACCORDO ALLA EN 10025-2:2019

| CARATTERISTICHE MECCANICHE A TEMPERATURA AMBIENTE - prospetto 6 | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| In conformità alla | | Carico unitario minimo di snervamento ReH in N/mm² | | | | | | | | | Resistenza a trazione Rm in N/mm² | | | |
| | | Spessore nominale mm | | | | | | | | | Spessore nominale | | | |
| EN 10027-1 | EN10027-2 | ≤16 | >16 ≤40 | >40 ≤63 | >63 ≤80 | >80 ≤100 | >100 ≤150 | >150 ≤200 | >200 ≤250 | >250 ≤400 | ≥3 ≤100 | >100 ≤150 | >150 ≤250 | >250 ≤400 |
| S355J2 | 1.0577 | 355 | 345 | 335 | 325 | 315 | 295 | 285 | 275 | 265 | 470÷630 | 450÷600 | 450÷600 | 450÷600 |

| CARATTERISTICHE MECCANICHE A TEMPERATURA AMBIENTE – prospetto 6 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| In conformità alla | | Posizione dei provini | Allungamento percentuale minimo dopo rottura A% | | | | | |
| | | | $L_0=5,65*\sqrt{S_0}$ | | | | | |
| EN 10027-1 | EN10027-2 | | ≥3≤40 | >40≤63 | >63≤100 | >100≤150 | >150≤250 | >250≤400 |
| S355J2 | 1.0577 | l | 22 | 21 | 20 | 18 | 17 | 17 |
| | | t | 20 | 19 | 18 | 18 | 17 | 17 |

| Caratteristiche meccaniche – Resilienza $KV_2$ longitudinale per prodotti piani e lunghi – prospetto 8 | | | | | |
|---|---|---|---|---|---|
| In conformità alla | | TEMPERATURE | Energia minima (J) – Spessore nominale in mm | | |
| EN 10027-1 | EN10027-2 | °C | ≤150 | >150≤250 | >250≤400 |
| S355J2 | 1.0577 | -20 | 27 | 27 | 27 |

## ➢ TABELLA 2 – CARATTERISTICHE IN ACCORDO ALLA EN 10025-2:2019

| COMPOSIZIONE CHIMICA ALL'ANALISI DI COLATA - prospetto 1 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| In conformità alla | | Metodo di deossidazione | C in % max per spessori nominali di prodotto in mm | | | Si | Mn | P | S | N | Cu | altro |
| EN 10027-1 | EN10027-2 | | ≤16 | >16≤30 | >30 | max. | max. | max. | max. | max. | max. | max |
| S355J2 | 1.0577 | FF | 0,20 | 0,20 | 0,22 | 0,55 | 1,60 | 0,025 | 0,025 | - | 0,55 | - |

| Valore massimo del CEV basato sull'analisi di colata - prospetto 5 | | | | | | | |
|---|---|---|---|---|---|---|---|
| In conformità alla | | Metodo di deossidazione | Valore massimo CEV in % per spessori nominali di prodotto in mm | | | | |
| EN 10027-1 | EN10027-2 | | ≤30 | >30≤40 | >40≤150 | >150≤250 | >250≤400 |
| S355J2 | 1.0577 | FF | 0,45 | 0,47 | 0,47 | 0,49 | 0,49 |

# CERTIFICATO DI CONTROLLO ULTRASONORO
# ULTRASONIC INSPECTION CERTIFICATE

Controlli effettuati su lamiera ante-taglio
Checks carried out on pre-cutting Steel Plate

Documento Nr / Document No
920

25/09/2024

| Cliente / Customer | Vs Ordine / Order |
|---|---|
| **SIDERTAGLIO LAMIERE S.R.L.** | |

| Dimensioni / Dimension | Cod. Interno / Code |
|---|---|
| **4010X3020** | **26200** |
| Colata / Heat No | Cert. Nr. / Cert. No |
| **2461219** | |
| Spessore / Thik | |
| **40** | |

| Materiale / Material | Oggetto / Object |
|---|---|
| **S355J2+N** | **Steel plate** |
| Stadio di Lavorazione / Working step | Particolare / Detail |
| **As conditions of supply** | |
| Posizione di controllo / Scanning position | Condizioni Superficiali / Surface condition |
| **100x100** | **As rolled** |

| Specifica di rif. / Specification Ref. | Classe accettabilità / Acceptance criterie |
|---|---|
| **EN 10160** | **S2E3** |
| Apparecchio Tipo / Instrument model | Mezzo accoppiamento / |
| **GILARDONI RDG 450** | **Water** |
| Blocco Campione / Reference Block | Perdite di trasferimento / Transfre lossee |
| **V1** | |

Taratura sensibilità d'esame / Sensibility range test

**Flat bottomed holes Ø 5 mm**

| **TRASDUTTORI** search units | **ONDE** waves | **TIPO** type | **FREQUENZA** | **SEZIONE (mm)** size (mm) | **ANGOLO** angle | **DIAMETRO** diameter | **FABBRICANTE** manufacturer |
|---|---|---|---|---|---|---|---|
| | **LONGIT** | **D25/4** | **4MHz** | | | **Ø25** | **IMG** |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

| **IDENTIFICAZIONE** identification | **AREA / TRATTO** Area/section | **TIPO DISCONT.** discontinuity | **AMPIEZZA** amplitude | **LUNGHEZZA** length | **PROFONDITA'** depth | **NOTE** remark | **RISULTATO** examination result |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

| | | |
|---|---|---|
| Risultato dell'esame | X | **Satisfactory / Conforme** |
| Examination result | | **Unsatisfactory / NON Conforme** |

Emesso da
Esaminatore

SIDERTAGLIO LAMIERE s.r.l.
Alessandro Callegari
UNI EN ISO 9712:2012 level II
Cert. Nr. DTC-END-A00562-14

| Ispettore Cliente / Ente terzo | Controllo qualità |
|---|---|
| | |

Sidertaglio Lamiere srl

Taglio plasma
Ossitaglio
fino a 500mm

**TAGLIO E COMMERCIO DI LAMIERE**
Via dell'Agricoltura 8/D - 36040 Meledo di Sarego (VI) - Tel. 0444 823059
Fax Amm. 0444 823364 - Uff. Tec. 0444 823201 - Email: info@sidertaglio.com - Web: www.sidertaglio.com
Reg. Imp. VI 33000/1996 - R.E.A. 236444 - Cod. Fisc. e P.IVA 02510610245

MARCEGAGLIA PALINI E BERTOLI

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www.marcegaglia.com

Marcegaglia Palini e Bertoli S.P.A.
via E.Fermi, 28 33058 San Giorgio di Nogaro, Udine - Italy
tel +39 0431623111

Type/Tipo 3.1 CERTIFICATO DI COLLAUDO EN10204

questo documento è stato generato automaticamente ed è valido senza firma

Number/Numero 16624421397 Creato il 19/06/2024

**Product: Hot Rolled Heavy Plates**
**NormaCollaudoLamieraTreno: EN10025-2:2019**
**Steel grade:: S355J2+N**

Customer/Cliente
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Code: 0000028513

Del. Address/Destinatario Merci
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Delivery/N° Consegna 8920573384
Of/Del 19/06/2024
Delivery note nr/N° doc. di trasp. 1066007973

Quality Control/Controllo Qualità
Q.M.D./RESP. M.Rizzatti
Plant/Stab. Palini e Bertoli

Pages/Pagine 1/7

Material/Codice Materiale
**LTS**

Description/Descrizione
**10,00 X 2450,00 X 12000,00 S355J2+N**

**Surface Quality: EN10163-2 CL A1**
**Flatness: rif EN 10029 cl. N**
**Thickness tolerance: EN10029 CLASSE B**

Delivery Condition: NORMALIZING ROLLING
Steel Making Process: BO= Basic oxigen

Order Nr/ordine **1191769614/15**
Materiale Cliente

Client Order/Ordine cliente **ORD. 2L 00181 DEL 28/5**
Date/data cliente **28/05/2024**

| Item | Batch/N° Partita | ID Palini | Heat/Colata | Quantity/Q.tà KG | Quantity/Q.tà PZZ |
|---|---|---|---|---|---|
| 1 | 24PZ003973 | 24R.366.03/A | 2377353 | 2352 | 1 ***26090*** |
| 2 | 24PZ003970 | 24R.366.02/B | 2377353 | 2352 | 1 ***26089*** |
| 3 | 24PZ003971 | 24R.366.02/A | 2377353 | 2352 | 1 ***26088*** |
| 4 | 24PZ003972 | 24R.366.03/B | 2377353 | 2352 | 1 ***26091*** |

Remarks/Note:
LAMIERE SABBIATE in acc. ISO 8501:2012 SA 2 ½.
CE Marking Certificate N.0474-CPR-0033 last issued 14/09/2020 Rev.05. Hot rolled products of structural steels in compliance with Regulation n°305/2011/EU dated 09/03/2011. DOP available on https://www.quality.marcegaglia.com.
UKCA Marking Certificate N.1244-CPR-1051 last issued 01/01/2023. Hot rolled products of structural steels in compliance with the Construction Products Regulation 2011 (retained EU law EUR 305/2011). DOP available on https://www.quality.marcegaglia.com.

| Batch/N° Partita | C (%) | Mn (%) | Si (%) | S (%) | P (%) | Cr (%) | Ni (%) | Cu (%) | Al (%) | Mo (%) | Nb (%) | V (%) | Ti (%) | N (%) | H (%) | B (%) | Ceq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.2 | 1.6 | 0.55 | 0.025 | 0.025 | 0.29 | 0.42 | 0.55 | 0.02<br>0.3 | 0.11 | 0.06 | 0.1 | 0.05 | | | | 0.45 |
| 24PZ003973 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |
| 24PZ003970 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |
| 24PZ003971 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |
| 24PZ003972 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |

| Batch/N° Partita | Forma | (1) | (2) | (3) | Tst [°C] | Rm [N/mmq] | ReH [N/mmq] | A% (%) | (1) | (2) | (3) | (4) | T [°C] | Kv1 [J] | Kv2 [J] | Kv3 [J] | Kv$^a$ [J] | TESTN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20<br>20 | 470<br>630 | 355 | 20 | | | | | -20 | | | | | |
| 24PZ003973 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |
| 24PZ003970 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |
| 24PZ003971 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |
| 24PZ003972 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |

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Uff. Tec. 0444 823201
C. F. e Part. IVA 02510610245

Controllo ad ultrasuoni

| Apparecchiatura | Numero di serie | Condizioni di superficie | Accoppiante | Mod. operativie | Taratura |
|---|---|---|---|---|---|
| Gilardoni RDG2000 | 050858001 | As Rolled | Acqua | Secondo le specifiche | Secondo le specifiche |

| Item | Norma di riferimento | Classe accettabilità | Esito | Indicazioni | Reticolo | Bordi | Sonda | Frequenza | Angolo |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Firma
II Liv. EN/ISO 9712
Q.M.D. M.Rizzatti

MARCEGAGLIA Palini e Bertoli S.p.A. QUALITY CONTROL Rizzatti Marco

(1)Posizione:1=Testa;2=Piede.(2)Posizione:1/2=1/2 spessore;P=Pelle;1/4=1/4 spessore.(3)Direzione:L=Longitudinale;T=Trasversale;(4)Spessore provino

DescrizioneMarchi

UKCA 1244 22 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

CE 0474 06 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

- Material Free of radioactive contamination
- Dimensional check and visual examination of the surface condition: without objection
- We Declare that the above mentioned plates are in compliance with the order prescription
- We hereby declare that the above mentioned material have been rolled in Italy, thus of European Community origin

MARCEGAGLIA PALINI E BERTOLI

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Marcegaglia Palini e Bertoli S.P.A.
via E.Fermi, 28 33058 San Giorgio di Nogaro, Udine - Italy
tel +39 0431623111

Type/Tipo 3.1 CERTIFICATO DI COLLAUDO EN10204

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Number/Numero 16624421397 Creato il 19/06/2024

**Product: Hot Rolled Heavy Plates**
**NormaCollaudoLamieraTreno: EN10025-2:2019**
**Steel grade:: S355J2+N**

Customer/Cliente
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Code: 0000028513

Del. Address/Destinatario Merci
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Delivery/N° Consegna 8920573384
Of/Del 19/06/2024
Delivery note nr/N° doc. di trasp. 1066007973

Quality Control/Controllo Qualità
Q.M.D./RESP. M.Rizzatti
Plant/Stab. Palini e Bertoli

Pages/Pagine 2/7

Material/Codice Materiale
**LTS**

Description/Descrizione
**10,00 X 2450,00 X 12000,00 S355J2+N**

**Surface Quality: EN10163-2 CL A1**
**Flatness: rif EN 10029 cl. N**
**Thickness tolerance: EN10029 CLASSE B**

Delivery Condition: NORMALIZING ROLLING
Steel Making Process: BO= Basic oxigen

Order Nr/ordine **1191769614/15**
Materiale Cliente

Client Order/Ordine cliente **ORD. 2L 00181 DEL 28/5**
Data/data cliente **28/05/2024**

| Item | Batch/N° Partita | ID Palini | Heat/Colata | Quantity/Q.tà KG | Quantity/Q.tà PZ |
|---|---|---|---|---|---|
| 1 | 24PZ003977 | 24R.365.02/B | 2377353 | 2352 | 1 *26076* |
| 2 | 24PZ003974 | 24R.366.04/B | 2377353 | 2352 | 1 *26075* |
| 3 | 24PZ003975 | 24R.366.04/A | 2377353 | 2352 | 1 *26074* |
| 4 | 24PZ003976 | 24R.365.02/A | 2377353 | 2352 | 1 *26077* |

Remarks/Note:
LAMIERE SABBIATE in acc. ISO 8501:2012 SA 2 ½.
CE Marking Certificate N.0474-CPR-0033 last issued 14/09/2020 Rev.05. Hot rolled products of structural steels in compliance with Regulation n°305/2011/EU dated 09/03/2011. DOP available on https://www.quality.marcegaglia.com.
UKCA Marking Certificate N.1244-CPR-1051 last issued 01/01/2023. Hot rolled products of structural steels in compliance with the Construction Products Regulation 2011 (retained EU law EUR 305/2011). DOP available on https://www.quality.marcegaglia.com.

| Batch/N° Partita | C (%) | Mn (%) | Si (%) | S (%) | P (%) | Cr (%) | Ni (%) | Cu (%) | Al (%) | Mo (%) | Nb (%) | V (%) | Ti (%) | N (%) | H (%) | B (%) | Ceq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.2 | 1.6 | 0.55 | 0.025 | 0.025 | 0.29 | 0.42 | 0.55 | 0.02<br>0.3 | 0.11 | 0.06 | 0.1 | 0.05 | | | | 0.45 |
| 24PZ003977 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |
| 24PZ003974 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |
| 24PZ003975 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |
| 24PZ003976 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |

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36040 MELEDO DI SAREGO (VI)
Tel. 0444 823059
Fax Amm. 0444 823364
Uff. Tec. 0444 823201
C. F. e Part. IVA 02510610245

| Batch/N° Partita | Forma | (1) | (2) | (3) | Tst [°C] | Rm [N/mmq] | ReH [N/mmq] | A% (%) | (1) | (2) | (3) | (4) | T [°C] | Kv1 [J] | Kv2 [J] | Kv3 [J] | Kv$^a$ [J] | TESTN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20<br>20 | 470<br>630 | 355 | 20 | | | | | -20 | | | | | |
| 24PZ003977 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |
| 24PZ003974 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |
| 24PZ003975 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |
| 24PZ003976 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |

Controllo ad ultrasuoni

| Apparecchiatura | Numero di serie | Condizioni di superficie | Accoppiante | Mod. operativie | Taratura |
|---|---|---|---|---|---|
| Gilardoni RDG2000 | 050858001 | As Rolled | Acqua | Secondo le specifiche | Secondo le specifiche |

| Item | Norma di riferimento | Classe accettabilità | Esito | Indicazioni | Reticolo | Bordi | Sonda | Frequenza | Angolo |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Firma
II Liv. EN/ISO 9712
Q.M.D. M.Rizzatti

MARCEGAGLIA Palini e Bertoli S.p.A. QUALITY CONTROL Rizzatti Marco

(1)Posizione:1=Testa;2=Piede.(2)Posizione:1/2=1/2 spessore;P=Pelle;1/4=1/4 spessore.(3)Direzione:L=Longitudinale;T=Trasversale;(4)Spessore provino

DescrizioneMarchi

UKCA 1244 22 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

CE 0474 06 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

- Material Free of radioactive contamination
- Dimensional check and visual examination of the surface condition: without objection
- We Declare that the above mentioned plates are in compliance with the order prescription
- We hereby declare that the above mentioned material have been rolled in Italy, thus of European Community origin

MARCEGAGLIA PALINI E BERTOLI

Marcegaglia
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tel +39 0431623111

Type/Tipo 3.1 CERTIFICATO DI COLLAUDO EN10204

questo documento è stato generato automaticamente ed è valido senza firma

Number/Numero 16624421397 Creato il 19/06/2024

**Product: Hot Rolled Heavy Plates**
**NormaCollaudoLamieraTreno: EN10025-2:2019**
**Steel grade:: S355J2+N**

Customer/Cliente
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Code: 0000028513

Del. Address/Destinatario Merci
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Delivery/N° Consegna 8920573384
Of/Del 19/06/2024
Delivery note nr/N° doc. di trasp. 1066007973

Quality Control/Controllo Qualità
Q.M.D./RESP. M.Rizzatti
Plant/Stab. Palini e Bertoli

Pages/Pagine 3/7

Material/Codice Materiale
**LTS**

Description/Descrizione
**10,00 X 2450,00 X 12000,00 S355J2+N**

**Surface Quality: EN10163-2 CL A1**
**Flatness: rif EN 10029 cl. N**
**Thickness tolerance: EN10029 CLASSE B**

Delivery Condition: NORMALIZING ROLLING
Steel Making Process: BO= Basic oxigen

Order Nr/ordine **1191769614/15**
Materiale Cliente

Client Order/Ordine cliente **ORD. 2L 00181 DEL 28/5**
Date/data cliente **28/05/2024**

| Item | Batch/N° Partita | ID Palini | Heat/Colata | Quantity/Q.tà KG | Quantity/Q.tà PZZ |
|---|---|---|---|---|---|
| 1 | 24PZ003981 | 24R.365.03/A | 2377353 | 2352 | 1 *26080* |
| 2 | 24PZ003978 | 24R.365.01/A | 2377353 | 2352 | 1 *26079* |
| 3 | 24PZ003979 | 24R.365.01/B | 2377353 | 2352 | 1 *26078* |
| 4 | 24PZ003980 | 24R.365.03/B | 2377353 | 2352 | 1 *26081* |

Remarks/Note:
LAMIERE SABBIATE in acc. ISO 8501:2012 SA 2 ½.
CE Marking Certificate N.0474-CPR-0033 last issued 14/09/2020 Rev.05. Hot rolled products of structural steels in compliance with Regulation n°305/2011/EU dated 09/03/2011. DOP available on https://www.quality.marcegaglia.com.
UKCA Marking Certificate N.1244-CPR-1051 last issued 01/01/2023. Hot rolled products of structural steels in compliance with the Construction Products Regulation 2011 (retained EU law EUR 305/2011). DOP available on https://www.quality.marcegaglia.com.

| Batch/N° Partita | C (%) | Mn (%) | Si (%) | S (%) | P (%) | Cr (%) | Ni (%) | Cu (%) | Al (%) | Mo (%) | Nb (%) | V (%) | Ti (%) | N (%) | H (%) | B (%) | Ceq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.2 | 1.6 | 0.55 | 0.025 | 0.025 | 0.29 | 0.42 | 0.55 | 0.02<br>0.3 | 0.11 | 0.06 | 0.1 | 0.05 | | | | 0.45 |
| 24PZ003981 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |
| 24PZ003978 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |
| 24PZ003979 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |
| 24PZ003980 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |

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Tel. 0444 823059
Fax Amm. 0444 823364
Uff. Tec. 0444 823201
C. F. e Part. IVA 02510610245

| Batch/N° Partita | Forma | (1) | (2) | (3) | Tst [°C] | Rm [N/mmq] | ReH [N/mmq] | A% (%) | (1) | (2) | (3) | (4) | T [°C] | Kv1 [J] | Kv2 [J] | Kv3 [J] | Kv$^a$ [J] | TESTN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20<br>20 | 470<br>630 | 355 | 20 | | | | | -20 | | | | | |
| 24PZ003981 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |
| 24PZ003978 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |
| 24PZ003979 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |
| 24PZ003980 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |

Controllo ad ultrasuoni

| Apparecchiatura | Numero di serie | Condizioni di superficie | Accoppiante | Mod. operativie | Taratura |
|---|---|---|---|---|---|
| Gilardoni RDG2000 | 050858001 | As Rolled | Acqua | Secondo le specifiche | Secondo le specifiche |

| Item | Norma di riferimento | Classe accettabilità | Esito | Indicazioni | Reticolo | Bordi | Sonda | Frequenza | Angolo |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Firma
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MARCEGAGLIA Palini e Bertoli S.p.A. QUALITY CONTROL Rizzatti Marco

(1)Posizione:1=Testa;2=Piede.(2)Posizione:1/2=1/2 spessore;P=Pelle;1/4=1/4 spessore.(3)Direzione:L=Longitudinale;T=Trasversale;(4)Spessore provino

DescrizioneMarchi

UKCA 1244 22 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

CE 0474 06 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

- Material Free of radioactive contamination
- Dimensional check and visual examination of the surface condition: without objection
- We Declare that the above mentioned plates are in compliance with the order prescription
- We hereby declare that the above mentioned material have been rolled in Italy, thus of European Community origin

MARCEGAGLIA PALINI E BERTOLI

Marcegaglia
46040 Via Bresciani, 16-Gazoldo degli Ippoliti Mantova-Italy
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Type/Tipo 3.1 CERTIFICATO DI COLLAUDO EN10204

questo documento è stato generato automaticamente ed è valido senza firma

Number/Numero 16624421397 Creato il 19/06/2024

**Product: Hot Rolled Heavy Plates**
**NormaCollaudoLamieraTreno: EN10025-2:2019**
**Steel grade:: S355J2+N**

Customer/Cliente
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Code: 0000028513

Del. Address/Destinatario Merci
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Delivery/N° Consegna 8920573384
Of/Del 19/06/2024
Delivery note nr/N° doc. di trasp. 1066007973

Quality Control/Controllo Qualità
Q.M.D./RESP. M.Rizzatti
Plant/Stab. Palini e Bertoli

Pages/Pagine 4/7

Material/Codice Materiale
**LTS**

Description/Descrizione
**15,00 X 2450,00 X 12000,00 S355J2+N**

**Surface Quality: EN10163-2 CL A1**
**Flatness: rif EN 10029 cl. N**
**Thickness tolerance: EN10029 CLASSE B**

Delivery Condition: NORMALIZING ROLLING
Steel Making Process: BO= Basic oxigen

Order Nr/ordine **1191769614/30**
Materiale Cliente

Client Order/Ordine cliente **ORD. 2L 00181 DEL 28/5**
Date/data cliente **28/05/2024**

| Item | Batch/N° Partita | ID Palini | Heat/Colata | Quantity/Q.tà KG | Quantity/Q.tà PZ |
|---|---|---|---|---|---|
| 1 | 24PZ003791 | 16F.6121.03/A | 142878 | 3528 | 1 *26084* |
| 2 | 24PZ003788 | 16F.6122.03/B | 442511 | 3528 | 1 *26083* |
| 3 | 24PZ003789 | 16F.6122.03/A | 442511 | 3528 | 1 *26082* |
| 4 | 24PZ003790 | 16F.6121.03/B | 142878 | 3528 | 1 *26085* |

Remarks/Note:
LAMIERE SABBIATE in acc. ISO 8501:2012 SA 2 ½.
CE Marking Certificate N.0474-CPR-0033 last issued 14/09/2020 Rev.05. Hot rolled products of structural steels in compliance with Regulation n°305/2011/EU dated 09/03/2011. DOP available on https://www.quality.marcegaglia.com.
UKCA Marking Certificate N.1244-CPR-1051 last issued 01/01/2023. Hot rolled products of structural steels in compliance with the Construction Products Regulation 2011 (retained EU law EUR 305/2011). DOP available on https://www.quality.marcegaglia.com.

| Batch/N° Partita | C (%) | Mn (%) | Si (%) | S (%) | P (%) | Cr (%) | Ni (%) | Cu (%) | Al (%) | Mo (%) | Nb (%) | V (%) | Ti (%) | N (%) | H (%) | B (%) | Ceq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.2 | 1.6 | 0.55 | 0.025 | 0.025 | 0.29 | 0.42 | 0.55 | 0.02<br>0.3 | 0.11 | 0.06 | 0.1 | 0.05 | | | | 0.45 |
| 24PZ003791 | .150 | 1.470 | .240 | .0050 | .0180 | .010 | .010 | .010 | .036 | .0000 | .030 | .001 | .0030 | .0020 | .00000 | .0002 | .40 |
| 24PZ003788 | .150 | 1.480 | .250 | .0050 | .0150 | .010 | .010 | .010 | .043 | .0000 | .032 | .001 | .0020 | .0040 | .00000 | .0001 | .40 |
| 24PZ003789 | .150 | 1.480 | .250 | .0050 | .0150 | .010 | .010 | .010 | .043 | .0000 | .032 | .001 | .0020 | .0040 | .00000 | .0001 | .40 |
| 24PZ003790 | .150 | 1.470 | .240 | .0050 | .0180 | .010 | .010 | .010 | .036 | .0000 | .030 | .001 | .0030 | .0020 | .00000 | .0002 | .40 |

| Batch/N° Partita | Forma | (1) | (2) | (3) | Tst [°C] | Rm [N/mmq] | ReH [N/mmq] | A% (%) | (1) | (2) | (3) | (4) | T [°C] | Kv1 [J] | Kv2 [J] | Kv3 [J] | Kv$^a$ [J] | TESTN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20<br>20 | 470<br>630 | 355 | 20 | | | | | -20 | | | | | |
| 24PZ003791 | P | 1 | P | T | 20 | 566 | 454 | 29.5 | 1 | P | L | 10.0 | -20 | 209 | 178 | 201 | 196 | 24-P09867R |
| 24PZ003788 | P | 1 | P | T | 20 | 585 | 457 | 24.5 | 1 | P | L | 10.0 | -20 | 180 | 66 | 152 | 132 | 24-P09095R |
| 24PZ003789 | P | 1 | P | T | 20 | 585 | 457 | 24.5 | 1 | P | L | 10.0 | -20 | 180 | 66 | 152 | 132 | 24-P09095R |
| 24PZ003790 | P | 1 | P | T | 20 | 566 | 454 | 29.5 | 1 | P | L | 10.0 | -20 | 209 | 178 | 201 | 196 | 24-P09867R |

SIDERTAGLIO LAMIERE srl
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Tel. 0444 823059
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Uff. Tec. 0444 823201
C. F. e Part. IVA 02510610245

Controllo ad ultrasuoni

| Apparecchiatura | Numero di serie | Condizioni di superficie | Accoppiante | Mod. operativie | Taratura |
|---|---|---|---|---|---|
| Gilardoni RDG2000 | 050858001 | As Rolled | Acqua | Secondo le specifiche | Secondo le specifiche |

| Item | Norma di riferimento | Classe accettabilità | Esito | Indicazioni | Reticolo | Bordi | Sonda | Frequenza | Angolo |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Firma
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Q.M.D. M.Rizzatti

MARCEGAGLIA Palini e Bertoli S.p.A. QUALITY CONTROL Rizzatti Marco

(1)Posizione:1=Testa;2=Piede.(2)Posizione:1/2=1/2 spessore;P=Pelle;1/4=1/4 spessore.(3)Direzione:L=Longitudinale;T=Trasversale;(4)Spessore provino

DescrizioneMarchi

UKCA 1244 22 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

CE 0474 06 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

- Material Free of radioactive contamination
- Dimensional check and visual examination of the surface condition: without objection
- We Declare that the above mentioned plates are in compliance with the order prescription
- We hereby declare that the above mentioned material have been rolled in Italy, thus of European Community origin

MARCEGAGLIA PALINI E BERTOLI

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via E.Fermi, 28 33058 San Giorgio di Nogaro, Udine - Italy
tel +39 0431623111

Type/Tipo 3.1 CERTIFICATO DI COLLAUDO EN10204

questo documento è stato generato automaticamente ed è valido senza firma

Number/Numero 16624421397 Creato il 19/06/2024

**Product: Hot Rolled Heavy Plates**
**NormaCollaudoLamieraTreno: EN10025-2:2019**
**Steel grade:: S355J2+N**

Customer/Cliente
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Code: 0000028513

Del. Address/Destinatario Merci
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Delivery/N° Consegna 8920573384
Of/Del 19/06/2024
Delivery note nr/N° doc. di trasp. 1066007973

Quality Control/Controllo Qualità
Q.M.D./RESP. M.Rizzatti
Plant/Stab. Palini e Bertoli

Pages/Pagine 5/7

Material/Codice Materiale
**LTS**

Description/Descrizione
**15,00 X 2450,00 X 12000,00 S355J2+N**

**Surface Quality: EN10163-2 CL A1**
**Flatness: rif EN 10029 cl. N**
**Thickness tolerance: EN10029 CLASSE B**

Delivery Condition: NORMALIZING ROLLING
Steel Making Process: BO= Basic oxigen

Order Nr/ordine **1191769614/30**
Materiale Cliente

Client Order/Ordine cliente **ORD. 2L 00181 DEL 28/5**
Date/data cliente **28/05/2024**

| Item | Batch/N° Partita | ID Palini | Heat/Colata | Quantity/Q.tà KG | Quantity/Q.tà PZZ |
|---|---|---|---|---|---|
| 1 | 24PZ003792 | 16F.6119.01/B | 442151 | 3528 | 1 ***26087*** |
| 2 | 24PZ003793 | 16F.6119.01/A | 442151 | 3528 | 1 ***26086*** |

Remarks/Note:
LAMIERE SABBIATE in acc. ISO 8501:2012 SA 2 ½.
CE Marking Certificate N.0474-CPR-0033 last issued 14/09/2020 Rev.05. Hot rolled products of structural steels in compliance with Regulation n°305/2011/EU dated 09/03/2011. DOP available on https://www.quality.marcegaglia.com.
UKCA Marking Certificate N.1244-CPR-1051 last issued 01/01/2023. Hot rolled products of structural steels in compliance with the Construction Products Regulation 2011 (retained EU law EUR 305/2011). DOP available on https://www.quality.marcegaglia.com.

| Batch/N° Partita | C (%) | Mn (%) | Si (%) | S (%) | P (%) | Cr (%) | Ni (%) | Cu (%) | Al (%) | Mo (%) | Nb (%) | V (%) | Ti (%) | N (%) | H (%) | B (%) | Ceq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.2 | 1.6 | 0.55 | 0.025 | 0.025 | 0.29 | 0.42 | 0.55 | 0.02<br>0.3 | 0.11 | 0.06 | 0.1 | 0.05 | | | | 0.45 |
| 24PZ003792 | .150 | 1.490 | .220 | .0060 | .0140 | .020 | .010 | .020 | .032 | .0000 | .028 | .001 | .0040 | .0020 | .00000 | .0001 | .40 |
| 24PZ003793 | .150 | 1.490 | .220 | .0060 | .0140 | .020 | .010 | .020 | .032 | .0000 | .028 | .001 | .0040 | .0020 | .00000 | .0001 | .40 |

| Batch/N° Partita | Forma | (1) | (2) | (3) | Tst [°C] | Rm [N/mmq] | ReH [N/mmq] | A% (%) | (1) | (2) | (3) | (4) | T [°C] | Kv1 [J] | Kv2 [J] | Kv3 [J] | Kv$^a$ [J] | TESTN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20<br>20 | 470<br>630 | 355 | 20 | | | | | -20 | | | | | |
| 24PZ003792 | P | 1 | P | T | 20 | 550 | 440 | 24.4 | 1 | P | L | 10.0 | -20 | 85 | 203 | 140 | 142 | 24-P10251R |
| 24PZ003793 | P | 1 | P | T | 20 | 550 | 440 | 24.4 | 1 | P | L | 10.0 | -20 | 85 | 203 | 140 | 142 | 24-P10251R |

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Via dell'Agricoltura, 8/D
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Tel. 0444 823059
Fax Amm. 0444 823364
Uff. Tec. 0444 823201
C. F. e Part. IVA 02510610245

Controllo ad ultrasuoni

| Apparecchiatura | Numero di serie | Condizioni di superficie | Accoppiante | Mod. operativie | Taratura |
|---|---|---|---|---|---|
| Gilardoni RDG2000 | 050858001 | As Rolled | Acqua | Secondo le specifiche | Secondo le specifiche |

| Item | Norma di riferimento | Classe accettabilità | Esito | Indicazioni | Reticolo | Bordi | Sonda | Frequenza | Angolo |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

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MARCEGAGLIA Palini e Bertoli S.p.A. QUALITY CONTROL Rizzatti Marco

(1)Posizione:1=Testa;2=Piede.(2)Posizione:1/2=1/2 spessore;P=Pelle;1/4=1/4 spessore.(3)Direzione:L=Longitudinale;T=Trasversale;(4)Spessore provino

DescrizioneMarchi

UKCA 1244 22 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

CE 0474 06 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

- Material Free of radioactive contamination
- Dimensional check and visual examination of the surface condition: without objection
- We Declare that the above mentioned plates are in compliance with the order prescription
- We hereby declare that the above mentioned material have been rolled in Italy, thus of European Community origin

MARCEGAGLIA
PALINI E BERTOLI

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tel +39 0431623111

Type/Tipo 3.1 CERTIFICATO DI COLLAUDO EN10204

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Number/Numero 16624421397 Creato il 19/06/2024

**Product: Hot Rolled Heavy Plates**
**NormaCollaudoLamieraTreno: EN10025-2:2019**
**Steel grade:: S355J2+N**

Customer/Cliente
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Code: 0000028513

Del. Address/Destinatario Merci
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Delivery/N° Consegna 8920573384
Of/Del 19/06/2024
Delivery note nr/N° doc. di trasp. 1066007973

Quality Control/Controllo Qualità
Q.M.D./RESP. M.Rizzatti
Plant/Stab. Palini e Bertoli

Pages/Pagine 6/7

Material/Codice Materiale
**LTS**

Description/Descrizione
**50,00 X 2000,00 X 12000,00 S355J2+N**

**Surface Quality: EN10163-2 CL A1**
**Flatness: rif EN 10029 cl. N**
**Thickness tolerance: EN10029 CLASSE B**

Delivery Condition: NORMALIZING ROLLING
Steel Making Process: BO= Basic oxigen

Order Nr/ordine **1191769614/102**
Materiale Cliente

Client Order/Ordine cliente **ORD. 2L 00181 DEL 28/5**
Date/data cliente **28/05/2024**

| Item | Batch/N° Partita | ID Palini | Heat/Colata | Quantity/Q.tà KG | Quantity/Q.tà PZZ |
|---|---|---|---|---|---|
| 1 | 24PZ003967 | 24J.1800.03 | 2459624 | 9600 | 1 *26073* |
| 2 | 24PZ003968 | 28W.28.04 | 23207033 | 9600 | 1 *26072* |

Remarks/Note:
LAMIERE SABBIATE in acc. ISO 8501:2012 SA 2 ½.
CE Marking Certificate N.0474-CPR-0033 last issued 14/09/2020 Rev.05. Hot rolled products of structural steels in compliance with Regulation n°305/2011/EU dated 09/03/2011. DOP available on https://www.quality.marcegaglia.com.
UKCA Marking Certificate N.1244-CPR-1051 last issued 01/01/2023. Hot rolled products of structural steels in compliance with the Construction Products Regulation 2011 (retained EU law EUR 305/2011). DOP available on https://www.quality.marcegaglia.com.

| Batch/N° Partita | C (%) | Mn (%) | Si (%) | S (%) | P (%) | Cr (%) | Ni (%) | Cu (%) | Al (%) | Mo (%) | Nb (%) | V (%) | Ti (%) | N (%) | H (%) | B (%) | Ceq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.1 | | | | | | 0.02 | | | | | | | | |
| | 0.22 | 1.6 | 0.55 | 0.025 | 0.025 | 0.29 | 0.42 | 0.55 | 0.3 | 0.11 | 0.06 | 0.1 | 0.05 | | | | 0.47 |
| 24PZ003967 | .161 | 1.464 | .168 | .0040 | .0130 | .037 | .022 | .031 | .054 | .0020 | .030 | .001 | .0020 | .0040 | .00020 | .0002 | .42 |
| 24PZ003968 | .157 | 1.490 | .230 | .0030 | .0130 | .033 | .019 | .030 | .031 | .0030 | .031 | .003 | .0120 | .0040 | .00210 | .0003 | .42 |

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Fax Amm. 0444 823364
Uff. Tec. 0444 823201
C. F. e Part. IVA 02510610245

| Batch/N° Partita | Forma | (1) | (2) | (3) | Tst [°C] | Rm [N/mmq] | ReH [N/mmq] | A% (%) | (1) | (2) | (3) | (4) | T [°C] | Kv1 [J] | Kv2 [J] | Kv3 [J] | Kv$^a$ [J] | TESTN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20 | 470 | 335 | 19 | | | | | -20 | | | | 27 | |
| | | | | | 20 | 630 | | | | | | | | | | | | |
| 24PZ003967 | C | 1 | 1/4 | T | 20 | 560 | 425 | 31.5 | 1 | P | L | 10.0 | -20 | 220 | 208 | 203 | 210 | 24-P11004S |
| 24PZ003968 | C | 1 | 1/4 | T | 20 | 534 | 401 | 34.5 | 1 | P | L | 10.0 | -20 | 215 | 243 | 227 | 228 | 24-P10853R |

Controllo ad ultrasuoni

| Apparecchiatura | Numero di serie | Condizioni di superficie | Accoppiante | Mod. operativie | Taratura |
|---|---|---|---|---|---|
| Gilardoni RDG2000 | 050858001 | As Rolled | Acqua | Secondo le specifiche | Secondo le specifiche |

| Item | Norma di riferimento | Classe accettabilità | Esito | Indicazioni | Reticolo | Bordi | Sonda | Frequenza | Angolo |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

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MARCEGAGLIA
Palini e Bertoli S.p.A.
QUALITY CONTROL
Rizzatti Marco

(1)Posizione:1=Testa;2=Piede.(2)Posizione:1/2=1/2 spessore;P=Pelle;1/4=1/4 spessore.(3)Direzione:L=Longitudinale;T=Trasversale;(4)Spessore provino

DescrizioneMarchi

UKCA 1244 22 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

CE 0474 06 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

- Material Free of radioactive contamination
- Dimensional check and visual examination of the surface condition: without objection
- We Declare that the above mentioned plates are in compliance with the order prescription
- We hereby declare that the above mentioned material have been rolled in Italy, thus of European Community origin

MARCEGAGLIA PALINI E BERTOLI

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via E.Fermi, 28 33058 San Giorgio di Nogaro, Udine - Italy
tel +39 0431623111

Type/Tipo 3.1 CERTIFICATO DI COLLAUDO EN10204

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Number/Numero 16624421397 Creato il 19/06/2024

**Product: Hot Rolled Heavy Plates**
**NormaCollaudoLamieraTreno: EN10025-2:2019**
**Steel grade:: S355J2+N**

Customer/Cliente
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Code: 0000028513

Del. Address/Destinatario Merci
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Delivery/N° Consegna 8920573384
Of/Del 19/06/2024
Delivery note nr/N° doc. di trasp. 1066007973

Quality Control/Controllo Qualità
Q.M.D./RESP. M.Rizzatti
Plant/Stab. Palini e Bertoli

Pages/Pagine 7/7

Material/Codice Materiale
**LTS**

Description/Descrizione
**40,00 X 2000,00 X 12000,00 S355J2+N**

**Surface Quality: EN10163-2 CL A1**
**Flatness: rif EN 10029 cl. N**
**Thickness tolerance: EN10029 CLASSE B**

Delivery Condition: NORMALIZING ROLLING
Steel Making Process: BO= Basic oxigen

Order Nr/ordine **1191769614/81**
Materiale Cliente

Client Order/Ordine cliente **ORD. 2L 00181 DEL 28/5**
Date/data cliente **28/05/2024**

| Item | Batch/N° Partita | ID Palini | Heat/Colata | Quantity/Q.tà KG | Quantity/Q.tà PZ |
|---|---|---|---|---|---|
| 1 | 24PZ003988 | 24C.328.03 | 2452518 | 7680 | 1 26071 |

Remarks/Note:
LAMIERE SABBIATE in acc. ISO 8501:2012 SA 2 ½.
CE Marking Certificate N.0474-CPR-0033 last issued 14/09/2020 Rev.05. Hot rolled products of structural steels in compliance with Regulation n°305/2011/EU dated 09/03/2011. DOP available on https://www.quality.marcegaglia.com.
UKCA Marking Certificate N.1244-CPR-1051 last issued 01/01/2023. Hot rolled products of structural steels in compliance with the Construction Products Regulation 2011 (retained EU law EUR 305/2011). DOP available on https://www.quality.marcegaglia.com.

| Batch/N° Partita | C (%) | Mn (%) | Si (%) | S (%) | P (%) | Cr (%) | Ni (%) | Cu (%) | Al (%) | Mo (%) | Nb (%) | V (%) | Ti (%) | N (%) | H (%) | B (%) | Ceq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.1 | | | | | | 0.02 | | | | | | | | |
| | 0.22 | 1.6 | 0.55 | 0.025 | 0.025 | 0.29 | 0.42 | 0.55 | 0.3 | 0.11 | 0.06 | 0.1 | 0.05 | | | | 0.47 |
| 24PZ003988 | .165 | 1.504 | .202 | .0020 | .0080 | .022 | .008 | .009 | .042 | .0010 | .028 | .001 | .0020 | .0040 | .00050 | .0001 | .42 |

| Batch/N° Partita | Forma | (1) | (2) | (3) | Tst [°C] | Rm [N/mmq] | ReH [N/mmq] | A% (%) | (1) | (2) | (3) | (4) | T [°C] | Kv1 [J] | Kv2 [J] | Kv3 [J] | Kv[a] [J] | TESTN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20 | 470 | 345 | 20 | | | | | -20 | | | | 27 | |
| | | | | | 20 | 630 | | | | | | | | | | | | |
| 24PZ003988 | C | 1 | 1/4 | T | 20 | 596 | 450 | 28.5 | 1 | P | L | 10.0 | -20 | 180 | 183 | 179 | 180 | 24-P07988R |

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Uff. Tec. 0444 823201
C. F. e Part. IVA 02510610245

Controllo ad ultrasuoni

| Apparecchiatura | Numero di serie | Condizioni di superficie | Accoppiante | Mod. operativie | Taratura |
|---|---|---|---|---|---|
| Gilardoni RDG2000 | 050858001 | As Rolled | Acqua | Secondo le specifiche | Secondo le specifiche |

| Item | Norma di riferimento | Classe accettabilità | Esito | Indicazioni | Reticolo | Bordi | Sonda | Frequenza | Angolo |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

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MARCEGAGLIA Palini e Bertoli S.p.A. QUALITY CONTROL Rizzatti Marco

(1)Posizione:1=Testa;2=Piede.(2)Posizione:1/2=1/2 spessore;P=Pelle;1/4=1/4 spessore.(3)Direzione:L=Longitudinale;T=Trasversale;(4)Spessore provino

DescrizioneMarchi

UKCA 1244 22 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

CE 0474 06 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

- Material Free of radioactive contamination
- Dimensional check and visual examination of the surface condition: without objection
- We Declare that the above mentioned plates are in compliance with the order prescription
- We hereby declare that the above mentioned material have been rolled in Italy, thus of European Community origin

# MARCEGAGLIA PALINI E BERTOLI

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www.marcegaglia.com

Marcegaglia Palini e Bertoli S.P.A.
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tel +39 0431623111

Type/Tipo 3.1 CERTIFICATO DI COLLAUDO EN10204

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Number/Numero 16624421397 Creato il 19/06/2024

**Product: Hot Rolled Heavy Plates**
**NormaCollaudoLamieraTreno: EN10025-2:2019**
**Steel grade:: S355J2+N**

Customer/Cliente
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Code: 0000028513

Del. Address/Destinatario Merci
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Delivery/N° Consegna 8920573384
Of/Del 19/06/2024
Delivery note nr/N° doc. di trasp. 1066007973

Quality Control/Controllo Qualità
Q.M.D./RESP. M.Rizzatti
Plant/Stab. Palini e Bertoli

Pages/Pagine 1/7

Material/Codice Materiale
**LTS**

Description/Descrizione
**10,00 X 2450,00 X 12000,00 S355J2+N**

**Surface Quality: EN10163-2 CL A1**
**Flatness: rif EN 10029 cl. N**
**Thickness tolerance: EN10029 CLASSE B**

Delivery Condition: NORMALIZING ROLLING
Steel Making Process: BO= Basic oxigen

Order Nr/ordine **1191769614/15**
Materiale Cliente

Client Order/Ordine cliente **ORD. 2L 00181 DEL 28/5**
Date/data cliente **28/05/2024**

| Item | Batch/N° Partita | ID Palini | Heat/Colata | Quantity/Q.tà KG | Quantity/Q.tà PZZ |
|---|---|---|---|---|---|
| 1 | 24PZ003973 | 24R.366.03/A | 2377353 | 2352 | 1 ***26090*** |
| 2 | 24PZ003970 | 24R.366.02/B | 2377353 | 2352 | 1 ***26089*** |
| 3 | 24PZ003971 | 24R.366.02/A | 2377353 | 2352 | 1 ***26088*** |
| 4 | 24PZ003972 | 24R.366.03/B | 2377353 | 2352 | 1 ***26091*** |

Remarks/Note:
LAMIERE SABBIATE in acc. ISO 8501:2012 SA 2 ½.
CE Marking Certificate N.0474-CPR-0033 last issued 14/09/2020 Rev.05. Hot rolled products of structural steels in compliance with Regulation n°305/2011/EU dated 09/03/2011. DOP available on https://www.quality.marcegaglia.com.
UKCA Marking Certificate N.1244-CPR-1051 last issued 01/01/2023. Hot rolled products of structural steels in compliance with the Construction Products Regulation 2011 (retained EU law EUR 305/2011). DOP available on https://www.quality.marcegaglia.com.

| Batch/N° Partita | C (%) | Mn (%) | Si (%) | S (%) | P (%) | Cr (%) | Ni (%) | Cu (%) | Al (%) | Mo (%) | Nb (%) | V (%) | Ti (%) | N (%) | H (%) | B (%) | Ceq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.2 | 1.6 | 0.55 | 0.025 | 0.025 | 0.29 | 0.42 | 0.55 | 0.02<br>0.3 | 0.11 | 0.06 | 0.1 | 0.05 | | | | 0.45 |
| 24PZ003973 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |
| 24PZ003970 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |
| 24PZ003971 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |
| 24PZ003972 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |

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Tel. 0444 823059
Fax Amm. 0444 823364
Uff. Tec. 0444 823201
C. F. e Part. IVA 02510610245

| Batch/N° Partita | Forma | (1) | (2) | (3) | Tst [°C] | Rm [N/mmq] | ReH [N/mmq] | A% (%) | (1) | (2) | (3) | (4) | T [°C] | Kv1 [J] | Kv2 [J] | Kv3 [J] | Kv$^a$ [J] | TESTN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20<br>20 | 470<br>630 | 355 | 20 | | | | | -20 | | | | | |
| 24PZ003973 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |
| 24PZ003970 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |
| 24PZ003971 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |
| 24PZ003972 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |

Controllo ad ultrasuoni

| Apparecchiatura | Numero di serie | Condizioni di superficie | Accoppiante | Mod. operativie | Taratura |
|---|---|---|---|---|---|
| Gilardoni RDG2000 | 050858001 | As Rolled | Acqua | Secondo le specifiche | Secondo le specifiche |

| Item | Norma di riferimento | Classe accettabilità | Esito | Indicazioni | Reticolo | Bordi | Sonda | Frequenza | Angolo |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

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MARCEGAGLIA Palini e Bertoli S.p.A. QUALITY CONTROL Rizzatti Marco

(1)Posizione:1=Testa;2=Piede.(2)Posizione:1/2=1/2 spessore;P=Pelle;1/4=1/4 spessore.(3)Direzione:L=Longitudinale;T=Trasversale;(4)Spessore provino

DescrizioneMarchi

UKCA 1244 22 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

CE 0474 06 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

- Material Free of radioactive contamination
- Dimensional check and visual examination of the surface condition: without objection
- We Declare that the above mentioned plates are in compliance with the order prescription
- We hereby declare that the above mentioned material have been rolled in Italy, thus of European Community origin

MARCEGAGLIA PALINI E BERTOLI

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www.marcegaglia.com

Marcegaglia Palini e Bertoli S.P.A.
via E.Fermi, 28 33058 San Giorgio di Nogaro, Udine - Italy
tel +39 0431623111

Type/Tipo 3.1 CERTIFICATO DI COLLAUDO EN10204

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Number/Numero 16624421397 Creato il 19/06/2024

**Product: Hot Rolled Heavy Plates**
**NormaCollaudoLamieraTreno: EN10025-2:2019**
**Steel grade:: S355J2+N**

Customer/Cliente
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Code: 0000028513

Del. Address/Destinatario Merci
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Delivery/N° Consegna 8920573384
Of/Del 19/06/2024
Delivery note nr/N° doc. di trasp. 1066007973

Quality Control/Controllo Qualità
Q.M.D./RESP. M.Rizzatti
Plant/Stab. Palini e Bertoli



Material/Codice Materiale
**LTS**

Description/Descrizione
**10,00 X 2450,00 X 12000,00 S355J2+N**

**Surface Quality: EN10163-2 CL A1**
**Flatness: rif EN 10029 cl. N**
**Thickness tolerance: EN10029 CLASSE B**

Delivery Condition: NORMALIZING ROLLING
Steel Making Process: BO= Basic oxigen

Order Nr/ordine **1191769614/15**
Materiale Cliente

Client Order/Ordine cliente **ORD. 2L 00181 DEL 28/5**
Client Date/data cliente **28/05/2024**

| Item | Batch/N° Partita | ID Palini | Heat/Colata | Quantity/Q.tà KG | Quantity/Q.tà PZZ |
|---|---|---|---|---|---|
| 1 | 24PZ003977 | 24R.365.02/B | 2377353 | 2352 | 1 *26076* |
| 2 | 24PZ003974 | 24R.366.04/B | 2377353 | 2352 | 1 *26075* |
| 3 | 24PZ003975 | 24R.366.04/A | 2377353 | 2352 | 1 *26074* |
| 4 | 24PZ003976 | 24R.365.02/A | 2377353 | 2352 | 1 *26077* |

Remarks/Note:
LAMIERE SABBIATE in acc. ISO 8501:2012 SA 2 ½.
CE Marking Certificate N.0474-CPR-0033 last issued 14/09/2020 Rev.05. Hot rolled products of structural steels in compliance with Regulation n°305/2011/EU dated 09/03/2011. DOP available on https://www.quality.marcegaglia.com.
UKCA Marking Certificate N.1244-CPR-1051 last issued 01/01/2023. Hot rolled products of structural steels in compliance with the Construction Products Regulation 2011 (retained EU law EUR 305/2011). DOP available on https://www.quality.marcegaglia.com.

| Batch/N° Partita | C (%) | Mn (%) | Si (%) | S (%) | P (%) | Cr (%) | Ni (%) | Cu (%) | Al (%) | Mo (%) | Nb (%) | V (%) | Ti (%) | N (%) | H (%) | B (%) | Ceq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.2 | 1.6 | 0.55 | 0.025 | 0.025 | 0.29 | 0.42 | 0.55 | 0.02<br>0.3 | 0.11 | 0.06 | 0.1 | 0.05 | | | | 0.45 |
| 24PZ003977 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |
| 24PZ003974 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |
| 24PZ003975 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |
| 24PZ003976 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |

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Tel. 0444 823059
Fax Amm. 0444 823364
Uff. Tec. 0444 823201
C. F. e Part. IVA 02510610245

| Batch/N° Partita | Forma | (1) | (2) | (3) | Tst [°C] | Rm [N/mmq] | ReH [N/mmq] | A% (%) | (1) | (2) | (3) | (4) | T [°C] | Kv1 [J] | Kv2 [J] | Kv3 [J] | Kv$^a$ [J] | TESTN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20<br>20 | 470<br>630 | 355 | 20 | | | | | -20 | | | | | |
| 24PZ003977 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |
| 24PZ003974 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |
| 24PZ003975 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |
| 24PZ003976 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |

Controllo ad ultrasuoni

| Apparecchiatura | Numero di serie | Condizioni di superficie | Accoppiante | Mod. operativie | Taratura |
|---|---|---|---|---|---|
| Gilardoni RDG2000 | 050858001 | As Rolled | Acqua | Secondo le specifiche | Secondo le specifiche |

| Item | Norma di riferimento | Classe accettabilità | Esito | Indicazioni | Reticolo | Bordi | Sonda | Frequenza | Angolo |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

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MARCEGAGLIA Palini e Bertoli S.p.A. QUALITY CONTROL Rizzatti Marco

(1)Posizione:1=Testa;2=Piede.(2)Posizione:1/2=1/2 spessore;P=Pelle;1/4=1/4 spessore.(3)Direzione:L=Longitudinale;T=Trasversale;(4)Spessore provino

DescrizioneMarchi

UKCA 1244 22 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

CE 0474 06 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

- Material Free of radioactive contamination
- Dimensional check and visual examination of the surface condition: without objection
- We Declare that the above mentioned plates are in compliance with the order prescription
- We hereby declare that the above mentioned material have been rolled in Italy, thus of European Community origin

**MARCEGAGLIA PALINI E BERTOLI**

Marcegaglia
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Tel. +39 - 0376 685 1 Fax. +39 - 0376 685 600
www.marcegaglia.com

Marcegaglia Palini e Bertoli S.P.A.
via E.Fermi, 28 33058 San Giorgio di Nogaro, Udine - Italy
tel +39 0431623111

Type/Tipo 3.1 CERTIFICATO DI COLLAUDO EN10204

questo documento è stato generato automaticamente ed è valido senza firma

Number/Numero 16624421397 Creato il 19/06/2024

**Product: Hot Rolled Heavy Plates**
**NormaCollaudoLamieraTreno: EN10025-2:2019**
**Steel grade:: S355J2+N**

Customer/Cliente
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Code: 0000028513

Del. Address/Destinatario Merci
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Delivery/N° Consegna 8920573384
Of/Del 19/06/2024
Delivery note nr/N° doc. di trasp. 1066007973

Quality Control/Controllo Qualità
Q.M.D./RESP. M.Rizzatti
Plant/Stab. Palini e Bertoli



Material/Codice Materiale
**LTS**

Description/Descrizione
**10,00 X 2450,00 X 12000,00 S355J2+N**

**Surface Quality: EN10163-2 CL A1**
**Flatness: rif EN 10029 cl. N**
**Thickness tolerance: EN10029 CLASSE B**

Delivery Condition: NORMALIZING ROLLING
Steel Making Process: BO= Basic oxigen

Order Nr/ordine **1191769614/15**
Materiale Cliente

Client Order/Ordine cliente **ORD. 2L 00181 DEL 28/5**
Date/data cliente **28/05/2024**

| Item | Batch/N° Partita | ID Palini | Heat/Colata | Quantity/Q.tà KG | Quantity/Q.tà PZ |
|---|---|---|---|---|---|
| 1 | 24PZ003981 | 24R.365.03/A | 2377353 | 2352 | 1 26080 |
| 2 | 24PZ003978 | 24R.365.01/A | 2377353 | 2352 | 1 26079 |
| 3 | 24PZ003979 | 24R.365.01/B | 2377353 | 2352 | 1 26078 |
| 4 | 24PZ003980 | 24R.365.03/B | 2377353 | 2352 | 1 26081 |

Remarks/Note:
LAMIERE SABBIATE in acc. ISO 8501:2012 SA 2 ½.
CE Marking Certificate N.0474-CPR-0033 last issued 14/09/2020 Rev.05. Hot rolled products of structural steels in compliance with Regulation n°305/2011/EU dated 09/03/2011. DOP available on https://www.quality.marcegaglia.com.
UKCA Marking Certificate N.1244-CPR-1051 last issued 01/01/2023. Hot rolled products of structural steels in compliance with the Construction Products Regulation 2011 (retained EU law EUR 305/2011). DOP available on https://www.quality.marcegaglia.com.

| Batch/N° Partita | C (%) | Mn (%) | Si (%) | S (%) | P (%) | Cr (%) | Ni (%) | Cu (%) | Al (%) | Mo (%) | Nb (%) | V (%) | Ti (%) | N (%) | H (%) | B (%) | Ceq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.2 | 1.6 | 0.55 | 0.025 | 0.025 | 0.29 | 0.42 | 0.55 | 0.02<br>0.3 | 0.11 | 0.06 | 0.1 | 0.05 | | | | 0.45 |
| 24PZ003981 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |
| 24PZ003978 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |
| 24PZ003979 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |
| 24PZ003980 | .144 | 1.350 | .174 | .0070 | .0100 | .027 | .018 | .027 | .045 | .0010 | .000 | .001 | .0000 | .0040 | .00000 | .0000 | .38 |

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Uff. Tec. 0444 823201
C. F. e Part. IVA 02510610245

| Batch/N° Partita | Forma | (1) | (2) | (3) | Tst [°C] | Rm [N/mmq] | ReH [N/mmq] | A% (%) | (1) | (2) | (3) | (4) | T [°C] | Kv1 [J] | Kv2 [J] | Kv3 [J] | Kv$^a$ [J] | TESTN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20<br>20 | 470<br>630 | 355 | 20 | | | | | -20 | | | | | |
| 24PZ003981 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |
| 24PZ003978 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |
| 24PZ003979 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |
| 24PZ003980 | P | 1 | P | T | 20 | 496 | 406 | 28.8 | 1 | P | L | 7.5 | -20 | 132 | 151 | 125 | 136 | 24-P08088R |

Controllo ad ultrasuoni

| Apparecchiatura | Numero di serie | Condizioni di superficie | Accoppiante | Mod. operativie | Taratura |
|---|---|---|---|---|---|
| Gilardoni RDG2000 | 050858001 | As Rolled | Acqua | Secondo le specifiche | Secondo le specifiche |

| Item | Norma di riferimento | Classe accettabilità | Esito | Indicazioni | Reticolo | Bordi | Sonda | Frequenza | Angolo |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

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MARCEGAGLIA Palini e Bertoli S.p.A. QUALITY CONTROL Rizzatti Marco

(1)Posizione:1=Testa;2=Piede.(2)Posizione:1/2=1/2 spessore;P=Pelle;1/4=1/4 spessore.(3)Direzione:L=Longitudinale;T=Trasversale;(4)Spessore provino

DescrizioneMarchi

UKCA 1244 22 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

CE 0474 06 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

- Material Free of radioactive contamination
- Dimensional check and visual examination of the surface condition: without objection
- We Declare that the above mentioned plates are in compliance with the order prescription
- We hereby declare that the above mentioned material have been rolled in Italy, thus of European Community origin

MARCEGAGLIA
PALINI E BERTOLI

Marcegaglia
46040 Via Bresciani, 16-Gazoldo degli Ippoliti Mantova-Italy
Tel. +39 - 0376 685 1 Fax. +39 - 0376 685 600
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Marcegaglia Palini e Bertoli S.P.A.
via E.Fermi, 28 33058 San Giorgio di Nogaro, Udine - Italy
tel +39 0431623111

Type/Tipo 3.1 CERTIFICATO DI COLLAUDO EN10204

questo documento è stato generato automaticamente ed è valido senza firma

Number/Numero 16624421397 Creato il 19/06/2024

**Product: Hot Rolled Heavy Plates**
**NormaCollaudoLamieraTreno: EN10025-2:2019**
**Steel grade:: S355J2+N**

Customer/Cliente
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Code: 0000028513

Del. Address/Destinatario Merci
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Delivery/N° Consegna 8920573384
Of/Del 19/06/2024
Delivery note nr/N° doc. di trasp. 1066007973

Quality Control/Controllo Qualità
Q.M.D./RESP. M.Rizzatti
Plant/Stab. Palini e Bertoli

Pages/Pagine 4/7

Material/Codice Materiale
**LTS**

Description/Descrizione
**15,00 X 2450,00 X 12000,00 S355J2+N**

**Surface Quality: EN10163-2 CL A1**
**Flatness: rif EN 10029 cl. N**
**Thickness tolerance: EN10029 CLASSE B**

Delivery Condition: NORMALIZING ROLLING
Steel Making Process: BO= Basic oxigen

Order Nr/ordine **1191769614/30**
Materiale Cliente

Client Order/Ordine cliente **ORD. 2L 00181 DEL 28/5**
Date/data cliente **28/05/2024**

| Item | Batch/N° Partita | ID Palini | Heat/Colata | Quantity/Q.tà KG | Quantity/Q.tà PZZ |
|---|---|---|---|---|---|
| 1 | 24PZ003791 | 16F.6121.03/A | 142878 | 3528 | 1 *26084* |
| 2 | 24PZ003788 | 16F.6122.03/B | 442511 | 3528 | 1 *26083* |
| 3 | 24PZ003789 | 16F.6122.03/A | 442511 | 3528 | 1 *26082* |
| 4 | 24PZ003790 | 16F.6121.03/B | 142878 | 3528 | 1 *26085* |

Remarks/Note:
LAMIERE SABBIATE in acc. ISO 8501:2012 SA 2 ½.
CE Marking Certificate N.0474-CPR-0033 last issued 14/09/2020 Rev.05. Hot rolled products of structural steels in compliance with Regulation n°305/2011/EU dated 09/03/2011. DOP available on https://www.quality.marcegaglia.com.
UKCA Marking Certificate N.1244-CPR-1051 last issued 01/01/2023. Hot rolled products of structural steels in compliance with the Construction Products Regulation 2011 (retained EU law EUR 305/2011). DOP available on https://www.quality.marcegaglia.com.

| Batch/N° Partita | C (%) | Mn (%) | Si (%) | S (%) | P (%) | Cr (%) | Ni (%) | Cu (%) | Al (%) | Mo (%) | Nb (%) | V (%) | Ti (%) | N (%) | H (%) | B (%) | Ceq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.2 | 1.6 | 0.55 | 0.025 | 0.025 | 0.29 | 0.42 | 0.55 | 0.02<br>0.3 | 0.11 | 0.06 | 0.1 | 0.05 | | | | 0.45 |
| 24PZ003791 | .150 | 1.470 | .240 | .0050 | .0180 | .010 | .010 | .010 | .036 | .0000 | .030 | .001 | .0030 | .0020 | .00000 | .0002 | .40 |
| 24PZ003788 | .150 | 1.480 | .250 | .0050 | .0150 | .010 | .010 | .010 | .043 | .0000 | .032 | .001 | .0020 | .0040 | .00000 | .0001 | .40 |
| 24PZ003789 | .150 | 1.480 | .250 | .0050 | .0150 | .010 | .010 | .010 | .043 | .0000 | .032 | .001 | .0020 | .0040 | .00000 | .0001 | .40 |
| 24PZ003790 | .150 | 1.470 | .240 | .0050 | .0180 | .010 | .010 | .010 | .036 | .0000 | .030 | .001 | .0030 | .0020 | .00000 | .0002 | .40 |

| Batch/N° Partita | Forma | (1) | (2) | (3) | Tst [°C] | Rm [N/mmq] | ReH [N/mmq] | A% (%) | (1) | (2) | (3) | (4) | T [°C] | Kv1 [J] | Kv2 [J] | Kv3 [J] | Kv$^a$ [J] | TESTN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20<br>20 | 470<br>630 | 355 | 20 | | | | | -20 | | | | | |
| 24PZ003791 | P | 1 | P | T | 20 | 566 | 454 | 29.5 | 1 | P | L | 10.0 | -20 | 209 | 178 | 201 | 196 | 24-P09867R |
| 24PZ003788 | P | 1 | P | T | 20 | 585 | 457 | 24.5 | 1 | P | L | 10.0 | -20 | 180 | 66 | 152 | 132 | 24-P09095R |
| 24PZ003789 | P | 1 | P | T | 20 | 585 | 457 | 24.5 | 1 | P | L | 10.0 | -20 | 180 | 66 | 152 | 132 | 24-P09095R |
| 24PZ003790 | P | 1 | P | T | 20 | 566 | 454 | 29.5 | 1 | P | L | 10.0 | -20 | 209 | 178 | 201 | 196 | 24-P09867R |

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Uff. Tec. 0444 823201
C. F. e Part. IVA 02510610245

Controllo ad ultrasuoni

| Apparecchiatura | Numero di serie | Condizioni di superficie | Accoppiante | Mod. operativie | Taratura |
|---|---|---|---|---|---|
| Gilardoni RDG2000 | 050858001 | As Rolled | Acqua | Secondo le specifiche | Secondo le specifiche |

| Item | Norma di riferimento | Classe accettabilità | Esito | Indicazioni | Reticolo | Bordi | Sonda | Frequenza | Angolo |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

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MARCEGAGLIA
Palini e Bertoli S.p.A.
QUALITY CONTROL
Rizzatti Marco

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DescrizioneMarchi

UKCA 1244 22 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

CE 0474 06 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

- Material Free of radioactive contamination
- Dimensional check and visual examination of the surface condition: without objection
- We Declare that the above mentioned plates are in compliance with the order prescription
- We hereby declare that the above mentioned material have been rolled in Italy, thus of European Community origin

MARCEGAGLIA PALINI E BERTOLI

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46040 Via Bresciani, 16-Gazoldo degli Ippoliti Mantova-Italy
Tel. +39 - 0376 685 1 Fax. +39 - 0376 685 600
www.marcegaglia.com

Marcegaglia Palini e Bertoli S.P.A.
via E.Fermi, 28 33058 San Giorgio di Nogaro, Udine - Italy
tel +39 0431623111

Type/Tipo 3.1 CERTIFICATO DI COLLAUDO EN10204

questo documento è stato generato automaticamente ed è valido senza firma

Number/Numero 16624421397 Creato il 19/06/2024

**Product: Hot Rolled Heavy Plates**
**NormaCollaudoLamieraTreno: EN10025-2:2019**
**Steel grade:: S355J2+N**

Customer/Cliente
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Code: 0000028513

Del. Address/Destinatario Merci
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Delivery/N° Consegna 8920573384
Of/Del 19/06/2024
Delivery note nr/N° doc. di trasp. 1066007973

Quality Control/Controllo Qualità
Q.M.D./RESP. M.Rizzatti
Plant/Stab. Palini e Bertoli



Material/Codice Materiale
**LTS**

Description/Descrizione
**15,00 X 2450,00 X 12000,00 S355J2+N**

**Surface Quality: EN10163-2 CL A1**
**Flatness: rif EN 10029 cl. N**
**Thickness tolerance: EN10029 CLASSE B**

Delivery Condition: NORMALIZING ROLLING
Steel Making Process: BO= Basic oxigen

Order Nr/ordine **1191769614/30**
Materiale Cliente

Client Order/Ordine cliente **ORD. 2L 00181 DEL 28/5**
Date/data cliente **28/05/2024**

| Item | Batch/N° Partita | ID Palini | Heat/Colata | Quantity/Q.tà KG | Quantity/Q.tà PZ |
|---|---|---|---|---|---|
| 1 | 24PZ003792 | 16F.6119.01/B | 442151 | 3528 | 1 26087 |
| 2 | 24PZ003793 | 16F.6119.01/A | 442151 | 3528 | 1 26086 |

Remarks/Note:
LAMIERE SABBIATE in acc. ISO 8501:2012 SA 2 ½.
CE Marking Certificate N.0474-CPR-0033 last issued 14/09/2020 Rev.05. Hot rolled products of structural steels in compliance with Regulation n°305/2011/EU dated 09/03/2011. DOP available on https://www.quality.marcegaglia.com.
UKCA Marking Certificate N.1244-CPR-1051 last issued 01/01/2023. Hot rolled products of structural steels in compliance with the Construction Products Regulation 2011 (retained EU law EUR 305/2011). DOP available on https://www.quality.marcegaglia.com.

| Batch/N° Partita | C (%) | Mn (%) | Si (%) | S (%) | P (%) | Cr (%) | Ni (%) | Cu (%) | Al (%) | Mo (%) | Nb (%) | V (%) | Ti (%) | N (%) | H (%) | B (%) | Ceq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.2 | 1.6 | 0.55 | 0.025 | 0.025 | 0.29 | 0.42 | 0.55 | 0.02<br>0.3 | 0.11 | 0.06 | 0.1 | 0.05 | | | | 0.45 |
| 24PZ003792 | .150 | 1.490 | .220 | .0060 | .0140 | .020 | .010 | .020 | .032 | .0000 | .028 | .001 | .0040 | .0020 | .00000 | .0001 | .40 |
| 24PZ003793 | .150 | 1.490 | .220 | .0060 | .0140 | .020 | .010 | .020 | .032 | .0000 | .028 | .001 | .0040 | .0020 | .00000 | .0001 | .40 |

| Batch/N° Partita | Forma | (1) | (2) | (3) | Tst [°C] | Rm [N/mmq] | ReH [N/mmq] | A% (%) | (1) | (2) | (3) | (4) | T [°C] | Kv1 [J] | Kv2 [J] | Kv3 [J] | Kv[a] [J] | TESTN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20<br>20 | 470<br>630 | 355 | 20 | | | | | -20 | | | | | |
| 24PZ003792 | P | 1 | P | T | 20 | 550 | 440 | 24.4 | 1 | P | L | 10.0 | -20 | 85 | 203 | 140 | 142 | 24-P10251R |
| 24PZ003793 | P | 1 | P | T | 20 | 550 | 440 | 24.4 | 1 | P | L | 10.0 | -20 | 85 | 203 | 140 | 142 | 24-P10251R |

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Uff. Tec. 0444 823201
C. F. e Part. IVA 02510610245

Controllo ad ultrasuoni

| Apparecchiatura | Numero di serie | Condizioni di superficie | Accoppiante | Mod. operativie | Taratura |
|---|---|---|---|---|---|
| Gilardoni RDG2000 | 050858001 | As Rolled | Acqua | Secondo le specifiche | Secondo le specifiche |

| Item | Norma di riferimento | Classe accettabilità | Esito | Indicazioni | Reticolo | Bordi | Sonda | Frequenza | Angolo |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

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MARCEGAGLIA Palini e Bertoli S.p.A. QUALITY CONTROL Rizzatti Marco

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DescrizioneMarchi

UKCA 1244 22 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

CE 0474 06 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

- Material Free of radioactive contamination
- Dimensional check and visual examination of the surface condition: without objection
- We Declare that the above mentioned plates are in compliance with the order prescription
- We hereby declare that the above mentioned material have been rolled in Italy, thus of European Community origin

**MARCEGAGLIA PALINI E BERTOLI**

Marcegaglia
46040 Via Bresciani, 16-Gazoldo degli Ippoliti Mantova-Italy
Tel. +39 - 0376 685 1 Fax. +39 - 0376 685 600
www.marcegaglia.com

Marcegaglia Palini e Bertoli S.P.A.
via E.Fermi, 28 33058 San Giorgio di Nogaro, Udine - Italy
tel +39 0431623111

Type/Tipo 3.1 CERTIFICATO DI COLLAUDO EN10204

questo documento è stato generato automaticamente ed è valido senza firma

Number/Numero 16624421397 Creato il 19/06/2024

**Product: Hot Rolled Heavy Plates**
**NormaCollaudoLamieraTreno: EN10025-2:2019**
**Steel grade:: S355J2+N**

Customer/Cliente
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Code: 0000028513

Del. Address/Destinatario Merci
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Delivery/N° Consegna 8920573384
Of/Del 19/06/2024
Delivery note nr/N° doc. di trasp. 1066007973

Quality Control/Controllo Qualità
Q.M.D./RESP. M.Rizzatti
Plant/Stab. Palini e Bertoli

Pages/Pagine 6/7

Material/Codice Materiale
**LTS**

Description/Descrizione
**50,00 X 2000,00 X 12000,00 S355J2+N**

**Surface Quality: EN10163-2 CL A1**
**Flatness: rif EN 10029 cl. N**
**Thickness tolerance: EN10029 CLASSE B**

Delivery Condition: NORMALIZING ROLLING
Steel Making Process: BO= Basic oxigen

Order Nr/ordine **1191769614/102**
Materiale Cliente

Client Order/Ordine cliente **ORD. 2L 00181 DEL 28/5**
Date/data cliente **28/05/2024**

| Item | Batch/N° Partita | ID Palini | Heat/Colata | Quantity/Q.tà KG | Quantity/Q.tà PZZ |
|---|---|---|---|---|---|
| 1 | 24PZ003967 | 24J.1800.03 | 2459624 | 9600 | 1 *26073* |
| 2 | 24PZ003968 | 28W.28.04 | 23207033 | 9600 | 1 *26072* |

Remarks/Note:
LAMIERE SABBIATE in acc. ISO 8501:2012 SA 2 ½.
CE Marking Certificate N.0474-CPR-0033 last issued 14/09/2020 Rev.05. Hot rolled products of structural steels in compliance with Regulation n°305/2011/EU dated 09/03/2011. DOP available on https://www.quality.marcegaglia.com.
UKCA Marking Certificate N.1244-CPR-1051 last issued 01/01/2023. Hot rolled products of structural steels in compliance with the Construction Products Regulation 2011 (retained EU law EUR 305/2011). DOP available on https://www.quality.marcegaglia.com.

| Batch/N° Partita | C (%) | Mn (%) | Si (%) | S (%) | P (%) | Cr (%) | Ni (%) | Cu (%) | Al (%) | Mo (%) | Nb (%) | V (%) | Ti (%) | N (%) | H (%) | B (%) | Ceq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.1 | | | | | | 0.02 | | | | | | | | |
| | 0.22 | 1.6 | 0.55 | 0.025 | 0.025 | 0.29 | 0.42 | 0.55 | 0.3 | 0.11 | 0.06 | 0.1 | 0.05 | | | | 0.47 |
| 24PZ003967 | .161 | 1.464 | .168 | .0040 | .0130 | .037 | .022 | .031 | .054 | .0020 | .030 | .001 | .0020 | .0040 | .00020 | .0002 | .42 |
| 24PZ003968 | .157 | 1.490 | .230 | .0030 | .0130 | .033 | .019 | .030 | .031 | .0030 | .031 | .003 | .0120 | .0040 | .00210 | .0003 | .42 |

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

| Batch/N° Partita | Forma | (1) | (2) | (3) | Tst [°C] | Rm [N/mmq] | ReH [N/mmq] | A% (%) | (1) | (2) | (3) | (4) | T [°C] | Kv1 [J] | Kv2 [J] | Kv3 [J] | Kv$^a$ [J] | TESTN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20 | 470 | 335 | 19 | | | | | -20 | | | | 27 | |
| | | | | | 20 | 630 | | | | | | | | | | | | |
| 24PZ003967 | C | 1 | 1/4 | T | 20 | 560 | 425 | 31.5 | 1 | P | L | 10.0 | -20 | 220 | 208 | 203 | 210 | 24-P11004S |
| 24PZ003968 | C | 1 | 1/4 | T | 20 | 534 | 401 | 34.5 | 1 | P | L | 10.0 | -20 | 215 | 243 | 227 | 228 | 24-P10853R |

Controllo ad ultrasuoni

| Apparecchiatura | Numero di serie | Condizioni di superficie | Accoppiante | Mod. operativie | Taratura |
|---|---|---|---|---|---|
| Gilardoni RDG2000 | 050858001 | As Rolled | Acqua | Secondo le specifiche | Secondo le specifiche |

| Item | Norma di riferimento | Classe accettabilità | Esito | Indicazioni | Reticolo | Bordi | Sonda | Frequenza | Angolo |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Firma
II Liv. EN/ISO 9712
Q.M.D. M.Rizzatti

MARCEGAGLIA Palini e Bertoli S.p.A. QUALITY CONTROL Rizzatti Marco

(1)Posizione:1=Testa;2=Piede.(2)Posizione:1/2=1/2 spessore;P=Pelle;1/4=1/4 spessore.(3)Direzione:L=Longitudinale;T=Trasversale;(4)Spessore provino

DescrizioneMarchi

UKCA 1244 22 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

CE 0474 06 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

- Material Free of radioactive contamination
- Dimensional check and visual examination of the surface condition: without objection
- We Declare that the above mentioned plates are in compliance with the order prescription
- We hereby declare that the above mentioned material have been rolled in Italy, thus of European Community origin

MARCEGAGLIA
PALINI E BERTOLI

Marcegaglia
46040 Via Bresciani, 16-Gazoldo degli Ippoliti Mantova-Italy
Tel. +39 - 0376 685 1 Fax. +39 - 0376 685 600
www.marcegaglia.com

Marcegaglia Palini e Bertoli S.P.A.
via E.Fermi, 28 33058 San Giorgio di Nogaro, Udine - Italy
tel +39 0431623111

Type/Tipo 3.1 CERTIFICATO DI COLLAUDO EN10204

questo documento è stato generato automaticamente ed è valido senza firma

Number/Numero 16624421397 Creato il 19/06/2024

**Product: Hot Rolled Heavy Plates**
**NormaCollaudoLamieraTreno: EN10025-2:2019**
**Steel grade:: S355J2+N**

Customer/Cliente
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Code: 0000028513

Del. Address/Destinatario Merci
SIDERTAGLIO LAMIERE S.R.L.
VIA DELL'AGRICOLTURA 8 D
36040 MELEDO DI SAREGO IT

Delivery/N° Consegna 8920573384
Of/Del 19/06/2024
Delivery note nr/N° doc. di trasp. 1066007973

Quality Control/Controllo Qualità
Q.M.D./RESP. M.Rizzatti
Plant/Stab. Palini e Bertoli

Pages/Pagine 7/7

Material/Codice Materiale
**LTS**

Description/Descrizione
**40,00 X 2000,00 X 12000,00 S355J2+N**

**Surface Quality: EN10163-2 CL A1**
**Flatness: rif EN 10029 cl. N**
**Thickness tolerance: EN10029 CLASSE B**

Delivery Condition: NORMALIZING ROLLING
Steel Making Process: BO= Basic oxigen

Order Nr/ordine **1191769614/81**
Materiale Cliente

Client Order/Ordine cliente **ORD. 2L 00181 DEL 28/5**
Date/data cliente **28/05/2024**

| Item | Batch/N° Partita | ID Palini | Heat/Colata | Quantity/Q.tà KG | Quantity/Q.tà PZZ |
|---|---|---|---|---|---|
| 1 | 24PZ003988 | 24C.328.03 | 2452518 | 7680 | 1 ~~26071~~ |

Remarks/Note:
LAMIERE SABBIATE in acc. ISO 8501:2012 SA 2 ½.
CE Marking Certificate N.0474-CPR-0033 last issued 14/09/2020 Rev.05. Hot rolled products of structural steels in compliance with Regulation n°305/2011/EU dated 09/03/2011. DOP available on https://www.quality.marcegaglia.com.
UKCA Marking Certificate N.1244-CPR-1051 last issued 01/01/2023. Hot rolled products of structural steels in compliance with the Construction Products Regulation 2011 (retained EU law EUR 305/2011). DOP available on https://www.quality.marcegaglia.com.

| Batch/N° Partita | C (%) | Mn (%) | Si (%) | S (%) | P (%) | Cr (%) | Ni (%) | Cu (%) | Al (%) | Mo (%) | Nb (%) | V (%) | Ti (%) | N (%) | H (%) | B (%) | Ceq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.1 | | | | | | 0.02 | | | | | | | | |
| | 0.22 | 1.6 | 0.55 | 0.025 | 0.025 | 0.29 | 0.42 | 0.55 | 0.3 | 0.11 | 0.06 | 0.1 | 0.05 | | | | 0.47 |
| 24PZ003988 | .165 | 1.504 | .202 | .0020 | .0080 | .022 | .008 | .009 | .042 | .0010 | .028 | .001 | .0020 | .0040 | .00050 | .0001 | .42 |

| Batch/N° Partita | Forma | (1) | (2) | (3) | Tst [°C] | Rm [N/mmq] | ReH [N/mmq] | A% (%) | (1) | (2) | (3) | (4) | T [°C] | Kv1 [J] | Kv2 [J] | Kv3 [J] | Kv[a] [J] | TESTN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20 | 470 | 345 | 20 | | | | | -20 | | | | 27 | |
| | | | | | 20 | 630 | | | | | | | | | | | | |
| 24PZ003988 | C | 1 | 1/4 | T | 20 | 596 | 450 | 28.5 | 1 | P | L | 10.0 | -20 | 180 | 183 | 179 | 180 | 24-P07988R |

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

Controllo ad ultrasuoni

| Apparecchiatura | Numero di serie | Condizioni di superficie | Accoppiante | Mod. operativie | Taratura |
|---|---|---|---|---|---|
| Gilardoni RDG2000 | 050858001 | As Rolled | Acqua | Secondo le specifiche | Secondo le specifiche |

| Item | Norma di riferimento | Classe accettabilità | Esito | Indicazioni | Reticolo | Bordi | Sonda | Frequenza | Angolo |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Firma
II Liv. EN/ISO 9712
Q.M.D. M.Rizzatti

MARCEGAGLIA
Palini e Bertoli S.p.A.
QUALITY CONTROL
Rizzatti Marco

(1)Posizione:1=Testa;2=Piede.(2)Posizione:1/2=1/2 spessore;P=Pelle;1/4=1/4 spessore.(3)Direzione:L=Longitudinale;T=Trasversale;(4)Spessore provino

DescrizioneMarchi

UKCA 1244 22 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

CE 0474 06 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

- Material Free of radioactive contamination
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- We hereby declare that the above mentioned material have been rolled in Italy, thus of European Community origin

A01 Produttore

AcciaieriaArvedi

Acciaieria Arvedi S.p.A.
Sede legale:
Viale Forlanini, 23
20134 Milano

Sede amministrativa e Stabilimenti:
Via Acquaviva, 18
26100 Cremona - Italia
Tel.+39 0372 4781

Via Di Servola, 1
34145 Trieste - Italia

Cap.Soc. € 112.900.000
interamente versato
Società soggetta all'attività di direzione e coordinamento di
Finarvedi SpA
Società con Socio Unico

Part.IVA IT 11852670154
Cod.fisc. 00910070192
Reg.Imp.MI 00910070192
REA MI 1497770

A07 Vostro Ordine **462**
A08 Nostra conferma **0311148841/200**
B01 **Bandelle NERO 1500x5,00x3000,00 S355J2+N**
Consegna/DDT **325708984 / 20 / 34041615**
B09 Spessore **5,00 mm**
B10 Larghezza **1.500,0 mm**
B11 Lunghezza **3.000,0 mm**
B02 Qualità **S355J2+N**
B04 Stato fornitura **UNI EN 10025-2-2019**

A06 Committente

**GABRIELLI S.P.A.**
**magazzino di Galliera Veneta**
**VIA L. DA VINCI 25**
**GALLIERA VENETA**
**35015 PD**

A02 **Certificato di collaudo**
**nr. 0000664290 3.1 EN10204**
Z02 Data **13.05.2021 EN10168**

| B16 | | C71 | C72 | C73 | C74 | C75 | C76 | C77 | C78 | C79 | C80 | C81 | C82 | C83 | C84 | C85 | C86 | C87 | C88 | C89 | C90 | C91 | C92 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IDENTIFIC.COLATA | | C% | Mn% | Si% | P% | S% | Cr% | Ni% | Mo% | Cu% | Sn% | Al% | Ti% | Nb% | V% | B% | N% | Nb% + Ti% + V% | Ti% +Nb% | Cr% +Mo% | Cu% + Cr% + Ni% | Si% + P% | CEV |
| | min | 0,10 | | | | | | | | | | 0,020 | | | | | | | | | | | |
| | max | 0,20 | 1,60 | 0,03 | 0,024 | 25,000 | 0,29 | 0,42 | 0,11 | 0,55 | | | | | | | | | | | | | 0,46 |
| 122771 | | 0,19 | 1,23 | 0,02 | 0,007 | 0,002 | 0,05 | 0,05 | 0,01 | 0,14 | 0,01 | 0,031 | | | | | | | | | | | 0,42 |

| B07 | B16 | B12 | C00 | C13 | C11 | C12 | C50 |
|---|---|---|---|---|---|---|---|
| IDENTIFICAZIONE PRODOTTO | IDENTIFIC. COLATA | MASSA TEORICA KG | | A5% | Rp02 | Rm | Piega |
| | | | | % | MPa | MPa | |
| | | | min | 20 | 355 | 470 | |
| | | | max | | | 630 | |
| 712277111-400071315 | 122771 | 1.629 | | 24 | 456 | 585 | OK |

IL PRESENTE CERTIFICATO E' COPIA CONFORME ALL'ORIGINALE RELATIVO AL NS DDT
N. 21004851 DEL 18/6/21
CLIENTE COMINOX SRL
GABRIELLI S.p.A. UNIP.
DIVISIONE LUNGHI

C00 Saggio id analisi di controllo
C30 Prova di durezza - Tipo prova
Z07 Nelle prove di trazione usate solo provette prismatiche

D01 Controllo marcatura, aspetto superficiale e dimensioni: Soddisfacente
Z01 Certifichiamo che il prodotto fornito è conforme ai requisiti
C02 Senso di prelievo: T Trasversale

Z05 Certificazioni del sistema di gestione
**Azienda con sistema di gestione certificato da IGQ secondo ISO 9001 e IATF 16949**

Prodotti di acciaio laminati a caldo per impieghi strutturali
Settore di utilizzo: Costruzioni o ingegneria civile

| | |
|---|---|
| Tolleranze dimensionali e di forma: | UNI EN 10051 |
| Allungamento | Acciaio: S355J2+N EN 10025 |
| Carico di rottura | |
| Carico di snervamento | |
| Energia di resilienza | |
| Saldabilità | |
| Durata: | Nessuna prestazione determinata |
| Sostanze regolamentate: | Nessuna prestazione determinata |

Z04 Marcatura CE
CE
1608
14
Cert.n.1608 CPR P054

B06 Marcatura

Z02 Validazione
NOME
T.FERABOLI

Z03 Timbro ente isp.

ACCIAIERIA ARVEDI * ASSICURAZIONE QUALITA'

A05 REDATTORE DOCUMENTO
CONTROLLO QUALITA' ACCIAIERIA ARVEDI
MOD-QUA-16 Rev.0 del 20/09/2016

| DICHIARAZIONE DI PRESTAZIONE CE [n°. 0000664290]<br>EC DECLARATION OF PERFORMANCE [n°. 0000664290] | CE<br>1608<br>14<br>Cert.n.1608 CPR P054 |
|---|---|

1.Codice di identificazione del prodotto tipo: **rotoli e nastri laminati a caldo per impieghi strutturali, secondo le norme UNI EN 10 10025-2 e UNI EN 10025-5**

Identification code of product type: **hot rolled coils and strips of structural steels according to standard UNI EN 10025-2 and UNI EN 10025-5**

Dimensioni: **spessore da 1,2 a 12,0 mm; larghezza da 100 a 1600 mm**
Dimensions: **thickness 1,2 - 12,0 mm; width 100 - 1600 mm**

2. Numero di tipo, lotto, serie o elemento di identificazione del prodotto da costruzione ai sensi dell articolo 11, paragrafo 4:
Type, batch or serial number or any element allowing identification of construction product as required under article 11(4):

**In accordo con no.lotto e numero colata indicato sul certificato di collaudo**
**In agreement with lot number and heat number indicated on the test certificate**

| Partita | Colata |
|---|---|
| 400071315 | 122771 |

3.Uso o usi previsti dal prodotto da costruzione, conformemente alla relativa specifica armonizzata, come previsto dal fabbricante:
*Intended use or uses of the construction product in accordance with the applicable harmonised technical specification, as foreseen by manufacturer:*

**Acciaio laminato a caldo per usi strutturali - Hot rolling steel for structural uses**

4. Nome, denominazione commerciale registrata o marchio registrato e indirizzo del fabbricante ai sensi dell' articolo 11, paragrafo 5:
*Name, registered trade name or registered trademark and contract address of manufacturer as required pursuant Article 11(5):*

**Acciaieria Arvedi S.p.A - via Acquaviva,18 - 26100 Cremona (ITALIA)**

5. Se opportuno, nome e indirizzo del mandatario il cui mandato copre i compiti cui all' articolo12, paragrafo 5:
*Name and contact address of the authorised representative whose mandate covers the tasks specified in article12(5):*

**Non applicabile - Not applicable**

6. Sistema o sistemi di valutazione e verifica della costanza di prestazione del prodotto da costruzione di cui all'allegato V alla EU 305-2011:
*System pr systems of assessment and verification of constancy of performance of the construction product as set in EU-regulation 305-2011 annex V:*

**System 2+**

7. Dichiarazione di prestazione relativa al prodotto da costruzione cherientra nell'ambito della norma armonizzata:
*Declaration of performance concerning construction product covered by a harmonised standard:*

Ente di certificazione: **I.G.Q. Via Giosuè Carducci 125/A - 20099 Sesto San Giovanni MI (ITALY)**
*Certification Body*

Numero del certificato FPC: **1608 CPR P054**
*Number of FPC certificate*

| DICHIARAZIONE DI PRESTAZIONE CE [n°. 0000664290]<br>EC DECLARATION OF PERFORMANCE [n°. 0000664290] | CE<br>1608<br>14<br>Cert.n.1608 CPR P054 |
|---|---|

**Ispezione iniziale dello stabilimento. Determinazione del prodotto tipo in base a prove di tipo (compreso campionamento). Sorveglianza, valulazione e verifica continua del controllo della produzione di fabbrica secondo l'allegato ZA della EN 10025-2005.**
*Performed the initial inspection of the manufacturing plant and factory production control and the continuous surveillance, assessment and evaluation of factory production control and issued the certificate of conformity of the factory production control in accordance with annexZA of EN 10025-2005.*

8. Caso di dichiarazione di prestazione relativa a un prodotto da costruzione per il quale è stata rilasciata una valutazione tecnica europea:
*Declaration of performance concerning construction product covered by European technical evaluation:*

**Non applicabile - Not applicable**

9. Prestazione dichiarata:
*Declared performance:*

| Caratteristiche essenziali<br>Essential characteristics | Prestazioni<br>Performance | Specifica tecnica armonizzata<br>Harmonised technical specification |
|---|---|---|
| Tolleranze Dimensionali | EN 10051-2010 | EN 10025-1:2005 |
| Allungamento | EN 10025-2:2019; 10025-5:2019 p. 7.3.1 | |
| Carico di Snervamento e Rottura | EN 10025-2:2019; 10025-5:2019 p. 7.3.1 | |
| Resilienza | EN 10025-2:2019; 10025-5:2019 p. 7.3.2 | |
| Saldabilità | EN 10025-2:2019; 10025-5:2019 p. 7.2.3 + 7.4.1 | |
| Durabilità | EN 10025-2:2019; 10025-5:2019 p. 7.2.1 + 7.4.3 | |

10. La prestazione del prodotto di cui ai punti 1 e 2 è conform e alla prestazione dichiarata di cui al punto 9:
*The performance of the product identified in point 1 and is in conformity with the declared performance in point 9:*

Si rilascia la presente dichiarazione sotto la responsabilità esclusiva del fabbricante di cui al punto 4.
*This declaration is issued under the sole responsability of manifactured identified in point 4.*

A nome e per conto Acciaieria Arvedi S.p.A :
Signed for and on behalf of Acciaieria Arvedi S.p.A

Cremona, 14.05.2021

Fabio Baldrighi (Sales Director)

MOD-QUA-16 Rev.1 del 28/12/2020

gabrielli
steel service centre

**Gabrielli** S.p.A. - Società Unipersonale
**Sede Legale e amministrativa :** Via Mazzini, 58 - 35013 Cittadella (PD) Italy - C.P.n. 52/B - Tel.:**+39.049.9414611** - Fax +39.049.9414664 - e-mail: info.gab@gabrielli.it - **www.gabrielli.it**
**C.F. - P.IVA IT 00362740284** - Reg. Imprese PD 00362740284 - R.E.A. PD 120850 - M. PD005320 - Cap. Soc. Euro 20.000.000,00 I. V. Direzione e coordinamento SO.FI.D.A. S.p.A.
Azienda con sistema di gestione qualità certificato da DNV **= ISO 9001 =** *(Spianatura e taglio di lamiere in fogli e nastri ricavati da coils laminati a caldo.*
*Commercio e lavorazione di lamiere grosse laminate da treno quarto. Commercio di prodotti siderurgici e pre-lavorazione di profili strutturali (taglio e foratura di travi)*

A02 TIPO DI CERTIFICATO : FERRIERA 3.1 EN10204-04 DOCUMENT TYPE : MILL 3.1 EN10204-04 Z02 Data: 04/02/21
A03 CERTIFICATO N°/DOCUMENT N°: 5394/ 3016 Pag. : 1

A07 ORDINE CLIENTE/CUSTOMER ORDER : 552 GALLIERA del 1/02/21 A08 ORDINE INTERNO/INTERNAL ORDER:2102628 del 1/02/21

A06 GABRIELLI SPA UNIPERSONALE
VIA MAZZINI, 58
35013 CITTADELLA PD
ITALIA

LISTA DI RINTRACCIABILITA"
PACKING LIST

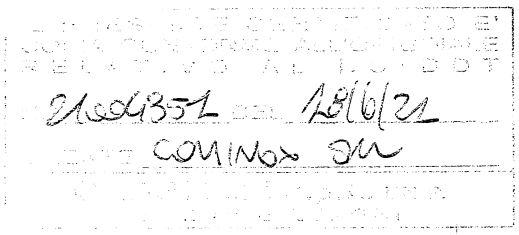
Destinatario: GABRIELLI SPA DIV.GALLIERA UNIPERSON
VIA LEONARDO DA VINCI, 25 - Z.I.
35015 GALLIERA VENETA PD

| Riga Descrizione / Pos. Description<br>N°Coil Interno<br>N°InternalCoil<br>B07 | N°Rif. Originale<br>N° Original Coil<br>B07 | N° Colata<br>N° Casting<br>B07 | N. Serie (S)<br>Label N°<br>B06 | Quantità Prodotta<br>Quantity Produced<br>B08 | Spess.<br>Thick.<br>B09 | Largh.<br>Width<br>B10 | Lungh.<br>Length<br>B11 | Articolo Cliente<br>Customer Item | N° DDT<br>Dispatch | Riga<br>Pos. | Data<br>Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-D LAM. CALDO S355J2 EN 10025-2/2004 SPIAN. | | | | | | | | | | | |
| 2017021 | 565503 | 731100 | 8748646 | 7 Fg | 10,00 x | 1500,00 x | 3000,00 | | 3016 | 1 | 4/02/21 |
| 2017021 | 565503 | 731100 | 8748647 | 7 Fg | 10,00 x | 1500,00 x | 3000,00 | | 3016 | 1 | 4/02/21 |

Z01 I risultati delle prove condotte presso il nostro laboratorio rientrano nei limiti stabiliti dalle norme di prodotto. Si assicura pertanto la conformità del materiale fornito alle prescrizioni del Vs. ordine.
The results of the tests carried out in our laboratory fall within the limits set by the product standards. Compliance of the supplied material with the provisions of y guaranteed.
Le Dichiarazioni di Prestazione sono disponibili nel ns. sito web all'indirizzo https://www.gabrielli.it/dop in conformità al REG. DEL. (UE) N.157/2014 (30/10/2013)
The Declarations of Performance are available in our website (https://www.gabrielli.it/dop) in accordance with REG. DEL. (UE) N. 157/2014 (30/10/2013)

Documento composto da 1 pagine / Document included by 1 page

GABRIELLI SPA UNIPERSONALE
Controllo Qualità




**Divisione Coils**
35013 **Cittadella** (PD) Italy -Via Mazzini, 58
Tel.:**+39.049.9414781**
Comparto Bassarena: Via Bassarena, 8/C
e-mail: info.dco@gabrielli.it

**Divisione Lamiere Grosse**
35013 **Cittadella** (PD) Italy
Via dell'Industria, 38 - Z.I.
Tel.:**+39.049.9415511**
e-mail: info.dlg@gabrielli.it

**Divisione Lunghi**
35015 **Galliera Veneta** (PD) Italy - Via Leonardo da Vinci, 25 - Tel. **+39.049.5968844**
31040 **Covolo di Pederobba** (TV) Italy - Via Guizza, 25 - Tel. **+39.0423.680411**
36040 **Grumolo delle Abbadesse** (VI) Italy - Via Nazionale, 82 - Tel. **+39.0444.580680**
e-mail: info.dpl@gabrielli.it

GRUPPO gabrielli
STEEL SERVICE NETWORK

**A01**
**voestalpine**
**Stahl GmbH**

# A02
# Abnahmeprüfzeugnis
**3.1 - EN 10204**

Seite 1 von 2
Z02 Datum 18-12-2020

voestalpine-Straße 3
4020 Linz, Austria
www.voestalpine.com/stahl

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A03 Bescheinigungs-Nr.: | W1624485 | A08 Auftrags-Nr.: | 2301474 | A07 BestDat.: | 14-09-2020 | Versanddatum: | 20-12-2020 6E |

| | | | | | |
|---|---|---|---|---|---|
| A06 Besteller | GABRIELLI S.P.A.<br>Via Giuseppe Mazzini, N. 58<br>I-35013 CITTADELLA, PD | B01 Fabrikat | WARMGEW. STAHLBAND | | |
| | | B02 Werkstoff | S355J2+N | B03 Norm | EN 10025-2:2004 |
| A07 BestNr.: | 20005615 | Zusätzliche Anforderungen | AL-BERUHIGT-KL.1VERZINKUNGSFAEHIG | | |
| A06 Empfänger | GABRIELLI S.P.A.<br>Via Giuseppe Mazzini, N. 58<br>I-35013 CITTADELLA, PD | | | | |
| Sachnummer | 6 | | | | |

Z01 - Besichtigung und Maßprüfung: keine Beanstandung. Wir bestätigen, dass die oben bezeichnete Lieferung den Bestellvorschriften (Normvorschriften) entspricht.
Z01 - Kennzeichnung: Erschmelzungsart (wenn spezifiziert), Markenbezeichnung, Schmelzennummer, Band/Blechnummer.

## *Umfang der Lieferung*

| B07 Schmelze | B06 Blech-Nr | Dimensionen Pos | B09 Dicke mm | B10 Breite mm | B11 Länge mm | B08 Stück | B12 Brutto kg | B13 Netto kg | B14 Liefs-Nr 11 44 |
|---|---|---|---|---|---|---|---|---|---|
| 731100 | 565503 | 60 | 9,99 | 1500,0 | | 1 | 29.690 | 29.690 | 47559 |
| | **Summen** | | | | | **1** | **29.690** | **29.690** | |

C70 - Erschmelzungsverfahren: LD

## *Chemische Zusammensetzung (Schmelzanalyse)*

| B07 Schmelze | C % | Si % | Mn % | P % | S % | Al % | Cu % | N % |
|---|---|---|---|---|---|---|---|---|
| 731100 | .174 | .015 | 1.460 | .008 | .0062 | .053 | .010 | .0035 |

## *Ergebnisse der Prüfungen*

| Versuch B07 Schmelze | Zugvers. C02 Lage | L0 | C11 Reh MPA | C12 Rm MPA | C13 A % | KerbschT C02 Lage | C40 Pf | C03 Prüftemperatur °C | C42 EW J | C42 EW J | C42 EW J |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 731100 | Q | A5 | 412 | 562 | 23.4 | L | CV 10 x t | -20 | 153 | 163 | 147 |

GABRIELLI S.p.A. UNIP.
DIVISIONE COILS
COPIA CONFORME ALL'ORIGINALE

A04
Herstellerzeichen
voestalpine

A01,A05;Z02
Abnahmebeauftragte(r) des Herstellers
Qualitaetslenkung Warmband Karl

voestalpine
ONE STEP AHEAD.

CE

0769

voestalpine Stahl GmbH, voestalpine-Straße 3, 4020 Linz, Austria

20

EN 10025-2:2004 S355J2+N

EN 10025-2:2004 S355J2+N
Leistungserklärung abrufbar unter www.voestalpine.com/stahl/Die-Steel-Division/Downloadcenter
Zur Verwendung bestimmt in Metallbauwerken oder in Metall-/Betonbundbauwerken

| | |
|---|---|
| Formtoleranzen Grenzabmaße | EN 10051 |
| Bruchdehnung | EN 10025-2:2004 |
| Zugfestigkeit | |
| Streckgrenze | |
| Schweißeignung | |
| Beständigkeit | |
| Gefährliche Substanzen | keine festgestellt |

GABRIELLI S.p.A. UNIP.
DIVISIONE COILS
COPIA CONFORME ALL'ORIGINALE

A04
Herstellerzeichen
voestalpine

A01,A05;Z02
Abnahmebeauftragte(r) des Herstellers
Qualitaetslenkung Warmband Karl

voestalpine
ONE STEP AHEAD.

**Fabbrica Italiana Lamiere srl**

Sede legale/head office
Via Sant'Agnese 12
20123 Milano
Stabilimento/Rolling mill
Via natale Gallino, 63
16164 Genova Pontedecimo

Tipo certificato/Type certificate 3.1 EN 10204
Numero certificato/Number 240000004290
Data/Date 11/03/2024

Cliente/Customer

Destinatario merce/Destination

Ordine/Order 2024.1.158.2
Data ordine/Date order 29/02/2024
Nota/Note

Firma/Signature

Timbro/Stamp

25705

ARTICOLO LAMIERA S355J2+N 30x2450x12000 mm S355J2+N UNI EN 10025-2 kg 6931 LC

| Partita/piastra/Plate | Colata/Heat | C [%] | Mn [%] | Si [%] | S [%] | P [%] | Cr [%] | Ni [%] | Cu [%] | Al [%] | MO [%] | Nb [%] | V [%] | Ti [%] | N [%] | Ceq [%] | HB | Verso | ReH [N/mm²] | Rm [N/mm²] | A% [%] | Verso | T [°C] | $Kv_1$ [J] | $Kv_2$ [J] | $Kv_3$ [J] | $Kv_a$ [J] | Saggio | Data |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0,20 | 1,60 | | 0,025 | 0,025 | | | 0,55 | | | | | | | 0,45 | | | 345 | 470<br>630 | 20 | | | 27 | 27 | 27 | 27 | | |
| 24LT004258 N10P074 | 322347 | 0,18 | 1,35 | 0,22 | 0,006 | 0,011 | 0,02 | 0,01 | 0,01 | 0,030 | 0,002 | 0,001 | 0,005 | 0,002 | 0,005 | 0,41 | | T | 363 | 520 | 31,5 | KVL | -20 | 146 | 133 | 147 | 142 | | |

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

Toll. Spess/Toll. thick EN10029 Cl B
Toll. Largh./toll. Width -0 +100
Toll. lLung/toll. Length -0 +200
Toll. Plan/toll plan. EN10029 N
Cond superf/cond. superf. EN 10163 B2
Stato di fornitura LC: laminazione controllata
Supply status Normalizing rolling

Stato di fornitura AR: in as rolled condition
Supply status AR in as rolled condition

NOTA:
Lamiere elencate sono conformi alla prescrizione all'ordine, e i controlli di marcatura, aspetto superficiale e dimensionale hanno dato esito positivo. Prodotto esente da radiazioni
The above mentioned are consistent with the order prescriptions: marking, inspection and measurement without objection. Product free from all types of radioactive materials
Le lamiere sono state controllate in accordo alla normativa vigente / We declare that the plates were controlled according to standard

FABBRICA ITALIANA LAMIERE SRL
Via natale Gallino, 63
16164 Genova Pontedecimo

EN 10025 - 1
EN 10025 - 2

17
0474 - CPR - 1673

CE

# CERTIFICATO DI CONTROLLO ULTRASONORO
# ULTRASONIC INSPECTION CERTIFICATE

Controlli effettuati su lamiera ante-taglio
Checks carried out on pre-cutting Steel Plate

| Cliente / Customer | Vs Ordine / Order |
|---|---|
| **SIDERTAGLIO LAMIERE S.R.L.** | |

Documento Nr / Document No
239
22/03/2024

| Dimensioni / Dimension | Cod. Interno / Code |
|---|---|
| **12200X2490** | **25705** |
| Colata / Heat No | Cert. Nr. / Cert. No |
| **322347** | |

Spessore / Thik
**30**

| Materiale / Material | Oggetto / Object |
|---|---|
| **S355J2+N** | **Steel plate** |
| Stadio di Lavorazione / Working step | Particolare / Detail |
| **As conditions of supply** | |
| Posizione di controllo / Scanning position | Condizioni Superficiali / Surface condition |
| **100x100** | **As rolled** |

| Specifica di rif. / Specification Ref. | Classe accettabilità / Acceptance criterie |
|---|---|
| **EN 10160** | **S2E3** |
| Apparecchio Tipo / Instrument model | Mezzo accoppiamento / |
| **GILARDONI RDG 450** | **Water** |
| Blocco Campione / Reference Block | Perdite di trasferimento / Transfre lossee |
| **V1** | |

Taratura sensibilità d'esame / Sensibility range test
**Flat bottomed holes Ø 5 mm**

| TRASDUTTORI search units | ONDE waves | TIPO type | FREQUENZA | SEZIONE (mm) size (mm) | ANGOLO angle | DIAMETRO diameter | FABBRICANTE manufacturer |
|---|---|---|---|---|---|---|---|
| | **LONGIT** | **D25/4** | **4MHz** | | | **Ø25** | **IMG** |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

| IDENTIFICAZIONE identification | AREA / TRATTO Area/section | TIPO DISCONT. discontinuity | AMPIEZZA amplitude | LUNGHEZZA length | PROFONDITA' depth | NOTE remark | RISULTATO examination result |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

| | | |
|---|---|---|
| Risultato dell'esame | X | **Satisfactory / Conforme** |
| Examination result | | **Unsatisfactory / NON Conforme** |

Emesso da
Esaminatore

SIDERTAGLIO LAMIERE s.r.l.
Alessandro Callegari
UNI EN ISO 9712:2012 level II
Cert. Nr. DTC-END-A00562-14

| Ispettore Cliente / Ente terzo | Controllo qualità |
|---|---|
| | |

Sidertaglio Lamiere srl

Taglio plasma
Ossitaglio
fino a 500mm

**TAGLIO E COMMERCIO DI LAMIERE**
Via dell'Agricoltura 8/D - 36040 Meledo di Sarego (VI) - Tel. 0444 823059
Fax Amm. 0444 823364 - Uff. Tec. 0444 823201 - Email: info@sidertaglio.com - Web: www.sidertaglio.com
Reg. Imp. VI 33000/1996 - R.E.A. 236444 - Cod. Fisc. e P.IVA 02510610245

REMAZEL

# CERTIFICATION LIST

Certificate Nr.: 001/2024
Date:

| Final Customer: | Order Customer: | Object: | Description: | Quantity: | Inspection and Test Plan (ITP): | Our job: |
|---|---|---|---|---|---|---|
| ROSETTI MARINO | 24005073 SIDERTAGLIO | C09-0001-P0001+P0002 | PEDESTAL+COLUMN | | | |

## MATERIAL

| Drawing | Pos. | Q.ty | Description | Material | Certificates 3.1 | Manufacturer | Heat/Plate ID | Additional Mechanical Test | UT Certificates | Nesting |
|---|---|---|---|---|---|---|---|---|---|---|
| C09-0001-P0001 | 1 | 1 | SHEET METAL 40mm | S355J2+N | 16624563335 | MARCEGAGLIA P&B | 2461219/24C .609.01 | | 920 | |
| C09-0001-P0001 | 2 | 1 | SHEET METAL 20mm | S355J2+N | 240000005205 | FABBRICA ITALIANA LAMIERE | 316829/24LT 005170 | | 267 | |
| C09-0001-P0001 | 3 | 2 | SHEET METAL 10mm | S355J2+N | 5394/3016 | GABRIELLI | 565503/8748 646 | | | |
| C09-0001-P0001 | 4 | 2 | SHEET METAL 5mm | S355J2+N | 664290 | ACCIAIERIA ARVEDI | 122771/7122 77111-400071315 | | | |
| C09-0001-P0001 | 5 | 1 | SHEET METAL | S355J2+N | 2022/002212/01 | ACCIAIERIA D'ITALIA | 180235-151872201 | | | |
| C09-0001-P0001 | 6 | 2 | SHEET METAL 5mm | S355J2+N | 664290 | ACCIAIERIA ARVEDI | 122771/7122 77111-400071315 | | | |
| C09-0001-P0002 | 1 | 1 | sheet metal 40mm | S355J2+N | 16624400805 | MARCEGAGLIA P&B | 441908/16F. 5953.01 | | 673 | |
| C09-0001-P0002 | 2 | 1 | SHEET METAL 40mm | S355J2+N | 16624563335 | MARCEGAGLIA P&B | 2461219/24C .609.01 | | 920 | |
| C09-0001-P0002 | 3A | 1 | SHEET METAL 15mm | S355J2+N | 16624421397 | MARCEGAGLIA P&B | 442151/16F. 6119.01/B | | | |
| C09-0001-P0002 | 3B | 1 | SHEET METAL 15mm | S355J2+N | 16624421397 | MARCEGAGLIA P&B | 442151/16F. 6119.01/A | | | |
| C09-0001-P0002 | 4 | 1 | SHEET METAL 15mm | S355J2+N | 16624421397 | MARCEGAGLIA P&B | 442151/16F. 6119.01/B | | | |
| C09-0001-P0002 | 6 | 4 | SHEET METAL 10mm | S355J2+N | 16624421397 | MARCEGAGLIA P&B | 2377353/24R .366.02/A | | | |
| C09-0001-P0002 | 7 | 2 | SHEET METAL 10mm | S355J2+N | 16624421397 | MARCEGAGLIA P&B | 2377353/24R .366.02/A | | | |
| C09-0001-P0002 | 8 | 1 | SHEET METAL 15mm | S355J2+N | 16624421397 | MARCEGAGLIA P&B | 442151/16F. 6119.01/A | | | |
| C09-0001-P0002 | 9 | 3 | SHEET METAL 15mm | S355J2+N | 16624421397 | MARCEGAGLIA P&B | 442151/16F. 6119.01/A | | | |
| C09-0001-P0002 | 10 | 1 | SHEET METAL 15mm | S355J2+N | 16624421397 | MARCEGAGLIA P&B | 442151/16F. 6119.01/A | | | |
| C09-0001-P0002 | 11 | 2 | SHEET METAL 5mm | S355J2+N | 664290 | ACCIAIERIA ARVEDI | 122771/7122 77111-400071315 | | | |
| C09-0001-P0002 | 12 | 8 | METAL PROFILE 10mm | S355J2+N | 5394/3016 | GABRIELLI | 565503/8748 646 | | | |
| C09-0001-P0002 | 13 | 5 | METAL PROFILE 5mm | S355J2+N | 664290 | ACCIAIERIA ARVEDI | 122771/7122 77111-400071315 | | | |
| C09-0001-P0002 | 14 | 4 | METAL PROFILE 5mm | S355J2+N | 664290 | ACCIAIERIA ARVEDI | 122771/7122 77111-400071315 | | | |
| C09-0001-P0002 | 15 | 1 | METAL PROFILE 30mm x D8 | S355J2+N | 240000004290 | FABBRICA ITALIANA LAMIERE | 322347/24LT 004258 | | 239 | |
| C09-0001-P0002 | 16 | 4 | METAL PROFILE 30mm x D8 | S355J2+N | 240000004290 | FABBRICA ITALIANA LAMIERE | 322347/24LT 004258 | | 239 | |

MARCEGAGLIA
PALINI E BERTOLI

Marcegaglia
46040 Via Bresciani, 16-Gazzolo degli Ippoliti Mantova-Italy
Tel. +39 - 0376 686 1 Fax. +39 - 0376 655 600
www.marcegaglia.com

Marcegaglia Palini e Bertoli S.P.A.
Via E.Fermi, 28 33058 San Giorgio di Nogaro, Udine - Italy
tel+39 0431623111

Type/Tipo 3.1 CERTIFICATO DI COLLAUDO EN10204 | questo documento è stato generato automaticamente ed è valido senza firma | Number/Numero 16624563335 | Creato il 05/09/2024

**Product: Hot Rolled Heavy Plates**
**NormaCollaudoLamieraTreno: EN10025-2:2019**
**Steel grade:: S355J2+N**

| Customer/Cliente | Code: 0000028587 | Del. Address/Destinatario Merci | Delivery/N° Consegna 8920635882<br>Of/Del 05/09/2024<br>Delivery note nr/N° doc. di trasp. 1066010892 | Quality Control/Controllo Qualità<br>Q.M.D./RESP. M.Rizzatti<br>Plant/Stab. Palini e Bertoli | Pages/Pagine 3/3 |
|---|---|---|---|---|---|

| Material/Codice Materiale | Surface Quality: - | Delivery Condition: NORMALIZING ROLLING | Order Nr/ordine | Client Order/Ordine cliente |
|---|---|---|---|---|
| LTS | Flatness: rif EN 10029 cl. N | Steel Making Process: BO= Basic oxigen | 1191787387/50 | 24*410 |
| Description/Descrizione | Thickness tolerance: EN10029 CLASSE B | | Materiale Cliente | Client Date/data cliente |
| 26200 40,00 X 3000,00 X 10000,00 S355J2+N | | | | 12/07/2024 |

| Item | Batch/N° Partita | ID Palini | Heat/Colata | Quantity/Q.tà KG | Quantity/Q.tà PZZ |
|---|---|---|---|---|---|
| 1 | 24KX018811 | 24C.609.01 | 2461219 | 9600 | 1 |

Remarks/Note:
CE Marking Certificate N.0474-CPR-0033 last issued 14/09/2020 Rev.05. Hot rolled products of structural steels in compliance with Regulation n°305/2011/EU dated 09/03/2011. DOP available on https://www.quality.marcegaglia.com.
UKCA Marking Certificate N.1244-CPR-1051 last issued 01/01/2023. Hot rolled products of structural steels in compliance with the Construction Products Regulation 2011 (retained EU law EUR 305/2011). DOP available on https://www.quality.marcegaglia.com.

| Batch/N° Partita | C (%) | Mn (%) | Si (%) | S (%) | P (%) | Cr (%) | Ni (%) | Cu (%) | Al (%) | Mo (%) | Nb (%) | V (%) | Ti (%) | N (%) | H (%) | B (%) | Ceq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.1 | | | | | | 0.02 | | | | | | | | |
| | 0.22 | 1.6 | 0.55 | 0.025 | 0.025 | 0.29 | 0.42 | 0.55 | 0.3 | 0.11 | 0.06 | 0.1 | 0.05 | | | | 0.47 |
| 24KX018811 | .156 | 1.447 | .184 | .0030 | .0090 | .032 | .017 | .021 | .043 | .0030 | .028 | .001 | .0020 | .0060 | .00040 | .0002 | .41 |

COPIA CONFORME ALL'ORIGINALE

IL PRESENTE CERTIFICATO VALE PER

LA QUANTITA' DEL NS. DDT

| Batch/N° Partita | Forma | (1) | (2) | (3) | Tst [°C] | Rm [N/mmq] | ReH [N/mmq] | A% (%) | (1) | (2) | (3) | (4) | T [°C] | Kv1 [J] | Kv2 [J] | Kv3 [J] | Kv* [J] | TESTN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20 | 470 | 345 | 20 | | | | | -20 | | | | 27 | |
| | | | | | 20 | 630 | | | | | | | | | | | | |
| 24KX018811 | C | 1 | 1/4 | T | 20 | 535 | 428 | 32.9 | 1 | P | L | 10.0 | -20 | 203 | 223 | 180 | 202 | 24-P14270R |

Controllo ad ultrasuoni

| Apparecchiatura | Numero di serie | Condizioni di superficie | Accoppiante | Mod. operativie | Taratura |
|---|---|---|---|---|---|
| Gliardoni RDG2000 | 050858001 | As Rolled | Acqua | Secondo le specifiche | Secondo le specifiche |

Firma
II Liv. EN/ISO 9712
Q.M.D. M.Rizzatti

MARCEGAGLIA Palini e Bertoli S.p.A. QUALITY CONTROL Rizzatti Marco

| Item | Norma di riferimento | Classe accettabilità | Esito | Indicazioni | Reticolo | Bordi | Sonda | Frequenza | Angolo |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

(1)Posizione:1-Testa;2-Piede,(2)Posizione:1/2-1/2 spessore;P-Pelle;1/4-1/4 spessore,(3)Direzione:L-Longitudinale;T-Trasversale;(4)Spessore provino

DescrizioneMarchi

UK CA 1244 22 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

CE 0474 06 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

- Material Free of radioactive contamination
- Dimensional check and visual examination of the surface condition: without objection
- We Declare that the above mentioned plates are in compliance with the order prescription
- We hereby declare that the above mentioned material have been rolled in Italy, thus of European Community origin

# DICHIARAZIONE DI PRESTAZIONE
# N°1.0577

1. Codice di identificazione unico del prodotto-tipo: **1.0577**
2. Numero di tipo: **S355J2**
3. Uso previsto del prodotto da costruzione, conformemente a **EN 10025-1:2004**
   **PRODOTTI LAMINATI A CALDO DI ACCIAIO PER IMPIEGHI STRUTTURALI DA UTILIZZARSI NELLE STRUTTURE METALLICHE O IN COMPOSITI METALLICI E STRUTTURE IN CALCESTRUZZO**
4. Nome e indirizzo del fabbricante:

**MARCEGAGLIA PALINI E BERTOLI S.P.A.**
Sede legale - **Via Bresciani, 16 – 46040 Gazoldo degli Ippoliti (MN)**
nello stabilimento di
**Via E. Fermi, 28 – 33058 San Giorgio di Nogaro (UD)**

6. Sistema di valutazione e verifica della costanza della prestazione del prodotto da costruzione: **2+**
7. L'organismo notificato:

**RINA Services S.p.A.**
**N° 0474**

Ha rilasciato il certificato di conformità del controllo della produzione in fabbrica fondandosi sui seguenti elementi:
i. Ispezione iniziale della fabbrica e del controllo della produzione in fabbrica;
ii. Esegue la sorveglianza continua, la valutazione e l'approvazione del controllo della produzione in fabbrica.

8. Nel caso di una dichiarazione di prestazione relativa ad un prodotto da costruzione per il quale è stata rilasciata una valutazione tecnica europea: **N.A.**
9. Prestazione dichiarata:

| Caratteristiche essenziali | Punti relativi ai requisiti della presente (o altra) norma europea | Prestazione | Specifica armonizzata |
|---|---|---|---|
| Tolleranza sulle dimensioni e tolleranze di forma | 7.7.1 | EN10029-2010 | EN 10025-2:2019 |
| Allungamento | 7.3.1 | CONFORME TABELLA 1 | |
| Resistenza alla trazione | 7.3.1 | | |
| Carico unitario di snervamento | 7.3.1 | | |
| Resilienza | 7.3.1+7.3.2 | | |
| Analisi chimica | 7.2.1 | CONFORME TABELLA 2 | |
| Saldabilità (composizione chimica) | 7.2+7.4.1 | NPD | |
| Durabilità (composizione chimica) | 7.2+7.4.3 | NPD | |

10. La prestazione del prodotto di cui ai punti 1 e 2 è conforme alla prestazione dichiarata di cui al punto 9.
Si rilascia la presente dichiarazione di prestazione sotto la responsabilità esclusiva del fabbricante di cui al punto 4.

In nome e per conto della MARCEGAGLIA PALINI E BERTOLI S.P.A.
San Giorgio di Nogaro, 10 marzo 2021

MARCEGAGLIA Palini e Bertoli S.p.A. Via E. Fermi, 28 33058 S. Giorgio di Nogaro, Ud - Italy P.I. 03217150983

## ➢ TABELLA 1- CARATTERISTICHE IN ACCORDO ALLA EN 10025-2:2019

| CARATTERISTICHE MECCANICHE A TEMPERATURA AMBIENTE - prospetto 6 | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| In conformità alla | | CARICO UNITARIO MINIMO DI SNERVAMENTO ReH IN N/MM² | | | | | | | | | RESISTENZA A TRAZIONE Rm IN N/MM² | | | |
| | | Spessore nominale mm | | | | | | | | | Spessore nominale | | | |
| EN 10027-1 | EN10027-2 | ≤16 | >16 ≤40 | >40 ≤63 | >63 ≤80 | >80 ≤100 | >100 ≤150 | >150 ≤200 | >200 ≤250 | >250 ≤400 | ≥3 ≤100 | >100 ≤150 | >150 ≤250 | >250 ≤400 |
| S355J2 | 1.0577 | 355 | 345 | 335 | 325 | 315 | 295 | 285 | 275 | 265 | 470÷630 | 450÷600 | 450÷600 | 450÷600 |

| CARATTERISTICHE MECCANICHE A TEMPERATURA AMBIENTE – prospetto 6 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| In conformità alla | | Posizione dei provini | ALLUNGAMENTO PERCENTUALE MINIMO DOPO ROTTURA A% | | | | | |
| | | | $L_0=5,65*\sqrt{S_0}$ | | | | | |
| EN 10027-1 | EN10027-2 | | ≥3≤40 | >40≤63 | >63≤100 | >100≤150 | >150≤250 | >250≤400 |
| S355J2 | 1.0577 | l | 22 | 21 | 20 | 18 | 17 | 17 |
| | | t | 20 | 19 | 18 | 18 | 17 | 17 |

| Caratteristiche meccaniche – Resilienza $KV_2$ longitudinale per prodotti piani e lunghi – prospetto 8 | | | | | |
|---|---|---|---|---|---|
| In conformità alla | | TEMPERATURE | Energia minima (J) – Spessore nominale in mm | | |
| EN 10027-1 | EN10027-2 | °C | ≤150 | >150≤250 | >250≤400 |
| S355J2 | 1.0577 | -20 | 27 | 27 | 27 |

## ➢ TABELLA 2 – CARATTERISTICHE IN ACCORDO ALLA EN 10025-2:2019

| COMPOSIZIONE CHIMICA ALL'ANALISI DI COLATA - prospetto 1 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| In conformità alla | | Metodo di deossidazione | C in % max per spessori nominali di prodotto in mm | | | Si | Mn | P | S | N | Cu | altro |
| EN 10027-1 | EN10027-2 | | ≤16 | >16≤30 | >30 | max. | max. | max. | max. | max. | max. | max |
| S355J2 | 1.0577 | FF | 0,20 | 0,20 | 0,22 | 0,55 | 1,60 | 0,025 | 0,025 | - | 0,55 | - |

| Valore massimo del CEV basato sull'analisi di colata - prospetto 5 | | | | | | | |
|---|---|---|---|---|---|---|---|
| In conformità alla | | Metodo di deossidazione | Valore massimo CEV in % per spessori nominali di prodotto in mm | | | | |
| EN 10027-1 | EN10027-2 | | ≤30 | >30≤40 | >40≤150 | >150≤250 | >250≤400 |
| S355J2 | 1.0577 | FF | 0,45 | 0,47 | 0,47 | 0,49 | 0,49 |

# CERTIFICATO DI CONTROLLO ULTRASONORO
# ULTRASONIC INSPECTION CERTIFICATE

Controlli effettuati su lamiera ante-taglio
Checks carried out on pre-cutting Steel Plate

| Cliente / Customer | Vs Ordine / Order |
|---|---|
| **SIDERTAGLIO LAMIERE S.R.L.** | |

Documento Nr / Document No
920
25/09/2024

| Dimensioni / Dimension | Cod. Interno / Code |
|---|---|
| **4010X3020** | **26200** |
| Colata / Heat No | Cert. Nr. / Cert. No |
| **2461219** | |
| Spessore / Thik | |
| **40** | |

| Materiale / Material | Oggetto / Object |
|---|---|
| **S355J2+N** | **Steel plate** |
| Stadio di Lavorazione / Working step | Particolare / Detail |
| **As conditions of supply** | |
| Posizione di controllo / Scanning position | Condizioni Superficiali / Surface condition |
| **100x100** | **As rolled** |

| Specifica di rif. / Specification Ref. | Classe accettabilità / Acceptance criterie |
|---|---|
| **EN 10160** | **S2E3** |
| Apparecchio Tipo / Instrument model | Mezzo accoppiamento / |
| **GILARDONI RDG 450** | **Water** |
| Blocco Campione / Reference Block | Perdite di trasferimento / Transfre lossee |
| **V1** | |

Taratura sensibilità d'esame / Sensibility range test

**Flat bottomed holes Ø 5 mm**

| **TRASDUTTORI** search units | **ONDE** waves | **TIPO** type | **FREQUENZA** | **SEZIONE (mm)** size (mm) | **ANGOLO** angle | **DIAMETRO** diameter | **FABBRICANTE** manufacturer |
|---|---|---|---|---|---|---|---|
| | **LONGIT** | **D25/4** | **4MHz** | | | **Ø25** | **IMG** |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

| **IDENTIFICAZIONE** identification | **AREA / TRATTO** Area/section | **TIPO DISCONT.** discontinuity | **AMPIEZZA** amplitude | **LUNGHEZZA** length | **PROFONDITA'** depth | **NOTE** remark | **RISULTATO** examination result |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

| | | |
|---|---|---|
| Risultato dell'esame | X | **Satisfactory / Conforme** |
| Examination result | | **Unsatisfactory / NON Conforme** |

Emesso da
Esaminatore

SIDERTAGLIO LAMIERE s.r.l.
Alessandro Callegari
UNI EN ISO 9712:2012 level II
Cert. Nr. DTG-END-A00562-14

| Ispettore Cliente / Ente terzo | Controllo qualità |
|---|---|
| | |

Sidertaglio Lamiere srl


**TAGLIO E COMMERCIO DI LAMIERE**

Via dell'Agricoltura 8/D - 36040 Meledo di Sarego (VI) - Tel. 0444 823059
Fax Amm. 0444 823364 - Uff. Tec. 0444 823201 - Email: info@sidertaglio.com - Web: www.sidertaglio.com
Reg. Imp. VI 33000/1996 - R.E.A. 236444 - Cod. Fisc. e P.IVA 02510610245


Taglio plasma
Ossitaglio
fino a 500mm

**Fabbrica Italiana Lamiere srl**

Sede legale/head office
Via Sant'Agnese 12
20123 Milano
Stabilimento/Rolling mill
Via natale Gallino, 63
16164 Genova Pontedecimo

Tipo certificato/Type certificate 3.1 EN 10204
Numero certificato/Number 240000005205
Data/Date 21/03/2024

Cliente/Customer

Destinatario merce/Destination

Ordine/Order 2024.1.196.2
Data ordine/Date order 12/03/2024
Nota/Note

Firma/Signature

Timbro/Stamp

25729

**ARTICOLO** LAMIERA S355J2+N 20x2450x12000 mm S355J2+N UNI EN 10025-2 kg 4621 LC

| Partita/piastra/Plate | Colata/Heat | C [%] | Mn [%] | Si [%] | S [%] | P [%] | Cr [%] | Ni [%] | Cu [%] | Al [%] | MO [%] | Nb [%] | V [%] | Ti [%] | N [%] | Ceq [%] | HB | Verso | ReH [N/mm²] | Rm [N/mm²] | A% [%] | Verso | T [°C] | $Kv_1$ [J] | $Kv_2$ [J] | $Kv_3$ [J] | $Kv_4$ [J] | Saggio | Data |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | 345 | 470 | 20 | | | 27 | 27 | 27 | 27 | | |
| | | 0,20 | 1,60 | | 0,025 | 0,025 | | | 0,55 | | | | | | | 0,45 | | | | 630 | | | | | | | | | |
| 24LT005170 N11P382 | 316829 | 0,17 | 1,35 | 0,24 | 0,005 | 0,015 | 0,03 | 0,01 | 0,01 | 0,025 | 0,002 | 0,001 | 0,004 | 0,002 | 0,005 | 0,40 | | T | 370 | 519 | 28,4 | KVL | -20 | 137 | 153 | 122 | 137 | | |

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

Toll. Spess/Toll. thick EN10029 Cl B
Toll. Largh./toll. Width -0 +100
Toll. lLung/toll. Length -0 +200
Toll. Plan/toll plan. EN10029 N
Cond superf/cond. superf. EN 10163 B2
Stato di fornitura LC: laminazione controllata
Supply status Normalizing rolling

Stato di fornitura AR: in as rolled condition
Supply status AR In as rolled condition

NOTA:
Lamiere elencate sono conformi alla prescrizione all'ordine, e i controlli di marcatura, aspetto superficiale e dimensionale hanno dato esito positivo. Prodotto esente da radiazioni
The above mentioned are consistent with the order prescriptions: marking, inspection and measurement without objection. Product free from all types of radioactive materials
Le lamiere sono state controllate in accordo alla normativa vigente / We declare that the plates were controlled according to standard

**FABBRICA ITALIANA LAMIERE SRL**
Via natale Gallino, 63
16164 Genova Pontedecimo

**EN 10025 - 1**
**EN 10025 - 2**

17
**0474 - CPR - 1673**

CE

**Gabrielli** S.p.A. - Società Unipersonale
**Sede Legale e amministrativa :** Via Mazzini, 58 - 35013 Cittadella (PD) Italy - C.P.n. 52/B - Tel.:**+39.049.9414611** - Fax +39.049.9414664 - e-mail: info.gab@gabrielli.it - **www.gabrielli.it**
**C.F. - P.IVA IT 00362740284** - Reg. Imprese PD 00362740284 - R.E.A. PD 120850 - M. PD005320 - Cap. Soc. Euro 20.000.000,00 I. V. Direzione e coordinamento SO.FI.D.A. S.p.A.

Azienda con sistema di gestione qualità certificato da DNV = **ISO 9001** = *(Spianatura e taglio di lamiere in fogli e nastri ricavati da coils laminati a caldo. Commercio e lavorazione di lamiere grosse laminate da treno quarto. Commercio di prodotti siderurgici e pre-lavorazione di profili strutturali (taglio e foratura di travi)*

A02 TIPO DI CERTIFICATO : FERRIERA 3.1 EN10204-04 DOCUMENT TYPE : MILL 3.1 EN10204-04 Z02 Data: 04/02/21
A03 CERTIFICATO N°/DOCUMENT N°: 5394/ 3016 Pag. : 1

A07 ORDINE CLIENTE/CUSTOMER ORDER : 552 GALLIERA del 1/02/21 A08 ORDINE INTERNO/INTERNAL ORDER:2102628 del 1/02/21

A06 GABRIELLI SPA UNIPERSONALE
VIA MAZZINI, 58
35013 CITTADELLA PD
ITALIA

LISTA DI RINTRACCIABILITA"
PACKING LIST

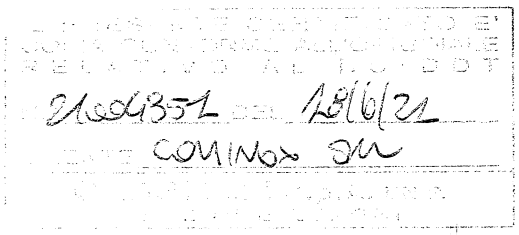
Destinatario: GABRIELLI SPA DIV.GALLIERA UNIPERSON
VIA LEONARDO DA VINCI, 25 - Z.I.
35015 GALLIERA VENETA PD

| Riga Descrizione / Pos. Description<br>N°Coil Interno<br>N°InternalCoil<br>B07 | N°Rif. Originale<br>N° Original Coil<br>B07 | N° Colata<br>N° Casting<br>B07 | N. Serie (S)<br>Label N°<br>B06 | Quantità Prodotta<br>Quantity Produced<br>B08 | Spess.<br>Thick.<br>B09 | Largh.<br>Width<br>B10 | Lungh.<br>Length<br>B11 | Articolo Cliente<br>Customer Item | N° DDT<br>Dispatch | Riga<br>Pos. | Data<br>Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-D LAM. CALDO S355J2 EN 10025-2/2004 SPIAN. | | | | | | | | | | | |
| 2017021 | 565503 | 731100 | 8748646 | 7 Fg | 10,00 x | 1500,00 x | 3000,00 | | 3016 | 1 | 4/02/21 |
| 2017021 | 565503 | 731100 | 8748647 | 7 Fg | 10,00 x | 1500,00 x | 3000,00 | | 3016 | 1 | 4/02/21 |

Z01 I risultati delle prove condotte presso il nostro laboratorio rientrano nei limiti stabiliti dalle norme di prodotto. Si assicura pertanto la conformità del materiale fornito alle prescrizioni del Vs. ordine.
The results of the tests carried out in our laboratory fall within the limits set by the product standards. Compliance of the supplied material with the provisions of y guaranteed.
Le Dichiarazioni di Prestazione sono disponibili nel ns. sito web all'indirizzo https://www.gabrielli.it/dop in conformità al REG. DEL. (UE) N.157/2014 (30/10/2013)
The Declarations of Performance are available in our website (https://www.gabrielli.it/dop) in accordance with REG. DEL. (UE) N. 157/2014 (30/10/2013)

Documento composto da 1 pagine / Document included by 1 page

GABRIELLI SPA UNIPERSONALE
Controllo Qualità



**A01**
**voestalpine**
**Stahl GmbH**

# A02
# Abnahmeprüfzeugnis
3.1 - EN 10204

Seite 1 von 2
Z02 Datum 18-12-2020

voestalpine-Straße 3
4020 Linz, Austria
www.voestalpine.com/stahl

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A03 Bescheinigungs-Nr.: | W1624485 | A08 Auftrags-Nr.: | 2301474 | A07 BestDat.: | 14-09-2020 | Versanddatum: | 20-12-2020 6E |

A06 Besteller
GABRIELLI S.P.A.
Via Giuseppe Mazzini, N. 58
I-35013 CITTADELLA, PD

B01 Fabrikat: WARMGEW. STAHLBAND
B02 Werkstoff: S355J2+N
B03 Norm: EN 10025-2:2004

A07 BestNr.: 20005615

Zusätzliche Anforderungen: AL-BERUHIGT-KL.1VERZINKUNGSFAEHIG

A06 Empfänger
GABRIELLI S.P.A.
Via Giuseppe Mazzini, N. 58
I-35013 CITTADELLA, PD

Sachnummer: 6

Z01 - Besichtigung und Maßprüfung: keine Beanstandung. Wir bestätigen, dass die oben bezeichnete Lieferung den Bestellvorschriften (Normvorschriften) entspricht.
Z01 - Kennzeichnung: Erschmelzungsart (wenn spezifiziert), Markenbezeichnung, Schmelzennummer, Band/Blechnummer.

## *Umfang der Lieferung*

| B07 Schmelze | B06 Blech-Nr | Pos | Dimensionen B09 Dicke mm | B10 Breite mm | B11 Länge mm | B08 Stück | B12 Brutto kg | B13 Netto kg | B14 Liefs-Nr 11 44 |
|---|---|---|---|---|---|---|---|---|---|
| 731100 | 565503 | 60 | 9,99 | 1500,0 | | 1 | 29.690 | 29.690 | 47559 |
| | Summen | | | | | 1 | 29.690 | 29.690 | |

C70 - Erschmelzungsverfahren: LD

## *Chemische Zusammensetzung (Schmelzanalyse)*

| B07 Schmelze | C % | Si % | Mn % | P % | S % | Al % | Cu % | N % |
|---|---|---|---|---|---|---|---|---|
| 731100 | .174 | .015 | 1.460 | .008 | .0062 | .053 | .010 | .0035 |

## *Ergebnisse der Prüfungen*

| Versuch B07 Schmelze | Zugvers. C02 Lage | L0 | C11 Reh MPA | C12 Rm MPA | C13 A % | KerbschT C02 Lage | C40 Pf | C03 Prüftemperatur °C | C42 EW J | C42 EW J | C42 EW J |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 731100 | Q | A5 | 412 | 562 | 23.4 | L | CV 10 x t | -20 | 153 | 163 | 147 |

GABRIELLI S.p.A. UNIP.
DIVISIONE COILS
COPIA CONFORME ALL'ORIGINALE

A04
Herstellerzeichen
voestalpine

A01,A05;Z02
Abnahmebeauftragte(r) des Herstellers
Qualitaetslenkung Warmband Karl

voestalpine
ONE STEP AHEAD.

CE

0769

voestalpine Stahl GmbH, voestalpine-Straße 3, 4020 Linz, Austria

20

EN 10025-2:2004 S355J2+N

EN 10025-2:2004 S355J2+N
Leistungserklärung abrufbar unter www.voestalpine.com/stahl/Die-Steel-Division/Downloadcenter
Zur Verwendung bestimmt in Metallbauwerken oder in Metall-/Betonbundbauwerken

| | |
|---|---|
| Formtoleranzen Grenzabmaße | EN 10051 |
| Bruchdehnung | EN 10025-2:2004 |
| Zugfestigkeit | |
| Streckgrenze | |
| Schweißeignung | |
| Beständigkeit | |
| Gefährliche Substanzen | keine festgestellt |

GABRIELLI S.p.A. UNIP.
DIVISIONE COILS
COPIA CONFORME ALL'ORIGINALE

A04
Herstellerzeichen
voestalpine

A01,A05;Z02
Abnahmebeauftragte(r) des Herstellers
Qualitaetslenkung Warmband Karl

voestalpine
ONE STEP AHEAD.

A01 Produttore

AcciaieriaArvedi

Acciaieria Arvedi S.p.A.
Sede legale:
Viale Forlanini, 23
20134 Milano

Sede amministrativa e Stabilimenti:
Via Acquaviva, 18
26100 Cremona - Italia
Tel.+39 0372 4781

Via Di Servola, 1
34145 Trieste - Italia

Cap.Soc. € 112.900.000
interamente versato
Società soggetta all'attività di direzione e coordinamento di
Finarvedi SpA
Società con Socio Unico

Part.IVA IT 11852670154
Cod.fisc. 00910070192
Reg.Imp.MI 00910070192
REA MI 1497770

A07 Vostro Ordine **462**
A08 Nostra conferma **0311148841/200**
B01 **Bandelle NERO 1500x5,00x3000,00 S355J2+N**
Consegna/DDT **325708984 / 20 / 34041615**
B09 Spessore **5,00 mm**
B10 Larghezza **1.500,0 mm**
B11 Lunghezza **3.000,0 mm**
B02 Qualità **S355J2+N**
B04 Stato fornitura **UNI EN 10025-2-2019**

A06 Committente

**GABRIELLI S.P.A.**
**magazzino di Galliera Veneta**
**VIA L. DA VINCI 25**
**GALLIERA VENETA**
**35015 PD**

A02 **Certificato di collaudo**
**nr. 0000664290 3.1 EN10204**
Z02 Data **13.05.2021 EN10168**

| B16 | | C71 | C72 | C73 | C74 | C75 | C76 | C77 | C78 | C79 | C80 | C81 | C82 | C83 | C84 | C85 | C86 | C87 | C88 | C89 | C90 | C91 | C92 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IDENTIFIC.COLATA | | C% | Mn% | Si% | P% | S% | Cr% | Ni% | Mo% | Cu% | Sn% | Al% | Ti% | Nb% | V% | B% | N% | Nb% + Ti% + V% | Ti% +Nb% | Cr% +Mo% | Cu% + Cr% + Ni% | Si% + P% | CEV |
| | min | 0,10 | | | | | | | | | | 0,020 | | | | | | | | | | | |
| | max | 0,20 | 1,60 | 0,03 | 0,024 | 25,000 | 0,29 | 0,42 | 0,11 | 0,55 | | | | | | | | | | | | | 0,46 |
| 122771 | | 0,19 | 1,23 | 0,02 | 0,007 | 0,002 | 0,05 | 0,05 | 0,01 | 0,14 | 0,01 | 0,031 | | | | | | | | | | | 0,42 |

| B07 | B16 | B12 | C00 | C13 | C11 | C12 | C50 |
|---|---|---|---|---|---|---|---|
| IDENTIFICAZIONE PRODOTTO | IDENTIFIC. COLATA | MASSA TEORICA KG | | A5% | Rp02 | Rm | Piega |
| | | | | % | MPa | MPa | |
| | | | min | 20 | 355 | 470 | |
| | | | max | | | 630 | |
| 712277111-400071315 | 122771 | 1.629 | | 24 | 456 | 585 | OK |

IL PRESENTE CERTIFICATO E' COPIA CONFORME ALL'ORIGINALE RELATIVO AL NS DDT
N. 21004851 DEL 18/6/21
CLIENTE COMINOX SRL
GABRIELLI S.p.A. UNIP.
DIVISIONE LUNGHI

C00 Saggio id analisi di controllo
C30 Prova di durezza - Tipo prova
Z07 Nelle prove di trazione usate solo provette prismatiche

D01 Controllo marcatura, aspetto superficiale e dimensioni: Soddisfacente
Z01 Certifichiamo che il prodotto fornito è conforme ai requisiti
C02 Senso di prelievo: T Trasversale

Z05 Certificazioni del sistema di gestione
**Azienda con sistema di gestione certificato da IGQ secondo ISO 9001 e IATF 16949**

Prodotti di acciaio laminati a caldo per impieghi strutturali
Settore di utilizzo: Costruzioni o ingegneria civile

| | |
|---|---|
| Tolleranze dimensionali e di forma: | UNI EN 10051 |
| Allungamento | |
| Carico di rottura | |
| Carico di snervamento | Acciaio: S355J2+N EN 10025 |
| Energia di resilienza | |
| Saldabilità | |
| Durata: | Nessuna prestazione determinata |
| Sostanze regolamentate: | Nessuna prestazione determinata |

Z04 Marcatura CE
CE
1608
14
Cert.n.1608 CPR P054

B06 Marcatura

Z02 Validazione
NOME
T.FERABOLI

Z03 Timbro ente isp.

ACCIAIERIA ARVEDI * ASSICURAZIONE QUALITA'

A05 REDATTORE DOCUMENTO
CONTROLLO QUALITA' ACCIAIERIA ARVEDI
MOD-QUA-16 Rev.0 del 20/09/2016

| DICHIARAZIONE DI PRESTAZIONE CE [n°. 0000664290]<br>EC DECLARATION OF PERFORMANCE [n°. 0000664290] | CE<br>1608<br>14<br>Cert.n.1608 CPR P054 |
|---|---|

1.Codice di identificazione del prodotto tipo: **rotoli e nastri laminati a caldo per impieghi strutturali, secondo le norme UNI EN 10 10025-2 e UNI EN 10025-5**

Identification code of product type: **hot rolled coils and strips of structural steels according to standard UNI EN 10025-2 and UNI EN 10025-5**

Dimensioni: **spessore da 1,2 a 12,0 mm; larghezza da 100 a 1600 mm**
Dimensions: **thickness 1,2 - 12,0 mm; width 100 - 1600 mm**

2. Numero di tipo, lotto, serie o elemento di identificazione del prodotto da costruzione ai sensi dell articolo 11, paragrafo 4:
Type, batch or serial number or any element allowing identification of construction product as required under article 11(4):

**In accordo con no.lotto e numero colata indicato sul certificato di collaudo**
**In agreement with lot number and heat number indicated on the test certificate**

| Partita | Colata |
|---|---|
| 400071315 | 122771 |

3.Uso o usi previsti dal prodotto da costruzione, conformemente alla relativa specifica armonizzata, come previsto dal fabbricante:
*Intended use or uses of the construction product in accordance with the applicable harmonised technical specification, as foreseen by manufacturer:*

**Acciaio laminato a caldo per usi strutturali - Hot rolling steel for structural uses**

4. Nome, denominazione commerciale registrata o marchio registrato e indirizzo del fabbricante ai sensi dell' articolo 11, paragrafo 5:
*Name, registered trade name or registered trademark and contract address of manufacturer as required pursuant Article 11(5):*

**Acciaieria Arvedi S.p.A - via Acquaviva,18 - 26100 Cremona (ITALIA)**

5. Se opportuno, nome e indirizzo del mandatario il cui mandato copre i compiti cui all' articolo12, paragrafo 5:
*Name and contact address of the authorised representative whose mandate covers the tasks specified in article12(5):*

**Non applicabile - Not applicable**

6. Sistema o sistemi di valutazione e verifica della costanza di prestazione del prodotto da costruzione di cui all'allegato V alla EU 305-2011:
*System pr systems of assessment and verification of constancy of performance of the construction product as set in EU-regulation 305-2011 annex V:*

**System 2+**

7. Dichiarazione di prestazione relativa al prodotto da costruzione cherientra nell'ambito della norma armonizzata:
*Declaration of performance concerning construction product covered by a harmonised standard:*

Ente di certificazione: **I.G.Q. Via Giosuè Carducci 125/A - 20099 Sesto San Giovanni MI (ITALY)**
*Certification Body*

Numero del certificato FPC: **1608 CPR P054**
*Number of FPC certificate*

| DICHIARAZIONE DI PRESTAZIONE CE [n°. 0000664290]<br>EC DECLARATION OF PERFORMANCE [n°. 0000664290] | CE<br>1608<br>14<br>Cert.n.1608 CPR P054 |
|---|---|

**Ispezione iniziale dello stabilimento. Determinazione del prodotto tipo in base a prove di tipo (compreso campionamento). Sorveglianza, valulazione e verifica continua del controllo della produzione di fabbrica secondo l'allegato ZA della EN 10025-2005.**
*Performed the initial inspection of the manufacturing plant and factory production control and the continuous surveillance, assessment and evaluation of factory production control and issued the certificate of conformity of the factory production control in accordance with annexZA of EN 10025-2005.*

8. Caso di dichiarazione di prestazione relativa a un prodotto da costruzione per il quale è stata rilasciata una valutazione tecnica europea:
*Declaration of performance concerning construction product covered by European technical evaluation:*

**Non applicabile - Not applicable**

9. Prestazione dichiarata:
*Declared performance:*

| Caratteristiche essenziali<br>Essential characteristics | Prestazioni<br>Performance | Specifica tecnica armonizzata<br>Harmonised technical specification |
|---|---|---|
| Tolleranze Dimensionali | EN 10051-2010 | EN 10025-1:2005 |
| Allungamento | EN 10025-2:2019; 10025-5:2019 p. 7.3.1 | |
| Carico di Snervamento e Rottura | EN 10025-2:2019; 10025-5:2019 p. 7.3.1 | |
| Resilienza | EN 10025-2:2019; 10025-5:2019 p. 7.3.2 | |
| Saldabilità | EN 10025-2:2019; 10025-5:2019 p. 7.2.3 + 7.4.1 | |
| Durabilità | EN 10025-2:2019; 10025-5:2019 p. 7.2.1 + 7.4.3 | |

10. La prestazione del prodotto di cui ai punti 1 e 2 è conform e alla prestazione dichiarata di cui al punto 9:
*The performance of the product identified in point 1 and is in conformity with the declared performance in point 9:*

Si rilascia la presente dichiarazione sotto la responsabilità esclusiva del fabbricante di cui al punto 4.
*This declaration is issued under the sole responsability of manifactured identified in point 4.*

A nome e per conto Acciaieria Arvedi S.p.A :
Signed for and on behalf of Acciaieria Arvedi S.p.A

Cremona, 14.05.2021

Fabio Baldrighi (Sales Director)

MOD-QUA-16 Rev.1 del 28/12/2020

**A01 Stabilimento produttore:**
**Manufacture's works :**
**Acciaierie d'Italia S.p.A.**

Acciaierie d'Italia

SEDE LEGALE : Viale Certosa, 239 - 20151 Milano ITALIA
Stabilimento di TARANTO
Via Appia SS7, km 648 - 74123 TARANTO ITALIA

A02 Tipo di documento Type of document
CERTIFICATO DI CONTROLLO
INSPECTION CERTIFICATE
EN 10204 TIPO 3.1

A03 N° Documento Doc.Nr. 2022/002212/01
Z02.1 Data Date 27/01/2022
A04

A07 Ordinazione Committente Customer's Order nr
E-MAIL 19/07/2021

A05 Redattore del documento Originator of the document
CONTROLLO QUALITÀ INTERNO

A08 N°Conferma Order 16413406 0031
A09 Art.Cliente Customer ref.

A12 Nave Vessel
A13Codice Code
A14 Data Date 26/01/2022

A06.1 Committente Customer
DUFERCO COMMERCIALE SPA
VIA DI SOTTORIPA 7/13
16124 GENOVA GE

A06.2 Destinatario Materiale Consignee
DUFERCO C/O CARTURAN
VIA EUROPA 19/A
35015 GALLIERA VENETA PD

A06.3 Destinatario del documento Consignee of the document
DUFERCO C/O CARTURAN
VIA EUROPA 19/A
35015 GALLIERA VENETA PD

A10 Informazioni commerciali supplementari Supplementary commercial information

B01 Prodotto Product : LAMIERE DA TRENO
B02 Qualità Steel quality : EN 10025-2
EN 10025-2 S355J2+N .
B03 Esigenze supplementari Supplementary requirements : NESSUNA PRESCRIZIONE
B04 Stato di fornitura Delivery condition : LAMINAZIONE DI NORMALIZZAZIONE
B05 Trattamento termico dei saggi Heat treatment of samples : .

B06 Marcatura Marking

DIMENSIONI NOM. NOM. DIMENSIONS :
Unità Units MM
B09 Spessore Thickness 8,0000
B10 Larghezza Width 2000,0000
B11 Lunghezza Length 12000,0000
B12 Massa teor. Theor.Mass 1507 Kg
B16 N° Colata Heat nr. 180235

25109
25110
25111
25112
25113
25114

**MATERIALE SPEDITO DELIVERED MATERIAL**

| B07 N°Lam. | B13 Massa | B07 N°Lam. | B13 Massa | B07 N°Lam. | B13 Massa | B07 N°Lam. | B13 Massa | B07 N°Lam. | B13 Massa |
|---|---|---|---|---|---|---|---|---|---|
| 151159101 | 1577 | 151159201 | 1571 | 151872101 | 1566 | 151872201 | 1559 | 151872301 | 1558 |
| 151873101 | 1579 | 151873201 | 1562 | | | | | | |

**B08 Totale numero pezzi Total pieces: 000007** **B14 Totale massa Total mass: 0010972 Kg.**

**COMPOSIZIONE CHIMICA E PROCESSO DI FABBRICAZIONE ACCIAIO CHEMICAL COMPOSITION AND STEELMAKING PROCESS**

**C70 Processo di fabbricazione acciaio : Y(Basic Oxygen) C94 Metodo di colaggio :Colata Continua Continuous Casting**

| C00 Ident. Saggio | C01 Posiz. Prelievo | C71 C % | C72 Si % | C73 Mn % | C74 P % | C75 S % | C76 Al % | C77 Nb % | C78 V % | C79 Mo % | C80 Ni % | C81 Cr % | C82 Cu % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Colata | 0,150 | 0,206 | 1,072 | 0,013 | 0,0110 | 0,033 | 0,001 | 0,004 | 0,001 | 0,002 | 0,016 | 0,009 |

| C00 Ident. Saggio | C01 Posiz. Prelievo | C83 Ti % | C84 N ppm | C85 B ppm | C86 Ca ppm | C87 Sn % | C88 H ppm | C89 V1 | C90 V2 | C91 V3 | C92 V4 | C93 CEQ % IIW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Colata | 0,013 | 60 | | | | | 5,566 | | | | 0,333 |

| VINCOLI ANALISI CHIMICA ADDITIONAL REQUIREMENTS | Colata Ladle Min | Colata Ladle Max | Prodotto Product Min | Prodotto Product Max |
|---|---|---|---|---|
| V1 = Al tot / N | 2,000 | | | |

**PROVA DI TRAZIONE TENSILE TEST**

| C00 Ident. saggio | C01 PP | C02 Dir | C03 Temp°C | B05 T.Term. | C10 Prov | C24 W/Ø mm | C23 : L0 [xSQR(S0)] | C09 Unità | C11 REH | C12 RM | C13 All.% | C14 RE/RM | C15 Strizione (%) Z1 | Z2 | Z3 | Media |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 151161 | C | T | + 20 | | P | 20,00 | 5,65 | MPa | 488 | 563 | 24,80 | | | | | |

**PROVA DI RESILIENZA IMPACT TEST**

| C00 Ident. Saggio | C01 P.P | C02 Lun | C40 Sp. | B05 Dir | C41 Provino | C09 T.Term. | C03 Largh | C42 Valori singoli Unità | C43 Temp°C | K1 | K2 | K3 | C43 Media | C44 Duttile % D1 | D2 | D3 | C43 Media |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 151161 | C | P | L | KV | 450 | | 5 | J | - 20 | 68 | 65 | 66 | 66 | | | | |

**D01 Controllo marcatura,identificazione,aspetto superficiale,forma e dimensioni : Soddisfacente**
**Control of marking,identification,surface appearance,shape and dimensional properties: OK**
**Z01 Si certifica che il materiale è conforme alle condizioni dell'ordine.**
**We hereby certify that the material complies with the terms of the order.**

C01 Posizione di prelievo Sample location
nella lunghezza : Respect to Length :
T = Testa
C = Centro
P = Piede

nello spessore : Respect to Thickness :
P = Pelle
2 = Centro spessore
3 = 1/3 spessore
4 = 1/4 spessore
5 = 1mm dalla superficie
R = 2mm dalla superficie
T = 3mm dalla superficie
1 = Pieno spessore

C02 Senso di prelievo Testing direction
L = Longitudinale
T = Trasversale
Q = Spessore
D = Diagonale

C10 Forma del provino Shape of the test piece
P = Prismatico
C = Cilindrico

Z04 Marchio CE
1608
Acciaierie d'Italia S.p.A.
Via Appia Km648, I-74123 TARANTO (ITALIA)
06
1608-CPR-P188
EN 10025-1 : 2004
Lamiera S355J2+N EN 10025-2 / 1.0577
Intesa per l'utilizzo in strutture saldate, bullonate e chiodate
**Tolleranze dimensionali e di forma:**
**Allungamento:**
**Carico di Rottura:**
**Carico di Snervamento:**
**Energia di Resilienza:**
**Saldabilità (CEV):**
**Durata:(composizione chimica):**
**Come indicato nel DoP** L0049720

Z03 Timbro dell'Ente Ispettivo
Inspection Body Stamp

Z02.2 Validazione CQ
QC Validation
A. BUFFO Skt 04972

Z05 CERTIFICAZIONI DEL SISTEMA DI GESTIONE - MS CERTIFICATIONS
**Sistema di gestione certificato secondo:**
**ISO 9001 – IATF 16949 – ISO/TS 29001 – ISO 14001 – ISO 45001**

http://54.36.88.47/pdf/1L0049720.pdf

1L0049720P AQV001I

**GALPERTI TECH FORGED PRODUCTS S.p.A.**
Capitale Sociale € 7.000.000,00 interamente versato
*Sede legale e Amministrativa:*
**23823 COLICO (LC)** - Via Ombriano, 14
C.C.I.A.A Lecco n. 03800290136 – R.E.A. 326757
C.F. 03800290136 - P.IVA IT03800290136
Tel. 0341-930186 - Fax 0341-930252
E-mail: galptech@galptech.com - www.galperti.com

The Original

## LISTING OF ITEMS & QTY READY FOR INSPECTION

CLIENT: REMAZEL ENGINEERING SPA
PO: 24004009
GALPERTI JOB: 240413
TYPE OF MTC: 3.1
REMAZEL JOB No.: 24-27012
PROJECT: Davit Crane

| Item | Description | Quantity | S/A *** | Material | Heat/Test | Certif. |
|---|---|---|---|---|---|---|
| 001/001 0003 | AN ANELLI<br>DE : 979,00 DI : 809,00 H : 70,00<br>MAT: 42CRMO4 MPS: 602<br>ST : BONIFICATO<br>(BON)<br>NCR: | 1 | S | ISO683-2 42CRMO4 | 145018/56A | 24/006307 |
| 001/001 0006 | AN ANELLI<br>DE : 811,00 DI : 684,00 H : 63,00<br>MAT: 42CRMO4 MPS: 602<br>ST : BONIFICATO<br>(BON)<br>NCR: | 1 | S | ISO683-2 42CRMO4 | 145018/56A | 24/006308 |

*** S = BALANCE A = PARTIAL

21-11-2024
FRANCO CORBELLINI
QBQ
CROSSWIND R

REMAZEL
Ziber
W R

GALPERTI TECH FORGED PRODUCTS S.p.A.
Capitale Sociale € 7.000.000,00 interamente versato
23823 COLICO (LC) - Via Ombriano, 14 - Tel. 0341-930186 - Fax 0341-930252
C.C.I.A.A Lecco n. 03800290136 – R.E.A. 326757 - C.F. 03800290136 - P.IVA IT03800290136
E-mail: galptech@galptech.com - www.galperti.com

Copia Originale

**CERTIFICATO DI COLLAUDO / TEST CERTIFICATE** EN 10204 / EN 10204 — **3.1**

NS.ORDINE / INTERNAL JOB: **240413**

SPETT.LE / MESSRS:
**REMAZEL ENGINEERING SPA**

**VIA CARLO OTTAVIO CORNAGGIA 10**
**20123 MILANO**

| CERTIFICATO / TEST CERTIFICATE N. | DATA / DATE | VS.ORDINE / YOUR P.O | DATA / DATE |
|---|---|---|---|
| 006307/1 | 04/11/2024 | 24004009 | 01/07/2024 |

| POS / ITEM | DESCRIZIONE / DESCRIPTION | QUANTITA' QUANTITY | S/A | MATERIALE / MATERIAL | N° COLATA / PROVA HEAT N°/TEST N° | ACCIAIERIA STEEL MILL | # |
|---|---|---|---|---|---|---|---|
| 001/001 | AN 979,00 x 809,00 x 70,00<br>006-0006-C0123<br>RALLA A SFERE A DENTATURA INTERNA<br>M10 Z94 ANELLO ESTERNO D.884 (N.32 FORI D.26)<br>COMMESSA 24-27012 | 1 | S | ISO683-2 42CRMO4 | 145018/56A | TRAVI E PROFIL. | A |

ANALISI CHIMICA / CHEMICAL ANALYSIS

| # | | C % | MN % | SI % | P % | S % | CR % | NI % | MO % | CU % | V % | SN % | AL % | NB % | TI % | N % | CO% | B % | H % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | L | 0,420 | 0,820 | 0,250 | 0,010 | 0,001 | 0,990 | 0,150 | 0,190 | 0,230 | 0,005 | 0,010 | 0,024 | 0,001 | 0,003 | 0,005 | 0,012 | 0,0003 | 0,0000 |
| A | C | 0,430 | 0,830 | 0,263 | 0,012 | 0,003 | 1,000 | 0,153 | 0,199 | 0,250 | 0,005 | 0,010 | 0,024 | 0,001 | 0,003 | 0,005 | 0,012 | 0,0003 | 0,0000 |

NOTE / NOTES

L = ANALISI COLATA / LADLE ANALYSIS
C = ANALISI DI PRODOTTO / CHECK ANALYSIS

CARATTERISTICHE MECCANICHE / MECHANICAL PROPERTIES

| # | | TRAZIONE / TENSILE | | | | | | | | | RESILIENZA / CHARPY TEST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TIPO TYPE | DIAMETRO DIAMETER mm. | SEZIONE AREA mm2. | LUNGHEZZA LENGHT mm. | TEMP. TEMPERATURE C | ROTTURA TENSILE Mpa | SNERVAMENTO YIELD Mpa | ALL. ELONG % | CONTR. REDUCT. % | TIPO TYPE KV | TEMP. TEMP. C | VALORI VALUES Joule | DUREZZA HARDNESS HB |
| A | S | | 12,50 | 122,70 | 50,00 | 20 | 835 | 600 | 15,0 | 55,0 | | -20 | Min. 27 Avg. 42 | Min. 260 |
| A | O | | 12,50 | 122,70 | 50,00 | 20 | 937 | 756 | 19,5 | 61,2 | | -20 | 73 - 70 - 69 | 312-315 |

NOTE / NOTES

O = OTTENUTE / OBTAINED
S = STANDARD

| # | TRATTAMENTI TERMICI / HEAT TREATMENTS |
|---|---|
| A | Quenched at 850 Dgr.C for 30min/inch minimum. Cooling in water |
| A | Tempered at 600 Dgr.C for 60min/inch minimum. Cooling in still air |

21-11-2024
FRANCO CORBELLINI
QBQ
CROSSWIND R

NOTE GENERALI / GENERAL NOTES

FINITURE / ROUGHNESS

STANDARD

NOTE / NOTES
Sample for Mechanical Test taken as per 240413-MPS-42CM4 Rev.0
Material according to 240413-MPS-42CM4 Rev.0 & DNV-ST-0378
Forging reduction ratio: 4:1 minimum

REMAZEL
Ziber
W R

| MARCHIO DI FABBRICA TRADE MARK | DATA COLLAUDO INT. INT. INSPECT DATE | COLLAUDATORE INT. INT. INSPECTOR |
|---|---|---|
| | 04/11/2024 | ACQUISTAPACE |

ENTE UFFICIALE DI COLLAUDO
INSPECTION AUTHORITY

GALPERTI TECH FORGED PRODUCTS S.p.A.
Capitale Sociale € 7.000.000,00 interamente versato
23823 COLICO (LC) - Via Ombriano, 14 - Tel. 0341-930186 - Fax 0341-930252
C.C.I.A.A Lecco n. 03800290136 – R.E.A. 326757 - C.F. 03800290136 - P.IVA IT03800290136
E-mail: galptech@galptech.com - www.galperti.com

SPETT.LE / MESSRS:
**REMAZEL ENGINEERING SPA**

**VIA CARLO OTTAVIO CORNAGGIA 10**
**20123 MILANO**

**CERTIFICATO DI COLLAUDO EN 10204**
**TEST CERTIFICATE EN 10204**
**3.1**

NS.ORDINE / INTERNAL JOB
**240413**

Fax Originale

| CERTIFICATO / M.T.CERTIFICATE N. | DATA / DATE | VS.ORDINE / YOUR P.O. | DATA / DATE |
|---|---|---|---|
| 006308/1 | 04/11/2024 | 24004009 | 01/07/2024 |

| POS / ITEM | DESCRIZIONE / DESCRIPTION | QUANTITA' QUANTITY | S/A | MATERIALE / MATERIAL | N° COLATA / PROVA HEAT N°/TEST N° | ACCIAIERIA STEEL MILL | # |
|---|---|---|---|---|---|---|---|
| 001/001 | AN 811,00 x 684,00 x 63,00<br>006-0006-C0123<br>RALLA A SFERE A DENTATURA INTERNA<br>M10 Z94 ANELLO ESTERNO D.884 (N.32 FORI D.26)<br>COMMESSA 24-27012 | 1 | S | ISO683-2 42CRMO4 | 145018/56A | TRAVI E PROFIL. | A |

ANALISI CHIMICA / CHEMICAL ANALYSIS

| # | | C % | MN % | SI % | P % | S % | CR % | NI % | MO % | CU % | V % | SN % | AL % | NB % | TI % | N % | CO% | B % | H % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | L | 0,420 | 0,820 | 0,250 | 0,010 | 0,001 | 0,990 | 0,150 | 0,190 | 0,230 | 0,005 | 0,010 | 0,024 | 0,001 | 0,003 | 0,005 | 0,012 | 0,0003 | 0,0000 |
| A | C | 0,430 | 0,830 | 0,263 | 0,012 | 0,003 | 1,000 | 0,153 | 0,199 | 0,250 | 0,005 | 0,010 | 0,024 | 0,001 | 0,003 | 0,005 | 0,012 | 0,0003 | 0,0000 |

NOTE / NOTES

L = ANALISI COLATA / LADLE ANALYSIS
C = ANALISI DI PRODOTTO / CHECK ANALYSIS

CARATTERISTICHE MECCANICHE / MECHANICAL PROPERTIES

| # | | TRAZIONE / TENSILE | | | | | | | | RESILIENZA / CHARPY TEST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TIPO TYPE | DIAMETRO DIAMETER mm. | SEZIONE AREA mm2. | LUNGHEZZA LENGHT mm. | TEMP. TEMPERATURE C | ROTTURA TENSILE Mpa | SNERVAMENTO YIELD Mpa | ALL. ELONG % | CONTR. REDUCT. % | TIPO TYPE KV | TEMP. TEMP. C | VALORI VALUES Joule | DUREZZA HARDNESS HB |
| A | S | | 12,50 | 122,70 | 50,00 | 20 | 835 | 600 | 15,0 | 55,0 | | -20 | Min. 27 Avg. 42 | Min. 260 |
| A | O | | 12,50 | 122,70 | 50,00 | 20 | 937 | 756 | 19,5 | 61,2 | | -20 | 73 - 70 - 69 | 312-315 |

NOTE / NOTES

O = OTTENUTE / OBTAINED
S = STANDARD

| # | TRATTAMENTI TERMICI / HEAT TREATMENTS | NOTE GENERALI / GENERAL NOTES |
|---|---|---|
| A | Quenched at 850 Dgr.C for 30min/inch minimum. Cooling in water | FINITURE / ROUGHNESS |
| A | Tempered at 600 Dgr.C for 60min/inch minimum. Cooling in still air | STANDARD |

21-11-2024
FRANCO CORBELLINI
QDQ
CROSSWIND R

NOTE / NOTES
Sample for Mechanical Test taken as per 240413-MPS-42CM4 Rev.0
Material according to 240413-MPS-42CM4 Rev.0 & DNV-ST-0378
Forging reduction ratio: 4:1 minimum

| MARCHIO DI FABBRICA TRADE MARK | DATA COLLAUDO INT. INT. INSPECT DATE | COLLAUDATORE INT. INT. INSPECTOR |
|---|---|---|
| | 04/11/2024 | ACQUISTAPACE |

REMAZEL
C. Zilber
DW QR

ENTE UFFICIALE DI COLLAUDO
INSPECTION AUTHORITY

File: 1724001010-QC-DB-00004 Rev.05

Duferco
TRAVI E PROFILATI

TRAVI E PROFILATI DI PALLANZENO S.p.A.
SOCIETÀ A SOCIO UNICO
SEDE LEGALE
VIA SEMPIONE, 7 – 28884 PALLANZENO (VB)
TEL. 03245011 – FAX. 032452705
PARTITA IVA IT 01910110038
CODICE FISCALE 01910110038
R.E.A. V.C.O. 191072 – REGISTRO IMPRESE (VB) N. 01910110038
CAPITALE SOCIALE € 30.000.000 I.V.
SEDE AMMINISTRATIVA
VIA A.DIAZ, 248 – 25010 SAN ZENO NAVIGLIO (BS)
STABILIMENTO DI SAN ZENO NAVIGLIO
VIA A. DIAZ, 248 - 25010 SAN ZENO NAVIGLIO (BS)
TELEFONO +3903021691 - FAX +390302867598

Azienda certificata
ISO 9001:2015
ISO 14001:2015
ISO 45001:2018

# CERTIFICATO DI CONTROLLO / INSPECTION CERTIFICATE

Numero/ Number 145018/831 /24 Data/Date 31/05/24

Norma / Standard Norma EN 10204 3.1:2004

MATERIALE CONFORME ALL'ORDINE / MATERIAL COMPLIANT TO

DDT N. / Delivery note 831 Data/Date 31/05/24

Ns Ordine N. / Our Order 44/43

Ordine Cliente N./Customer PO G240097

**CLIENTE / CUSTOMER**

OFF.NICOLA GALPERTI & FIGLIO SPA

VIA E.FERMI 46

23824 DERVIO LC

Destinazione/Delivery location
CERCINO

**COLATA n. / HEAT n.**
145018

**Identificazione / Identification**
DOPP.FACC.RAL1003+9005+6000

**Specifica cliente / Customer's Specification**
MPS 33 REV.8

**Prodotto / Product**
Ø 280 mm

| Lunghezza / Lenght (m) | Pezzi / Pieces | Massa / Mass (ton) |
|---|---|---|
| 6,00 | 7 | 20,664 |

**Stato di Fornitura / Delivery condition**
AS CAST

**Qualità acciaio / Steel grade**
42CrMo4

ACCIAIO PRODOTTO IN EAF-LF-(VD) - COLATA CONTINUA - MATERIALE ESENTE DA RADIOATTIVITA'(max 0,1 Bq/g) E DA Hg (max 0,1%) - TRATTAMENTO ARGON IN SIVIERA / STEEL PRODUCTED BY EAF-LF-(VD) - CONTINUOUS CASTING - RADIOACTIVITY FREE (max 0,1 Bq/g) AND Hg FREE (n 0,1%) - ARGON STIRRING IN LADLE FURNACE

| Chemical Composition % | C | Mn | Si | P | S | Al | Cu | N | Cr | Ni | Mo | V | Nb | Sn | Ti | B | Ca | Co | H2(ppm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0,42 | 0,82 | 0,25 | 0,010 | 0,001 | 0,024 | 0,23 | 0,005 | 0,99 | 0,15 | 0,19 | 0,005 | 0,001 | 0,010 | 0,003 | 0,0003 | 0,0010 | 0,012 | < 2,5 |

REMAZEL
C. Elber
GW QR

**JOMINY test**

| 1/16" | 1 | 2 | 3 | 4 | 6 | 7 | 8 | 9 | 12 | 16 | 20 | 22 | 26 | 28 | 32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 1,5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| HRC | 57,4 | 57,4 | 57,4 | 57,4 | 57,0 | 56,4 | 55,2 | 54,1 | 50,3 | 47,6 | 46,1 | 43,7 | 42,8 | 41,1 | 40,3 |

GALPERTI TECH FORGED PRODUCTS
STATUS:
☑ APPROVED
☐ NOT APPROVED

Q.A.
STATUS
APPROVED
NOT APPROVED

**LIVELLO INCLUSIONALE / INCLUSIONAL LEVEL**
ASTM E45/A

| | A | B | C | D |
|---|---|---|---|---|
| T | 1,0 | 0,0 | 0,0 | 1,0 |
| H | 1,0 | 0,0 | 0,0 | 0,5 |

**AUSTENITIC GRAIN**
UNIENISO 643
Dimensione/Size
8

Assenza di riparazioni mediante saldatura/No repairs by welding.

Trattamento Sottovuoto/Vacuum Degassed.

21-11-2024

FRANCO CORBELLINI
QBQ
CROSSWIND R

Quality Control Product
Samuele Bottari

REMAZEL

# CERTIFICATION LIST

Certificate Nr.: 1
Date: 23/09/2024

| Final Customer: | Order Customer: | Object: | Description: | Quantity: | Inspection and Test Plan (ITP): | Our job: |
|---|---|---|---|---|---|---|
| ROSETTI MARINO | 24005170 | BOOM + TROLLEY | C09-0001-P0004 Rev.D & C09-0001-P0006 Rev.C | | 1724001010-QC-ITP-00002 | 24-27012 |

## MATERIAL

| Drawing | Pos. | Q.ty | Description | Material | Certificates 3.1 | Manufacturer | Heat/Plate ID | Additional Mechanical Test | UT Certificates | Nesting |
|---|---|---|---|---|---|---|---|---|---|---|
| C09-0001-P004_REV.C | 24 | 1 | Sheet 5 mm | S355 J2+N | 23C227 | 730/0291248 | 730324314 | | | |
| C09-0001-P004_REV.C | 12 | 1 | Sheet 6 mm | S355 J2+N | 24C077 | 1003494977 | 410436 | | | |
| C09-0001-P004_REV.C | 13 | 1 | Sheet 10 mm | S355 J2+N | 21T018 | 496293 | 1628104 | | | |
| C09-0001-P004_REV.C | 1 | 2 | Sheet 8mm | S355 J2+N | 24T003 | 709265 5352 001 | 487237 | | | L54439 |
| C09-0001-P004_REV.C | 16 | 1 | Sheet 8mm | S355 J2+N | 24T003 | 709265 5352 001 | 487237 | | | L54439 |
| C09-0001-P004_REV.C | 17 | 1 | Sheet 8mm | S355 J2+N | 24T003 | 709265 5352 001 | 487237 | | | L54439 |
| C09-0001-P004_REV.C | 18 | 1 | Sheet 8mm | S355 J2+N | 24T003 | 709265 5352 001 | 487237 | | | L54439 |
| C09-0001-P004_REV.C | 23 | 1 | Sheet 8mm | S355 J2+N | 24T003 | 709265 5352 001 | 487237 | | | L54439 |
| C09-0001-P004_REV.C | 11 | 2 | Sheet 10 mm | S355 J2+N | 21T018 | 496293 | 1628104 | | | |
| C09-0001-P004_REV.C | 20 | 1 | Sheet 10 mm | S355 J2+N | 21T018 | 496293 | 1628104 | | | |
| C09-0001-P004_REV.C | 21 | 1 | Sheet 10 mm | S355 J2+N | 21T018 | 496293 | 1628104 | | | |
| C09-0001-P004_REV.C | 10 | 2 | Sheet 12 mm | S355 J2+N | 24T176 | 230412-FP01KS-0011A1- | SU99873 | | | |
| C09-0001-P006_REV.A | 2 | 4 | Sheet 12 mm | S355 J2+N | 24T176 | 230412-FP01KS-0011A1- | SU99873 | | | |
| C09-0001-P004_REV.C | 2 | 2 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P004_REV.C | 6 | 2 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P004_REV.C | 8 | 1 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P004_REV.C | 9 | 1 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P004_REV.C | 19 | 1 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P004_REV.C | 14 | 2 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| C09-0001-P006_REV.A | 3 | 1 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P006_REV.A | 4 | 1 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P006_REV.A | 5 | 2 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P006_REV.A | 6 | 2 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P006_REV.A | 7 | 2 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P006_REV.A | 8 | 4 | Sheet 15 mm | S355 J2+N | 24T169 | HPL/TC/D/2010/18044 | Q20592 | | | L54443 |
| C09-0001-P004_REV.C | 4 | 1 | Sheet 20mm | S355 J2+N | 24T194 | HPL/TC/D/2010/19363 | P24134 | | | L54435 |
| C09-0001-P004_REV.C | 5 | 1 | Sheet 20mm | S355 J2+N | 24T194 | HPL/TC/D/2010/19363 | P24134 | | | L54435 |
| C09-0001-P006_REV.A | 1 | 1 | Sheet 30mm | S355 J2+N | 19T081 | 107725 | A1/02808469 | | SGP | |
| C09-0001-P004_REV.C | 3 | 1 | Sheet 50mm | S355 J2+N | 20T409 | 20170910-PS-003-043 | P38608 | | SGP | L54436 |
| C09-0001-P004_REV.C | 7 | 1 | Sheet 10 mm | S355 J2+N | 21T018 | 496293 | 1628104 | | | |
| C09-0001-P004_REV.C | 15 | 1 | Sheet 10 mm | S355 J2+N | 21T018 | 496293 | 1628104 | | | |
| C09-0001-P004_REV.C | 22 | 1 | Sheet 10 mm | S355 J2+N | 21T018 | 496293 | 1628104 | | | |

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


METINVEST
FERRIERA VALSIDER SPA

A01 Società per azioni con socio unico soggetta a direzione e coordinamento di Metinvest B.V
Via Antonio Salieri, 36 · 37050 Vallese di Oppeano VR, Italy
Phone +39 045 7133311 · Fax +39 39 045 7133394
Cap. Soc. Euro 22.700.937,00 i.v. · P.IVA 03067420236
C.F. e Reg. Imp. n. 13120560159 · REA 306151/VR
http://valsider.metinvestholding.com


(A) PROCESSO DI ELABORAZIONE / STEELMAKING PROCESS: E = ELECTRIC ; BO = BASI
(B) STATO DI FORNITURA / DELIVERY CONDITION: AR = GREZZO DI LAMINAZIONE / AS
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 ;
M = LAMINAZIONE TERMOMECCANICA / Thermomechanical rolling
(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

MANNI SIPRE
STEEL ENGINEERING
UFFICIO CERTIFICATI - COPIA INFORMATICA CONFORME ORIGINALE
NS. CONFERMA: 0000006104
RIF. ORDINE: AGG.ORD. B9000100 DE
DDT: 0000101575
PLACCA/COLATA: 201840072A

A03 N° Certificato / Certificate no.: 107725
Z02 Data / Date: 22/01/2019
A08 N° Ordine / Works order: 95185698
A07 N° Ordine cliente / Customer's order: AM1S000795
DDT: BOL 1900858
del / date: 21/01/2019
Pratica / File no.:
del / date:

B01/B02/B03
Prodotto / Product: Lamiere / Hot rolled plates
Qualità / Steel grade: S355J2+N
Normativa / Specification: EN 10025-2:2004

A06 Cliente / Customer

**Manni Sipre S.P.A.**
**Via Righi 7**
**37135 VERONA**
**Italy**

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

| B07 ITEM | B07 IDENTIFICATIVO PRODOTTO / PRODUCT ID | B16 COLATA / HEAT | B09/B11 DIMENSIONI [mm] / DIMENSIONS | B12 PESO TEORICO [t] / THEORICAL WEIGHT | B07 LOTTO / BATCH NO. | C70 PROCESSO ELAB. (A) / STEELMAKING PROCESS | B04 STATO FORNITURA (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: TEMPERATURA (Q) °C / TEMPERATURE | PERMANENZA (Q) Min / HOLDING TIME | RAFFREDDAMENTO / COOLING | TEMPERATURA (T) °C / TEMPERATURE | PERMANENZA (T) Min / HOLDING TIME | RAFFREDDAMENTO / COOLING |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2018/39053A | A1/02808469 | 30.00X2450X12000 | 6,92 | 49946 | BO | N* | [ZD580] | | | | | | | | | | | | | | | | | |
| 1 | 2018/39187A | A1/02808611 | 30.00X2450X12000 | 6,92 | 49944 | BO | N* | [ZD583] | | | | | | | | | | | | | | | | | |
| 1 | 2018/39692A | A1/02810281 | 30.00X2450X12000 | 6,92 | 50047 | BO | N* | [ZD635] | | | | | | | | | | | | | | | | | |
| 1 | 2018/40072A | A1/02808469 | 30.00X2450X12000 | 6,92 | 49176 | BO | N* | [ZD033] | | 19T081 | | | | | | | | | | | | | | | |

## 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S355J2+N Min | | | | | | | | | | | | | | | | | | | | | |
| S355J2+N Max | 0,20 | 1,60 | 0,55 | 0,025 | 0,025 | 0,550 | | | | | | | | | | | | | | | |
| A1/02808469 | 0,16 | 1,48 | 0,22 | 0,010 | 0,003 | 0,060 | 0,040 | 0,040 | 0,01 | 0,033 | 0,005 | 0,023 | 0,005 | | | 0,0060 | 0,0005 | 0,0003 | 0,41 | 0,42 | 0,25 |
| A1/02808611 | 0,17 | 1,53 | 0,30 | 0,011 | 0,002 | 0,040 | 0,020 | 0,040 | 0,01 | 0,038 | 0,005 | 0,022 | 0,005 | | | 0,0070 | 0,0005 | 0,0002 | 0,43 | 0,44 | 0,26 |
| A1/02810281 | 0,17 | 1,46 | 0,27 | 0,014 | 0,002 | 0,040 | 0,020 | 0,030 | 0,01 | 0,035 | 0,005 | 0,023 | 0,005 | | | 0,0070 | 0,0005 | 0,0002 | 0,41 | 0,43 | 0,26 |

| 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 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 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% INDIVIDUAL VALUES | C54 Z% VALORE MEDIO / Z% MEAN VALUE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SPESSORE PRODOTTO / PRODUCT THICKNESS | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S355J2+N Min 16.10 - 40.00 | | | | | | | | | | | | | L | -20 | | 27 | 0 | | | | | | | | | | |
| S355J2+N Min 16.10 - 40.00 | | | | | 20 | 345 | 470 | | 20 | | | | | | | | | | | | | | | | | | |
| S355J2+N Max 16.10 - 40.00 | | | | | 20 | 630 | 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 PRODOTTO PRODUCT 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 STRENGTH | FORMA PROVINO (4) SHAPE OF TEST PIECE | LARGHEZZA [mm] WIDTH | DIREZIONE (3) ORIENTATION | TEMPERATURA [°C] TEST TEMPERATURE | POSIZIONE (2) LOCATION | [J] INDIVIDUAL VALUES | MEDIA [J] SINGOLI VALORI MEAN VALUE | DIREZIONE (3) ORIENTATION | MANDREL MANDRINO [mm] | ANGOLO [°] ANGLE | ESITO (5) RESULT | POSIZIONE (2) LOCATION | METODO TEST METHOD | SINGOLI VALORI INDIVIDUAL VALUES | MEDIA MEAN VALUE | Z% INDIVIDUAL VALUES | Z% VALORE MEDIO Z% MEAN VALUE |
| ZD033 | 30,00 | 2 | P | T | 20 | 435 | 571 | 0,76 | 37 | | P | 10,00 | L | -20 | P | 175 176 166 | 173 | | | | | | | | | | |
| ZD580 | 30,00 | 2 | P | T | 20 | 416 | 570 | 0,73 | 34 | | P | 10,00 | L | -20 | P | 182 154 159 | 165 | | | | | | | | | | |
| ZD583 | 30,00 | 2 | P | T | 20 | 408 | 556 | 0,73 | 27 | | P | 10,00 | L | -20 | P | 156 173 169 | 166 | | | | | | | | | | |
| ZD635 | 30,00 | 2 | P | T | 20 | 418 | 544 | 0,77 | 78 | | P | 10,00 | L | -20 | P | 179 153 166 | 166 | | | | | | | | | | |

C10

UNI EN ISO 6892-1:2009/ UNI EN ISO 148-1:2011

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 10029:2010 CL.A | -0+100 MM | -0+200 MM | EN 10163/2:2004 CL A1 | EN 10029:2010 CL. N |

CERTIFICHIAMO che i prodotti elencati 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 products are consistent with the order prescriptions: marking, inspection and measurement without objection.
DICHIARIAMO CHE I PRODOTTI SONO STATI CONTROLLATI IN ACCORDO ALLA NORMATIVA VIGENTE E CHE LE RADIAZIONI IONIZZANTI NON ECCEDONO IL VALORE DEL FONDO NATURALE.
WE DECLARE THAT THE PRODUCTS WERE CONTROLLED ACCORDING TO STANDARD AND RADIATION DO NOT EXCEED THE NATURAL RADIATION.

Z06

| Z07 | Z03 ENTE COLLAUDO / INSPECTION BODY | Z02 |
|---|---|---|
| | TIMBRO DELL'ISPETTORE<br>STAMP OF THE INSPECTION<br>REPRESENTATIVE | Valsider CONTROLLO QUALITÀ |

| Z04 | |
|---|---|
| CE 0948 | **Prodotti conformi ai requisiti della marcatura CE. Certificato di conformità CE n° 0948-CPR-0015 emesso da TÜV Italia srl .**<br>**Products in compliance with CE marking requirements. Certificate of conformity N° 0948-CPR-0015 from TÜV Italia srl.** |

CERTIFICAZIONE DI SISTEMA QUALITÀ DNV·GL ISO 9001

AZIENDA CON SISTEMA DI GESTIONE QUALITÀ CERTIFICATO DA DNV GL = ISO 9001 =

Certificazione valida per materiale fornitoVi con ns. DDT nr. C4001380 del 23/09/2024 relativo a:

PZ. 1 PARTICOLARE: C09-0001-P006_REV.A SP. 30mm
POS. 1
RIF. VS. ORD. 24005170 DEL 11/09/2024
RIF. VS. COMM. 24-27012

METINVEST
FERRIERA VALSIDER SPA

**Ferrirera Valsider SPA**
Via Antonio Salieri, 36
37050 Vallese di Oppeano VR, Italy
Phone +39 045 7133311
Fax +39 39 045 7133394
http://valsider.metinvestholding.com

**DICHIARAZIONE DI PRESTAZIONE (Reg. UE N. 305/2011)**

N.S355-2

Il sottoscritto Viktor Dembytskyy, rappresentante il produttore:
**Ferriera Valsider spa**
**Via Antonio Salieri , 36 - 37050 - vallese di Oppeano (VR)**
nello stabilimento produttivo di:
**Via Antonio Salieri , 36 - 37050 - vallese di Oppeano (VR)**
Dichiara qui di seguito che i prodotti:
Prodotti piani laminati a caldo in acciaio secondo EN10025-1:2004.

**DECLARATION OF PERFORMANCE (Reg . UE N. 305/2011)**

N.S355-2

I, the undersigned, Viktor Dembytskyy, ,representing the manufacturer:
**Ferriera Valsider spa**
**Via Antonio Salieri , 36 - 37050 - vallese di Oppeano (VR)**
the production site:
**Via Antonio Salieri , 36 - 37050 - vallese di Oppeano (VR)**
Hereby declares that the products: Hot-rolled flat products of steel according to EN10025-1: 2004.
Hot-rolled flat products of steel according to EN10025-1: 2004.

| Qualità / Steel grade | Normativa / Specification |
|---|---|
| S355J2C+N+Z25 | EN 10025-2:2004 |
| S355JR+AR | EN 10025-2:2004 |
| S355JR+N | EN 10025-2:2004 |
| S355K2+AR | EN 10025-2:2004 |
| S355K2+N | EN 10025-2:2004 |
| S355K2+N+Z15 | EN 10025-2:2004 |
| S355K2+N+Z25 | EN 10025-2:2004 |
| S355K2+N+Z35 | EN 10025-2:2004 |
| S355K2C+N | EN 10025-2:2004 |
| S355J0+AR | EN 10025-2:2004 |
| S355J0+AR+Z25 | EN 10025-2:2004 |
| S355J0+N | EN 10025-2:2004 |
| S355J0+N+Z35 | EN 10025-2:2004 |
| S355J0C+AR | EN 10025-2:2004 |
| S355J0C+N | EN 10025-2:2004 |
| S355J2+AR | EN 10025-2:2004 |
| S355J2+N | EN 10025-2:2004 |
| S355J2+N+Z15 | EN 10025-2:2004 |
| S355J2+N+Z25 | EN 10025-2:2004 |
| S355J2+N+Z35 | EN 10025-2:2004 |
| S355J2C+N | EN 10025-2:2004 |

| Tipo prodotto / Product type | Qualità / Steel grade | Codice identificativo univoco prodotto/ Unique product identifier code | Numero interno/ Internal number | Specifica tecnica armonizzata / Harmonized techical specification |
|---|---|---|---|---|
| Lamiera/Plate | S355J2+N | 2018/39053A | 1839053 | EN10025-1:2004 |
| Lamiera/Plate | S355J2+N | 2018/39187A | 1839187 | EN10025-1:2004 |
| Lamiera/Plate | S355J2+N | 2018/39692A | 1839692 | EN10025-1:2004 |
| Lamiera/Plate | S355J2+N | 2018/40072A | 1840072 | EN10025-1:2004 |

Che i prodotti specificati nel presente documento sono destinati ad essere utilizzati nelle strutture saldate, bullonate e chiodate.

Che i prodotti specificati nel presente documento presentano le seguenti caratteristiche essenziali e prestazioni:

The products specified in this document are intended to be used in metal structures or mixed metal and concrete structures.

The products specified in this document have the following essential features and performance:

| Caratteristiche Essenziali / Essential features | Prestazione / Performance | Norma Armonizzata / Harmonized specification |
|---|---|---|
| Tolleranze dimensionali e forma /Tollerance on dimensions and shape | Conforme / Compliance | EN10025-1:2004 |
| Allungamento /Elongation | Conforme / Compliance | EN10025-1:2004 |
| Resistenza a Trazione/Tensile Strength | Conforme / Compliance | EN10025-1:2004 |
| Carico Unitario snervamento/Yield Strength | Conforme / Compliance | EN10025-1:2004 |
| Resilienza/Impact | Conforme / Compliance | EN10025-1:2004 |
| Saldabilità/Weldability | Conforme / Compliance | EN10025-1:2004 |
| Durabilità/Durability | NPD | |
| Sostanza Regolamentata/Regulated substance | NPD | |

Si dichiara inoltre che l'organismo notificato, TÜV Italia [N. 0948] ha effettuato:
- ispezione iniziale dello stabilimento e del controllo della produzione in fabbrica
- sorveglianza, valutazione e verifica continua del controllo della produzione in fabbrica

secondo il sistema di valutazione e verifica della costanza della prestazione 2+ ed ha rilasciato il certificato di controllo della produzione in fabbrica numero 0948-CPR-0015

It also states that the notified body, TÜV Italia [N. 0948], carried out:
- Initial inspection of factory and of factory production control
- Monitoring, evaluation and continuous assessment of factory production control

according to the system of assessment and verification of constancy of performance 2 + and released the certificate of factory production control number 0948-CPR-0015

CE 0948

**Lamiere conformi ai requisiti della marcatura CE. Certificato di conformità CE n° 0948-CPR-0015 emesso da TÜV Italia srl . Plates in compliance with CE marking requirements. Certificate of conformity N° 0948-CPR-0015 from TÜV Italia srl.**

Si rilascia la presente dichiarazione di prestazione sotto la responsabilità esclusiva del fabbricante

This declaration of performance is made under the sole responsibility of the manufacturer

Vallese di Oppeano,

22/01/2019

Viktor Dembytskyy

Managing Director
Ferriera Valsider s.p.a.
Metinvest Group

posco

# Mill Test Certificate

Certificate No. : 230412-FP01KS-0011A1-0003
Date of Issue : Apr., 17, 2023

Order No. : 01S6041044
PO No. : 2302-23021 (23021)
Supplier :
Commodity : PLATE
Customer :
Spec & Type : EN10025-2 S355J2+NR

| Size | Product No. | Quantity | Weight (kg) | Heat No. | Position | Tensile Test YP (MPa) | Tensile Test TS (MPa) | Tensile Test EL (%) | Impact Test V Notch -20 °C Energy (Joule) | Division | Chemical Composition C (%) | Si (%) | Mn (%) | P (%) | S (%) | Cr (%) | Ni (%) | B (ppm) | Cu (%) | Mo (%) | N (ppm) | Nb (%) | Ti (%) | V (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12x2500x12000 | PP35062501-2504 | 4 | 11,304 | SU99872 | T | 444 | 562 | 25 | 1: 157<br>2: 120<br>3: 136<br>A: 138 | L<br>P | 0.1493<br>0.1457 | 0.203<br>0.193 | 1.517<br>1.528 | 0.0084<br>0.0071 | 0.0028<br>0.0028 | 0.020<br>0.039 | 0.020<br>0.017 | 2<br>1 | 0.019<br>0.020 | 0.005<br>0.004 | 36<br>33 | 0.024<br>0.024 | 0.0129<br>0.0124 | 0.001<br>0.002 |
| 12x2500x12000 | PP35062201-2204 | 4 | 11,304 | SU99872 | T | 450 | 564 | 27 | 1: 256<br>2: 216<br>3: 270<br>A: 247 | L<br>P | 0.1493<br>0.1457 | 0.203<br>0.193 | 1.517<br>1.528 | 0.0084<br>0.0071 | 0.0028<br>0.0028 | 0.020<br>0.039 | 0.020<br>0.017 | 2<br>1 | 0.019<br>0.020 | 0.005<br>0.004 | 36<br>33 | 0.024<br>0.024 | 0.0129<br>0.0124 | 0.001<br>0.002 |
| ~~12x2500x12000~~ | ~~PP35099301-9304~~ | ~~4~~ | ~~11,304~~ | ~~SU99873~~ | T | 445 | 564 | 29 | 1: 117<br>2: 178<br>3: 127<br>A: 141 | L<br>P | 0.1480<br>0.1490 | 0.199<br>0.195 | 1.530<br>1.536 | 0.0067<br>0.0074 | 0.0024<br>0.0031 | 0.042<br>0.037 | 0.020<br>0.014 | 1<br>1 | 0.020<br>0.020 | 0.004<br>0.004 | 38<br>35 | 0.026<br>0.024 | 0.0129<br>0.0122 | 0.002<br>0.002 |
| 12x2500x12000 | PP35099401-9404<br>24T176 | ~~4~~ 1 | 11,304 | SU99873 | T | 445 | 564 | 29 | 1: 117<br>2: 178<br>3: 127<br>A: 141 | L<br>P | 0.1480<br>0.1490 | 0.199<br>0.195 | 1.530<br>1.536 | 0.0067<br>0.0074 | 0.0024<br>0.0031 | 0.042<br>0.037 | 0.020<br>0.014 | 1<br>1 | 0.020<br>0.020 | 0.004<br>0.004 | 38<br>35 | 0.026<br>0.024 | 0.0129<br>0.0122 | 0.002<br>0.002 |
| ~~12x2500x12000~~ | ~~PP35099501-9504~~ | ~~4~~ | ~~11,304~~ | ~~SU99873~~ | T | 445 | 564 | 29 | 1: 117<br>2: 178<br>3: 127<br>A: 141 | L<br>P | 0.1480<br>0.1490 | 0.199<br>0.195 | 1.530<br>1.536 | 0.0067<br>0.0074 | 0.0024<br>0.0031 | 0.042<br>0.037 | 0.020<br>0.014 | 1<br>1 | 0.020<br>0.020 | 0.004<br>0.004 | 38<br>35 | 0.026<br>0.024 | 0.0129<br>0.0122 | 0.002<br>0.002 |
| ~~12x2500x12000~~ | ~~PP35099601-9604~~ | ~~4~~ | ~~11,304~~ | ~~SU99873~~ | T | 449 | 572 | 30 | 1: 178<br>2: 77<br>3: 204<br>A: 153 | L<br>P | 0.1480<br>0.1490 | 0.199<br>0.195 | 1.530<br>1.536 | 0.0067<br>0.0074 | 0.0024<br>0.0031 | 0.042<br>0.037 | 0.020<br>0.014 | 1<br>1 | 0.020<br>0.020 | 0.004<br>0.004 | 38<br>35 | 0.026<br>0.024 | 0.0129<br>0.0122 | 0.002<br>0.002 |

CE EN10025-2 S355J2
2814

* Position - T : Top, M : Middle, B : Bottom
* Tensile Test. Direction : Transversal, Gauge Length : 5.65 $\sqrt{A_o}$ (Rectangular), YP Method : Upper Point
* Impact Test. Direction : Surface Longitudinal, Full-Size : 10 mmX10 mm
* Division - L : Ladle Analysis, P : Products Analysis
* Supply Condition : As-Rolled unless otherwise Heat Treated.

This material has been fully killed and made by basic oxygen process. This material is fine grained steel.
This material has been made by vacuum degassing process.
No repair welding was performed to the products. Test Certificate is issued according to ISO 10474/EN 10204 3.1.
We hereby certify that the material herein has been made in accordance with the order and above specification.

Legal sanction can be imposed on forging. Improper use of product can cause safety issues.

Surveyor To :

Park, Junyoung

posco

# Mill Test Certificate

Certificate No. : 230412-FP01KS-0011A1-0003
Date of Issue : Apr., 17, 2023

Order No. : 01S6041044
PO No. : 2302-23021 (23021)
Supplier :
Commodity : PLATE
Customer :
Spec & Type : EN10025-2 S355J2+NR

| Product No. | Division | Sol-Al (%) | CEQ (%) |
|---|---|---|---|
| PP35062501-2504 | L | 0.032 | 0.41 |
| | P | 0.031 | |
| PP35062201-2204 | L | 0.032 | 0.41 |
| | P | 0.031 | |
| PP35099301-9304 | L | 0.030 | 0.42 |
| | P | 0.033 | |
| PP35099401-9404 | L | 0.030 | 0.42 |
| | P | 0.033 | |
| PP35099501-9504 | L | 0.030 | 0.42 |
| | P | 0.033 | |
| PP35099001-9004 | L | 0.030 | 0.42 |
| | P | 0.033 | |

Certificazione valida per materiale fornitoVi con ns. DDT nr. C4001380 del 23/09/2024 relativo a:

PZ. 2 PARTICOLARE: C09-0001-P004_REV.C SP. 12mm POS. 10
PZ. 4 PARTICOLARE: C09-0001-P006_REV.A SP. 12mm POS. 2
RIF. VS. ORD. 24005170 DEL 11/09/2024
RIF. VS. COMM. 24-27012

CE EN10025-2 S355J2
2814

This material has been fully killed and made by basic oxygen process. This material is fine grained steel.
This material has been made by vacuum degassing process.
No repair welding was performed to the products. Test Certificate is issued according to ISO 10474/EN 10204 3.1.
We hereby certify that the material herein has been made in accordance with the order and above specification.

Legal sanction can be imposed on forging. Improper use of product can cause safety issues.

Surveyor To :

Park, Junyoung

posco

# CE marking information

Certificate No. : 230412-FP01KS-0011A1-0003
Date of Issue : Apr., 17, 2023

Order No. : 01S6041044
PO No. : 2302-23021 (23021)
Supplier :
Commodity : PLATE
Customer :
Spec & Type : EN10025-2 S355J2+NR

| Product No. | CE 2814 | POSCO Co., Ltd - Gwangyang Works<br>20-26, Pokposarang-gil, Gwangyang-si, Jeollanam-do, 57807, Korea<br>12<br>2814/CPR/0038/CPR/M U M/1210003/1 |
|---|---|---|
| PP35099301-9304<br>PP35099401-9404<br>PP35099501-9504<br>PP35099001-9004<br>PP35099101-9104<br>PP35099201-9204<br>PP35061701-1704 | **EN 10025-1:2004**<br>**Types S355J2**<br>To be used in construction structural steels<br>Tolerances on dimensions and shape :EN 10029 | **Elongation :**<br>**Tensile strength :**<br>**Yield strength :** : **EN10025-2**<br>**Impact strength :**<br>**Weldability :**<br>**Durability :**<br>Dangerous Substances : No Performance Determind |

This material has been fully killed and made by basic oxygen process. This material is fine grained steel.
This material has been made by vacuum degassing process.
No repair welding was performed to the products. Test Certificate is issued according to ISO 10474/EN 10204 3.1.
We hereby certify that the material herein has been made in accordance with the order and above specification.

Legal sanction can be imposed on forging. Improper use of product can cause safety issues.

Surveyor To :

Park, Junyoung

posco

# Declaration of Performance

Issued in accordance with the
**CONSTRUCTION PRODUCTS REGULATIONS**
(EU Regulation No. 305/2011)

**EU DoP No. GY-S355J2-220805-001**

**Types S355J2 according EN 10025-2**
To be used in construction structural steels

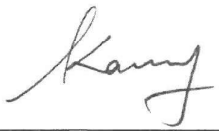

**POSCO Co., Ltd. - Gwangyang works**
20-26, Pokposarang-gil,
Gwangyang-si, Jeollanam-do, Korea
Tel : +82 (0)61 790 0114
Webside : www.posco.com


CE Marking Notified Body
**Lloyd's Register Verification B.V.**
K.P. Van der Mandelelaan 41 A Rotterdam
Country : Netherlands
Tel :+31 (0)10 4145088
Email : rotterdam@lr.org
Website : www.lr.org

system of assessment and verification of constancy of performance of the construction product as set out EN10025-1:2004
System 2+

Certificate No.
2814/CPR/0038/CPR/MUM/1210003/1

Lloyd's Register Verification B.V.(2814) performed initial inspection of the manufacturing plant and of factory. Production control and the continuous surveillance assessment and evaluation of factory production control under system 2+ and issued the certificate of conformity of the factory production control.



C.H. Kang / Head,
Quality Planning Group,
POSCO

05th August 2022
Date

| Essential characteristics | Perfomance | Harmonised technical specification |
|---|---|---|
| Tolerances on dimensions and shape | Acc. to EN10029 | EN10025-1 : 2004 |
| Minimum yield strength (MPa) | Threshold value in EN10025-2 for S355J2 | |
| Tensile strength (MPa) | | |
| Minimum percentage elongation after fracture (%) | | |
| Impact strength (longitudinal) | | |
| Weldability Maximum CEV (Ladle analysis) | | |
| Durability | | |

# ArcelorMittal Nippon Steel India Limited

HAZIRA - 394270, DIST.SURAT, GUJARAT, INDIA
CIN : U27100GJ1976FLC013787

## MILL TEST AND INSPECTION CERTIFICATE

Test Certificate No. : HPL/TC/D/2010/18044
Material Specification : EN 10025-2 : 2019 S355 J2+N
Sales Order No. : 2110090961

Date : 25.08.2023

M AND S GLOBAL INVESTMENTS SA,
VIA NASSA 29, 6900 LUGANO,
SWITZERLAND

WE CERTIFY THAT THE PLATES HAVE BEEN MANUFACTURED, INSPECTED AND TESTED IN ACCORANCE WITH THE REQUIEREMENT OF EN 10025-2 : 2019 S355 J2+N.

| Sr. No. | Plate No. | Heat No. | Size in mm T_W_L | Theoretical Weight (Mt.) | Mechanical Properties | | | | | | | | Chemical Analysis (%) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | YS | UTS | %EL | Impact in Joules at '-20°C' | | | | | | C# | Mn | S | P | Si | Cr | Ni | Cu | Ti | V | Nb | Mo | Al | N | Nb+V+Ti | CE *** |
| | | | | | MPa | MPa | GL= 5.65√S0 | 1 | 2 | 3 | Avg. | LA/ PA | 0.200 | 1.600 | 0.025 | 0.025 | 0.150-0.250 | ~ | ~ | 0.550 | 0.050 | 0.130 | 0.050 | ~ | 0.020 | 0.0120 | 0.200 | 0.450 | |
| | | | | | 355 Min * | 470-630 | 20 Min ** | 27 J Min | | | | | | Max | Max | Max | Max | | | | Max | Max | Max | Max | | Min | Max | Max | Max | |
| 173 | JV4162211D | Q20590 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Q20590 Total | | 84.780 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 174 | JV4091111D | Q20592 | 15_2500_12000 | 3.533 | 396 | 525 | 37 | 176 | 198 | 138 | 171 | LA | 0.175 | 1.295 | 0.002 | 0.011 | 0.191 | 0.026 | 0.046 | 0.040 | 0.002 | 0.047 | 0.004 | 0.005 | 0.037 | 0.0063 | 0.052 | 0.413 | | |
| 175 | JV4091112D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | PA | 0.171 | 1.300 | 0.001 | 0.011 | 0.190 | 0.026 | 0.049 | 0.037 | 0.003 | 0.049 | 0.004 | 0.007 | 0.035 | 0.0072 | 0.056 | 0.410 | | |
| 176 | JV4091211D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 177 | JV4092111D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 178 | JV4092211D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 179 | JV4092212D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 180 | JV4093111D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 181 | JV4093112D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 182 | JV4093113D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 183 | JV4101111D | Q20592 | 15_2500_12000 | 3.533 | 391 | 542 | 35 | 192 | 148 | 198 | 179 | | | | | | | | | | | | | | | | | | | |
| 184 | JV4101112D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 185 | JV4101113D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 186 | JV4103111D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 187 | JV4103112D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 188 | JV4103211D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 189 | JV4104111D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 190 | JV4104211D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 191 | JV4104212D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 192 | JV4105111D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 193 | JV4105211D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 194 | JV4105212D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 195 | JV4106111D | Q20592 | 15_2500_12000 | 3.533 | 431 | 544 | 32 | 182 | 162 | 196 | 180 | | | | | | | | | | | | | | | | | | | |
| 196 | JV4106112D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 197 | JV4106211D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 198 | JV4107111D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 199 | JV4107112D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 200 | JV4107113D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 201 | JV4108111D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 202 | JV4108112D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 203 | JV4108113D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 204 | JV4109111D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 205 | JV4109211D | Q20592 | 15_2500_12000 | 3.533 | 435 | 525 | 36 | 130 | 144 | 160 | 145 | | | | | | | | | | | | | | | | | | | |
| 206 | JV4109212D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 207 | JV4110111D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 208 | JV4110112D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 209 | JV4110211D | Q20592 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | |

24T169

COPIA CONFORME ALL'ORIGINALE
IL PRESENTE CERTIFICATO VALE PER
LA QUANTITA' DEL NS. DDT 946 DEL 05/04/2024
SETAL S.P.A.

HS Code: 72085110
Place of Melting: INDIA, Facility: AM/NS INDIA
Place of Hot-rolling: INDIA, Facility: AM/NS INDIA

Authorised Signatory (Quality Assurance)
ArcelorMittal Nippon Steel India Limited
AMNSIL/QAC-PMP/05/F
www.amns.in

# AM/NS INDIA

## ArcelorMittal Nippon Steel India Limited

HAZIRA - 394270, DIST.SURAT, GUJARAT, INDIA
CIN : U27100GJ1976FLC013787

## MILL TEST AND INSPECTION CERTIFICATE

CE 0045 ArcelorMittal Nippon Steel India Limited 06 0045-CPR-0978

Test Certificate No. : HPL/TC/D/2010/18044
Material Specification : EN 10025-2 : 2019 S355 J2+N
Sales Order No. : 2110090961

Date : 25.08.2023

M AND S GLOBAL INVESTMENTS SA,
VIA NASSA 29, 6900 LUGANO,
SWITZERLAND

WE CERTIFY THAT THE PLATES HAVE BEEN MANUFACTURED, INSPECTED AND TESTED IN ACCORANCE WITH THE REQUIEREMENT OF EN 10025-2 : 2019 S355 J2+N.

| Sr. No. | Plate No. | Heat No. | Size in mm T_W_L | Theoretical Weight (Mt.) | Mechanical Properties | | | | | | | | Chemical Analysis (%) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | YS | UTS | %EL | Impact in Joules at '-20°C' | | | | | | C# | Mn | S | P | Si | Cr | Ni | Cu | Ti | V | Nb | Mo | Al | N | Nb+V+Ti | CE *** |
| | | | | | MPa | MPa | GL= 5.65√S0 | 1 | 2 | 3 | Avg. | LA/ PA | 0.200 | 1.600 | 0.025 | 0.025 | 0.150-0.250 | ~ | ~ | 0.550 | 0.050 | 0.130 | 0.050 | ~ | 0.020 | 0.0120 | 0.200 | 0.450 | | |
| | | | | | 355 Min * | 470-630 | 20 Min ** | 27 J Min | | | | | | Max | Max | Max | Max | | | | Max | Max | Max | Max | | Min | Max | Max | Max | | |
| 312 | JV4175212D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 313 | JV4176111D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 314 | JV4176112D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 315 | JV4176211D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 316 | JV4190111D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 317 | JV4190211D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 318 | JV4190311D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 319 | JV4191111D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 320 | JV4191211D | R19261 | 20_2500_12000 | 4.710 | 436 | 545 | 33 | 196 | 174 | 176 | 182 | | | | | | | | | | | | | | | | | | | | |
| 321 | JV4191212D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 322 | JV4316111D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 323 | JV4316211D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 324 | JV4317111D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 325 | JV4317211D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 326 | JV4317311D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 327 | JV4318111D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 328 | JV4318211D | R19261 | 20_2500_12000 | 4.710 | 401 | 553 | 31 | 180 | 160 | 160 | 167 | | | | | | | | | | | | | | | | | | | | |
| 329 | JV4318212D | R19261 | 20_2500_12000 | 4.710 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **R19261 Total** | | 122.460 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 330 | JV4111111D | R19262 | 15_2500_12000 | 3.533 | 429 | 534 | 37 | 180 | 132 | 146 | 153 | LA | 0.172 | 1.289 | 0.003 | 0.011 | 0.196 | 0.020 | 0.014 | 0.010 | 0.002 | 0.045 | 0.004 | 0.002 | 0.036 | 0.0060 | 0.051 | 0.402 | | | |
| 331 | JV4111112D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | PA | 0.169 | 1.293 | 0.002 | 0.013 | 0.193 | 0.018 | 0.016 | 0.011 | 0.004 | 0.047 | 0.005 | 0.005 | 0.034 | 0.0069 | 0.056 | 0.400 | | | |
| 332 | JV4111113D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 333 | JV4112111D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 334 | JV4112112D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 335 | JV4112211D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 336 | JV4113111D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 337 | JV4113211D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 338 | JV4113212D | R19262 | 15_2500_12000 | 3.533 | 403 | 539 | 36 | 142 | 186 | 182 | 170 | | | | | | | | | | | | | | | | | | | | |
| 339 | JV4114111D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 340 | JV4114112D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 341 | JV4114113D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 342 | JV4115111D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 343 | JV4115112D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 344 | JV4115113D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 345 | JV4116111D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 346 | JV4116112D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 347 | JV4116113D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 348 | JV4117111D | R19262 | 15_2500_12000 | 3.533 | | | | | | | | | | | | | | | | | | | | | | | | | | | |

COPIA CONFORME ALL'ORIGINALE

IL PRESENTE CERTIFICATO VALE PER

LA QUANTITA' DEL NS. DDT 946 DEL 05/04/2024

Authorised Signatory (Quality Assurance)
ArcelorMittal Nippon Steel India Limited
AMNSIL/QAC-PMP/05/F
www.amns.in

HS Code: 7 2 0 8 5 1 9 0

Place of Melting & Casting: INDIA, Facility: AM/NS INDIA
Place of Hot-rolling: INDIA, Facility: AM/NS INDIA

SETAL S.P.A.

# ArcelorMittal Nippon Steel India Limited

HAZIRA - 394270, DIST.SURAT, GUJARAT, INDIA
CIN : U27100GJ1976FLC013787

## MILL TEST AND INSPECTION CERTIFICATE

CE 0045 ArcelorMittal Nippon Steel India Limited DB 0045-CPR-0975

Test Certificate No. : HPL/TC/D/2010/18044
Material Specification : EN 10025-2 : 2019 S355 J2+N
Sales Order No. : 2110090961

Date : 25.08.2023

M AND S GLOBAL INVESTMENTS SA,
VIA NASSA 29, 6900 LUGANO,
SWITZERLAND

WE CERTIFY THAT THE PLATES HAVE BEEN MANUFACTURED, INSPECTED AND TESTED IN ACCORANCE WITH THE REQUIEREMENT OF EN 10025-2 : 2019 S355 J2+N.

| Sr. No. | Plate No. | Heat No. | Size in mm T_W_L | Theoretical Weight (Mt.) | Mechanical Properties | | | | | | | | Chemical Analysis (%) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | YS | UTS | %EL | Impact in Joules at '-20°C' | | | | | | C# | Mn | S | P | Si | Cr | Ni | Cu | Ti | V | Nb | Mo | Al | N | Nb+V+Ti | CE *** |
| | | | | | MPa | MPa | GL= 5.65√S0 | 1 | 2 | 3 | Avg. | LA/ PA | 0.200 | 1.600 | 0.025 | 0.025 | 0.150-0.250 | ~ | ~ | 0.550 | 0.050 | 0.130 | 0.050 | ~ | 0.020 | 0.0120 | 0.200 | 0.450 | | |
| | | | | | 355 Min * | 470-630 | 20 Min ** | 27 J Min | | | | | | Max | Max | Max | Max | | | | Max | Max | Max | Max | | Min | Max | Max | Max | | |
| | | S21512 Total | | 76.539 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 416 | JV4479000G | S21537 | 50_2500_12000 | 11.775 | 410 | 528 | 34 | 152 | 152 | 138 | 147 | LA | 0.180 | 1.373 | 0.002 | 0.015 | 0.219 | 0.027 | 0.025 | 0.023 | 0.003 | 0.055 | 0.004 | 0.006 | 0.034 | 0.0072 | 0.062 | 0.430 | | |
| 417 | JV4480000G | S21537 | 50_2500_12000 | 11.775 | | | | | | | | PA | 0.178 | 1.374 | 0.001 | 0.014 | 0.216 | 0.026 | 0.024 | 0.023 | 0.002 | 0.056 | 0.006 | 0.008 | 0.032 | 0.0081 | 0.064 | 0.428 | | |
| 418 | JV4481000G | S21537 | 50_2500_12000 | 11.775 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 419 | JV4482000G | S21537 | 50_2500_12000 | 11.775 | 403 | 521 | 35 | 172 | 136 | 152 | 153 | | | | | | | | | | | | | | | | | | | |
| 420 | JV4483000G | S21537 | 50_2500_12000 | 11.775 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 421 | JV4484000G | S21537 | 50_2500_12000 | 11.775 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 422 | JV4485000G | S21537 | 50_2500_12000 | 11.775 | 418 | 553 | 37 | 168 | 152 | 164 | 161 | | | | | | | | | | | | | | | | | | | |
| 423 | JV4486000G | S21537 | 50_2500_12000 | 11.775 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | S21537 Total | | 94.200 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Grand Total | | 2322.277 | | | | | | | | | | | | | | | | | | | | | | | | | | |

Note: (1) Test Certificate conforms to EN 10204:2004 Type 3.1
(2) Material conforms to standard rolling & weight tolerance.
(3) Supply condition : Plates in Normalizing rolled and trimmed edge condition.
(4) Process Route : Hot Metal/ HBI - EAF/Conarc - LF (Fully Killed steel) - VD- CCM - RHF - Plate Rolling (Normalizing Rolling).
(5) Orientation of Tensile test Specimen is Transverse and Impact test specimen is Longitudinal to the rolling direction.
(6) Tensile specimen size : 10 mm dia round specimen for thickness >20mm & full thickness flat specimen for thickness ≤20mm. Impact specimen size : 10x10x55mm for thickness ≥11mm & 7.5x10x55mm for thickness 8mm to <11mm.
(7) * Requirement of YS is 355 MPa min for thickness ≤16mm, 345 MPa min for thickness >16mm to ≤40mm, 335 MPa min for >40 to ≤63mm thicknes & 325 MPa min for >63 to ≤80mm thickness
** Requirement of %EL is 20min for thickness >3mm to ≤40mm, 19min for thickness >40mm to ≤63mm & 18min for thickness >63mm to ≤80mm.
*** Requirement of CE is 0.450 max for thickness ≤30mm & 0.470 max for thickness >30mm.
# Requirement of %C is 0.200 max for thickness ≤40mm & 0.220 max for thickness >40mm.
(8) Surface condition as per EN 10163-2 : 2004 Class B Sub class 3. Reconditioning / Repair of plates by welding on steel not performed.
(9) Ultrasonic Test found satisfactory as per EN10160_CLASS_S1E1.
(10) Stencilling marking details : Manufacturer Name, Plate No, Heat No, Size, Specification, UT code, CE Marking. Low stress steel die stamping details: Plate No, Heat No, Specification.
(11) Tolerance on Thickness as per EN 10029 Class A. Flatness as per EN 10029 Class N Type L Table 4:2010 & Camber as per EN 10029:2010 (0.2% max of actual length of the plate).
(12) Durability : No performance determined
(13) Regulated Substance : No performance determined
(14) Intended uses : Hot rolled steel plates for Building Construction or Civil Engineering.

Legend: LA: Ladle Analysis(%), PA: Product Analysis(%), T-Thickness, W-Width, L-Length, CE: C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15.
HBI - Hot Briquetted Iron, EAF- Electric Arc Furnace, LF- Ladle Furnace, VD- Vacuum Degassing, CCM- Continuous Casting Mill, RHF- Reheating Furnace.

COPIA CONFORME ALL'ORIGINALE
IL PRESENTE CERTIFICATO VALE PER
LA QUANTITA' DEL NS. DDT 946 DEL 05/04/2024
SETAL S.P.A.

HS Code: 7 2 0 8 5 1 1 0
Place of Melting & Casting: INDIA, Facility: AM/NS INDIA
Place of Hot-rolling: INDIA, Facility: AM/NS INDIA

Authorised Signatory (Quality Assurance)
ArcelorMittal Nippon Steel India Limited

Certificazione valida per materiale fornitoVi con ns. DDT nr. C4001380 del 23/09/2024 relativo a:
PZ. 2 PARTICOLARE: C09-0001-P004_REV.C SP. 15mm POS. 2
PZ. 2 PARTICOLARE: C09-0001-P004_REV.C SP. 15mm POS. 6
PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 15mm POS. 8
PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 15mm POS. 9
PZ. 1 PARTICOLARE: C09-0001-P004_REV.C SP. 15mm POS. 19
PZ. 2 PARTICOLARE: C09-0001-P004_REV.C SP. 15mm POS. 14
PZ. 1 PARTICOLARE: C09-0001-P006_REV.A SP. 15mm POS. 3
PZ. 1 PARTICOLARE: C09-0001-P006_REV.A SP. 15mm POS. 4
PZ. 2 PARTICOLARE: C09-0001-P006_REV.A SP. 15mm POS. 5
PZ. 2 PARTICOLARE: C09-0001-P006_REV.A SP. 15mm POS. 6
PZ. 2 PARTICOLARE: C09-0001-P006_REV.A SP. 15mm POS. 7
PZ. 4 PARTICOLARE: C09-0001-P006_REV.A SP. 15mm POS. 8
RIF. VS. ORD. 2400177 DEL 11/09/2024 - RIF. VS. COMM. 24-27012

AM/NS INDIA

# DECLARATION OF PERFORMANCE

No: PM/CE/2016/02

Unique identification code of the product-type:
**Plate S355J2 / 1.0577**

1. Type, batch or serial number or any other element allowing identification of the construction product as required under Article 11(4):

   **Plate S355J2 / 1.0577 according to EN 10025-2**

2. Intended use or uses of the construction product, in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer:

   **Welded, bolted and riveted structures**

3. Name, registered trade name or registered trade mark and contact address of the manufacturer as required pursuant Article 11(5):

   **ArcelorMittal Nippon Steel India Limited**
   **Address: 27th KM, Surat-Hazira Road, Hazira, Surat, India - 394270**

4. Name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2):

   **Not applicable**

5. System or systems of assessment and verification of constancy of performance of the construction product as set out in Annex V:

   **System 2+**

6. In case of the declaration of performance concerning a construction product covered by a harmonised standard:

7. Notified body TUV NORD System GmbH & Co KG, Germany performed the initial inspection of the manufacturing plant and of factory production control and the continuous surveillance, assessment and evaluation of factory production control under system 2+ and issued the certificate of conformity of the factory production control with no 0045-CPR-0978.

AM/NS INDIA

8. Declared performance:

| Essential characteristic | | | Performance | | Harmonised techn. specification |
|---|---|---|---|---|---|
| Tolerances on dimensions / shape | Thickness | | EN 10029 | | EN 10025-1:2004 |
| | Flatness | | EN 10029 | | |
| Yield strength | Nominal thickness (mm) > | ≤ | Values min (MPa) | | |
| | | 16 | 355 | | |
| | 16 | 40 | 345 | | |
| | 40 | 63 | 335 | | |
| | 63 | 80 | 325 | | |
| | 80 | 100 | 315 | | |
| | 100 | 150 | 295 | | |
| Tensile strength | Nominal thickness (mm) > | ≤ | Values min (MPa) | max (MPa) | |
| | | 100 | 470 | 630 | |
| | 100 | 400 | 450 | 600 | |
| Elongation | Nominal thickness (mm) > | ≤ | Values min (%) | | |
| | | 40 | 20 | | |
| | 40 | 63 | 19 | | |
| | 63 | 150 | 18 | | |
| | 150 | 400 | 17 | | |
| Impact strength | Nominal thickness (mm) > | ≤ | Values min (J) | | |
| | | 400 | 27 at -20°C | | |
| Weldability | Nominal thickness (mm) > | ≤ | Values max (CEV, %) | | |
| | | 40 | 0,43 | | |
| | 40 | 100 | 0,45 | | |
| Durability (chemical composition) | Nominal thickness (mm) > | ≤ | | min (%) | max (%) |
| | | 30 | C | | 0,20 |
| | | | Si | | 0,55 |
| | | | Mn | | 1,60 |
| | | | P | | 0,025 |
| | | | S | | 0,025 |
| | | | Cu | | 0,55 |
| | 30 | 400 | C | | 0,22 |
| | | | Si | | 0,55 |
| | | | Mn | | 1,60 |
| | | | P | | 0,025 |
| | | | S | | 0,025 |
| | | | Cu | | 0,55 |

9. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 8.

This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 3.
Signed for and on behalf of the manufacturer by:

Sumanta Dasgupta

(Quality Assurance)

Hazira-Surat, Date: 19.07.2023

PM/CE/2016/02

## TRACCIABILITA' ORDINE REMAZEL 4122-24006104

| POS. | SP. | Q.TA | CERTIFICATO | COLATA | ID PLATE |
|---|---|---|---|---|---|
| C09-0001-P0003_REV.A | 15 | 4 | 24066181 | 3300962 | 1000046726 |
| C09-0001-P0005/01 | 45 | 1 | 619669 | LNAA78 | LNAA780802A |
| C09-0001-P0005/02 | 15 | 1 | 2440 | NLK-2466898 | L2403769 |
| C09-0001-P0005/03 | 15 | 1 | 2440 | NLK-2466898 | L2403769 |
| C09-0001-P0005/05 | 15 | 1 | 2440 | NLK-2466898 | L2403769 |
| C09-0001-P0005/06 | 15 | 1 | 2440 | NLK-2466898 | L2403769 |
| C09-0001-P0011/01 | 15 | 2 | 2440 | NLK-2466898 | L2403769 |
| C09-0001-P0085/03 | 15 | 2 | 2440 | NLK-2466898 | L2403769 |
| C09-0001-P0087 | 15 | 1 | 2440 | NLK-2466898 | L2403769 |
| C09-0001-P0005/04 | 25 | 2 | 16624648524 | 340928 | 16F.7120.03 |
| C09-0001-P0011/02 | 25 | 2 | 16624648524 | 340928 | 16F.7120.03 |
| C09-0001-P0005/07 | 30 | 1 | 1347 | SHA-2472001126 | SHA-2472001126 |
| C09-0001-P0028/01 | 20 | 1 | 2443 | EUS/420526 | L2403765 |
| C09-0001-P0028/02 | 20 | 1 | 2443 | EUS/420526 | L2403765 |
| C09-0001-P0056/03 | 20 | 2 | 2443 | EUS/420526 | L2403765 |
| C09-0001-P0085/04 | 20 | 1 | 2443 | EUS/420526 | L2403765 |
| C09-001-P0085/05 | 20 | 1 | 2443 | EUS/420526 | L2403765 |
| C09-0001-P0028/03 | 10 | 2 | 627031 | STAD49 | STAD490209A |
| C09-0001-P0056/02 | 10 | 2 | 627031 | STAD49 | STAD490209A |
| C09-0001-P0056/05 | 10 | 1 | 627031 | STAD49 | STAD490209A |
| C09-0001-P0057/01 | 10 | 2 | 627031 | STAD49 | STAD490209A |
| C09-0001-P0057/03 | 10 | 1 | 627031 | STAD49 | STAD490209A |
| C09-0001-P0057/04 | 10 | 2 | 627031 | STAD49 | STAD490209A |
| C09-0001-P0057/05 | 10 | 2 | 627031 | STAD49 | STAD490209A |

COSME GROUP

(A04)
(A01)

siderscal

0948-CPR-0617 del 14/05/2024 Rev.00

(B06) (Z04) **Marcatura CE**

CE 0948 24

| **CERTIFICATO DI COLLAUDO INSPECTION CERTIFICATE EN 10204** | | **TIPO CERTIFICATO TYPE OF CERTIFICATE** | |
|---|---|---|---|
| | | | 3.1 |
| (A03) N° | 2443 | DATA | 25/10/2024 |
| Standard Product Reference | | | EN 10025-2 |

| | | | |
|---|---|---|---|
| (A06) CLIENTE / CUSTOMER | COSME GROUP SRL | (B07) COLATA / HEAT | EUS/420526 |

| | | | | | |
|---|---|---|---|---|---|
| N° ORDINE / CUSTOMER ORDER (A07) | RIF. VS. ORD. DEL 21/10/2024 | CODICE ARTICOLO / PRODUCT NUMBER (A09) | L.S355.020.2000.GG00 | REF. DDT N° | 870 VEDT24 del 24/10/2024 |
| N* ORDINE INTERNO / INTERNAL ORDER (A08) | 136 / 24VEOR | LOTTO / LOT | **L2403765** | | |

## ANALISI CHIMICHE DI COLATA / HEAT ANALYSIS

| %C | %Si | %Mn | %P | %S | %Cr | %Ni | %Cu | %Mo | %V | %Nb | %Ti | %Al | %N | %H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,186 | 0,218 | 1,520 | 0,010 | 0,008 | 0,021 | 0,008 | 0,015 | 0,000 | 0,002 | 0,002 | 0,002 | 0,042 | 37,000 | 0,000 |

| | | | | | Dimensioni Nominali/Nominal Dimension | | | |
|---|---|---|---|---|---|---|---|---|
| Condizioni Fornitura (B04) Product Delivery Conditions | +N | Elaborazione dell'acciaio (C70) | BOF | Grade (B02) (B03) S355J2 | T (B09) | W (B10) | L (B11) | CEV (C82) |
| | | | | | 20,0 | 2015 | 12230 | 0,445 |

| Prodotto/Product (B01) | Massa Teorica / Theoretical Mass (B12) | | Massa Effettiva / Actual Mass (B13) | | IDL | N° Pezzi / N° Pieces |
|---|---|---|---|---|---|---|
| LAMIERE | | 3869 | | 960 | 1643-2/24 | 1 (B08) |

## CARATTERISTICHE MECCANICHE / MECHANICAL PROPERTIES

| NORMA / STANDARD (C05) | PROVE DI TRAZIONE\TENSILE TEST | | | Orientamento dei provon / direction of test pieces (1) (C02) | T |
|---|---|---|---|---|---|
| | Rm (Mpa) | ReH (Mpa) | A% | Forma del provino / Test piece shape (2) (C10) | FT |
| ISO 6892 | 510 (C12) | 372 (C11) | 29,00 (C13) | (1): T Trasversale/transverse L longitudinale/longitudinal<br>(2): Rett Sezione Rettangolare/ Rectangular Cross-Section<br>Circ. Sezione Circolare/ Circular Cross-Section | |

| Norme Standard (C05) | PROVE DI RESILIENZA | | | | | | Orientamento Provini / Direction of test pieces (C02) |
|---|---|---|---|---|---|---|---|
| ISO 148-1 | Tipo Provini/Test Pieces Type (C40) | K1 (C42) | K2 (C42) | K3 (C42) | KX (C03) | Temp (C43) | |
| | V-notch | 96,000 | 96,000 | 102,00 | 98,000 | -20,00 | L |

| Norme Standard (C05) | PROVE DI TRAZIONE ASSE Z / TENSILE TEST Z AXIS (C50) | | | Orientamento Provini / Direction of test pieces (C02) |
|---|---|---|---|---|
| EN 10164 | Tipo Provini/Test Pieces Type (C51) | Z% AVERAGE THREE TESTS (C52) | MINIMUM Z% (C53) | |
| | | | | Z |

| Norme Standard (D03) | CLASSE ULTRASUONI / ULTRASONIC CLASS (D02) | | Strumento: AnyScan 30 (D06) |
|---|---|---|---|
| EN 10160 | Classe UT / UT Class (D04) | Classe UT Bordo / UT Class Edge (D05) | Sonda:DoppiaPiana4MHz//2Mhz (D07) |
| | | | UT 9712: D-00427-UT (D08) |

## (D01) TOLLERANZE FORMA E DIMENSIONE / SHAPE AND DIMENSION TOLLERANCE

| Planarità / Flatness | | Classe Superficie/Surface class | | Tolleranza Spessore / Thickness Tolerance | | Tolleranza Lunghezza/ Lenght Tolerance | - 0 / + 200 |
|---|---|---|---|---|---|---|---|
| Norma / Standard | N | Norma / Standard | A1 | Norma / Standard | A | Tolleranza Larghezza/ Width Tollerance | - 0 / + 70 |
| EN 10029 | | EN 10163-2 | | EN 10029 | | | |

La spedizione è conforme all'ordine (Z01)
The delivery is in accordance with the order

Organizzazione del controllo / Inspection organization:
QUALITY DEPARTMENT (A05)

Ispettore / Inspector 25/10/2024

siderscal

OFF. 3614 DEL 12/11/2024
W.O. 0011E 24006104 DEL 28/11/2024

COSME GROUP SRL
VIA DEI PLATANI, 15/2
33050 SANTA MARIA LA LONGA (UD)
Tel. 0432 801333 - Fax 0432 801991
P.IVA - C.F. - R.I. di Udine 02815120304
e-mail: info@cosmegroup.it

COSME GROUP

Scheda controllo ultrasuoni
Inspection Certificate

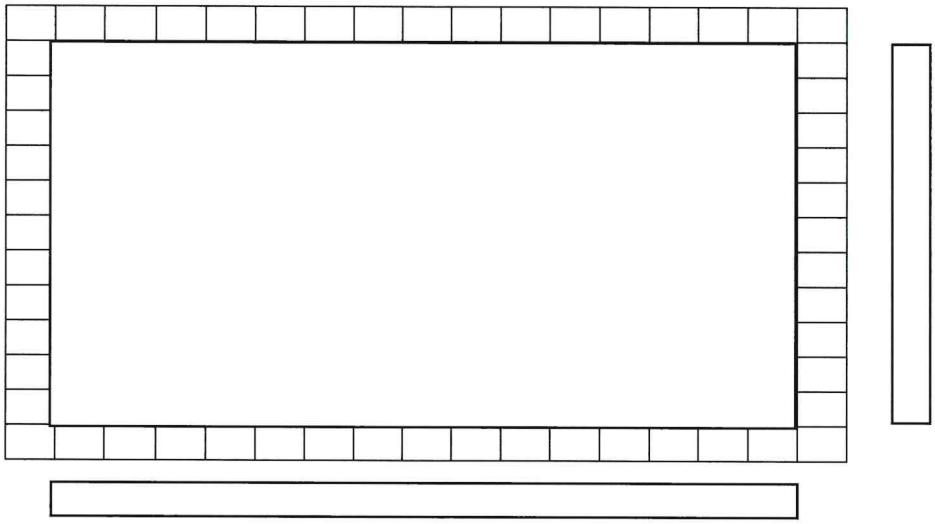
Impresa best 2022 Friuli Venezia Giulia

TÜV SÜD ISO 9001

## SCHEDA CONTROLLO ULTRASUONI LAMIERE

| | | | | |
|---|---|---|---|---|
| CONFERMA GROUP 2024 | CLIENTE: | | QUALITA': S355J2+N | |
| ID LAMIERA: L2403765 | COLATA: EUS/420526 | | | |
| *CONTROLLO DIMENSIONALE* | *SPESSORE* | *LARGHEZZA* | *LUNGHEZZA* | *PESO* |
| DIMENSIONI ORDINE | 20 | 2015 | 12230 | 3870 |
| CONTROLLO ASPETTO E STATO SUPERFICIALE (EN 10163) | NATURALE DI LAMINAZIONE | | | |
| GIUDIZIO SUPERFICIE | CONFORME | | | |

### *SCHEDA LAMIERA*



*STRUMENTO:*
***GILARDONI RDG450***

*ACCOPPIANTE:*
**ACQUA**

*4 - CONTROLLO*
***CAMPIONE*: REF. D. 8mm ECO.**

5 – SONDA UTILIZZATA:
- □ - BDD 20/2 0°
- □ - BDD 20/4 0°
- □ - BDD 20/4 5°
- **X - DP 25/2 0°**
- □ - SD 25/4 0°

ISTRUZIONE TECNICA: PO_851_14 (PG. CONTROLLI UT)

### *CONTROLLO UT*

| NORMA: | CLASSE: | GRIGLIA/BORDO: | -TIPO CONTROLLO: | - CLASSE ASSEGNATA: |
|---|---|---|---|---|
| **UNI EN 10160** | **S2E3** | **100x100** | **100% SUPERFICIE INDICATA** | **S2E3** |

*- ANOMALIE RISCONTRATE:* NESSUNA ANOMALIA RISCONTRATA.

LAMIERA BORDI NATURALI

*COMPILATO: ANDREA ORSO*
*UNI EN ISO 9712:12 – SNT TC 1°*
*LEV. 3 UT – C,F,T,W,WP – IND-21-02444-R*

*- DATA COMPILAZIONE SCHEDA: 25/10/2024*

(A04)
(A01)

siderscal

| CERTIFICATO DI COLLAUDO INSPECTION CERTIFICATE EN 10204 | | TIPO CERTIFICATO TYPE OF CERTIFICATE |
|---|---|---|
| | | 3.1 |
| (A03) N° | 2440 | DATA 25/10/2024 |
| Standard Product Reference | | |

| (A06) CLIENTE / CUSTOMER | COSME GROUP SRL | (B07) COLATA / HEAT | NLK-2466898 |
|---|---|---|---|

| N° ORDINE / CUSTOMER ORDER (A07) | RIF. VS. ORD. DEL 21/10/2024 | CODICE ARTICOLO / PRODUCT NUMBER (A09) | L.S355.015.2450.GG12 | REF. DDT N° | 870 VEDT24 del 24/10/2024 |
|---|---|---|---|---|---|
| N° ORDINE INTERNO / INTERNAL ORDER (A08) | 136 / 24VEOR | LOTTO / LOT | **L2403769** | | |

## ANALISI CHIMICHE DI COLATA / HEAT ANALYSIS

| %C | %Si | %Mn | %P | %S | %Cr | %Ni | %Cu | %Mo | %V | %Nb | %Ti | %Al | %N | %H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,157 | 0,183 | 1,430 | 0,008 | 0,002 | 0,025 | 0,013 | 0,030 | 0,001 | 0,049 | 0,003 | 0,001 | 0,050 | 0,003 | 0,000 |

| Condizioni Fornitura (B04) Product Delivery Conditions | +N | Elaborazione dell'acciaio (C70) | BOF | Grade (B02) (B03) | S355J2 | Dimensioni Nominali/Nominal Dimension T (B09) | W (B10) | L (B11) | CEV (C82) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 15,0 | 2525 | 12170 | 0,413 |

| Prodotto/Product (B01) | Massa Teorica / Theoretical Mass (B12) | 3618 | Massa Effettiva / Actual Mass (B13) | 3997 | IDL | N° Pezzi / N° Pieces (B08) |
|---|---|---|---|---|---|---|
| LAMIERE | | | | | 1670-1/24 | 1 |

## CARATTERISTICHE MECCANICHE / MECHANICAL PROPERTIES

| NORMA / STANDARD (C05) | PROVE DI TRAZIONE\TENSILE TEST | | | Orientamento dei provon / direction of test pieces (1) (C02) | |
|---|---|---|---|---|---|
| | Rm (Mpa) | ReH (Mpa) | A% | Forma del provino / Test piece shape (2) (C10) | |
| ISO 6892 | (C12) | (C11) | (C13) | (1): T Trasversale/transverse L longitudinale/longitudinal<br>(2): Rett Sezione Rettangolare/ Rectangular Cross-Section<br>Circ. Sezione Circolare/ Circular Cross-Section | |

| Norme Standard (C05) | PROVE DI RESILIENZA | | | | | | Orientamento Provini / Direction of test pieces (C02) |
|---|---|---|---|---|---|---|---|
| | Tipo Provini/Test Pieces Type (C40) | K1 (C42) | K2 (C42) | K3 (C42) | KX (C03) | Temp (C43) | |
| ISO 148-1 | V-notch | | | | | | |

| Norme Standard (C05) | PROVE DI TRAZIONE ASSE Z / TENSILE TEST Z AXIS (C50) | | | Orientamento Provini / Direction of test pieces (C02) |
|---|---|---|---|---|
| | Tipo Provini/Test Pieces Type (C51) | Z% AVERAGE THREE TESTS (C52) | MINIMUM Z% (C53) | |
| EN 10164 | | | | |

| Norme Standard (D03) | CLASSE ULTRASUONI / ULTRASONIC CLASS (D02) | | Strumento: AnyScan 30 (D06) |
|---|---|---|---|
| | Classe UT / UT Class (D04) | Classe UT Bordo / UT Class Edge (D05) | Sonda:DoppiaPiana4MHz//2Mhz (D07) |
| EN 10160 | | | UT 9712: D-00427-UT (D08) |

## (D01) TOLLERANZE FORMA E DIMENSIONE / SHAPE AND DIMENSION TOLLERANCE

| Planarità / Flatness | | Classe Superficie/Surface class | | Tolleranza Spessore / Thickness Tolerance | | Tolleranza Lunghezza/ Lenght Tolerance | - 0 / + 200 |
|---|---|---|---|---|---|---|---|
| Norma / Standard | | Norma / Standard | | Norma / Standard | | Tolleranza Larghezza/ Width Tollerance | - 0 / + 70 |
| EN 10029 | | EN 10163-2 | | EN 10029 | | | |

La spedizione è conforme all'ordine (Z01)
The delivery is in accordance with the order

Organizzazione del controllo / Inspection organization:
QUALITY DEPARTMENT (A05)

Ispettore / Inspector 25/10/2024

siderscal

COSME GROUP SRL
VIA DEI PLATANI, 138
33050 SANTA MARIA LA LONGA (UD)
Tel. 0432 801333 - Fax 0432 801991
P.IVA - C.F. - R.I. di Udine 02815120304
cosmegroup.it e-mail: info@cosmegroup.it

ORT. 3614 DEL 12/11/2024
V.S. DDT/E 2400001014 DEL 28/10/2024

(A04)
(A01)

sidersca l

| CERTIFICATO DI COLLAUDO INSPECTION CERTIFICATE EN 10204 | | TIPO CERTIFICATO TYPE OF CERTIFICATE 3.1 | |
|---|---|---|---|
| (A03) N° | 2440 | DATA | 25/10/2024 |
| Standard Product Reference | | | |

| (A06) CLIENTE / CUSTOMER | COSME GROUP SRL | (B07) COLATA / HEAT | NLK-2466898 |
|---|---|---|---|

| N° ORDINE / CUSTOMER ORDER (A07) | RIF. VS. ORD. DEL 21/10/2024 | CODICE ARTICOLO / PRODUCT NUMBER (A09) | L.S355.015.2450.GG12 | REF. DDT N° | 870 VEDT24 del 24/10/2024 |
|---|---|---|---|---|---|
| N* ORDINE INTERNO / INTERNAL ORDER (A08) | 136 / 24VEOR | LOTTO / LOT | **L2403769** | | |

## ANALISI CHIMICHE DI COLATA / HEAT ANALYSIS

| %C | %Si | %Mn | %P | %S | %Cr | %Ni | %Cu | %Mo | %V | %Nb | %Ti | %Al | %N | %H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,157 | 0,183 | 1,430 | 0,008 | 0,002 | 0,025 | 0,013 | 0,030 | 0,001 | 0,049 | 0,003 | 0,001 | 0,050 | 0,003 | 0,000 |

| Condizioni Fornitura (B04) Product Delivery Conditions | +N | Elaborazione dell'acciaio (C70) | BOF | Grade (B02) (B03) | S355J2 | Dimensioni Nominali/Nominal Dimension T (B09) | W (B10) | L (B11) | CEV (C82) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 15,0 | 2525 | 12170 | 0,413 |

| Prodotto/Product (B01) | Massa Teorica / Theoretical Mass (B12) | 3618 | Massa Effettiva / Actual Mass (B13) | 3997 | IDL | N° Pezzi / N° Pieces (B08) |
|---|---|---|---|---|---|---|
| LAMIERE | | | | | 1670-1/24 | 1 |

## CARATTERISTICHE MECCANICHE / MECHANICAL PROPERTIES

| NORMA / STANDARD (C05) | PROVE DI TRAZIONE\TENSILE TEST Rm (Mpa) | ReH (Mpa) | A% | Orientamento dei provon / direction of test pieces (1) (C02) | |
|---|---|---|---|---|---|
| | | | | Forma del provino / Test piece shape (2) (C10) | |
| ISO 6892 | (C12) | (C11) | (C13) | (1): T Trasversale/transverse L longitudinale/longitudinal<br>(2): Rett Sezione Rettangolare/ Rectangular Cross-Section<br>Circ. Sezione Circolare/ Circular Cross-Section | |

| Norme Standard (C05) | PROVE DI RESILIENZA Tipo Provini/Test Pieces Type (C40) | K1 (C42) | K2 (C42) | K3 (C42) | KX (C03) | Temp (C43) | Orientamento Provini / Direction of test pieces (C02) |
|---|---|---|---|---|---|---|---|
| ISO 148-1 | V-notch | | | | | | |

| Norme Standard (C05) | PROVE DI TRAZIONE ASSE Z / TENSILE TEST Z AXIS (C50) Tipo Provini/Test Pieces Type (C51) | Z% AVERAGE THREE TESTS (C52) | MINIMUM Z% (C53) | Orientamento Provini / Direction of test pieces (C02) |
|---|---|---|---|---|
| EN 10164 | | | | |

| Norme Standard (D03) | CLASSE ULTRASUONI / ULTRASONIC CLASS (D02) Classe UT / UT Class (D04) | Classe UT Bordo / UT Class Edge (D05) | Strumento: AnyScan 30 (D06) | Sonda:DoppiaPiana4MHz//2Mhz (D07) | UT 9712: D-00427-UT (D08) |
|---|---|---|---|---|---|
| EN 10160 | | | | | |

## (D01) TOLLERANZE FORMA E DIMENSIONE / SHAPE AND DIMENSION TOLLERANCE

| Planarità / Flatness | Classe Superficie/Surface class | Tolleranza Spessore / Thickness Tolerance | Tolleranza Lunghezza/ Lenght Tolerance | - 0 / + 200 |
|---|---|---|---|---|
| Norma / Standard: EN 10029 | Norma / Standard: EN 10163-2 | Norma / Standard: EN 10029 | Tolleranza Larghezza/ Width Tollerance | - 0 / + 70 |

La spedizione è conforme all'ordine (Z01)
The delivery is in accordance with the order

Organizzazione del controllo / Inspection organization:
QUALITY DEPARTMENT (A05)

Ispettore / Inspector 25/10/2024

sidersca l

COSME GROUP SRL
VIA DEI PLATANI, 138
33050 SANTA MARIA LA LONGA (UD)
Tel. 0432 801333 - Fax 0432 801991
P.IVA - C.F. - R.I. di Udine 02815120304
cosmegroup.it e-mail: info@cosmegroup.it

ORT. 3614 DEL 12/11/2024
V.S. DDT/E 2400001104 DEL 28/10/2024

# 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 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.: 619669
Z02 Data / Date: 24/07/2024
A08 N° Ordine Trametal / Works order: 32403786
A07 N° Ordine cliente / Customer's order: email 03/07
DDT: BOL 32414527
del / date: 23/07/2024
Pratica / File no.:
del / date:

A06 Cliente / Customer

**COSME GROUP SRL**

**Via dei platani 15/2**
**33050 SANTA MARIA LA LONGA 33050 IT**

**UD 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: S355J2+N
Normativa / Specification: EN10025-2:2019

| 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 | VELOCITA' RISCALDO °C/h HEATING RATE | TEMPERATURA TRATTAMENTO °C TEMPERATURE TREATMENT | HOLDING TIME | PERMANENZA Min | VELOCITA' RAFFREDDAMENTO °C/h COOLING RATE | END TEMPERATURE | TEMPERATURA FINE °C | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | LNAA780802A | 1947873 | 45.00X2000X12000 | 8,48 | 793486 | BO | N | GD891 | | | | | | | | | | | | | | | | | | | | | | | | |

## 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S355J2+N Min 40.10 - 200.00 | | | | | | | | | | | | | | | | | | | | | |
| S355J2+N Max 40.10 - 200.00 | 0,22 | 1,60 | 0,55 | 0,025 | 0,025 | 0,550 | | | | | | | | | | | | | | 0,47 | |
| LNAA78 | 0,17 | 1,44 | 0,23 | 0,015 | 0,002 | 0,010 | 0,010 | 0,010 | <0.005 | 0,031 | 0,001 | 0,024 | 0,002 | <0.005 | 0,0000 | 0,0056 | 0,0003 | 0,0000 | 0,41 | 0,41 | 0,25 |

| 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 ORIENTATION (3) | 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 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SPESSORE LAMIERA PLATE THICKNESS | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S355J2+N Min 40.10 - 63.00 | | | | | 20 | 335 | 470 | | 19,0 | | | | | | | | | | | | | | | | | | | |
| S355J2+N Max 40.10 - 63.00 | | | | | 20 | | 630 | | | | | | | | | | | | | | | | | | | | | |
| S355J2+N Min 6.00 - 999.00 | | | | | | | | | | | | | L | -20 | | | 27 | | | | | | | | | | | |
| GD891 | 45,00 | 2 | D | T | 20 | 388 | 515 | 0,75 | 33,3 | | C | 10,00 | L | -20 | P | 239 192 207 | 213 | | | | | | | | | | | |

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** |
| 1 | A200F | EN 10029 CL.A | -0+100 MM | -0+200 MM | EN 10163/2 CL A1 | 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** |
| | **TIMBRO DELL'ISPETTORE STAMP OF THE INSPECTION REPRESENTATIVE** | METINVEST TRAMETAL S.p.A. F. Andrian CQ Manager |

COSME GROUP SRL
VIA DEI PLATANI, 138
33050 SANTA MARIA LA LONGA (UD)
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cosmegroup.it e-mail: info@cosmegroup.it

DDT. 3614 DEL 12/11/2024
VS. ORDINE 2400610 DEL 28/10/2024

METINVEST
METINVEST TRAMETAL SPA

Metinvest Trametal spa
Head Office:
Via XII Ottobre 1, 5° piano
16121 Genova - Italy
Tel. +39 010 5762911
Fax +39 010 5762990
trametal@trametal.it

**DICHIARAZIONE DI PRESTAZIONE (Reg. UE N. 305/2011)**

N.S355-2

Il sottoscritto Roberto Re, rappresentante il produttore:
**METINVEST TRAMETAL SpA**
**Via XII Ottobre 1, 5° Piano – 16121 Genova**
nello stabilimento produttivo di:
**Via E. Fermi, 44 – 33058 San Giorgio di Nogaro (UD)**
Dichiara qui di seguito che i prodotti:
Prodotti piani laminati a caldo in acciaio secondo EN10025-1:2004.

**DECLARATION OF PERFORMANCE (Reg . UE N. 305/2011)**

N.S355-2

I, the undersigned Roberto Re, representing the manufacturer:

**METINVEST TRAMETAL SpA**
**Via XII Ottobre, 1 – 16121 Genova**
the production site:
**Via E. Fermi, 44 – 33058 San Giorgio di Nogaro (UD)**
Hereby declares that the products:
Hot-rolled flat products of steel according to EN10025-1: 2004.

| Qualità / Steel grade | Normativa / Specification |
|---|---|
| S355J2NZ15 | EN10025-2:2019 |
| S355JR+AR | EN10025-2:2019 |
| S355JR+N | EN10025-2:2019 |
| S355J0+AR | EN10025-2:2019 |
| S355J0+N | EN10025-2:2019 |
| S355J2+N | EN10025-2:2019 |
| S355K2+N | EN10025-2:2019 |
| S355J2NZ25 | EN10025-2:2019 |
| S355J2NZ35 | EN10025-2:2019 |
| S355K2NZ15 | EN10025-2:2019 |
| S355K2NZ25 | EN10025-2:2019 |
| S355K2NZ35 | EN10025-2:2019 |
| S355J0C+N | EN10025-2:2019 |
| S355J2C+N | EN10025-2:2019 |
| S355K2C+N | EN10025-2:2019 |

| Tipo prodotto / Product type | Qualità / Steel grade | Codice identificativo univoco prodotto/ Unique product identifier code | Numero interno/ Internal number | Specifica tecnica armonizzata / Harmonized techical specification |
|---|---|---|---|---|
| Lamiera/ Plate | S355J2+N | LNAA780802A | 1947873 | EN10025-1:2004 |

Che i prodotti specificati nel presente documento sono destinati ad essere utilizzati nelle strutture saldate, bullonate e chiodate.

Che i prodotti specificati nel presente documento presentano le seguenti caratteristiche essenziali e prestazioni:

The products specified in this document are intended to be used in welded structures, bolted and riveted.

The products specified in this document have the following essential features and performance:

| Caratteristiche Essenziali / Essential features | Prestazione / Performance | Norma Armonizzata / Harmonized specification |
|---|---|---|
| Tolleranze dimensionali e forma /Tollerance on dimensions and shape | Conforme / Compliance | EN10025-1:2004 |
| Allungamento /Elongation | Conforme / Compliance | EN10025-1:2004 |
| Resistenza a Trazione/Tensile Strength | Conforme / Compliance | EN10025-1:2004 |
| Carico Unitario snervamento/Yield Strength | Conforme / Compliance | EN10025-1:2004 |
| Resilienza/Impact | Conforme / Compliance | EN10025-1:2004 |
| Saldabilità/Weldability | Conforme / Compliance | EN10025-1:2004 |
| Durabilità/Durability | NPD | |
| Sostanza Regolamentata/Regulated substance | NPD | |

Si dichiara inoltre che l'organismo notificato, TUV SUD - Italia [N. 0948] ha effettuato:
- ispezione iniziale dello stabilimento e del controllo della produzione in fabbrica
- sorveglianza, valutazione e verifica continua del controllo della produzione in fabbrica

secondo il sistema di valutazione e verifica della costanza della prestazione 2+ ed ha rilasciato il certificato di controllo della produzione in fabbrica numero 0948-CPR-0157 Rev.02

It also states that the notified body, TUV SUD - Italia [N. 0948], carried out:
- Initial inspection of factory and of factory production control
- Monitoring, evaluation and continuous assessment of factory production control

according to the system of assessment and verification of constancy of performance 2 + and released the certificate of factory production control number 0948-CPR-0157 Rev.02.

CE

**Lamiere conformi ai requisiti della marcatura CE. Certificato di conformità CE n° 0948-CPR-0157 Rev.02 emesso da TUV SUD - Italia in data 13/12/2019. Plates in compliance with CE marking requirements. Certificate of conformity N° 0948-CPR-0157 Rev.02 from TUV SUD - Italia on 13/12/2019.**

Si rilascia la presente dichiarazione di prestazione sotto la responsabilità esclusiva del fabbricante

This declaration of performance is made under the sole responsibility of the manufacturer

San Giorgio di Nogaro,

24/07/2024

Roberto Re



Managing Director
Metinvest Trametal spa
Metinvest Group

**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**

COSME GROUP

Scheda controllo ultrasuoni
Inspection Certificate

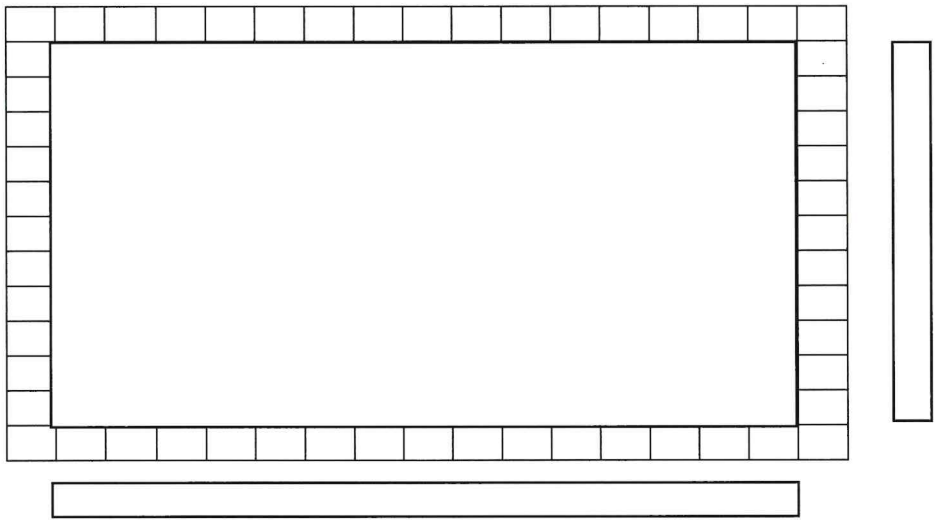
Impresa best 2022 Friuli Venezia Giulia

TÜV SÜD ISO 9001

# SCHEDA CONTROLLO ULTRASUONI LAMIERE

| | | | | |
|---|---|---|---|---|
| CONFERMA GROUP 2024 | CLIENTE: | | QUALITA': S355J2+N | |
| ID LAMIERA: LNAA780802A | COLATA: LNAA78 | | | |
| *CONTROLLO DIMENSIONALE* | *SPESSORE* | *LARGHEZZA* | *LUNGHEZZA* | *PESO* |
| DIMENSIONI ORDINE | 45 | 2000 | 12000 | 8480 |
| CONTROLLO ASPETTO E STATO SUPERFICIALE (EN 10163) | NATURALE DI LAMINAZIONE | | | |
| GIUDIZIO SUPERFICIE | CONFORME | | | |

## *SCHEDA LAMIERA*



*STRUMENTO:*
***GILARDONI RDG450***

*ACCOPPIANTE:*
**ACQUA**

*4 - CONTROLLO*
***CAMPIONE*: REF. D. 8mm ECO.**

5 – SONDA UTILIZZATA:
- ☐ - BDD 20/2 0°
- ☐ - BDD 20/4 0°
- ☐ - BDD 20/4 5°
- **X - DP 25/2 0°**
- ☐ - SD 25/4 0°

ISTRUZIONE TECNICA: PO_851_14 (PG. CONTROLLI UT)

## *CONTROLLO UT*

| NORMA: | CLASSE: | GRIGLIA/BORDO: | -TIPO CONTROLLO: | - CLASSE ASSEGNATA: |
|---|---|---|---|---|
| **UNI EN 10160** | **S2E3** | **100x100** | **100% SUPERFICIE INDICATA** | **S2E3** |

| | |
|---|---|
| *- ANOMALIE RISCONTRATE:* | NESSUNA ANOMALIA RISCONTRATA. |
| | LAMIERA BORDI NATURALI |

*COMPILATO: ANDREA ORSO*
*UNI EN ISO 9712:12 – SNT TC 1°*
*LEV. 3 UT – C,F,T,W,WP – IND-21-02444-R*

*- DATA COMPILAZIONE SCHEDA: 23/07/2024*

(A04)
(A01)

siderscal

0948-CPR-0617 del 14/05/2024 Rev.00

(B06) (Z04) **Marcatura CE**

CE 0948 24

| CERTIFICATO DI COLLAUDO INSPECTION CERTIFICATE EN 10204 | | | TIPO CERTIFICATO TYPE OF CERTIFICATE |
|---|---|---|---|
| | | | 3.1 |
| (A03) N° | 1347 | DATA | 30/08/2024 |
| Standard Product Reference | | | EN 10025-2 |

| (A06) CLIENTE / CUSTOMER | COSME GROUP SRL | (B07) COLATA / HEAT | SHA-2472001126 |
|---|---|---|---|

| N° ORDINE / CUSTOMER ORDER (A07) | | N* ORDINE INTERNO / INTERNAL ORDER (A08) | | CODICE ARTICOLO / PRODUCT NUMBER (A09) | L.S355.030.2450.GS | REF. DDT N° | 555 VEDT24 del 29/08/2024 |
|---|---|---|---|---|---|---|---|

## ANALISI CHIMICHE DI COLATA / HEAT ANALYSIS

| %C | %Si | %Mn | %P | %S | %Cr | %Ni | %Cu | %Mo | %V | %Nb | %Ti | %Al | %N | %H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,201 | 0,230 | 1,450 | 0,008 | 0,004 | 0,020 | 0,010 | 0,020 | 0,000 | 0,000 | 0,001 | 0,017 | 0,038 | 0,004 | 0,000 |

| Condizioni Fornitura (B04) Product Delivery Conditions | +N | Elaborazione dell'acciaio (C70) | BOF | Grade (B02) | S355J2 | Dimensioni Nominali Nominal Dimension | T (B09) | W (B10) | L (B11) | CEV (C82) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 30,0 | 2525 | 12075 | 0,449 |

| Prodotto/Product (B01) | Massa Teorica / Theoretical Mass (B12) | | Massa Effettiva / Actual Mass (B13) | | IDL | N° Pezzi / N° Pieces |
|---|---|---|---|---|---|---|
| LAMIERE | | 7180 | | 7179 | 1006-1/24 | 1 (B08) |

## CARATTERISTICHE MECCANICHE / MECHANICAL PROPERTIES

| NORMA / STANDARD (C05) | PROVE DI TRAZIONE\TENSILE TEST | | | Orientamento dei provon / direction of test pieces (1) (C02) | T |
|---|---|---|---|---|---|
| | Rm (Mpa) | ReH (Mpa) | A% | Forma del provino / Test piece shape (2) (C10) | Circ |
| ISO 6892 | 504 (C12) | 364 (C11) | 24,00 (C13) | (1): T Trasversale/transverse L longitudinale/longitudinal<br>(2): Rett Sezione Rettangolare/ Rectangular Cross-Section<br>Circ. Sezione Circolare/ Circular Cross-Section | |

| Norme Standard (C05) | PROVE DI RESILIENZA | | | | | | Orientamento Provini / Direction of test pieces (C02) |
|---|---|---|---|---|---|---|---|
| | Tipo Provini/Test Pieces Type (C40) | K1 (C42) | K2 (C42) | K3 (C42) | KX (C03) | Temp (C43) | |
| ISO 148-1 | V-notch | 100,00 | 97,000 | 133,00 | 110,00 | -20,00 | L |

| Norme Standard (C05) | PROVE DI TRAZIONE ASSE Z / TENSILE TEST Z AXIS (C50) | | | Orientamento Provini / Direction of test pieces (C02) |
|---|---|---|---|---|
| | Tipo Provini/Test Pieces Type (C51) | Z% AVERAGE THREE TESTS (C52) | MINIMUM Z% (C53) | |
| EN 10164 | | | | Z |

| Norme Standard (D03) | CLASSE ULTRASUONI / ULTRASONIC CLASS (D02) | | Strumento: AnyScan 30 (D06) |
|---|---|---|---|
| | Classe UT / UT Class (D04) | Classe UT Bordo / UT Class Edge (D05) | Sonda:DoppiaPiana4MHz//2Mhz (D07) |
| EN 10160 | | | UT 9712: D-00427-UT (D08) |

## (D01) TOLLERANZE FORMA E DIMENSIONE / SHAPE AND DIMENSION TOLLERANCE

| Planarità / Flatness | | Classe Superficie/Surface class | | Tolleranza Spessore / Thickness Tolerance | | Tolleranza Lunghezza/ Lenght Tolerance | - 0 / + 200 |
|---|---|---|---|---|---|---|---|
| Norma / Standard | N | Norma / Standard | A1 | Norma / Standard | A | Tolleranza Larghezza/ Width Tollerance | - 0 / + 70 |
| EN 10029 | | EN 10163-2 | | EN 10029 | | | |

La spedizione è conforme all'ordine (Z01)
The delivery is in accordance with the order

Organizzazione del controllo / Inspection organization:
QUALITY DEPARTMENT (A05)

Ispettore / Inspector 30/08/2024

siderscal

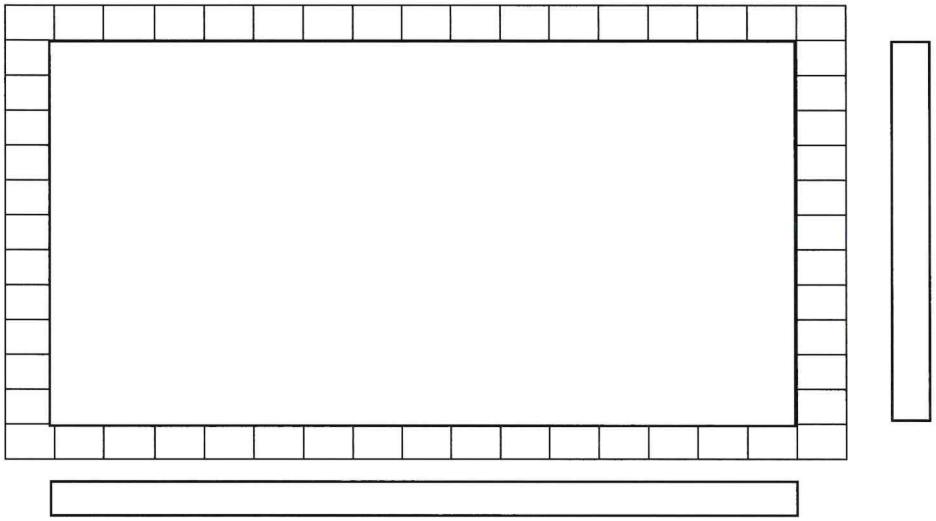
COSME GROUP SRL
VIA DEI PLATANI, 15/B
33050 SANTA MARIA LA LONGA (UD)
Tel. 0432 801333 - Fax 0432 801991
P.IVA - C.F. - R.I. di Udine 02815120304
www.cosmegroup.it e-mail: info@cosmegroup.it

DDT. 3614 DEL 12/11/2024
VS ORD DE 2400 6104 DEL 28/10/2024

# SCHEDA CONTROLLO ULTRASUONI LAMIERE

| | | | | |
|---|---|---|---|---|
| CONFERMA GROUP 2024 | CLIENTE: | | QUALITA': S355J2+N | |
| ID LAMIERA: SHA-2472001126 | COLATA: SHA-2472001126 | | | |
| *CONTROLLO DIMENSIONALE* | *SPESSORE* | *LARGHEZZA* | *LUNGHEZZA* | *PESO* |
| DIMENSIONI ORDINE | 30 | 2525 | 12075 | 7179 |
| CONTROLLO ASPETTO E STATO SUPERFICIALE (EN 10163) | NATURALE DI LAMINAZIONE | | | |
| GIUDIZIO SUPERFICIE | CONFORME | | | |

## *SCHEDA LAMIERA*



*STRUMENTO:*
***GILARDONI RDG450***

*ACCOPPIANTE:*
**ACQUA**

*4 - CONTROLLO*
***CAMPIONE*: REF. D. 8mm ECO.**

5 – SONDA UTILIZZATA:
- □ - BDD 20/2 0°
- □ - BDD 20/4 0°
- □ - BDD 20/4 5°
- **X - DP 25/2 0°**
- □ - SD 25/4 0°

ISTRUZIONE TECNICA: PO_851_14 (PG. CONTROLLI UT)

## *CONTROLLO UT*

| NORMA: | CLASSE: | GRIGLIA/BORDO: | -TIPO CONTROLLO: | - CLASSE ASSEGNATA: |
|---|---|---|---|---|
| **UNI EN 10160** | **S2E3** | **100x100** | **100% SUPERFICIE INDICATA** | **S2E3** |

*- ANOMALIE RISCONTRATE:* NESSUNA ANOMALIA RISCONTRATA.

LAMIERA BORDI NATURALI

*COMPILATO: ANDREA ORSO*
*UNI EN ISO 9712:12 – SNT TC 1°*
*LEV. 3 UT – C,F,T,W,WP – IND-21-02444-R*

*- DATA COMPILAZIONE SCHEDA: 30/08/2024*

**MARCEGAGLIA PALINI E BERTOLI**

Marcegaglia
46040 Via Bresciani, 16-Gazoldo degli Ippoliti Mantova-Italy
Tel. +39 - 0376 685 1 Fax. +39 - 0376 685 600
www.marcegaglia.com

Marcegaglia Palini e Bertoli S.P.A.
via E.Fermi, 28 33058 San Giorgio di Nogaro, Udine - Italy
tel +39 0431623111

Type/Tipo 3.1 CERTIFICATO DI COLLAUDO EN10204 | questo documento è stato generato automaticamente ed è valido senza firma | Number/Numero 16624648524 | Creato il 04/10/2024

**Product: Hot Rolled Heavy Plates**
**NormaCollaudoLamieraTreno: EN10025-2:2019**
**Steel grade:: S355J2+N**

Customer/Cliente
COSME GROUP S.R.L.
VIA DEI PLATANI 15/2
33050 SANTA MARIA LA LONGA IT

Code: 0000091849

Del. Address/Destinatario Merci
COSME GROUP S.R.L.
VIA DEI PLATANI 15/2
33050 SANTA MARIA LA LONGA IT

Delivery/N° Consegna 8920670772
Of/Del 04/10/2024
Delivery note nr/N° doc. di trasp. 1066012337

Quality Control/Controllo Qualità
Q.M.D./RESP. M.Rizzatti
Plant/Stab. Palini e Bertoli

Pages/Pagine 1/3

Material/Codice Materiale
**LTS**

Description/Descrizione
**25,00 X 2450,00 X 12000,00 S355J2+N**

**Surface Quality: EN10163-2 CL A1**
**Flatness: rif EN 10029 cl. N**
**Thickness tolerance: EN10029 CLASSE B**

Delivery Condition: NORMALIZING ROLLING
Steel Making Process: BO= Basic oxigen

Order Nr/ordine **1191806012/10**
Materiale Cliente

Client Order/Ordine cliente *** ORD. 194/24**
Client Date/data cliente **18/09/2024**

| Item | Batch/N° Partita | ID Palini | Heat/Colata | Quantity/Q.tà KG | Quantity/Q.tà PZZ |
|---|---|---|---|---|---|
| 1 | 24PZ005623 | 16F.7118.01 | 340930 | 5880 | 1 |
| 2 | 24PZ005620 | 16F.7121.02 | 340801 | 5880 | 1 |
| 3 | 24PZ005621 | 16F.7121.01 | 340801 | 5880 | 1 |
| 4 | 24PZ005622 | 16F.7120.03 | 340928 | 5880 | 1 |

Remarks/Note:
LAMIERE SABBIATE in acc. ISO 8501:2012 SA 2 ½.
CE Marking Certificate N.0474-CPR-0033 last issued 14/09/2020 Rev.05. Hot rolled products of structural steels in compliance with Regulation n°305/2011/EU dated 09/03/2011. DOP available on https://www.quality.marcegaglia.com.
UKCA Marking Certificate N.1244-CPR-1051 last issued 01/01/2023. Hot rolled products of structural steels in compliance with the Construction Products Regulation 2011 (retained EU law EUR 305/2011). DOP available on https://www.quality.marcegaglia.com.

DDT. 3614 DEL 12/11/2024
VS. ORD DE 2400610 4 DEL 28/10/2024

| Batch/N° Partita | C (%) | Mn (%) | Si (%) | S (%) | P (%) | Cr (%) | Ni (%) | Cu (%) | Al (%) | Mo (%) | Nb (%) | V (%) | Ti (%) | N (%) | H (%) | B (%) | Ceq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.2 | 1.6 | 0.55 | 0.025 | 0.025 | 0.29 | 0.42 | 0.55 | 0.02<br>0.3 | 0.11 | 0.06 | 0.1 | 0.05 | | | | 0.45 |
| 24PZ005623 | .150 | 1.500 | .230 | .0030 | .0150 | .010 | .010 | .020 | .037 | .0000 | .030 | .001 | .0010 | .0040 | .00000 | .0001 | .40 |
| 24PZ005620 | .160 | 1.420 | .200 | .0040 | .0190 | .020 | .010 | .020 | .034 | .0000 | .030 | .001 | .0010 | .0020 | .00000 | .0001 | .40 |
| 24PZ005621 | .160 | 1.420 | .200 | .0040 | .0190 | .020 | .010 | .020 | .034 | .0000 | .030 | .001 | .0010 | .0020 | .00000 | .0001 | .40 |
| 24PZ005622 | .150 | 1.470 | .210 | .0040 | .0150 | .010 | .010 | .010 | .033 | .0000 | .028 | .001 | .0030 | .0030 | .00000 | .0001 | .40 |

| Batch/N° Partita | Forma | (1) | (2) | (3) | Tst [°C] | Rm [N/mmq] | ReH [N/mmq] | A% (%) | (1) | (2) | (3) | (4) | T [°C] | Kv1 [J] | Kv2 [J] | Kv3 [J] | Kv[a] [J] | TESTN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20 | 470 | 345 | 20 | | | | | -20 | | | | 27 | |
| | | | | | 20 | 630 | | | | | | | | | | | | |
| 24PZ005623 | C | 1 | P | T | 20 | 596 | 493 | 27.1 | 1 | P | L | 10.0 | -20 | 240 | 235 | 224 | 233 | 24-P17806R |
| 24PZ005620 | P | 1 | P | T | 20 | 574 | 470 | 30.0 | 1 | P | L | 10.0 | -20 | 188 | 207 | 212 | 202 | 24-P17896S |
| 24PZ005621 | P | 1 | P | T | 20 | 562 | 455 | 29.8 | 1 | P | L | 10.0 | -20 | 206 | 211 | 212 | 209 | 24-P17219R |
| 24PZ005622 | C | 1 | P | T | 20 | 607 | 481 | 28.5 | 1 | P | L | 10.0 | -20 | 186 | 173 | 194 | 184 | 24-P17807R |

COSME GROUP SRL
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P.IVA - C.F. - R.I. di Udine 02815120304
cosmegroup.it e-mail: info@cosmegroup.it

Controllo ad ultrasuoni

| Apparecchiatura | Numero di serie | Condizioni di superficie | Accoppiante | Mod. operativie | Taratura |
|---|---|---|---|---|---|
| Gilardoni RDG2000 | 050858001 | As Rolled | Acqua | Secondo le specifiche | Secondo le specifiche |

Firma
II Liv. EN/ISO 9712
Q.M.D. M.Rizzatti

MARCEGAGLIA Palini e Bertoli S.p.A. QUALITY CONTROL Rizzatti Marco

| Item | Norma di riferimento | Classe accettabilità | Esito | Indicazioni | Reticolo | Bordi | Sonda | Frequenza | Angolo |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

(1)Posizione:1=Testa;2=Piede.(2)Posizione:1/2=1/2 spessore;P=Pelle;1/4=1/4 spessore.(3)Direzione:L=Longitudinale;T=Trasversale;(4)Spessore provino

DescrizioneMarchi

UKCA 1244 22 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

CE 0474 06 MARCEGAGLIA PALINI E BERTOLI v. Enrico Fermi, 28 33058 - S. Giorgio Nogaro Udine - Italy EN 10025-1 EN 10025-2

- Material Free of radioactive contamination
- Dimensional check and visual examination of the surface condition: without objection
- We Declare that the above mentioned plates are in compliance with the order prescription
- We hereby declare that the above mentioned material have been manufactured in Italy, thus of European Community origin

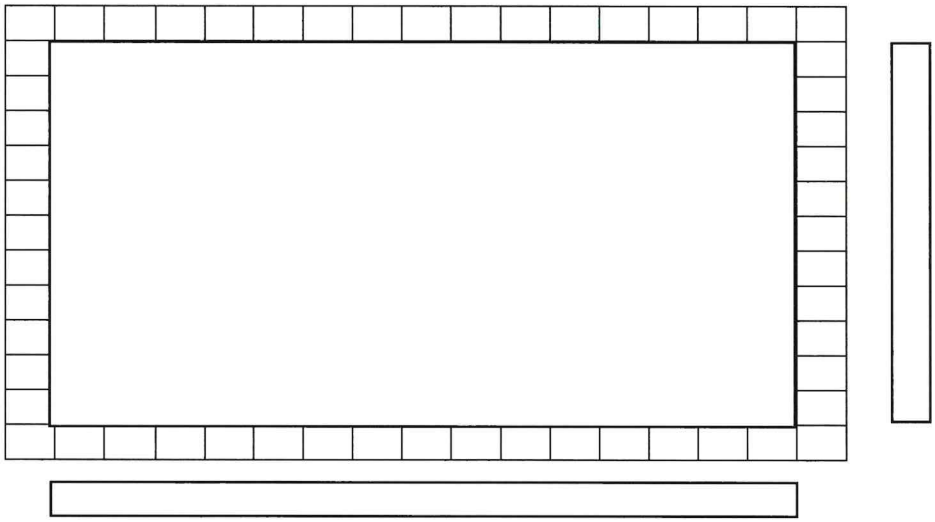
COSME GROUP

Scheda controllo ultrasuoni
Inspection Certificate

# SCHEDA CONTROLLO ULTRASUONI LAMIERE

| | | | | |
|---|---|---|---|---|
| CONFERMA GROUP 2024 | CLIENTE: | | QUALITA': S355J2+N | |
| ID LAMIERA: 16F.7120.03 | COLATA: 340928 | | | |
| *CONTROLLO DIMENSIONALE* | *SPESSORE* | *LARGHEZZA* | *LUNGHEZZA* | *PESO* |
| DIMENSIONI ORDINE | 25 | 2450 | 12000 | 5880 |
| CONTROLLO ASPETTO E STATO SUPERFICIALE (EN 10163) | NATURALE DI LAMINAZIONE | | | |
| GIUDIZIO SUPERFICIE | CONFORME | | | |

## *SCHEDA LAMIERA*



*STRUMENTO:*
***GILARDONI RDG450***

*ACCOPPIANTE:*
**ACQUA**

*4 - CONTROLLO*
***CAMPIONE*: REF. D. 8mm ECO.**

5 – SONDA UTILIZZATA:
- □ - BDD 20/2 0°
- □ - BDD 20/4 0°
- □ - BDD 20/4 5°
- **X - DP 25/2 0°**
- □ - SD 25/4 0°

ISTRUZIONE TECNICA: PO_851_14 (PG. CONTROLLI UT)

## *CONTROLLO UT*

| NORMA: | CLASSE: | GRIGLIA/BORDO: | -TIPO CONTROLLO: | - CLASSE ASSEGNATA: |
|---|---|---|---|---|
| **UNI EN 10160** | **S2E3** | **100x100** | **100% SUPERFICIE INDICATA** | **S2E3** |

*- ANOMALIE RISCONTRATE:* NESSUNA ANOMALIA RISCONTRATA.

LAMIERA BORDI NATURALI

*COMPILATO: ANDREA ORSO*
*UNI EN ISO 9712:12 – SNT TC 1°*
*LEV. 3 UT – C,F,T,W,WP – IND-21-02444-R*

*- DATA COMPILAZIONE SCHEDA: 04/10/2024*

| REMAZEL | CERTIFICATION LIST | Certificate Nr.: 001/24<br>Date: 30/10/2024 |
|---|---|---|

| Final Customer: | Order Customer: | Object: | Description: | Quantity: | Inspection and Test Plan (ITP): | Our job: |
|---|---|---|---|---|---|---|
| Rosetti Marino | EFC | | | | | |

## MATERIAL

| Drawing | Pos. | Q.ty | Description | Material | Certificates 3.1 | Order | Heat/Plate ID | Additional Mechanical Test | UT Certificates | Nesting |
|---|---|---|---|---|---|---|---|---|---|---|
| C09-0001-P0015 | 1 | 1 | WHEEL Ø200mm | C45 | B2202309120154 | 24006083 | 23807325 | * | * | |
| C09-0001-P0066 | 1 | 1 | PULLEY BOOM Ø320mm | S355J2 | 255714\1 | 24006433 | 457170 | * | * | |
| C09-0001-P0045 | 1 | 1 | PULLEY Ø240mm | S355J2 | H72116580 | 24006083 | 0014477Z | * | * | |
| C09-0001-P0046 | 1 | 1 | ANTISKID | S355J2 | CRL2413532164 | 24006083 | 815265 | * | * | |
| C09-0001-P0085 | 1 | 1 | Ø279*35 | S355J2+N | 1154/4 | 24006083 | 1240905 | * | * | |
| C09-0001-P0085 | 2 | 1 | Ø127*30 | S355J2+N | 1253/3 | 24006083 | 1241244 | * | * | |

Продукція виготовлена в умовах сертифікованих систем менеджменту якості, навколишнього середовища та безпеки./The products were manufactured in controlled conditions of certified quality, environment and safety management system

(A01)
ТОВАРИСТВО З ОБМЕЖЕНОЮ ВІДПОВІДАЛЬНІСТЮ
"ИНТЕРПАЙП НИКО ТЬЮБ"
Юридична адреса: пр.Трубников,56,м.Нікополь,Україна,53200
Адрес виробництва: вул.Каштанова,35,м.Дніпро,Україна,49081
Контактна інформація: +38(0562)35-85-07,quality@m.interpipe.biz
LIMITED LIABILITY COMPANY "INTERPIPE NIKO TUBE"
Legal address: Trubnykiv Av.,56,Nikopol,Ukraine,53200
Facility address: Kaschtanova Str.,35,Dnipro,Ukraine,49081
Contact information: +38(0562)35-85-07,quality@m.interpipe.biz

ІНСПЕКЦІЙНИЙ СЕРТИФІКАТ
INSPECTION CERTIFICATE (A02)
EN 10204-2004/3.1

No : 1154/4
Аркуш / Page 1/3 (A03)
Дата / Data 02.04.2024

(A13)
CE
07
DoP №LLC"INTERPIPE NIKO TUBE" /1.0576-2021
EN 10210-1:2006
0090

| | |
|---|---|
| Вантажоодержувач/ Consignee (A06.1)<br>E. F. C. ACCIAI s.r.l. 25030 - Via Quinzano 84, Castelmella (Brescia), 25030, Italy | Контракт №/ Contract #<br>COC24/0583 |
| | Заводське замовлення/Production order # (A08)<br>640583/101 |
| Країна/ Country (A06.1)<br>Італія/Italy | № замовлення клієнта/ Customers ref # (A07)<br>PO#201/24 |
| Транспортний засіб/ Vehicle №<br>AO 7197CE/AO0150XP | Унікальний №/ Unique #<br>24-002284 (A09) |

| | |
|---|---|
| (B01,B02,B03)<br>Стан постачання / Dellivery condition | Труби сталеві безшовні гарячекатані/Seamless steel hot-rolled pipes |
| | EN 10210-1:2006/ EN 10210-2:2019/ EN 10297-1:2003/ EN 10216-3:2013 |
| | E355+N/ P355N TC1/ S355J2H |
| | Труби обрізані під прямим кутом / Pipes are cut off under a right angle |
| | Труби без ковпачків / Pipes without caps. |
| | Труби без покриття./ Pipes without coating. |

Додаткова інформація/Additional information
Завод сертифікований по PED (Pressure Equipment Directive) 2014/68/EU (appendix 1 exp. 4.3 and 7.5). / The Mill is PED (Pressure Equipment Directive) 2014/68/EU (appendix 1 exp. 4.3 and 7.5) certified.
Маса фактична. / Actual weight.
Без травлення/ Pipes without etching

Термообробка/Heat treatment
Нормалізація з прокатного нагріву за температури 845-945°C / Normalized rolling at the temperature 845-945 deg C.

| № поз. Item No | (B07.4) Номер пакунка Bundie# | (B07.3) Номери труб Pipe# | (B07.1) Номер плавки Heat# | (B07.2) Номер партії Inspection Lot# | (B09) Зовнішній діаметр OD мм mm | (B09) Товщина стінки WT мм mm | (B010) Довжина Length м m | (B11) Загальна довжина Total length м m | (B08) штуки pieces | (B13) Фактична вага Actual weight брутто gross кг kg | (B13) Фактична вага Actual weight нетто net кг kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 51 | 8236 | 1240905 | 653 | 298.5 | 45.00 | 6.00-7.10 | 6,88 | 1 | 1978 | 1968 |
| 2 | 52 | 8235 | 1240905 | 653 | 298.5 | 45.00 | 6.00-7.10 | 6,86 | 1 | 2006 | 1996 |
| 3 | 53 | 8234 | 1240905 | 653 | 298.5 | 45.00 | 6.00-7.10 | 6,03 | 1 | 1760 | 1750 |
| | | For item/поз.: # 24-002284-008 | | | | РАЗОМ/TOTAL | | 19,77 | 3 | 5744 | 5714 |

ПАКУНКІВ/BUNDLES 3

Продукція виготовлена в умовах сертифікованих систем менеджменту якості, навколишнього середовища та безпеки./The products were manufactured in controlled conditions of certified quality, environment and safety management system

(A01)
ТОВАРИСТВО З ОБМЕЖЕНОЮ ВІДПОВІДАЛЬНІСТЮ
"ИНТЕРПАЙП НИКО ТЬЮБ"
Юридична адреса: пр.Трубников,56,м.Нікополь,Україна,53200
Адрес виробництва: вул.Каштанова,35,м.Дніпро,Україна,49081
Контактна інформація: +38(0562)35-85-07,quality@m.interpipe.biz
LIMITED LIABILITY COMPANY "INTERPIPE NIKO TUBE"
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ІНСПЕКЦІЙНИЙ СЕРТИФІКАТ
INSPECTION CERTIFICATE
EN 10204-2004/3.1 (A02)

No : 1154/4
Аркуш / Page 2/3 (A03)
Дата / Data 02.04.2024

(C71) **Хімічний склад по сертифікатним даним на заготівку в % /Heat analysis acc.to the billet manufacturer certificate %**

| (B07.1) Номер плавки Heat # | C x100 | Mn x100 | Si x100 | S x1000 | P x1000 | Cr x100 | Ni x100 | Cu x100 | Mo x1000 | Ti x1000 | V x1000 | Nb x1000 | Al x1000 | B x1000 | N x1000 | CEV |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| min | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| max | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0,47 |
| 1240905 | 19.2 | 149.9 | 24 | 3 | 14 | 9.3 | 10.5 | 17.1 | 11 | 4 | 5 | 3 | 31 | 0.4 | 6.2 | 0.48 |

| | |
|---|---|
| CEV | C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15 |
| НД на заготівку/Normative documentation for billets | ТУ У 24.1-33718431-001:2015 Изм.№1 |
| Завод виробник/ Plant-manufacturer | "Дніпросталь"/"MP"DNEPROSTEEL"LLC |
| (C70) | Сталь вироблена методом плавління в електродуговій печі з подальшим безперервним розливом. Сталь повністю розкислена та дрібнозерниста. Сталь розкислена алюмінієм. Заготовка виготовлена з чавуну та сталі на ТОВ «МЗ Дніпросталь» (ЄДРПОУ номер 33718431 ) за адресою: Україна, м. Дніпро, вул. Дніпросталівська 4/ The steel is produced by melting in an electric arc furnace followed by continuous casting. The steel is fully killed and fine-grained. The steel is killed with aluminium. The billet is made of cast iron and steel at "MP"DNEPROSTEEL"LLC (USREOU number 33718431) at the following address: 4, Dneprostalivska Str., Dnipro, Ukraine. |
| (C93-C99) | Не містить жодних матеріалів або компонентів, що походять з Росії, Білорусі, окупованих територій України (Крим, Донецька, Луганська, Херсонська, Запорізька області), Ірану, Сирії, Північної Кореї чи будь-якої іншої санкційної юрисдикції. Митний код: заготовка, одержана безперервним литтям, кругла, з нелегованої сталі, з масовою часткою вуглецю менш як 0,25 % - 720719/ Does not contain any materials or components originating from Russia, Belarus, the occupied territories of Ukraine (Crimea, Donetsk, Luhansk, Kherson, Zaporizhzhia regions), Iran, Syria, North Korea or any other sanctioned jurisdiction. Customs code: The billets produced by continuous casting, round, of unalloyed steel with a mass fraction of carbon less than 0.25% – 720719 |

(C72) **Результати контролю хімічного складу метала труб/Results of chemical analysis of pipes**

| (B07.1) Номер плавки Heat # | Номер партії Lot# | (C00.1) зразок Test piece | C x100 | Mn x100 | Si x100 | S x1000 | P x1000 | Cr x100 | Ni x100 | Cu x100 | Mo x1000 | Ti x1000 | V x1000 | Nb x1000 | Al x1000 | B x1000 | N x1000 | CEV |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| min | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| max | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0,47 |
| 1240905 | 653 | 1 | 19 | 149 | 23 | 2 | 13 | 9 | 10 | 17 | 10 | 5 | 5 | 2 | 30 | | 6 | 0.48 |

| | |
|---|---|
| CEV | C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15 |

## Результати випробувань труб - Test results for pipes

### Випробування на розтягнення/ Tensile test

| (B07.1) Номер плавки Heat# | (B07.2) Номер партії Lot# | (C12) Межа міцності Tensile strength Rm | (C12) Межа міцності Tensile strength t= Rm | (C11) Межа плинності Rp0,2 Yield strength Rp0,2 | (C11) Межа плинності Yield strength t= | (C13) Відносне подовження Elongation 70 | (C13) Відносне подовження Elongation t= | (C15) Відносне звуження Relative narrowing | (C15) Відносне звуження Relative narrowing t= | (C14) Ставлення Rt/Rm Ratio Rt/Rm | (C02) Орієнтація зразків Spesimens orientation* | (C10.1) Ширина смугового зразка Width of stip specimen | (C10.2) Діаметр циліндричного зразка Diameter of cylindrical specimen | (C10.1) Довжина зразка Length of specimen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | МПа | МПа | МПа | МПа | % | % | % | % | | | мм/mm | мм/mm | мм/mm |
| min | | 490 | | 335 | | 22 | | | | - | | | | |
| max | | 630 | | | | | | | | - | | | | |
| 1240905 | 653 | 556 | - | 381 | - | 31,0 | - | - | - | - | L | | 14 | 70 |

* L - Поздовжній зразок / Longitudinal specimen; T - Поперечний зразок / transverse specimen

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(A01)
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ІНСПЕКЦІЙНИЙ СЕРТИФІКАТ (A02)
INSPECTION CERTIFICATE
EN 10204-2004/3.1

No : 1154/4 (A03)
Аркуш / Page 3/3
Дата / Data 02.04.2024

**Випробування на удар/Impact test**

| (B07.1) Номер плавки Heat# | (C00.1) Номер партії Lot# | (C02) Орієнтація зразка Spesimens orientation* | (C40) Тип надрізання, температура Type of notch, temperature | Норматив Norm | Випробування на удар (Ударна в'язкість) Impact test (Impact strength) (C42) 1 | (C42) 2 | (C42) 3 | (C43) сер.знач./av. | (C44) Площа зсуву Shear area | (C41) Ширина смугового зразка Width of stip specimen |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | min | Дж | Дж | Дж | Дж | % | мм/mm |
| 1240905 | 653 | L | KV -20°C | 40 | 102,0 | 121,8 | 117,6 | 113,8 | | 10x10 |
| 1240905 | 653 | T | KV -20°C | 27 | 75,6 | 118,6 | 69,6 | 87,9 | | 10x10 |

* L - поздовжній зразок/Longitudial spesimen; T - поперечний зразок/transverse spesimen
** Результати випробувань зменшених зразків перераховані на повнорозмірні/Non-fullsize specimens results convert to fullsize (10x10mm)

(C50,D55)
**Інші види контролю / Other tests**

| Вид випробування/ Type of test | Параметри/ Criteria | | Результати контролю/ Test results |
|---|---|---|---|
| Сплющення/ Flattening test | За стандартом / As per Standard | 100% | Задовільно / Satisfactory |
| Кільцеве розтягнення/ Ring tensile | За стандартом/ As per Standard | 100% | Задовільно / Satisfactory |
| Випробування гідравлічним тиском/ Hydrostatic test | 7MPa/5sec | 100% | Задовільно / Satisfactory |
| Візуальний контроль/ Visual inspection | За стандартом / As per Standard | 100% | Задовільно / Satisfactory |
| Контроль геометричних параметрів/ Dimensional inspection | За стандартом/ As per Standard | 100% | Задовільно / Satisfactory |

(A04,B06)
**Маркування фарбою/ Marking paint**
INTERPIPE NIKO TUBE EN 10210-1.2 S355J2H EN 10297-1 E355+N EN 10216-3 P355N TC1 pipe dimensions Heat# Lot# Pipe# stamp QD Conformance symbol CE

(Z01)
Труби виготовлені і випробувані відповідно до вимог EN 10210-1:2006/ EN 10210-2:2019/ EN 10297-1:2003/ EN 10216-3:2013 і замовлення / Pipes were produced and inspected according to requirements of EN 10210-1:2006/ EN 10210-2:2019/ EN 10297-1:2003/ EN 10216-3:2013 and order's requirements

(A05,Z02,Z03)

| Дата/Data | |
|---|---|
| 02.04.2024 | Підпис особи, відповідальної за видачу сертифікату /Signature of Certificate ispector Іваненко Дарина Андріївна/Ivanenko Darina |

Вказівка в дужках відповідає кодам згідно EN 10168 /Indication in parentheses correspond to sttributes according to EN 10168.

(Z05)
Ваші пропозиції щодо поліпшення продукції просимо надсилати на ел.адресу / Please send Your proposals for improving the product by e-mail or fax or by phpne info@ nstp.interpipe.biz www.interpipe.biz Phone: +380 566-630-133 Fax: +380 566-639-379. e-mail: info@ua.interpipe.biz Phone: +38 (056)74-74-066 Fax: +38(056)770-20-01 Цей інспекційний сертифікат стосується лише перерахованої в ньому продукції. Неприпустимо внесення змін або інше неправомірне використання сертифіката. /This inspection certificateis only for the listed products. Modification or unauthorized use of the certificate is strictly prohibited. Violations can be considered as forgery and is subject to prosecution

INTERPIPE NIKO TUBE

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(A01)

ТОВАРИСТВО З ОБМЕЖЕНОЮ ВІДПОВІДАЛЬНІСТЮ "ИНТЕРПАЙП НИКО ТЬЮБ"
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(A02)

ІНСПЕКЦІЙНИЙ СЕРТИФІКАТ
INSPECTION CERTIFICATE
EN 10204-2004/3.1

(A03)

No :
1253/3
Аркуш / Page 1/5
Дата / Data
01.05.2024

(A13)

CE
07
DoP
№LLC"INTERPIPE NIKO TUBE"
/1.0576-2021
EN 10210-1:2006
0090

| | |
|---|---|
| Вантажоодержувач/ Consignee (A06.1)<br>E. F. C. ACCIAI s.r.l. 25030 - Via Quinzano 84, Castelmella (Brescia), 25030, Italy | Контракт №/ Contract #<br>COC24/0761 |
| | Заводське замовлення/Production order # (A08)<br>540761/101 |
| Країна/ Country (A06.1)<br>Італія/Italy | № замовлення клієнта/ Customers ref # (A07)<br>PO#511/24 |
| Транспортний засіб/ Vehicle №<br>AO 2500KB/AO2221XP | Унікальний №/ Unique #<br>24-003142 (A09) |

| | |
|---|---|
| (B01,B02,B03)<br>Стан постачання / Dellivery condition<br>Нормалізовані/ Normalized condition | Труби сталеві безшовні гарячекатані/Seamless steel hot-rolled pipes |
| | EN 10210-1:2006/ EN 10210-2:2019/ EN 10297-1:2003/ EN 10216-3:2013 |
| | E355+N/ P355N TC1/ S355J2H |
| | Труби обрізані під прямим кутом / Pipes are cut off under a right angle |
| | Труби без ковпачків / Pipes without caps. |
| | Труби без покриття./ Pipes without coating. |

Додаткова інформація/Additional information
Виробник труб сертифікований відповідно до EN ISO 9001:2015, відповідно сертифіката № 2010022314373/001 / The manufacturer of pipes is certified EN ISO 9001: 2015, according to certificate No. 2010022314373/001
Завод сертифікований по PED (Pressure Equipment Directive) 2014/68/EU (appendix 1 exp. 4.3 and 7.5). / The Mill is PED (Pressure Equipment Directive) 2014/68/EU (appendix 1 exp. 4.3 and 7.5) certified.
Маса фактична. / Actual weight.
Країна виплавки та виробництва - Україна./Country of melt and manufacturer UKRAINE.
Без травлення/ Pipes without etching

Термообробка/Heat treatment
Труби виготовлені шляхом гарячої деформації та нормалізовані при температурі 845...945°C, охолоджені на повітрі /Pipes produced by Hot Forming followed by normalizing at the temperature 845 deg C to 945 deg C cooled at air

| № поз. Item No | (B07.4) Номер пакунка Bundle# | (B07.3) Номери труб Pipe# | (B07.1) Номер плавки Heat# | (B07.2) Номер партії Inspection Lot# | (B09) Зовнішній діаметр OD мм mm | (B09) Товщина стінки WT мм mm | (B010) Довжина Length м m | (B11) Загальна довжина Total length м m | (B08) штуки pieces | (B13) Фактична вага Actual weight брутто gross кг kg | (B13) Фактична вага Actual weight нетто net кг kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4076 | 1-6 | 1241244 | 1104 | 101.6 | 25.00 | 7.00-8.00 | 45,69 | 6 | 2124 | 2114 |
| 2 | 4078 | 13-15 | 1241244 | 1104 | 101.6 | 25.00 | 7.00-8.00 | 22,74 | 3 | 1062 | 1052 |
| | | | | | | | РАЗОМ/TOTAL ПАКУНКІВ/BUNDLES 2 | 68,43 | 9 | 3186 | 3166 |

For item/поз.: # 24-003142-015

Супровідний дерев'яний пакувальний матеріал / Accompanying packaging wooden material 4

INTERPIPE NIKO TUBE

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(A02)
ІНСПЕКЦІЙНИЙ СЕРТИФІКАТ
INSPECTION CERTIFICATE
EN 10204-2004/3.1

(A03)
No :
1253/3
Аркуш / Page 2/5
Дата / Data
01.05.2024

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | РАЗОМ ВАНТАЖ/TOTAL CARGO | | | | 3190 | |
| 3 | 3864 | 16 | 1241244 | 964 | 127.0 | 30.00 | 6.00-7.00 | 6,69 | 1 | 474 | 472 |
| | | | | | | РАЗОМ/TOTAL ПАКУНКІВ/BUNDLES 1 | | 6,69 | 1 | 474 | 472 |
| | | For item/поз.: # 24-003142-022 | | | | | | | | | |
| 4 | 4319 | 10 | 1241296 | 1030 | 152.4 | 25.00 | 6.50-7.50 | 7,07 | 1 | 557 | 556 |
| | | | | | | РАЗОМ/TOTAL ПАКУНКІВ/BUNDLES 1 | | 7,07 | 1 | 557 | 556 |
| | | For item/поз.: # 24-003142-023 | | | | | | | | | |
| 5 | 4307 | 7,8 | 1241277 | 1117 | 152.4 | 30.00 | 7.00-8.00 | 14,56 | 2 | 1339 | 1336 |
| | | | | | | РАЗОМ/TOTAL ПАКУНКІВ/BUNDLES 1 | | 14,56 | 2 | 1339 | 1336 |
| | | For item/поз.: # 24-003142-025 | | | | | | | | | |
| | | | | | | Супровідний дерев'яний пакувальний матеріал / Accompanying packaging wooden material | | | | 1 | |
| | | | | | | РАЗОМ ВАНТАЖ/TOTAL CARGO | | | | 1340 | |
| 6 | 4231 A | 41 | 1241277 | 1131 | 159.0 | 28.00 | 5.92-6.02 | 6,01 | 1 | 544 | 542 |
| | | | | | | РАЗОМ/TOTAL ПАКУНКІВ/BUNDLES 1 | | 6,01 | 1 | 544 | 542 |
| | | For item/поз.: # 24-003142-030 | | | | | | | | | |
| 7 | 3827 | 8 | 1241278 | 982 | 193.7 | 30.00 | 5.50-6.50 | 6,16 | 1 | 710 | 708 |
| | | | | | | РАЗОМ/TOTAL ПАКУНКІВ/BUNDLES 1 | | 6,16 | 1 | 710 | 708 |
| | | For item/поз.: # 24-003142-039 | | | | | | | | | |
| | | | | | | Супровідний дерев'яний пакувальний матеріал / Accompanying packaging wooden material | | | | 1 | |
| | | | | | | РАЗОМ ВАНТАЖ/TOTAL CARGO | | | | 711 | |
| | | | | | | **РАЗОМ/TOTAL** | | **108,92** | **15** | **6810** | **6780** |
| | | | | | | **ПАКУНКІВ/BUNDLES 7** | | | | | |
| | | | | | | **Супровідний дерев'яний пакувальний матеріал / Accompanying packaging wooden material** | | | | **6** | |
| | | | | | | **РАЗОМ ВАНТАЖ/TOTAL CARGO** | | **108,92** | **15** | **6816** | **6780** |

(A01)
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(A02)
ІНСПЕКЦІЙНИЙ СЕРТИФІКАТ
INSPECTION CERTIFICATE
EN 10204-2004/3.1

(A03)
No : 1253/3
Аркуш / Page 3/5
Дата / Data 01.05.2024

(C71) **Хімічний склад по сертифікатним даним на заготівку в % /Heat analysis acc.to the billet manufacturer certificate %**

| (B07.1) Номер плавки Heat # | C x100 | Mn x100 | Si x100 | S x1000 | P x1000 | Cr x100 | Ni x100 | Cu x100 | Mo x1000 | Ti x1000 | V x1000 | Nb x1000 | Al x1000 | B x1000 | N x1000 | CEV |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| min | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| max | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.47 |
| 1241244 | 17.2 | 135.4 | 20 | 4 | 18 | 13.8 | 10.7 | 21.4 | 9 | 2 | 4 | 3 | 33 | 0.4 | 5 | 0.45 |
| 1241277 | 17.1 | 132.5 | 18.8 | 4 | 16 | 11.9 | 11.9 | 22.5 | 12 | 3 | 4 | 2 | 25 | 0.4 | 6.1 | 0.44 |
| 1241278 | 17.5 | 132.8 | 19.5 | 4 | 15 | 11.3 | 11.3 | 21.9 | 10 | 4 | 4 | 2 | 28 | 0.4 | 5.5 | 0.44 |
| 1241296 | 18 | 135.3 | 20.6 | 3 | 14 | 10.4 | 10.3 | 20.8 | 10 | 3 | 4 | 3 | 31 | 0.5 | 5.2 | 0.45 |

| | |
|---|---|
| CEV | C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15 |
| НД на заготівку/Normative documentation for billets | ТУ У 24.1-33718431-001:2015 Изм.№1 |
| Завод виробник/ Plant-manufacturer | "Дніпросталь"/"MP"DNEPROSTEEL"LLC |
| (C70) | Сталь вироблена методом плавління в електродуговій печі з подальшим безперервним розливом. Сталь повністю розкислена та дрібнозерниста. Сталь розкислена алюмінієм. Заготовка виготовлена з чавуну та сталі на ТОВ «МЗ Дніпросталь» (ЄДРПОУ номер 33718431 ) за адресою: Україна, м. Дніпро, вул. Дніпросталівська 4/ The steel is produced by melting in an electric arc furnace followed by continuous casting. The steel is fully killed and fine-grained. The steel is killed with aluminium. The billet is made of cast iron and steel at "MP"DNEPROSTEEL"LLC (USREOU number 33718431) at the following address: 4, Dneprostalivska Str., Dnipro, Ukraine. |
| (C93-C99) | Не містить жодних матеріалів або компонентів, що походять з Росії, Білорусі, окупованих територій України (Крим, Донецька, Луганська, Херсонська, Запорізька області), Ірану, Сирії, Північної Кореї чи будь-якої іншої санкційної юрисдикції. Митний код: заготовка, одержана безперервним литтям, кругла, з нелегованої сталі, з масовою часткою вуглецю менш як 0,25 % - 720719/ Does not contain any materials or components originating from Russia, Belarus, the occupied territories of Ukraine (Crimea, Donetsk, Luhansk, Kherson, Zaporizhzhia regions), Iran, Syria, North Korea or any other sanctioned jurisdiction. Customs code: The billets produced by continuous casting, round, of unalloyed steel with a mass fraction of carbon less than 0.25% – 720719 |

(C72) **Результати контролю хімічного складу метала труб/Results of chemical analysis of pipes**

| (B07.1) Номер плавки Heat # | Номер партії Lot# | (C00.1) зразок Test piece | C x100 | Mn x100 | Si x100 | S x1000 | P x1000 | Cr x100 | Ni x100 | Cu x100 | Mo x1000 | Ti x1000 | V x1000 | Nb x1000 | Al x1000 | B x1000 | N x1000 | CEV |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| min | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| max | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.47 |
| 1241244 | 1104 | 2 | 17 | 132 | 20 | 3 | 18 | 13 | 11 | 21 | 10 | 5 | 5 | 1 | 34 | | 5 | 0.44 |
| | 964 | 1 | 19 | 134 | 19 | 3 | 18 | 13 | 11 | 21 | 10 | 5 | 5 | 2 | 30 | | 6 | 0.46 |
| 1241277 | 1117 | 2 | 17 | 133 | 20 | 2 | 15 | 12 | 12 | 22 | 12 | 5 | 5 | 2 | 25 | | 6 | 0.44 |
| | 1131 | 1 | 18 | 132 | 20 | 3 | 14 | 11 | 12 | 21 | 11 | 5 | 5 | 2 | 25 | | 6 | 0.45 |
| 1241278 | 982 | 1 | 19 | 134 | 20 | 3 | 16 | 11 | 12 | 22 | 11 | 5 | 5 | 2 | 29 | | 6 | 0.46 |
| 1241296 | 1030 | 1 | 17 | 134 | 20 | 2 | 14 | 10 | 11 | 23 | 12 | 5 | 5 | 2 | 34 | | 5 | 0.44 |

| | |
|---|---|
| CEV | C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15 |

**Результати випробувань труб - Test results for pipes**

**Випробування на розтягнення/ Tensile test**

| (B07.1) | (B07.2) | (C12) | (C12) | (C11) | (C11) | (C13) | (C13) | (C15) | (C15) | (C14) | (C02) | (C10.1) | (C10.2) | (C10.1) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

INTERPIPE NIKO TUBE

ООВ ВНІТІ-ТЕСТ
№ 80054
ДСТУ ISO 9001:2015

The testing laboratory is accredited in accordance with the requirements of DSTU EN ISO IEC 17025:2019

Продукція виготовлена в умовах сертифікованих систем менеджменту якості, навколишнього середовища та безпеки./The products were manufactured in controlled conditions of certified quality, environment and safety management system

(A01)
ТОВАРИСТВО З ОБМЕЖЕНОЮ ВІДПОВІДАЛЬНІСТЮ
"ИНТЕРПАЙП НИКО ТЬЮБ"
Юридична адреса:
пр.Трубников,56,м.Нікополь,Україна,53200
Адрес виробництва:
вул.Каштанова,35,м.Дніпро,Україна,49081
Контактна інформація: +38(0562)35-85-07,quality@m.interpipe.biz
LIMITED LIABILITY COMPANY "INTERPIPE NIKO TUBE"
Legal address: Trubnykiv Av.,56,Nikopol,Ukraine,53200
Facility address: Kaschtanova Str.,35,Dnipro,Ukraine,49081
Contact information: +38(0562)35-85-07,quality@m.interpipe.biz

(A02)
ІНСПЕКЦІЙНИЙ СЕРТИФІКАТ
INSPECTION CERTIFICATE
EN 10204-2004/3.1

(A03)
No : 1253/3
Аркуш / Page 4/5
Дата / Data 01.05.2024

| Номер плавки Heat# | Номер партії Lot# | Межа міцності Tensile strength Rm | Межа міцності Tensile strength t= Rm | Межа плинності Yield strength | Межа плинності Yield strength t= | Відносне подовження Elongation | Відносне подовження Elongation t= | Відносне звуження Relative narrowing | Відносне звуження Relative narrowing t= | Ставлення Rt/Rm Ratio Rt/Rm | Орієнтація зразків Spesimens orientation* | Ширина смугового зразка Width of stip specimen | Діаметр циліндричного зразка Diameter of cylindrical | Довжина зразка Length of specimen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | МПа | МПа | МПа | МПа | % | % | % | % | | | мм/mm | мм/mm | мм/mm |
| min | | 490 | | 345 | | 22 | | | | - | | | | |
| max | | 630 | | | | | | | | - | | | | |
| 1241244 | 1104 | 543 | - | 425 | - | 30,0 | - | - | - | - | L | | 14 | 70 |
| 1241244 | 964 | 538 | - | 375 | - | 25,2 | - | - | - | - | L | | 14 | 70 |
| 1241277 | 1117 | 546 | - | 436 | - | 28,8 | - | - | - | - | L | | 14 | 70 |
| 1241277 | 1131 | 532 | - | 397 | - | 28,4 | - | - | - | - | L | | 14 | 70 |
| 1241278 | 982 | 523 | - | 356 | - | 27,1 | - | - | - | - | L | | 14 | 70 |
| 1241296 | 1030 | 515 | - | 400 | - | 27,0 | - | - | - | - | L | | 14 | 70 |

* L - Поздовжній зразок / Longitudinal specimen; T - Поперечний зразок / transverse specimen

**Випробування на удар/Impact test**

| (B07.1) Номер плавки Heat# | (C00.1) Номер партії Lot# | (C02) Орієнтація зразка Spesimens orientation* | (C40) Тип надрізання, температура Type of notch, temperature | Норматив Norm | Випробування на удар (Ударна в 'язкість) Impact test (Impact strength) (C42) 1 | (C42) 2 | (C42) 3 | (C43) сер.знач./av. | (C44) Площа зсуву Shear area | (C41) Ширина смугового зразка Width of stip specimen |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | min | Дж | Дж | Дж | Дж | % | мм/mm |
| 1241244 | 1104 | L | KV -20°C | 40 | 177,6 | 201,0 | 189,6 | 189,4 | | 10x10 |
| 1241244 | 1104 | T | KV -20°C | 27 | 173,4 | 166,8 | 175,8 | 172,0 | | 10x10 |
| 1241244 | 964 | L | KV -20°C | 40 | 168,0 | 161,4 | 123,6 | 151,0 | | 10x10 |
| 1241244 | 964 | T | KV -20°C | 27 | 161,4 | 134,4 | 159,0 | 151,6 | | 10x10 |
| 1241277 | 1117 | L | KV -20°C | 40 | 153,6 | 103,8 | 192,0 | 149,8 | | 10x10 |
| 1241277 | 1117 | T | KV -20°C | 27 | 177,6 | 128,4 | 133,2 | 146,4 | | 10x10 |
| 1241277 | 1131 | L | KV -20°C | 40 | 177,0 | 162,0 | 184,2 | 174,4 | | 10x10 |
| 1241277 | 1131 | T | KV -20°C | 27 | 148,2 | 153,0 | 165,0 | 155,4 | | 10x10 |
| 1241278 | 982 | L | KV -20°C | 40 | 158,4 | 163,2 | 162,6 | 161,4 | | 10x10 |
| 1241278 | 982 | T | KV -20°C | 27 | 149,4 | 154,2 | 157,8 | 153,8 | | 10x10 |
| 1241296 | 1030 | L | KV -20°C | 40 | 161,4 | 167,2 | 143,4 | 157,3 | | 10x10 |
| 1241296 | 1030 | T | KV -20°C | 27 | 136,8 | 144,0 | 140,4 | 140,4 | | 10x10 |

* L - поздовжній зразок/Longitudial spesimen; T - поперечний зразок/transverse spesimen

** Результати випробувань зменшених зразків перераховані на повнорозмірні/Non-fullsize specimens results convert to fullsize (10x10mm)

(A01)
ТОВАРИСТВО З ОБМЕЖЕНОЮ ВІДПОВІДАЛЬНІСТЮ
"ИНТЕРПАЙП НИКО ТЬЮБ"
Юридична адреса:
пр.Трубников,56,м.Нікополь,Україна,53200
Адрес виробництва:
вул.Каштанова,35,м.Дніпро,Україна,49081
Контактна інформація: +38(0562)35-85-07,quality@m.interpipe.biz
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Contact information: +38(0562)35-85-07,quality@m.interpipe.biz

(A02)
ІНСПЕКЦІЙНИЙ СЕРТИФІКАТ
INSPECTION CERTIFICATE
EN 10204-2004/3.1

(A03)
No :
1253/3
Аркуш / Page 5/5
Дата / Data
01.05.2024

(C50,D55)

**Інші види контролю / Other tests**

| Вид випробування/ Type of test | Параметри/ Criteria | | Результати контролю/ Test results |
|---|---|---|---|
| Сплющення/ Flattening test | За стандартом / As per Standard | 100% | Задовільно / Satisfactory |
| Випробування гідравлічним тиском/ Hydrostatic test | 7MPa/5sec | 100% | Задовільно / Satisfactory |
| Візуальний контроль/ Visual inspection | За стандартом/ As per Standard | 100% | Задовільно / Satisfactory |
| Контроль геометричних параметрів/ Dimensional inspection | За стандартом/ As per Standard | 100% | Задовільно / Satisfactory |

(A04,B06)

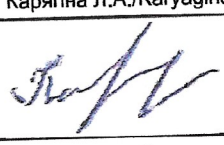
**Маркування фарбою/ Marking paint**

INTERPIPE NIKO TUBE EN 10210-1.2 S355J2H EN 10297-1 E355+N EN 10216-3 P355N TC1 pipe dimensions Heat# Lot# Pipe# stamp QD Conformance symbol CЄ

(Z01)

Труби виготовлені і випробувані відповідно до вимог EN 10210-1:2006/ EN 10210-2:2019/ EN 10297-1:2003/ EN 10216-3:2013 і замовлення / Pipes were produced and inspected according to requirements of EN 10210-1:2006/ EN 10210-2:2019/ EN 10297-1:2003/ EN 10216-3:2013 and order's requirements

(A05,Z02,Z03)

| Дата/Data | |
|---|---|
| 01.05.2024 | Підпис особи, відповідальної за видачу сертифікату /Signature of Certificate ispector Карягіна Л.А./Karyagina L.A. |
|  |  |

Вказівка в дужках відповідає кодам згідно EN 10168 /Indication in parentheses correspond to sttributes according to EN 10168.

(Z05)

Ваші пропозиції щодо поліпшення продукції просимо надсилати на ел.адресу / Please send Your proposals for improving the product by e-mail or fax or by phpne info@ nstp.interpipe.biz www.interpipe.biz Phone: +380 566-630-133 Fax: +380 566-639-379. e-mail: info@ua.interpipe.biz Phone: +38(056)74-74-066 Fax: +38(056)770-20-01 Цей інспекційний сертифікат стосується лише перерахованої в ньому продукції. Неприпустимо внесення змін або інше неправомірне використання сертифіката. /This inspection certificateis only for the listed products. Modification or unauthorized use of the certificate is strictly prohibited. Violations can be considered as forgery and is subject to prosecution

## 9 Pin/Shaft/Wheel/Pulley

| Pin for Davit Crane X-99001 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| *Part Number* | *Rev.* | *Description* | *Material* | *Pos.* | *Qt.y* | *Heat/IDplate* | *Certificates 3.1* | *Other mechanical test* |
| | | | | | | | | |
| C09-0001-P0013 | A | Shaft traveling trolley | Rod Bar Ø50 mm AISI 630 | 01 | 1 | 400197 | 2024031179 | N.A. |
| C09-0001-P0014 | A | Pulley Axis Ø60 | Rod Bar Ø 65 mm AISI 630 | 01 | 1 | 400197 | 202402159 | N.A. |
| C09-0001-P0015 | A | Wheel Ø 167 | C45 | 1 | 1 | 23807325 | B2202309120154 | N.A. |
| C09-0001-P0016 | A | Axis for Wheel Ø90 | AISI 630 | 01 | 1 | 300549 | 2023053221 | N.A. |
| C09-0001-P0037 | A | Shaft Pulley Hook | Rod Bar Ø 60 mm AISI 630 | 01 | 1 | 400197 | 202402159 | N.A. |
| C09-0001-P0038 | B | Roller Bearing Swivels | S355J2 | 01 | 1 | 480592 | 429339/1 | N.A. |
| C09-0001-P0066 | A | Pulley Boom Ø320 | S355J2 | 01 | 1 | 457170 | 255714/1 | N.A. |
| C09-0001-P0045 | A | Pulley Ø209 for rope Ø11 | S355J2 | 01 | 1 | 0014477Z | H72116580 | N.A. |
| C09-0001-P0046 | A | Hook Anti-Skid | S355J2C | 01 | 1 | 815265 | CRL2413532164 | N.A. |
| C09-0001-P0050 | A | Trolley Pinion M=6 Z=13 | 42CrMo4 | 01 | 1 | 220602441 | 4883 | N.A. |
| C09-0001-P0040 | A | Shaft Winch Ø80 mm | AISI 630 | 01 | 1 | 401373 | 2024049141 | N.A. |
| We declare that all dimensions checked are in compliance with the drawings | | | | | | | | |

REMAZEL

# CERTIFICATION LIST

Certificate Nr.: 001/24
Date: 04/11/2024

| Final Customer: | Order Customer: | Object: | Description: | Quantity: | Inspection and Test Plan (ITP): | Our job: |
|---|---|---|---|---|---|---|
| Rosetti Marino | COGNE | | Pins/Axis | | 1724001010-QC-ITP-00002 | |

## MATERIAL

| Drawing | Pos. | Q.ty | Description | Material | Certificates 3.1 | Order | Heat/Plate ID | Additional Mechanical Test | UT Certificates | Nesting |
|---|---|---|---|---|---|---|---|---|---|---|
| C09-0001-P0013 | 1 | 1 | T TRAVELLING TROLLEY Ø | AISI 630 | 2024031179 | 24005759 | 400197 | MICRO | 1177/24 | |
| C09-0001-P0014 | 1 | 1 | PULLEY AXIS Ø65mm | AISI 630 | 2024024159 | 24005759 | 400197 | MICRO | 982/24 | |
| C09-0001-P0016 | 1 | 1 | AXIS FOR WHEEL Ø90mm | AISI 630 | 2023053221 | 24005759 | 300549 | MICRO | 2029/23 | |
| C09-0001-P0037 | 1 | 1 | PULLEY HOOK Ø65mm | AISI 630 | 2024024159 | 24005759 | 400197 | MICRO | 982/24 | |
| C09-0001-P0040 | 1 | 1 | SHAFT WINCH Ø80mm | AISI 630 | 2024049141 | 24006040 | 401373 | MICRO | 1903/24 | |

**COGNE ACCIAI SPECIALI S.p.a.**

ITALY - 11100 AOSTA - VIA PARAVERA, 16
TEL +39.0165.3021 - FAX +39.0165.302296
CAP. SOC. 405.563.167,00 EUR INT. VERS.
C.F. 02187360967
VAT: IT00571320076 - R.E.A. n. AO-50474

**Company with Management Systems certified according to ISO 9001, ITAF 16949, EN 9100, ISO 14001 and ISO 45001.**

INSPECTION CERTIFICATE 3.1 (EN 10204:2004)
DOCUMENT NUMBER 2024031179


| | |
|---|---|
| CUSTOMER: | REMAZEL ENGINEERING S.P.A. |
| CUSTOMER'S ORDER: | 24005967 |
| MANUFACTURER'S WORKS: | AOSTA, VIA PARAVERA 16 - ITALY |
| PRODUCER OF THE DOC: | OUALITY DEPARTMENT |
| MANUFACTURER'S WORKS ORDER NO: | 0001142588 / 000010 |
| MARK OF THE MANUFACTURER: | **COGNE** |
| DISPATCH NOTE: | 0081635683 / 000010 WEIGHT: 10 KG / 22 LB |
| INTERNAL SPEC: | H1150DLT |
| PRODUCT: | PEL PEELED ROUND BARS TOLERANCE: ISOK11 |
| SURFACE FINISH: | 2B Cold Finished |
| PRODUCT DELIVERY CONDITION: | SI SOL.ANN+PRECIPIT. HARDENED |
| PRODUCT DIMENSIONS (mm): | 50,000 ( 1,969 in) |
| GRADE: | AISI 630-17.4PH-1.4542 INTERNAL GRADE: 630 3 IMCO |
| IDENTIFICATION HEAT NO: | 400197 IDENTIFICATION LOT NO: 398000 |
| MARKING OF THE PRODUCT: | TEST PIECE N: 800 |

---

THE MATERIAL MEETS THE REQUIREMENTS OF: ASTM A564 / ASME SA564 (R19a) H1150D, ASTM A484/A484M (21), NACE MR0175 (21)/ISO 15156-3, NACE MR0103 (15).
REFERENCE NORMS FOR CHEMICAL COMPOSITION ONLY: EN 10088-3 (14).
STEELMAKING EAF + AOD
PRODUCTION ROUTE: HOT ROLLING
HEAT TREATMENT: SOL.ANNEALING 1040°C+/-14°C 1H+30 MIN/INCH FORCED AIR COOLING BELOW 32°C;
DOUBLE AGING 620+/-14°C 4H MIN AIR COOLING BELOW 32°C.(FURNACE THERMOCOUPLES)
HOT ROLLED
REDUCTION RATIO 169,2

CHEMICAL LADLE ANALYSIS ACCORDING TO ASTM A751 - EN ISO 14284
Control lot No. - Weight :21000000681 - 0 - 0 LB

| ELEMENTS | C | Si | Mn | P | S | Cr | Mo | Ni | Nb | Cu |
|---|---|---|---|---|---|---|---|---|---|---|
| MEASUREMENT UNIT | % w/w | % w/w | % w/w | % w/w | % w/w | % w/w | % w/w | % w/w | % w/w | % w/w |
| OBTAINED | 0,018 | 0,31 | 0,72 | 0,024 | 0,025 | 15,75 | 0,20 | 4,64 | 0,27 | 3,55 |
| ELEMENTS | Co | Ta | | | | | | | | |
| MEASUREMENT UNIT | % w/w | % w/w | | | | | | | | |
| OBTAINED | 0,08 | 0,005 | | | | | | | | |

---

HARDNESS TEST IN AS DELIVERY CONDITION
Control lot No. - Weight :21000002161 - 3.086 KG - 6.803 LB
SPECIFICATION ENISO6508 HARDNESS TEST HRC TESTING METHOD:
OBTAINED 32,7

---

IMPACT TEST IN AS DELIVERY CONDITION
Control lot No. - Weight :21000002161 - 3.086 KG - 6.803 LB
SPECIFICATION EN ISO 148-1-KV2 DIRECTION OF THE TEST PIECE: L
TYPE OF TEST PIECE KV
TEST TEMPERATURE °C 60-
MEASUREMENT UNIT J
OBTAINED 86 71 78

---

DATE 03.07.2024 VALENTINA PRAZ VP(QUALITY CERTIFICATOR) - ELECTRONICALLY GENERATED CERTIFICATE -**Cogne**

**COGNE ACCIAI SPECIALI S.p.a.**

ITALY - 11100 AOSTA - VIA PARAVERA, 16
TEL +39.0165.3021 - FAX +39.0165.302296
CAP. SOC. 405.563.167,00 EUR INT. VERS.
C.F. 02187360967
VAT: IT00571320076 - R.E.A. n. AO-50474

**Company with Management Systems certified according to ISO 9001, ITAF 16949, EN 9100, ISO 14001 and ISO 45001.**



GRAIN SIZE
Control lot No. - Weight :21000002161 - 3.086 KG - 6.803 LB
SPECIFICATION ASTME112 --
OBTAINED 7

---

LATERAL EXPANSION
Control lot No. - Weight :21000002161 - 3.086 KG - 6.803 LB
SPECIFICATION -- --
OBTAINED 1,05 0,95 1,00

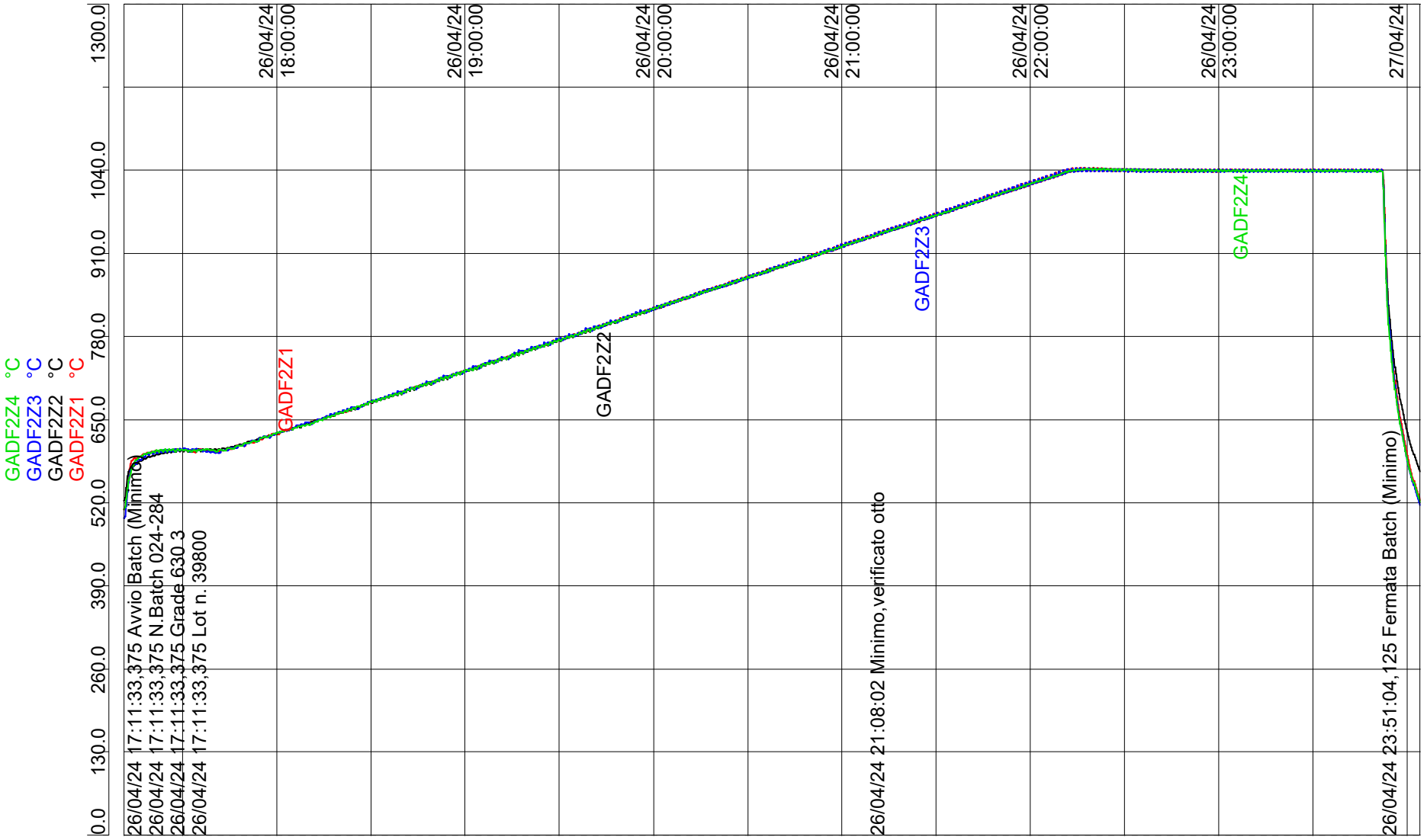
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ULTRASONIC TEST ACCORDING TO EN10308 class 4 equivalent to SEP 1920 group C class 3 and ASTM A388 FBH 3 for sizes less than 120 mm and ACCORDING TO EN 10308 class 3, equivalent to ASTM A388 FBH5 for sizes more than 120 mm: SATISFACTORY
TENSILE TEST
Control lot No. - Weight :21000002161 - 3.086 KG - 6.803 LB
SPECIFICATION ASTMA370-E8-0.5"SPEC DIRECTION OF THE TEST PIECE: L

| | RMB | RP02B | ZB | AL2B |
|---|---|---|---|---|
| MEASUREMENT UNIT | NMM | NMM | % | % |
| | | | | 4,0 D |
| OBTAINED | 1002 | 908 | 66,2 | 22,2 |

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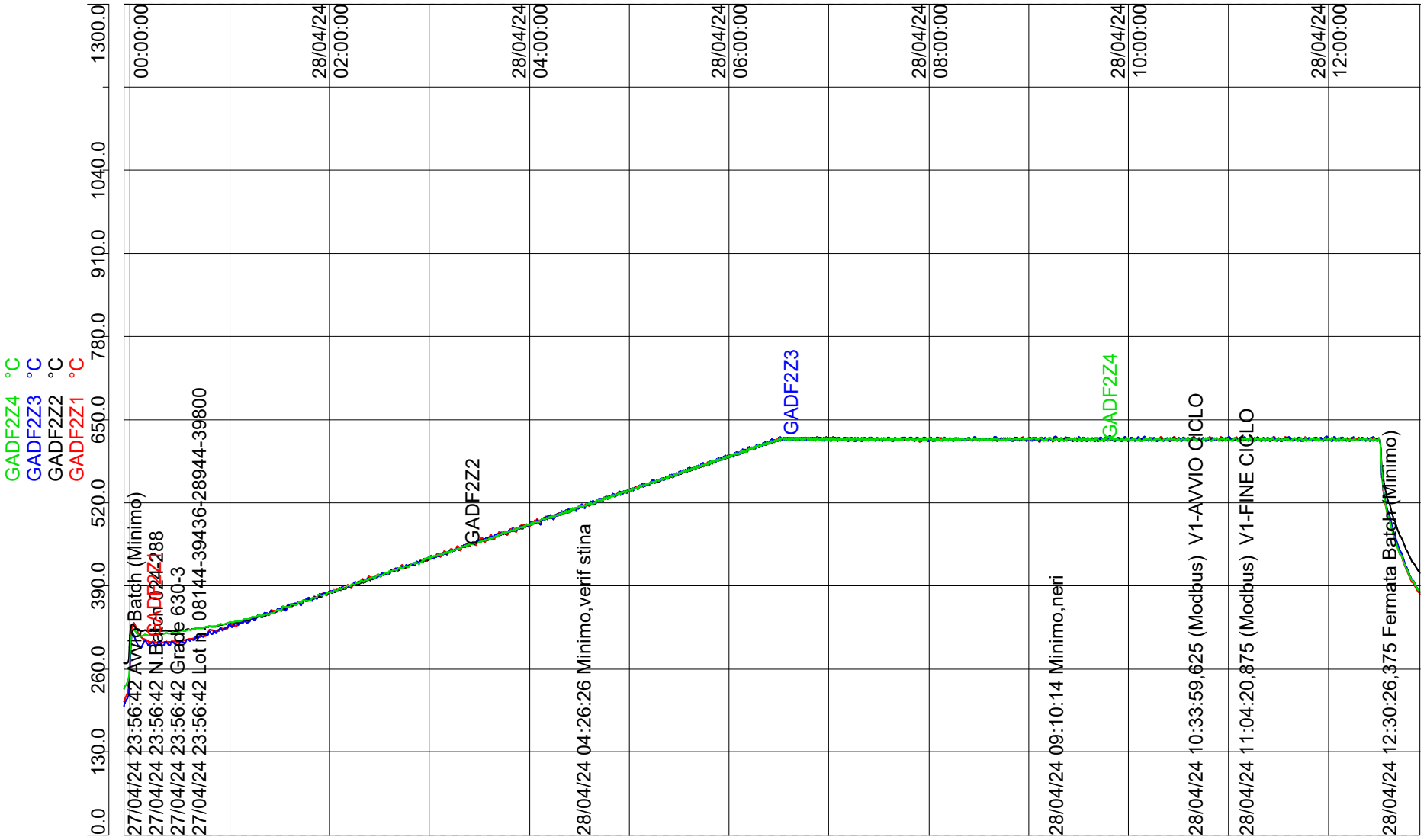
THE PRODUCT SATISFIES THE DIRECTIVES: 2015/863/EU (ROHS3) - 2011/65/EU (ROHS2) - 2000/53/EU - 2002/95/EU(RoHS) - 2003/11/EU-2005/618/EU AND PED 2014/68/EU (ANNEX I, SECTION 4.3).
MARKING: PRODUCER LOGO, MATERIAL NO, HEAT NO, LOT NR.
RADIOACTIVITY CONTROL PERFORMED WITH A GAMMA SPECTROMETER: ASTM E181.
GAMMA ACTIVITY ON THE PRODUCTS BELOW 0.1 BQ/G ACCORDING TO EU RESOLUTION 2013/59/EURATOM , IAEA RS-G-1.7 AND IAEA SSG-17.
WHERE NOT SPECIFIED ALL THE NORMS MENTIONED ARE INTENDED IN THEIR LAST REVISION AT THE DATE OF ISSUE OF THIS DOCUMENT.




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Grafico13

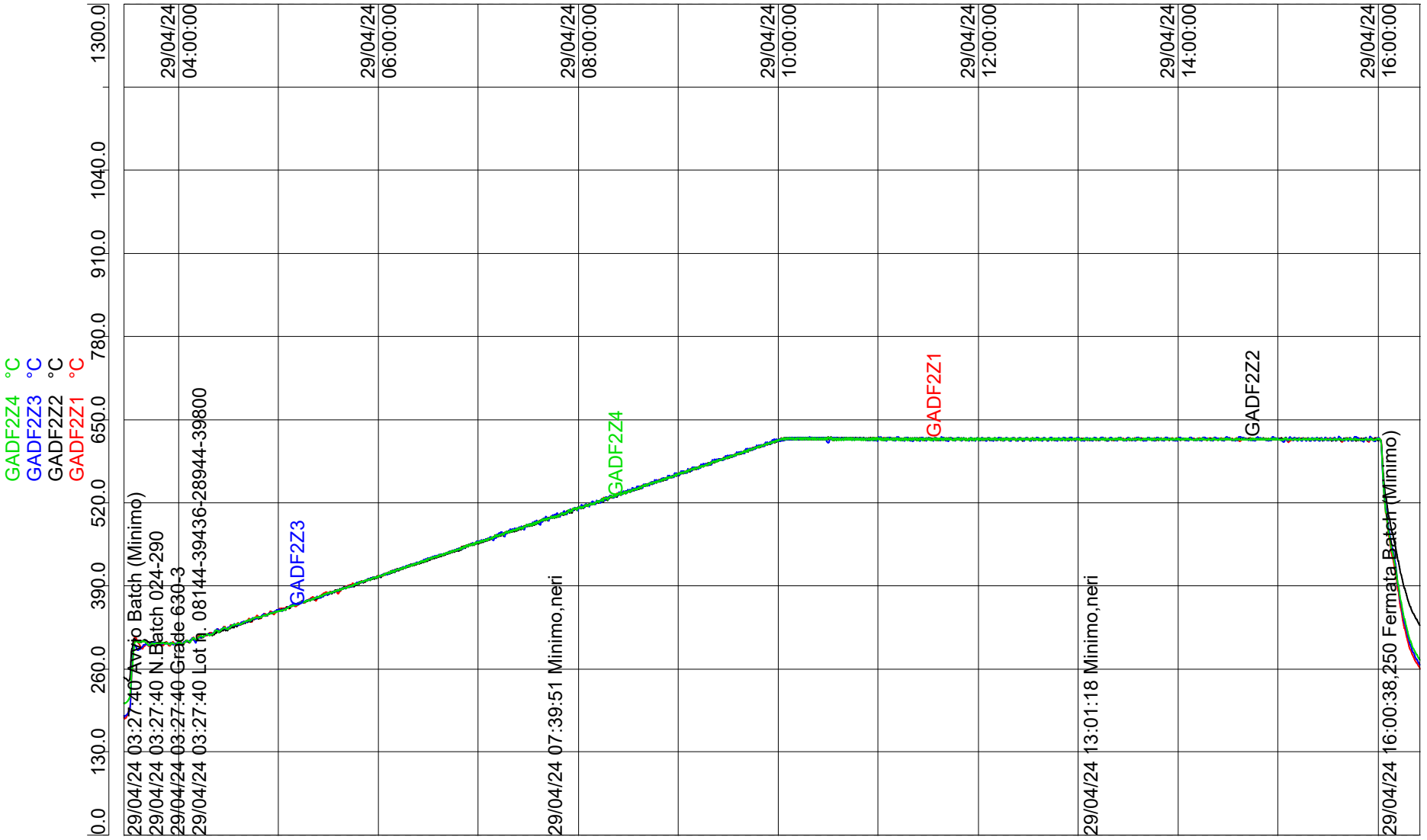
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Page 1 of 1




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Page 1 of 1




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02/07/2024 12:43:03

Grafico13

29/04/24 16:25:22,210
Page 1 of 1

**COGNE ACCIAI SPECIALI S.p.a.**
Via Paravera, 16
I-11100 AOSTA

MICROPHOTO **All.N 1**
**МИКРОСЪЁМКА**

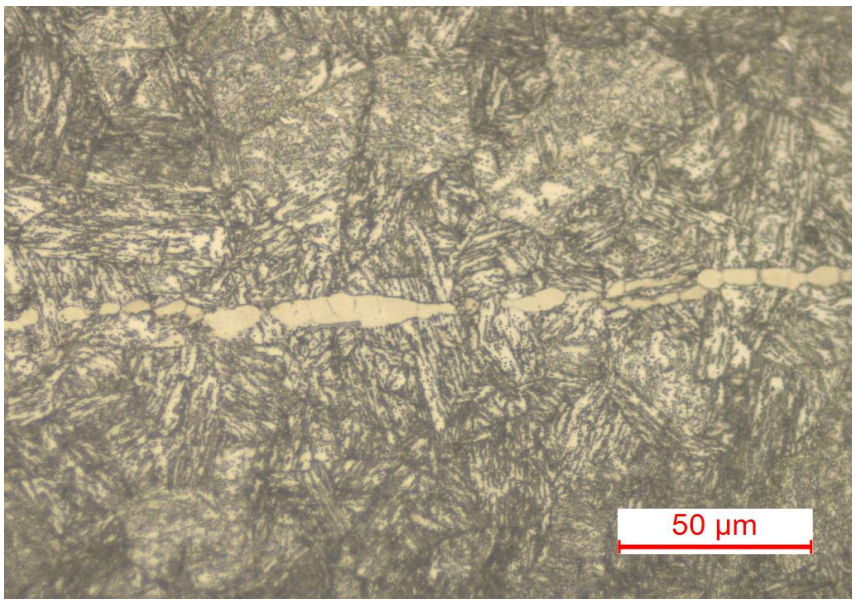
| | | | |
|---|---|---|---|
| ***MARCA***<br>*NUANCES*<br>*WERKESTOFF*<br>*GRADE*<br>*МАРКА* | 630 3 | ***LOTTO DI CONTROLLO***<br>*LOT DE CONTRÔLE*<br>*LAUFKARTE*<br>*CONTROL LOT*<br>*ПАРТИЯ КОНТРОЛЯ* | 21000002161 |
| ***COLATA***<br>*COULEE*<br>*SCHMELZE*<br>*HEAT*<br>*ПЛАВКА* | 400197 | ***REAGENTE***<br>*RÉACTIF*<br>*REAGENS*<br>*ETCHANT*<br>*РЕАГЕНТ* | Cogne Unico |
| ***TIPO DI APPARECCHIO***<br>*TIPE D'APPAREIL*<br>*PRUEFGERAT TYP*<br>*INSTRUMENT TYPE*<br>*ТИП АППАРАТА* | Microscopio: | **Leica DMI3000M s/n342700** | |
| *INGRANDIMENTO*<br>*AGRANDISSEMENT*<br>*VERGRÖSSERUNG*<br>*ENLARGEMENT*<br>*УВЕЛИЧЕНИЕ* | X500 | | |

DIREZIONE D'ESAME
*DIRECTION D'EXAMEN*
*PRUEFRICHTUNG*
SCANNING DIRECTION
НАПРАВЛЕНИЕ
ПРИ ИССЛЕДОВАНИИ

[X] **LONGITUDINALE - LONGITUDINAL - ПРОДОЛЬНОЕ**

[ ] **TRASVERSALE – TRANSVERSAL – KREUZEND-ПОПЕРЕЧНОЕ**

PHOTO (ELECTRONIC IMAGE) – ФОТОСНИМКИ (ЭЛЕКТРОННОЕ ИЗОБРАЖЕНИЕ)




NOTE:
ПРИМЕЧАНИЯ:

| | |
|---|---|
| **FIRMA** UNTERSCHRIFT<br>SIGNATURE SIGNATURE<br>ПОДПИСЬ | **DATA** DATUM<br>DATE DATE<br>ДАТА |
| Christian Del Guerra | 06/05/24 |

Mod.Micro Rev.5

COGNE ACCIAI SPECIALI S.P.A.

# CERTIFICATO DI COLLAUDO ULTRASUONI
CERTIFICAT DE CONTROLE PAR ULTRASONS
ULTRASCHALL PRUEFZEUGNIS
REPORT OF ULTRASONIC INSPECTION
ОТЧЕТ ОБ УЛЬТРАЗВУКОВОМ КОНТРОЛЕ

**N. US.**
1177/24

| | | | | | |
|---|---|---|---|---|---|
| ***CLIENTE*** *CLIENTSGG BESTELLER CUSTOMER* ЗАКАЗЧИК | | | ***CONFERMA*** *CONFIRMATION AUFTRAGSBESTRAKTIGUNG CONFIRMATION* ПОДТВЕРЖД. ЗАКАЗА | | |
| ***MARCA*** *NUANCES WERKESTOFF GRADE* МАРКА | 630 3 W.No 1.4542 | | ***ORDINE*** *COMMANDE AUFTRAG ORDER* ЗАКАЗ | | |
| ***SPECIFICA*** *SPECIFICATION PRUKEVORSCHRIFT SPECIFICATION* ТЕХ. ТРЕБОВАНИЯ | EN10308 prospetto2 cl4 | | ***COLATA*** *COULEE SCHMELZE HEAT* ПЛАВКА | 400197 | ***SCHEDA*** *LOT LAUFKARTE LOT* ПАРТИЯ 398000 |
| ***PRODOTTO*** *PRODUIT ERZEUGNISFORM PRODUCT* ИЗДЕЛИЕ | ROUND BARS 50 mm | | ***STATO DI LAVORAZIONE*** *STADE DU PRODUIT LIEFERZUSTAND WORKING STEP* ОБРАБОТКА | PEELED | |
| ***TIPO DI APPARECCHIO*** *TIPE D'APPAREILPARUS PRUEFGERAT TYP INSTRUMENT TYPE* ТИП АППАРАТА | USM36 | 18107589 | ***COSTRUTTORE*** *CONSTRUCTEUR BAUART MAKE* ИЗГОТОВИТЕЛЬ | KRAUTKRAMER | |
| ***TIPO DI SONDA*** *TIPE DE PALPEUR PRUFKOPT PROBETYPE* ТИП ЗОНДА | SEB4-S | | ***FREQUENZA*** ***FREQUENCE*** *FREQUENZ FREQUENCY* ЧАСТОТА | 4 MHz S/N | 67257 50316 |

***DIREZIONE D'ESAME***
*DIRECTION D'EXAMEN PRUEFRICHTUNG SCANNING DIRECTION*
НАПРАВЛЕНИЕ ПРИ

- [X] *RADIALE - RADIAL*
- [ ] *ASSIALE - AXIAL*
- [ ] *SONDE ANGOLATE - ANGLE BEAMS*

- [ ] ***MATRICOLA BLOCCO CAMPIONE***
***DENTIFICATION BLOC DE REFERENCE MUSTER BLOCK***
***MUSTER BLOCK***
***TEST BLOCK NR***
№ ОБРАЗЦА ДЛЯ ИСПЫТАНИЯ

- [ ] ***AVG SCALE***
*ECRANS ABAQUES AVG AVG SKALEN AVG SCALE*
ШКАЛА *AVG*

- [X] ***AVG DIAGRAMMI***
***DIAGRAMMES AVG***
***AVG DIAGRAMM***
***AVG DIAGRAM***
ДИАГРАММЫ ***AVG***

- [ ] **V1**
- [ ] **V2**

**RISULTATODELL'ESAME**
RESULTAT DE L' ESSAI
PRUEFERGERBNISSE
RESULT OF THE TEST
РЕЗУЛЬТАТ
ИСПЫТАНИЯ

**EXAM DATA :** 28/06/2024
**INSPECTED N. BARS** 29

**THE MATERIAL IS IN ACCORDANCE TO THE FOLLOWING SPECIFICATIONS:**

EN10308 prospetto2 cl4

| | | | |
|---|---|---|---|
| **L'ISPETTORE CND** ZUSTANDER CND<br>L'INSPECTEUR CND CND INSPECTOR<br>ИНСПЕКТОР НРК<br>NADALIN SIMONE<br>Liv. II - ISO 9712 N° Cert.32040/PND/C | **III LIV.CND**<br>**III** УРОВЕНЬ НРК<br>BAISOTTI MARCO<br>Liv.III - ISO 9712 N° Cert.34194/PND/C | | **DATA** DATUM<br>DATE DATE<br>ДАТА<br>29/06/2024 |

(Mod. Certus Rev. 6)

**COGNE ACCIAI SPECIALI S.p.a.**

ITALY - 11100 AOSTA - VIA PARAVERA, 16
TEL +39.0165.3021 - FAX +39.0165.302296
CAP. SOC. 405.563.167,00 EUR INT. VERS.
C.F. 02187360967
VAT: IT00571320076 - R.E.A. n. AO-50474

**Company with Management Systems certified according to ISO 9001, ITAF 16949, EN 9100, ISO 14001 and ISO 45001.**

INSPECTION CERTIFICATE 3.1 (EN 10204:2004)
DOCUMENT NUMBER 2024024159


| | | | |
|---|---|---|---|
| CUSTOMER: | REMAZEL ENGINEERING S.P.A. | | |
| CUSTOMER'S ORDER: | 24005967 | | |
| MANUFACTURER'S WORKS: | AOSTA, VIA PARAVERA 16 - ITALY | | |
| PRODUCER OF THE DOC: | OUALITY DEPARTMENT | | |
| MANUFACTURER'S WORKS ORDER NO: | 0001142588 / 000020 | | |
| MARK OF THE MANUFACTURER: | **COGNE** | | |
| DISPATCH NOTE: | 0081634250 / 000020 WEIGHT: 8 KG / 18 LB | | |
| INTERNAL SPEC: | H1150DLT | | |
| PRODUCT: | PEL PEELED ROUND BARS TOLERANCE: ISOK11 | | |
| SURFACE FINISH: | 2B Cold Finished | | |
| PRODUCT DELIVERY CONDITION: | SI SOL.ANN+PRECIPIT. HARDENED | | |
| PRODUCT DIMENSIONS (mm): | 65,000 ( 2,559 in) | LENGTH (mm) | 04000 06200 ( 00157 00244 in) |
| GRADE: | AISI 630-17.4PH-1.4542 | INTERNAL GRADE: | 630 3 IMCO |
| IDENTIFICATION HEAT NO: | 400197 | IDENTIFICATION LOT NO: | 236590 |
| MARKING OF THE PRODUCT: | | TEST PIECE N: | 659 |

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THE MATERIAL MEETS THE REQUIREMENTS OF: ASTM A564 / ASME SA564 (R19a) H1150D, ASTM A484/A484M (21), NACE MR0175 (21)/ISO 15156-3, NACE MR0103 (15).
REFERENCE NORMS FOR CHEMICAL COMPOSITION ONLY: EN 10088-3 (14).
STEELMAKING EAF + AOD
PRODUCTION ROUTE: HOT ROLLING
HEAT TREATMENT: SOL.ANNEALING 1040°C+/-14°C 1H+30 MIN/INCH FORCED AIR COOLING BELOW 32°C;
DOUBLE AGING 620+/-14°C 4H MIN AIR COOLING BELOW 32°C.(FURNACE THERMOCOUPLES)
HOT ROLLED
REDUCTION RATIO 100,8

CHEMICAL LADLE ANALYSIS ACCORDING TO ASTM A751 - EN ISO 14284
Control lot No. - Weight :21000000681 - 0 - 0 LB

| ELEMENTS | C | Si | Mn | P | S | Cr | Mo | Ni | Nb | Cu |
|---|---|---|---|---|---|---|---|---|---|---|
| MEASUREMENT UNIT | % w/w | % w/w | % w/w | % w/w | % w/w | % w/w | % w/w | % w/w | % w/w | % w/w |
| OBTAINED | 0,018 | 0,31 | 0,72 | 0,024 | 0,025 | 15,75 | 0,20 | 4,64 | 0,27 | 3,55 |

| ELEMENTS | Co | Ta |
|---|---|---|
| MEASUREMENT UNIT | % w/w | % w/w |
| OBTAINED | 0,08 | 0,005 |

---

HARDNESS TEST IN AS DELIVERY CONDITION
Control lot No. - Weight :21000006291 - 1.781 KG - 3.926 LB
SPECIFICATION ENISO6508 HARDNESS TEST HRC TESTING METHOD:
OBTAINED 32,4

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IMPACT TEST IN AS DELIVERY CONDITION
Control lot No. - Weight :21000006291 - 1.781 KG - 3.926 LB
SPECIFICATION EN ISO 148-1-KV2 DIRECTION OF THE TEST PIECE: L
TYPE OF TEST PIECE KV
TEST TEMPERATURE °C 60-
MEASUREMENT UNIT J
OBTAINED 82 87 87

---

DATE 31.05.2024 MORABITO ROSA CF(QUALITY CERTIFICATOR) - ELECTRONICALLY GENERATED CERTIFICATE -**Cogne**

**COGNE ACCIAI SPECIALI S.p.a.**

ITALY - 11100 AOSTA - VIA PARAVERA, 16
TEL +39.0165.3021 - FAX +39.0165.302296
CAP. SOC. 405.563.167,00 EUR INT. VERS.
C.F. 02187360967
VAT: IT00571320076 - R.E.A. n. AO-50474

**Company with Management Systems certified according to ISO 9001, ITAF 16949, EN 9100, ISO 14001 and ISO 45001.**



GRAIN SIZE
Control lot No. - Weight :21000006291 - 1.781 KG - 3.926 LB
SPECIFICATION ASTME112 --
OBTAINED 7

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LATERAL EXPANSION
Control lot No. - Weight :21000006291 - 1.781 KG - 3.926 LB
SPECIFICATION -- --
OBTAINED 0,8 0,7 0,8

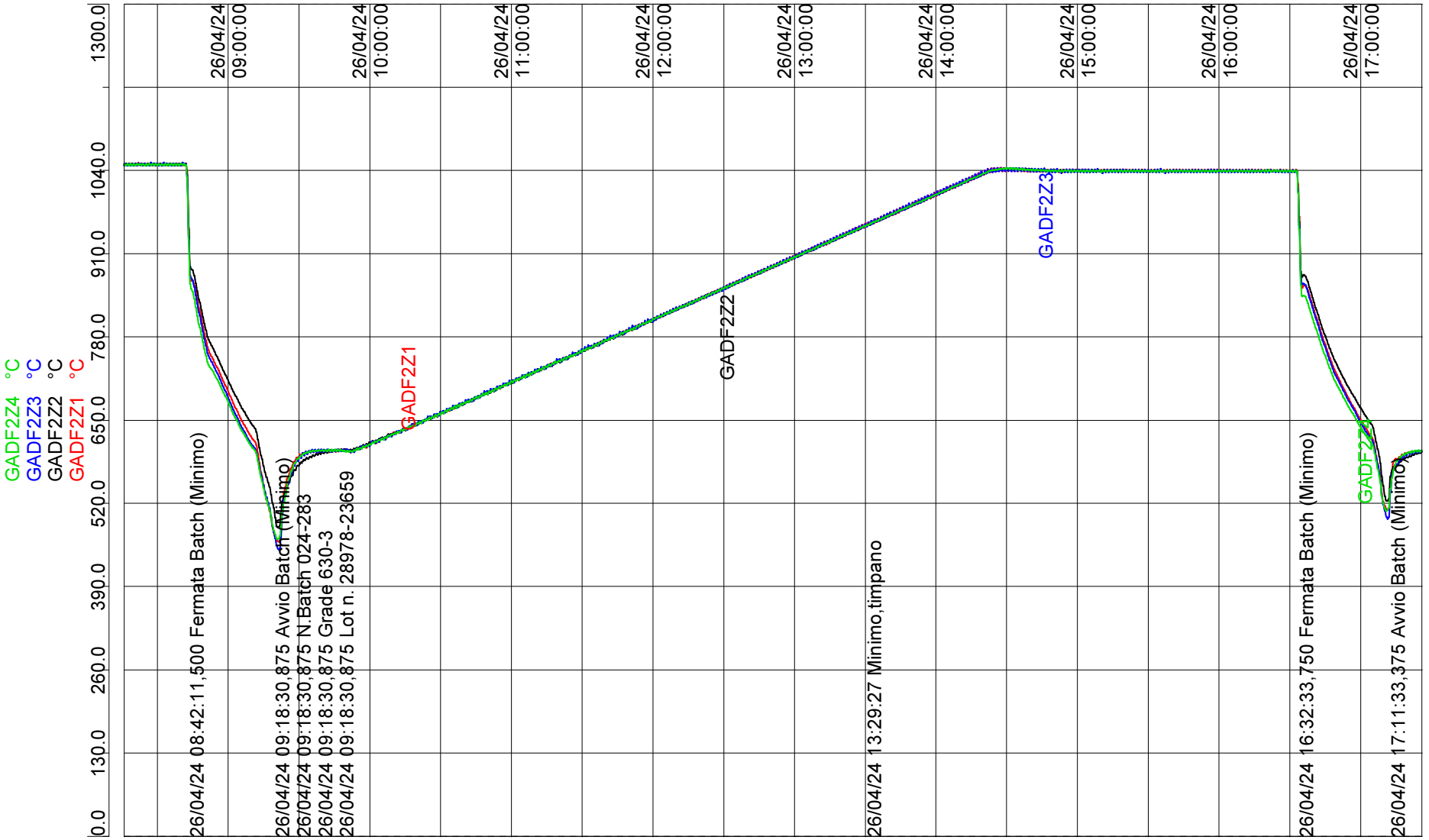
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ULTRASONIC TEST ACCORDING TO EN10308 class 4 equivalent to SEP 1920 group C class 3 and ASTM A388 FBH 3 for sizes less than 120 mm and ACCORDING TO EN 10308 class 3, equivalent to ASTM A388 FBH5 for sizes more than 120 mm: SATISFACTORY
TENSILE TEST
Control lot No. - Weight :21000006291 - 1.781 KG - 3.926 LB
SPECIFICATION ASTMA370-E8-0.5"SPEC DIRECTION OF THE TEST PIECE: L

| | RMB | RP02B | ZB | AL2B |
|---|---|---|---|---|
| MEASUREMENT UNIT | NMM | NMM | % | % |
| | | | | 4,0 D |
| OBTAINED | 989 | 890 | 66,5 | 21,0 |

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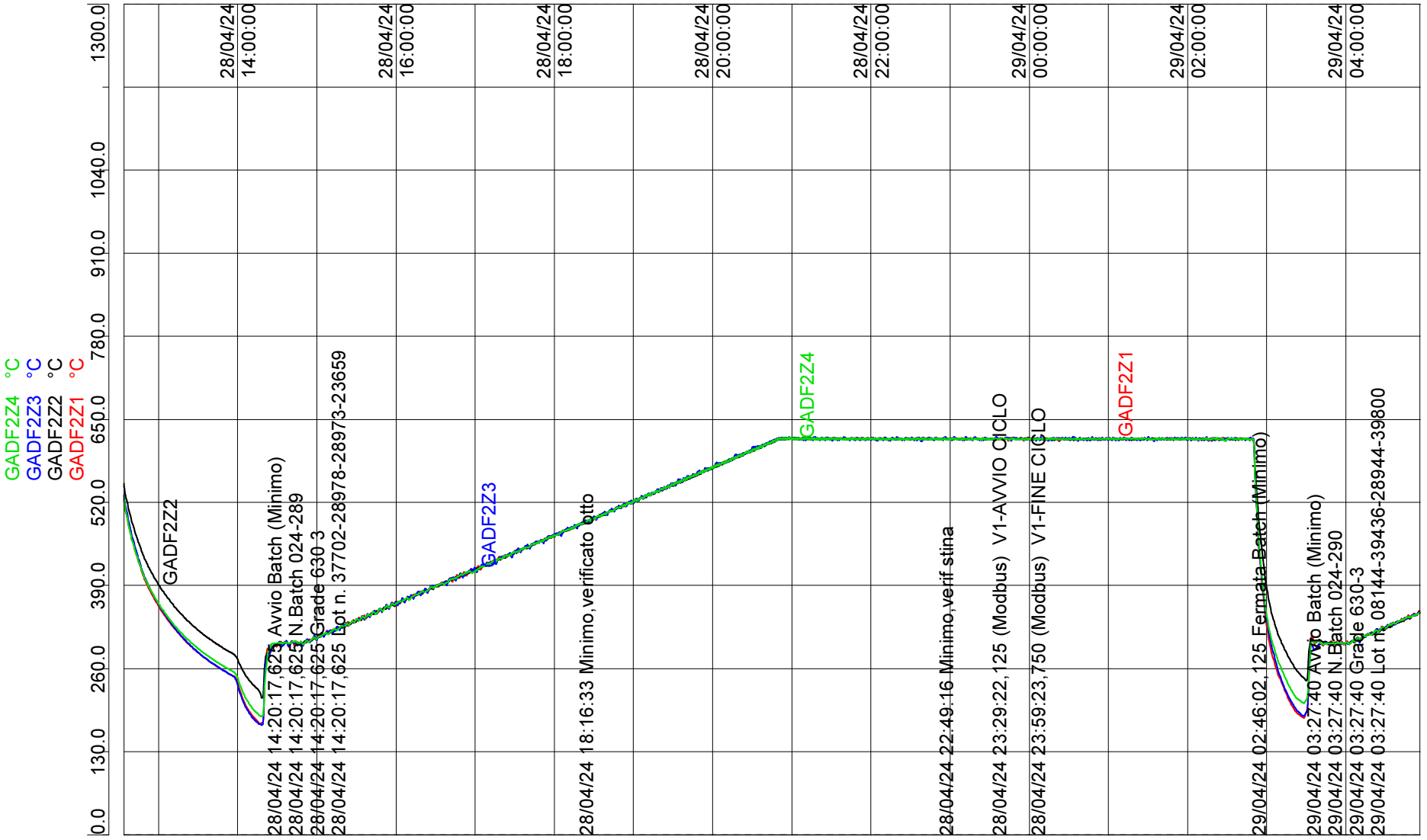
THE PRODUCT SATISFIES THE DIRECTIVES: 2015/863/EU (ROHS3) - 2011/65/EU (ROHS2) - 2000/53/EU - 2002/95/EU(RoHS) - 2003/11/EU-2005/618/EU AND PED 2014/68/EU (ANNEX I, SECTION 4.3).
MARKING: PRODUCER LOGO, MATERIAL NO, HEAT NO, LOT NR.
RADIOACTIVITY CONTROL PERFORMED WITH A GAMMA SPECTROMETER: ASTM E181.
GAMMA ACTIVITY ON THE PRODUCTS BELOW 0.1 BQ/G ACCORDING TO EU RESOLUTION 2013/59/EURATOM , IAEA RS-G-1.7 AND IAEA SSG-17.
WHERE NOT SPECIFIED ALL THE NORMS MENTIONED ARE INTENDED IN THEIR LAST REVISION AT THE DATE OF ISSUE OF THIS DOCUMENT.




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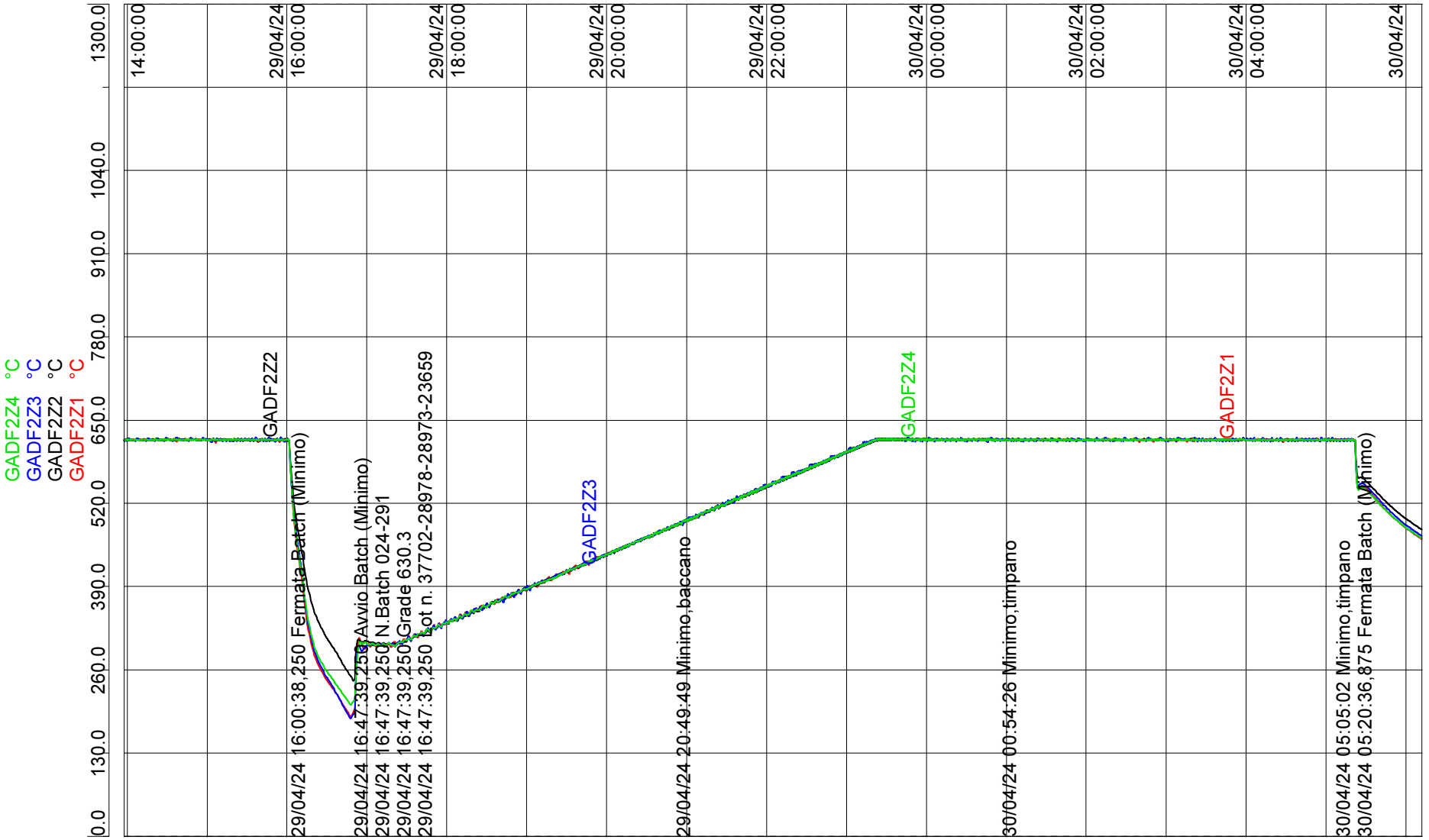
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Page 1 of 1




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Grafico1

29/04/24 04:56:00
Page 1 of 1




29/04/24 13:58:00
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Grafico1

30/04/24 06:12:00
Page 1 of 1

**COGNE ACCIAI SPECIALI S.p.a.**
Via Paravera, 16
I-11100 AOSTA

MICROPHOTO **All.N 1**
**МИКРОСЪЁМКА**

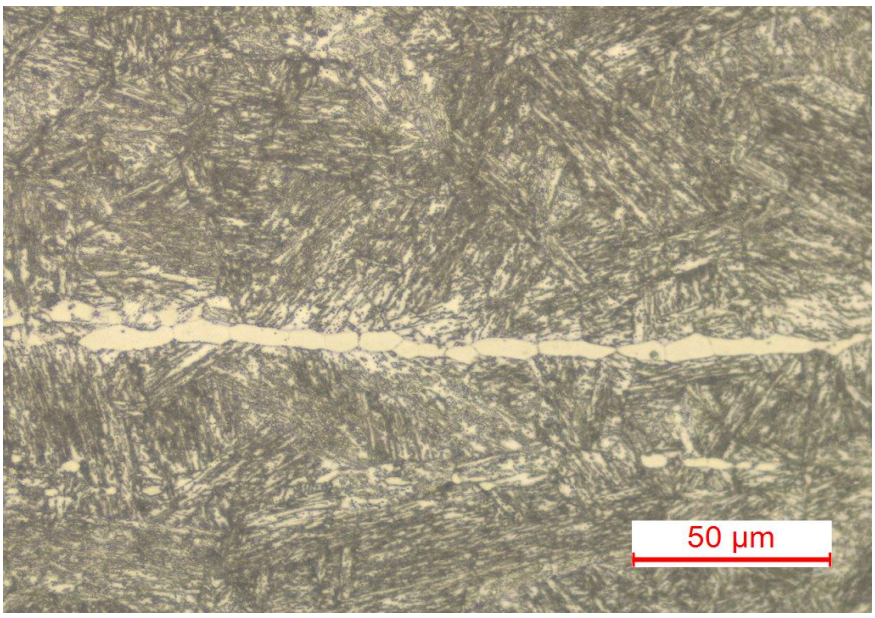
| | | | |
|---|---|---|---|
| ***MARCA***<br>*NUANCES*<br>*WERKESTOFF*<br>*GRADE*<br>*МАРКА* | 630 3 | ***LOTTO DI CONTROLLO***<br>*LOT DE CONTRÔLE*<br>*LAUFKARTE*<br>*CONTROL LOT*<br>*ПАРТИЯ КОНТРОЛЯ* | 21000006291 |
| ***COLATA***<br>*COULEE*<br>*SCHMELZE*<br>*HEAT*<br>*ПЛАВКА* | 400197 | ***REAGENTE***<br>*RÉACTIF*<br>*REAGENS*<br>*ETCHANT*<br>*РЕАГЕНТ* | Cogne Unico |
| ***TIPO DI APPARECCHIO***<br>*TIPE D'APPAREIL*<br>*PRUEFGERAT TYP*<br>*INSTRUMENT TYPE*<br>*ТИП АППАРАТА* | Microscopio: | **Leica DMI3000M s/n342700** | |
| *INGRANDIMENTO*<br>*AGRANDISSEMENT*<br>*VERGRÖSSERUNG*<br>*ENLARGEMENT*<br>*УВЕЛИЧЕНИЕ* | X500 | | |

DIREZIONE D'ESAME
*DIRECTION D'EXAMEN*
*PRUEFRICHTUNG*
SCANNING DIRECTION
НАПРАВЛЕНИЕ
ПРИ ИССЛЕДОВАНИИ

[X] **LONGITUDINALE - LONGITUDINAL - ПРОДОЛЬНОЕ**

[ ] **TRASVERSALE – TRANSVERSAL – KREUZEND-ПОПЕРЕЧНОЕ**

PHOTO (ELECTRONIC IMAGE) – ФОТОСНИМКИ (ЭЛЕКТРОННОЕ ИЗОБРАЖЕНИЕ)




NOTE:
ПРИМЕЧАНИЯ:

| **FIRMA** UNTERSCHRIFT<br>SIGNATURE SIGNATURE<br>ПОДПИСЬ | **DATA** DATUM<br>DATE DATE<br>ДАТА |
|---|---|
| Christian Del Guerra | 06/05/24 |

Mod.Micro Rev.5

COGNE ACCIAI SPECIALI S.P.A.

# CERTIFICATO DI COLLAUDO ULTRASUONI
CERTIFICAT DE CONTROLE PAR ULTRASONS
ULTRASCHALL PRUEFZEUGNIS
REPORT OF ULTRASONIC INSPECTION
ОТЧЕТ ОБ УЛЬТРАЗВУКОВОМ КОНТРОЛЕ

**N. US.** 982/24

| | | | | | |
|---|---|---|---|---|---|
| ***CLIENTE*** *CLIENTSGG BESTELLER CUSTOMER* ЗАКАЗЧИК | | | ***CONFERMA*** *CONFIRMATION AUFTRAGSBESTRAKTIGUNG CONFIRMATION* ПОДТВЕРЖД. ЗАКАЗА | | |
| ***MARCA*** *NUANCES WERKESTOFF GRADE* МАРКА | 630 3 W.No 1.4542 | | ***ORDINE*** *COMMANDE AUFTRAG ORDER* ЗАКАЗ | | |
| ***SPECIFICA*** *SPECIFICATION PRUKEVORSCHRIFT SPECIFICATION* ТЕХ. ТРЕБОВАНИЯ | EN10308 prospetto2 cl4 | | ***COLATA*** *COULEE SCHMELZE HEAT* ПЛАВКА | 400197 | ***SCHEDA*** *LOT LAUFKARTE LOT* ПАРТИЯ 236590 |
| ***PRODOTTO*** *PRODUIT ERZEUGNISFORM PRODUCT* ИЗДЕЛИЕ | ROUND BARS 65 mm | | ***STATO DI LAVORAZIONE*** *STADE DU PRODUIT LIEFERZUSTAND WORKING STEP* ОБРАБОТКА | PEELED | |
| ***TIPO DI APPARECCHIO*** *TIPE D'APPAREILPARUS PRUEFGERAT TYP INSTRUMENT TYPE* ТИП АППАРАТА | USM36 SN | 23010091 | ***COSTRUTTORE*** *CONSTRUCTEUR BAUART MAKE* ИЗГОТОВИТЕЛЬ | KRAUTKRAMER | |
| ***TIPO DI SONDA*** *TIPE DE PALPEUR PRUFKOPT PROBETYPE* ТИП ЗОНДА | SEB4-S | | ***FREQUENZA*** ***FREQUENCE*** *FREQUENZ FREQUENCY* ЧАСТОТА | 4 MHz S/N | 67257 50316 |

***DIREZIONE D'ESAME***
*DIRECTION D'EXAMEN PRUEFRICHTUNG SCANNING DIRECTION*
НАПРАВЛЕНИЕ ПРИ

- [X] *RADIALE - RADIAL*
- [ ] *ASSIALE - AXIAL*
- [ ] *SONDE ANGOLATE - ANGLE BEAMS*

- [ ] ***MATRICOLA BLOCCO CAMPIONE***
***DENTIFICATION BLOC DE REFERENCE MUSTER BLOCK***
***MUSTER BLOCK***
***TEST BLOCK NR***
№ ОБРАЗЦА ДЛЯ ИСПЫТАНИЯ

- [ ] ***AVG SCALE***
*ECRANS ABAQUES AVG AVG SKALEN AVG SCALE*
ШКАЛА *AVG*

- [X] ***AVG DIAGRAMMI***
***DIAGRAMMES AVG***
***AVG DIAGRAMM***
***AVG DIAGRAM***
ДИАГРАММЫ ***AVG***

- [ ] **V1**
- [ ] **V2**

**RISULTATODELL'ESAME**
RESULTAT DE L' ESSAI
PRUEFERGERBNISSE
RESULT OF THE TEST
РЕЗУЛЬТАТ ИСПЫТАНИЯ

**EXAM DATA :** 25/05/2024
**INSPECTED N. BARS** 10

**THE MATERIAL IS IN ACCORDANCE TO THE FOLLOWING SPECIFICATIONS:**

EN10308 prospetto2 cl4

| | | | |
|---|---|---|---|
| **L'ISPETTORE CND** ZUSTANDER CND L'INSPECTEUR CND CND INSPECTOR ИНСПЕКТОР НРК<br>NADALIN SIMONE<br>Liv. II - ISO 9712 N° Cert.32040/PND/C | **III LIV.CND** **III** УРОВЕНЬ НРК<br>BAISOTTI MARCO<br>Liv.III - ISO 9712 N° Cert.34194/PND/C | | **DATA** DATUM DATE DATE ДАТА<br>30/05/2024 |

(Mod. Certus Rev. 6)

**COGNE ACCIAI SPECIALI S.p.a.**

ITALY - 11100 AOSTA - VIA PARAVERA, 16
TEL +39.0165.3021 - FAX +39.0165.302296
CAP. SOC. 405.563.167,00 EUR INT. VERS.
C.F. 02187360967
VAT: IT00571320076 - R.E.A. n. AO-50474

**Company with Management Systems certified according to ISO 9001, ITAF 16949, EN 9100, ISO 14001 and ISO 45001.**

INSPECTION CERTIFICATE 3.1 (EN 10204:2004)
DOCUMENT NUMBER 2023053221


| | | | |
|---|---|---|---|
| CUSTOMER: | REMAZEL ENGINEERING S.P.A. | | |
| CUSTOMER'S ORDER: | 24005967 | | |
| MANUFACTURER'S WORKS: | AOSTA, VIA PARAVERA 16 - ITALY | | |
| PRODUCER OF THE DOC: | OUALITY DEPARTMENT | | |
| MANUFACTURER'S WORKS ORDER NO: | 0001142588 / 000030 | | |
| MARK OF THE MANUFACTURER: | **COGNE** | | |
| DISPATCH NOTE: | 0081634250 / 000030 WEIGHT: 18 KG / 40 LB | | |
| INTERNAL SPEC: | H1150DLT | | |
| PRODUCT: | PEL PEELED ROUND BARS TOLERANCE: ISOK11 | | |
| SURFACE FINISH: | 2B Cold Finished | | |
| PRODUCT DELIVERY CONDITION: | SI SOL.ANN+PRECIPIT. HARDENED | | |
| PRODUCT DIMENSIONS (mm): | 90,000 ( 3,543 in) | LENGTH (mm) | 04000 06200 ( 00157 00244 in) |
| GRADE: | AISI 630-17.4PH-1.4542 | INTERNAL GRADE: | 630 3 IMCO |
| IDENTIFICATION HEAT NO: | 300549 | IDENTIFICATION LOT NO: | 401710 |
| MARKING OF THE PRODUCT: | | TEST PIECE N: | 171 |

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THE MATERIAL MEETS THE REQUIREMENTS OF: ASTM A564 / ASME SA564 (R19a) H1150D, ASTM A484/A484M (21), NACE MR0175 (21)/ISO 15156-3, NACE MR0103 (15).
REFERENCE NORMS FOR CHEMICAL COMPOSITION ONLY: EN 10088-3 (14).
STEELMAKING EAF + AOD
PRODUCTION ROUTE: HOT ROLLING
HEAT TREATMENT: SOL.ANNEALING 1040°C+/-14°C 1H+30 MIN/INCH FORCED AIR COOLING BELOW 32°C;
DOUBLE AGING 620+/-14°C 4H MIN AIR COOLING BELOW 32°C.(FURNACE THERMOCOUPLES)
HOT ROLLED
REDUCTION RATIO 52,8

CHEMICAL LADLE ANALYSIS ACCORDING TO ASTM A751 - EN ISO 14284
Control lot No. - Weight :020000961376 - 81.550 KG - 179.784 LB

| ELEMENTS | C | Si | Mn | P | S | Cr | Mo | Ni | Nb | Cu |
|---|---|---|---|---|---|---|---|---|---|---|
| MEASUREMENT UNIT | % w/w | % w/w | % w/w | % w/w | % w/w | % w/w | % w/w | % w/w | % w/w | % w/w |
| OBTAINED | 0,018 | 0,35 | 0,71 | 0,022 | 0,024 | 15,69 | 0,19 | 4,62 | 0,26 | 3,37 |

| ELEMENTS | Co | Ta |
|---|---|---|
| MEASUREMENT UNIT | % w/w | % w/w |
| OBTAINED | 0,09 | 0,005 |

---

HARDNESS TEST IN AS DELIVERY CONDITION
Control lot No. - Weight :020000971110 - 4.000 KG - 8.818 LB
SPECIFICATION ENISO6508 HARDNESS TEST HRC TESTING METHOD:
OBTAINED 32

---

IMPACT TEST IN AS DELIVERY CONDITION
Control lot No. - Weight :020000971110 - 4.000 KG - 8.818 LB
SPECIFICATION EN ISO 148-1-KV2 DIRECTION OF THE TEST PIECE: L
TYPE OF TEST PIECE KV

| TEST TEMPERATURE °C | 60- | | |
|---|---|---|---|
| MEASUREMENT UNIT | J | | |
| OBTAINED | 62 | 68 | 57 |

---

DATE 20.11.2023 BARBARA VIETTI MV(QUALITY CERTIFICATOR) - ELECTRONICALLY GENERATED CERTIFICATE -**Cogne**

**COGNE ACCIAI SPECIALI S.p.a.**

ITALY - 11100 AOSTA - VIA PARAVERA, 16
TEL +39.0165.3021 - FAX +39.0165.302296
CAP. SOC. 405.563.167,00 EUR INT. VERS.
C.F. 02187360967
VAT: IT00571320076 - R.E.A. n. AO-50474

**Company with Management Systems certified according to ISO 9001, ITAF 16949, EN 9100, ISO 14001 and ISO 45001.**



GRAIN SIZE
Control lot No. - Weight :020000971110 - 4.000 KG - 8.818 LB
SPECIFICATION ASTME112 --
OBTAINED 6

---

LATERAL EXPANSION
Control lot No. - Weight :020000971110 - 4.000 KG - 8.818 LB
SPECIFICATION -- --
OBTAINED 0,7 0,7 0,6

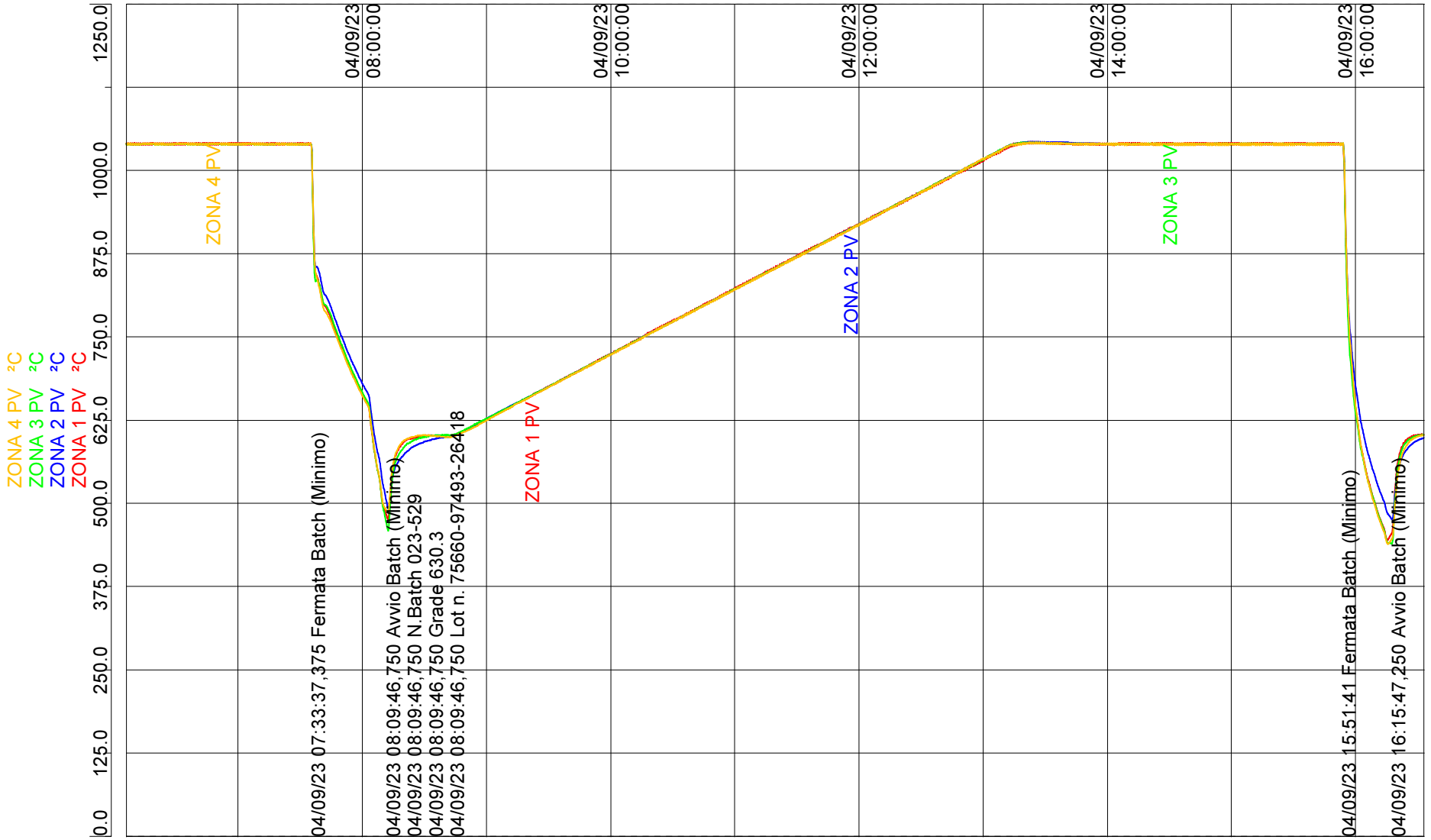
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ULTRASONIC TEST ACCORDING TO EN10308 class 4 equivalent to SEP 1920 group C class 3 and ASTM A388 FBH 3 for sizes less than 120 mm and ACCORDING TO EN 10308 class 3, equivalent to ASTM A388 FBH5 for sizes more than 120 mm: SATISFACTORY
TENSILE TEST
Control lot No. - Weight :020000971110 - 4.000 KG - 8.818 LB
SPECIFICATION ASTMA370-E8-0.5"SPEC DIRECTION OF THE TEST PIECE: L

| | RMB | RP02B | ZB | AL2B |
|---|---|---|---|---|
| MEASUREMENT UNIT | NMM | NMM | % | % |
| | | | | 4,0 D |
| OBTAINED | 974 | 848 | 64,9 | 21,8 |

---

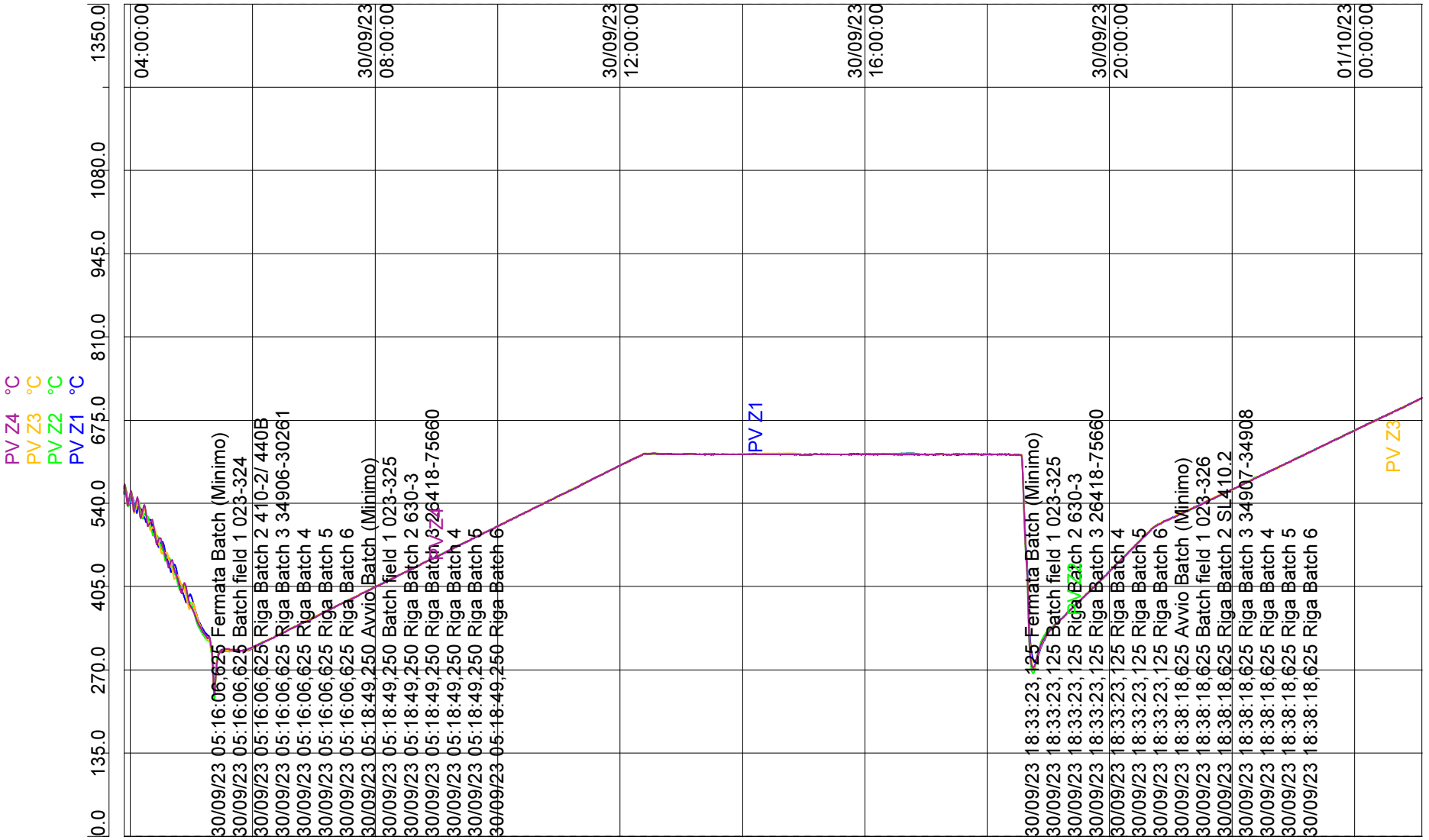
THE PRODUCT SATISFIES THE DIRECTIVES: 2015/863/EU (ROHS3) - 2011/65/EU (ROHS2) - 2000/53/EU - 2002/95/EU(RoHS) - 2003/11/EU-2005/618/EU AND PED 2014/68/EU.
MARKING: PRODUCER LOGO, MATERIAL NO, HEAT NO, LOT NR.
WHERE NOT SPECIFIED ALL THE NORMS MENTIONED ARE INTENDED IN THEIR LAST REVISION AT THE DATE OF ISSUE OF THIS DOCUMENT.




04/09/23 06:06:00
17/10/2023 16:15:01

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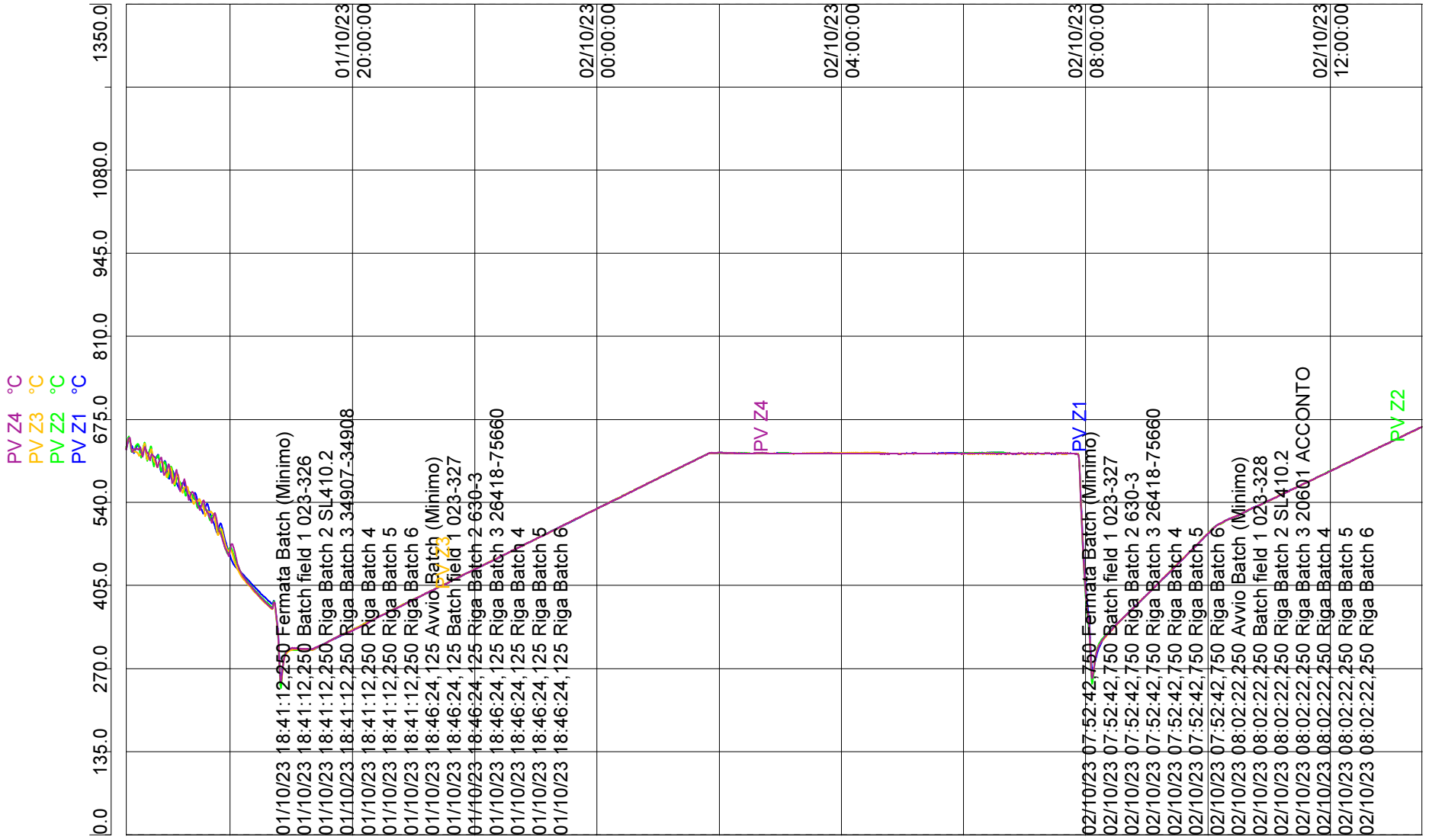
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Page 1 of 1




30/09/23 03:54:00
17/10/2023 16:17:52

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01/10/23 01:06:00
Page 1 of 1




01/10/23 16:18:00
17/10/2023 16:19:01

Grafico13

02/10/23 13:30:00
Page 1 of 1

**COGNE ACCIAI SPECIALI S.p.a.**
Via Paravera, 16
I-11100 AOSTA

MICROPHOTO **All.N 1**
**МИКРОСЪЁМКА**

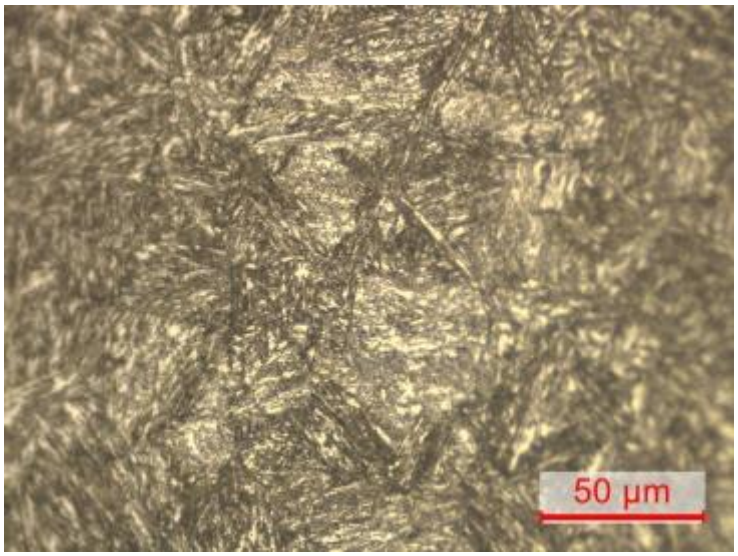
| | | | |
|---|---|---|---|
| ***MARCA***<br>*NUANCES*<br>*WERKESTOFF*<br>*GRADE*<br>*МАРКА* | 630 3 | ***LOTTO DI CONTROLLO***<br>*LOT DE CONTRÔLE*<br>*LAUFKARTE*<br>*CONTROL LOT*<br>*ПАРТИЯ КОНТРОЛЯ* | 020000971110 |
| ***COLATA***<br>*COULEE*<br>*SCHMELZE*<br>*HEAT*<br>*ПЛАВКА* | 300549 | ***REAGENTE***<br>*RÉACTIF*<br>*REAGENS*<br>*ETCHANT*<br>*РЕАГЕНТ* | Cogne Unico (UNI 3137-65) |
| ***TIPO DI APPARECCHIO***<br>*TIPE D'APPAREIL*<br>*PRUEFGERAT TYP*<br>*INSTRUMENT TYPE*<br>*ТИП АППАРАТА* | Microscopio: | **Leica DM2700M s/n430371** | |
| *INGRANDIMENTO*<br>*AGRANDISSEMENT*<br>*VERGRÖSSERUNG*<br>*ENLARGEMENT*<br>*УВЕЛИЧЕНИЕ* | **500 X** | | |

DIREZIONE D'ESAME
*DIRECTION D'EXAMEN*
*PRUEFRICHTUNG*
SCANNING DIRECTION
НАПРАВЛЕНИЕ
ПРИ ИССЛЕДОВАНИИ

[X] **LONGITUDINALE - LONGITUDINAL - ПРОДОЛЬНОЕ**

[ ] **TRASVERSALE – TRANSVERSAL – KREUZEND-ПОПЕРЕЧНОЕ**

PHOTO (ELECTRONIC IMAGE) – ФОТОСНИМКИ (ЭЛЕКТРОННОЕ ИЗОБРАЖЕНИЕ)




NOTE:
ПРИМЕЧАНИЯ:

| **FIRMA** UNTERSCHRIFT<br>SIGNATURE SIGNATURE<br>ПОДПИСЬ | **DATA** DATUM<br>DATE DATE<br>ДАТА |
|---|---|
| Daidone/Frison | 05/10/23 |

Mod.Micro Rev.5

COGNE ACCIAI SPECIALI S.P.A.

# CERTIFICATO DI COLLAUDO ULTRASUONI
CERTIFICAT DE CONTROLE PAR ULTRASONS
ULTRASCHALL PRUEFZEUGNIS
REPORT OF ULTRASONIC INSPECTION
ОТЧЕТ ОБ УЛЬТРАЗВУКОВОМ КОНТРОЛЕ

**N. US.**
2029/23

| | |
|---|---|
| ***CLIENTE***<br>*CLIENTSGG*<br>*BESTELLER*<br>*CUSTOMER*<br>ЗАКАЗЧИК | ***CONFERMA***<br>*CONFIRMATION*<br>*AUFTRAGSBESTRAKTIGUNG*<br>*CONFIRMATION*<br>ПОДТВЕРЖД. ЗАКАЗА |
| ***MARCA***<br>*NUANCES*<br>*WERKESTOFF*<br>*GRADE*<br>МАРКА: 630 3 W.No 1.4542 | ***ORDINE***<br>*COMMANDE*<br>*AUFTRAG*<br>*ORDER*<br>ЗАКАЗ |
| ***SPECIFICA***<br>*SPECIFICATION*<br>*PRUKEVORSCHRIFT*<br>*SPECIFICATION*<br>ТЕХ. ТРЕБОВАНИЯ: EN10308 prospetto2 cl4 | ***COLATA***<br>*COULEE*<br>*SCHMELZE*<br>*HEAT*<br>ПЛАВКА: 300549<br>***SCHEDA***<br>*LOT*<br>*LAUFKARTE*<br>*LOT*<br>ПАРТИЯ: 401710 |
| ***PRODOTTO***<br>*PRODUIT*<br>*ERZEUGNISFORM*<br>*PRODUCT*<br>ИЗДЕЛИЕ: ROUND BARS 90 mm | ***STATO DI LAVORAZIONE***<br>*STADE DU PRODUIT*<br>*LIEFERZUSTAND*<br>*WORKING STEP*<br>ОБРАБОТКА: ROUGH GROUND |
| ***TIPO DI APPARECCHIO***<br>*TIPE D'APPAREILPARUS*<br>*PRUEFGERAT TYP*<br>*INSTRUMENT TYPE*<br>ТИП АППАРАТА: USM36 18107589 | ***COSTRUTTORE***<br>*CONSTRUCTEUR*<br>*BAUART*<br>*MAKE*<br>ИЗГОТОВИТЕЛЬ: KRAUTKRAMER |
| ***TIPO DI SONDA***<br>*TIPE DE PALPEUR*<br>*PRUFKOPT*<br>*PROBETYPE*<br>ТИП ЗОНДА: SEB-4-S | ***FREQUENZA***<br>***FREQUENCE***<br>*FREQUENZ*<br>*FREQUENCY*<br>ЧАСТОТА: 4 MHz S/N 67257-50474 |

***DIREZIONE D'ESAME***
*DIRECTION D'EXAMEN*
*PRUEFRICHTUNG*
*SCANNING DIRECTION*
НАПРАВЛЕНИЕ ПРИ

- [X] *RADIALE - RADIAL*
- [ ] *ASSIALE - AXIAL*
- [ ] *SONDE ANGOLATE - ANGLE BEAMS*

- [ ] ***MATRICOLA BLOCCO CAMPIONE***
***DENTIFICATION BLOC DE REFERENCE MUSTER BLOCK***
***MUSTER BLOCK***
***TEST BLOCK NR***
№ ОБРАЗЦА ДЛЯ ИСПЫТАНИЯ

- [ ] ***AVG SCALE***
*ECRANS ABAQUES AVG*
*AVG SKALEN*
*AVG SCALE*
ШКАЛА *AVG*

- [X] ***AVG DIAGRAMMI***
***DIAGRAMMES AVG***
***AVG DIAGRAMM***
***AVG DIAGRAM***
ДИАГРАММЫ ***AVG***

- [ ] **V1**
- [ ] **V2**

**RISULTATODELL'ESAME**
RESULTAT DE L' ESSAI
PRUEFERGERBNISSE
RESULT OF THE TEST
РЕЗУЛЬТАТ ИСПЫТАНИЯ

**EXAM DATA :** 22/10/2023
**INSPECTED N. BARS** 5

**THE MATERIAL IS IN ACCORDANCE TO THE FOLLOWING SPECIFICATIONS:**

EN10308 prospetto2 cl4

| | | | |
|---|---|---|---|
| **L'ISPETTORE CND** ZUSTANDER CND<br>L'INSPECTEUR CND CND INSPECTOR<br>ИНСПЕКТОР НРК<br>NADALIN SIMONE<br>Liv.II - ISO 9712 N° Cert.32040/PND/C | **III LIV.CND**<br>**III** УРОВЕНЬ НРК<br>BAISOTTI MARCO<br>Liv.III - ISO 9712 N° Cert.34194/PND/C | | **DATA** DATUM<br>DATE DATE<br>ДАТА<br>23/10/2023 |

(Mod. Certus Rev. 6)

**COGNE ACCIAI SPECIALI S.p.a.**

ITALY - 11100 AOSTA - VIA PARAVERA, 16
TEL +39.0165.3021 - FAX +39.0165.302296
CAP. SOC. 439.208.027,00 EUR INT. VERS.
C.F. 02187360967
VAT: IT00571320076 - R.E.A. n. AO-50474

**Company with Management Systems certified according to ISO 9001, ITAF 16949, EN 9100, ISO 14001 and ISO 45001.**

INSPECTION CERTIFICATE 3.1 (EN 10204:2004)
DOCUMENT NUMBER 2024049141


CUSTOMER:
CUSTOMER'S ORDER:
MANUFACTURER'S WORKS: AOSTA, VIA PARAVERA 16 - ITALY
PRODUCER OF THE DOC: QUALITY DEPARTMENT
MANUFACTURER'S WORKS ORDER NO:
MARK OF THE MANUFACTURER: **COGNE**
DISPATCH NOTE: WEIGHT:

INTERNAL SPEC: H1150DLT
PRODUCT: PEL PEELED ROUND BARS TOLERANCE: ISOK11
SURFACE FINISH: 2B Cold Finished
PRODUCT DELIVERY CONDITION: SI SOL.ANN+PRECIPIT. HARDENED
PRODUCT DIMENSIONS (mm): 80,000 ( 3,150 in) LENGTH (mm) 06000 06200 ( 00236 00244 in)
GRADE: AISI 630-17.4PH-1.4542 INTERNAL GRADE: 630 3 IMCO
IDENTIFICATION HEAT NO: 401373 IDENTIFICATION LOT NO: 578420
MARKING OF THE PRODUCT: 1.4542 TEST PIECE N: 842

---

THE MATERIAL MEETS THE REQUIREMENTS OF: ASTM A564 / ASME SA564 (R19a) H1150D, ASTM A484/A484M (21), NACE MR0175 (21)/ISO 15156-3, NACE MR0103 (15).
REFERENCE NORMS FOR CHEMICAL COMPOSITION ONLY: EN 10088-3 (14).
STEELMAKING EAF + AOD
PRODUCTION ROUTE: HOT ROLLING
HEAT TREATMENT: SOL.ANNEALING 1040°C+/-14°C 1H+30 MIN/INCH FORCED AIR COOLING BELOW 32°C;
DOUBLE AGING 620+/-14°C 4H MIN AIR COOLING BELOW 32°C.(FURNACE THERMOCOUPLES)
HOT ROLLED ROUND BARS
REDUCTION RATIO 66,1

CHEMICAL LADLE ANALYSIS ACCORDING TO ASTM A751 - EN ISO 14284
Control lot No. - Weight :21000023506 - 87.399 KG - 192.679 LB

| ELEMENTS | C | Si | Mn | P | S | Cr | Mo | Ni | Nb | Cu |
|---|---|---|---|---|---|---|---|---|---|---|
| MEASUREMENT UNIT | % w/w | % w/w | % w/w | % w/w | % w/w | % w/w | % w/w | % w/w | % w/w | % w/w |
| OBTAINED | 0,018 | 0,32 | 0,71 | 0,019 | 0,026 | 15,97 | 0,18 | 4,66 | 0,27 | 3,46 |

| ELEMENTS | Co | Ta |
|---|---|---|
| MEASUREMENT UNIT | % w/w | % w/w |
| OBTAINED | 0,10 | 0,005 |

---

HARDNESS TEST IN AS DELIVERY CONDITION
Control lot No. - Weight :21000028440 - 1.620 KG - 3.571 LB
SPECIFICATION ENISO6508 HARDNESS TEST HRC TESTING METHOD:
OBTAINED 28,2

---

IMPACT TEST IN AS DELIVERY CONDITION
Control lot No. - Weight :21000028440 - 1.620 KG - 3.571 LB
SPECIFICATION EN ISO 148-1-KV2 DIRECTION OF THE TEST PIECE: L
TYPE OF TEST PIECE KV
TEST TEMPERATURE °C 60-
MEASUREMENT UNIT J
OBTAINED 55 57 56

---

DATE 17.10.2024 MORABITO ROSA CF(QUALITY CERTIFICATOR) - ELECTRONICALLY GENERATED CERTIFICATE -**Cogne**

**COGNE ACCIAI SPECIALI S.p.a.**

ITALY - 11100 AOSTA - VIA PARAVERA, 16
TEL +39.0165.3021 - FAX +39.0165.302296
CAP. SOC. 439.208.027,00 EUR INT. VERS.
C.F. 02187360967
VAT: IT00571320076 - R.E.A. n. AO-50474

**Company with Management Systems certified according to ISO 9001, ITAF 16949, EN 9100, ISO 14001 and ISO 45001.**



GRAIN SIZE
Control lot No. - Weight :21000028440 - 1.620 KG - 3.571 LB
SPECIFICATION ASTME112 --
OBTAINED 6,5

---

LATERAL EXPANSION
Control lot No. - Weight :21000028440 - 1.620 KG - 3.571 LB
SPECIFICATION -- --
OBTAINED 0,71 0,78 0,75

---

ULTRASONIC TEST ACCORDING TO EN10308 class 4 equivalent to SEP 1920 group C class 3 and ASTM A388 FBH 3 for sizes less than 120 mm and ACCORDING TO EN 10308 class 3, equivalent to ASTM A388 FBH5 for sizes more than 120 mm: SATISFACTORY
TENSILE TEST
Control lot No. - Weight :21000028440 - 1.620 KG - 3.571 LB
SPECIFICATION ASTMA370-E8-0.5"SPEC DIRECTION OF THE TEST PIECE: L

| | RMB | RP02B | ZB | AL2B |
|---|---|---|---|---|
| MEASUREMENT UNIT | NMM | NMM | % | % |
| | | | | 4,0 D |
| OBTAINED | 958 | 819 | 64,9 | 24,0 |

---

THE PRODUCT SATISFIES THE DIRECTIVES: 2015/863/EU (ROHS3) - 2011/65/EU (ROHS2) - 2000/53/EU - 2002/95/EU(RoHS) - 2003/11/EU-2005/618/EU AND PED 2014/68/EU (ANNEX I, SECTION 4.3).
MARKING: PRODUCER LOGO, MATERIAL NO, HEAT NO, LOT NR.
RADIOACTIVITY CONTROL PERFORMED WITH A GAMMA SPECTROMETER: ASTM E181.
GAMMA ACTIVITY ON THE PRODUCTS BELOW 0.1 BQ/G ACCORDING TO EU RESOLUTION 2013/59/EURATOM , IAEA RS-G-1.7 AND IAEA SSG-17.
WHERE NOT SPECIFIED ALL THE NORMS MENTIONED ARE INTENDED IN THEIR LAST REVISION AT THE DATE OF ISSUE OF THIS DOCUMENT.

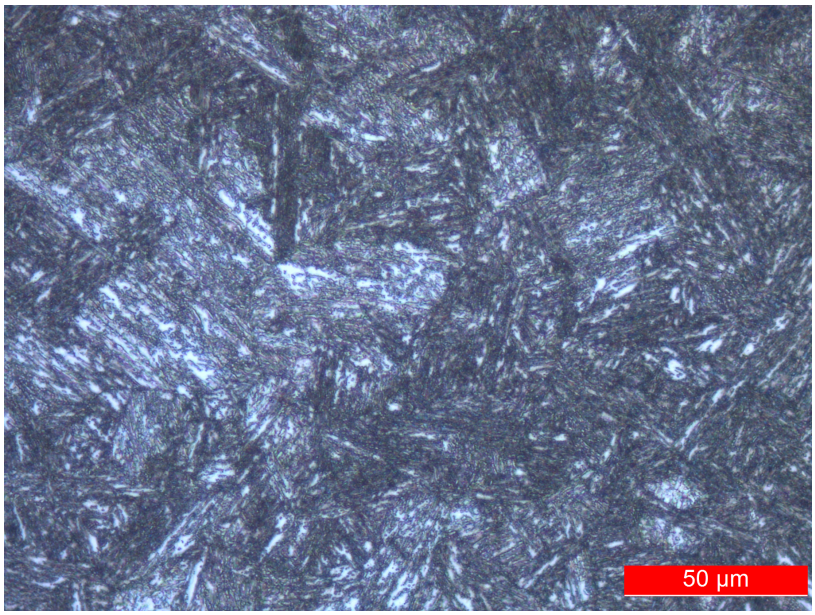
**COGNE ACCIAI SPECIALI S.p.a.**
Via Paravera, 16
I-11100 AOSTA

MICROPHOTO
**МИКРОСЪЁМКА**

Annex 1

| | | | |
|---|---|---|---|
| ***MARCA***<br>*NUANCES*<br>*WERKESTOFF*<br>*GRADE*<br>*МАРКА* | 630 3 | ***LOTTO DI CONTROLLO***<br>*LOT DE CONTRÔLE*<br>*LAUFKARTE*<br>*CONTROL LOT*<br>*ПАРТИЯ КОНТРОЛЯ* | 21000028440 |
| ***COLATA***<br>*COULEE*<br>*SCHMELZE*<br>*HEAT*<br>*ПЛАВКА* | 401373 | ***REAGENTE***<br>*RÉACTIF*<br>*REAGENS*<br>*ETCHANT*<br>*РЕАГЕНТ* | Cogne Unico (UNI 3137-65) |
| ***TIPO DI APPARECCHIO***<br>*TIPE D'APPAREIL*<br>*PRUEFGERAT TYP*<br>*INSTRUMENT TYPE*<br>*ТИП АППАРАТА* | Leica DMI3000M S/N 342700 | | |
| ***INGRANDIMENTO***<br>*AGRANDISSEMENT*<br>*VERGROSSERUNG*<br>*ENLARGEMENT*<br>*УВЕЛИЧЕНИЕ* | 500X | | |
| ***DIREZIONE D'ESAME***<br>*DIRECTION D'EXAMEN*<br>*PRUEFRICHTUNG*<br>*SCANNING DIRECTION*<br>*НАПРАВЛЕНИЕ*<br>*ПРИ ИССЛЕДОВАНИИ* | Longitudinal | | |

PHOTO (ELECTRONIC IMAGE) – ФОТОСНИМКИ (ЭЛЕКТРОННОЕ ИЗОБРАЖЕНИЕ)




NOTE:
ПРИМЕЧАНИЯ:

| **FIRMA** UNTERSCHRIFT<br>SIGNATURE SIGNATURE<br>ПОДПИСЬ | **DATA** DATUM<br>DATE DATE<br>ДАТА |
|---|---|
| N. Avati | 08-10-2024 |

Mod.Micro Rev.6

COGNE ACCIAI SPECIALI S.P.A.

# CERTIFICATO DI COLLAUDO ULTRASUONI
CERTIFICAT DE CONTROLE PAR ULTRASONS
ULTRASCHALL PRUEFZEUGNIS
REPORT OF ULTRASONIC INSPECTION
ОТЧЕТ ОБ УЛЬТРАЗВУКОВОМ КОНТРОЛЕ

**N. US.**
1903/24

| | |
|---|---|
| ***CLIENTE*** *CLIENTSGG BESTELLER CUSTOMER* ЗАКАЗЧИК | ***CONFERMA*** *CONFIRMATION AUFTRAGSBESTRAKTIGUNG CONFIRMATION* ПОДТВЕРЖД. ЗАКАЗА |
| ***MARCA*** *NUANCES WERKESTOFF GRADE* МАРКА: 630 3 W.No 1.4542 | ***ORDINE*** *COMMANDE AUFTRAG ORDER* ЗАКАЗ |
| ***SPECIFICA*** *SPECIFICATION PRUKEVORSCHRIFT SPECIFICATION* ТЕХ. ТРЕБОВАНИЯ: EN10308 prospetto2 cl4 | ***COLATA*** *COULEE SCHMELZE HEAT* ПЛАВКА: 401373 — ***SCHEDA*** *LOT LAUFKARTE LOT* ПАРТИЯ: 578420 |
| ***PRODOTTO*** *PRODUIT ERZEUGNISFORM PRODUCT* ИЗДЕЛИЕ: ROUND BARS 80 mm | ***STATO DI LAVORAZIONE*** *STADE DU PRODUIT LIEFERZUSTAND WORKING STEP* ОБРАБОТКА: PEELED |
| ***TIPO DI APPARECCHIO*** *TIPE D'APPAREILPARUS PRUEFGERAT TYP INSTRUMENT TYPE* ТИП АППАРАТА: USM36 SN 23010091 | ***COSTRUTTORE*** *CONSTRUCTEUR BAUART MAKE* ИЗГОТОВИТЕЛЬ: KRAUTKRAMER |
| ***TIPO DI SONDA*** *TIPE DE PALPEUR PRUFKOPT PROBETYPE* ТИП ЗОНДА: SEB-4-S | ***FREQUENZA*** ***FREQUENCE*** *FREQUENZ FREQUENCY* ЧАСТОТА: 4 MHz S/N 67257-50474 |

***DIREZIONE D'ESAME***
*DIRECTION D'EXAMEN PRUEFRICHTUNG SCANNING DIRECTION*
НАПРАВЛЕНИЕ ПРИ

- [X] *RADIALE - RADIAL*
- [ ] *ASSIALE - AXIAL*
- [ ] *SONDE ANGOLATE - ANGLE BEAMS*

- [ ] ***MATRICOLA BLOCCO CAMPIONE***
***DENTIFICATION BLOC DE REFERENCE MUSTER BLOCK***
***MUSTER BLOCK***
***TEST BLOCK NR***
№ ОБРАЗЦА ДЛЯ ИСПЫТАНИЯ

- [ ] ***AVG SCALE***
*ECRANS ABAQUES AVG AVG SKALEN AVG SCALE*
ШКАЛА *AVG*
- [X] ***AVG DIAGRAMMI***
***DIAGRAMMES AVG***
***AVG DIAGRAMM***
***AVG DIAGRAM***
ДИАГРАММЫ ***AVG***
- [ ] **V1**
- [ ] **V2**

**RISULTATODELL'ESAME**
RESULTAT DE L' ESSAI
PRUEFERGERBNISSE
RESULT OF THE TEST
РЕЗУЛЬТАТ ИСПЫТАНИЯ

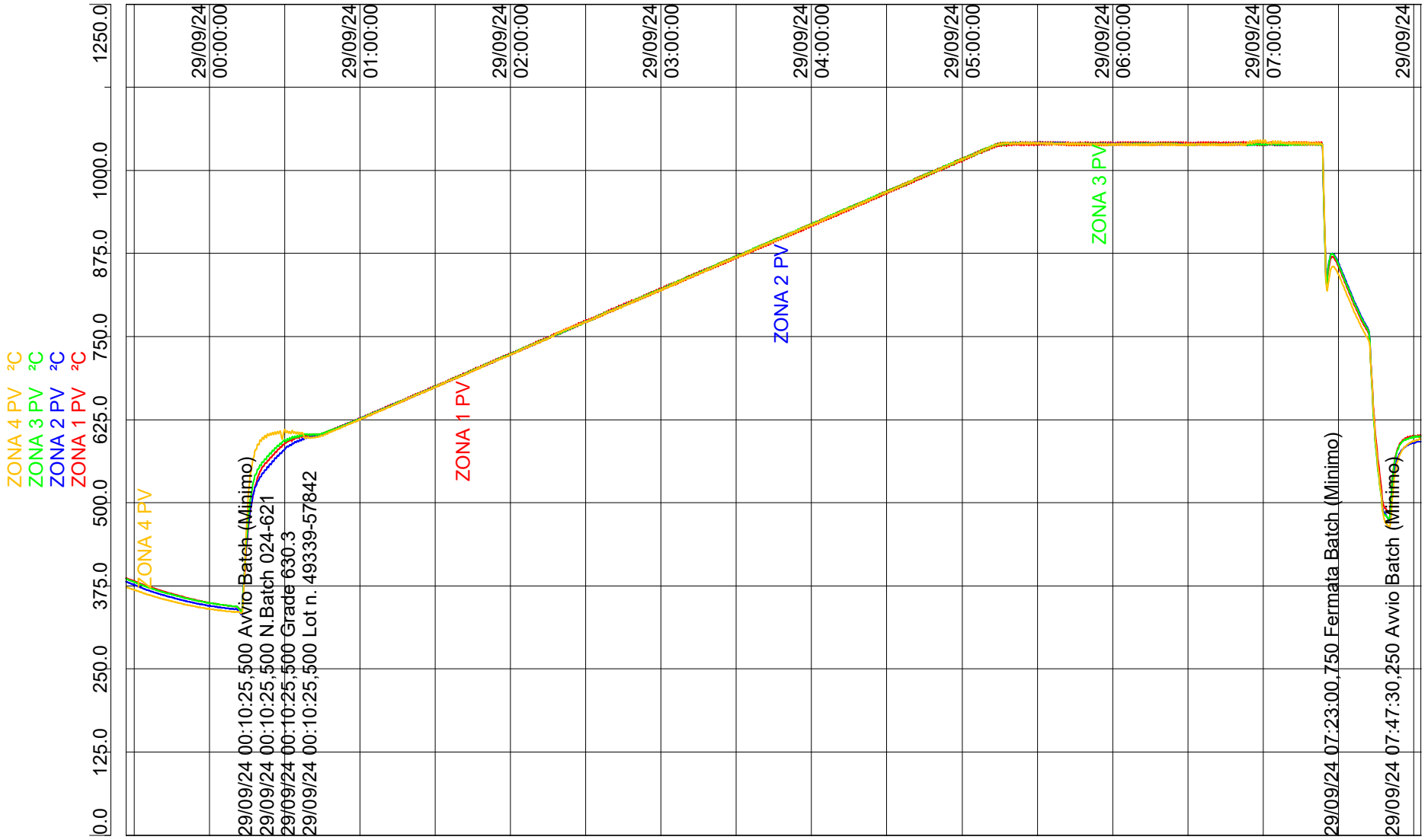
**EXAM DATA :** 14/10/2024
**INSPECTED N. BARS** 6

**THE MATERIAL IS IN ACCORDANCE TO THE FOLLOWING SPECIFICATIONS:**

EN10308 prospetto2 cl4

| | | | |
|---|---|---|---|
| **L'ISPETTORE CND** ZUSTANDER CND L'INSPECTEUR CND CND INSPECTOR ИНСПЕКТОР НРК<br>NADALIN SIMONE<br>Liv. II - ISO 9712 N° Cert.32040/PND/C | **III LIV.CND** **III** УРОВЕНЬ НРК<br>BAISOTTI MARCO<br>Liv.III - ISO 9712 N° Cert.34194/PND/C | | **DATA** DATUM DATE DATE ДАТА<br>17/10/2024 |

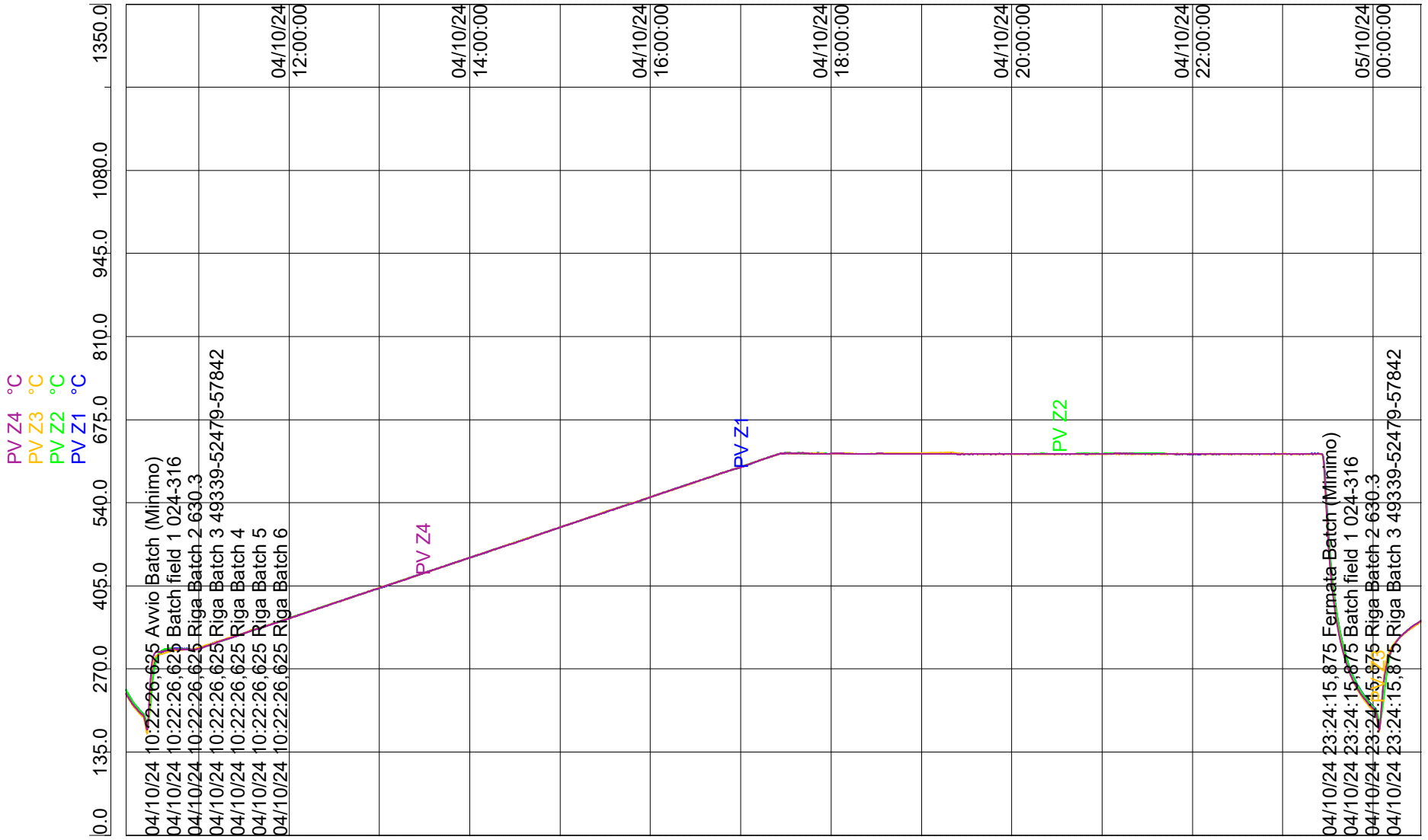
(Mod. Certus Rev. 6)




28/09/24 23:27:00
16/10/2024 15:26:23

Grafico1

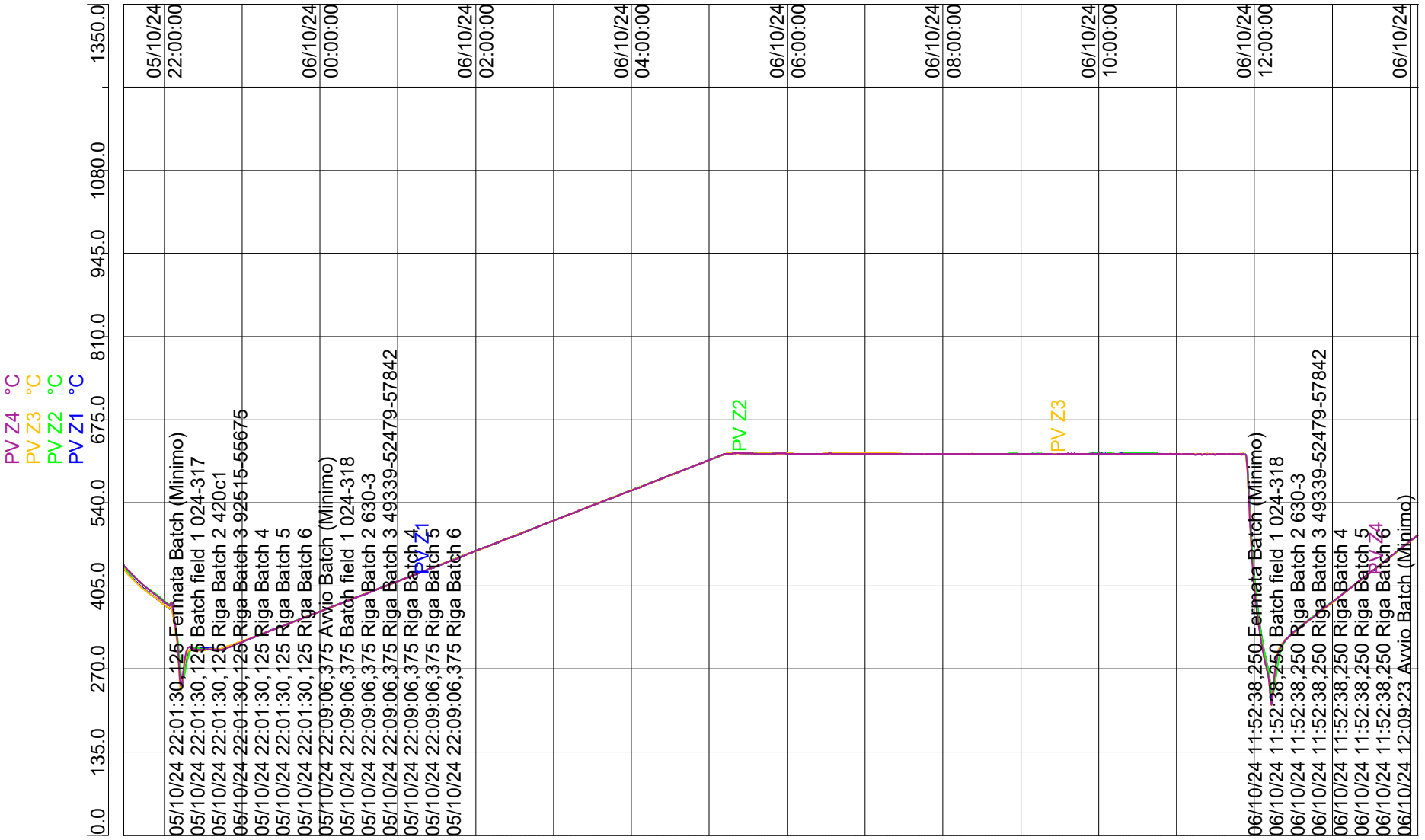
29/09/24 08:03:00
Page 1 of 1




04/10/24 10:12:00
16/10/2024 15:36:49

Grafico3

05/10/24 00:32:00
Page 1 of 1




05/10/24 21:29:00
16/10/2024 15:40:08

Grafico3

06/10/24 14:06:00
Page 1 of 1

| REMAZEL | CERTIFICATION LIST | Certificate Nr.: 001/24<br>Date: 30/10/2024 |
|---|---|---|

| Final Customer: | Order Customer: | Object: | Description: | Quantity: | Inspection and Test Plan (ITP): | Our job: |
|---|---|---|---|---|---|---|
| Rosetti Marino | EFC-24006083+24006433 | | | | | |

# MATERIAL

| Drawing | Pos. | Q.ty | Description | Material | Certificates 3.1 | Order | Heat/Plate ID | Additional Mechanical Test | UT Certificates | Nesting |
|---|---|---|---|---|---|---|---|---|---|---|
| C09-0001-P0015 | 1 | 1 | WHEEL Ø200mm | C45 | B2202309120154 | 24006083 | 23807325 | * | * | |
| C09-0001-P0045 | 1 | 1 | PULLEY Ø240mm | S355J2 | H72116580 | 24006083 | 0014477Z | * | * | |
| C09-0001-P0046 | 1 | 1 | ANTISKID | S355J2 | CRL2413532164 | 24006083 | 815265 | * | * | |
| C09-0001-P0085 | 1 | 1 | Ø279*35 | S355J2+N | 1154/4 | 24006083 | 1240905 | * | * | |
| C09-0001-P0085 | 2 | 1 | Ø127*30 | S355J2+N | 1253/3 | 24006083 | 1241244 | * | * | |
| C09-0001-P0066 | 1 | 1 | PULLEYBOOM Ø320mm | S355J2+N | 255714/1 | 24006433 | 457170 | * | * | |

湖南华菱湘潭钢铁有限公司
HUNAN VALIN XIANGTAN IRON AND STEEL CO., LTD

# 产品质量证明书

MILL'S TEST CERTIFICATE/INSPECTION CERTIFICATE

湖南省湘潭市岳塘区
Zip Code: 411101
Yuetang, Xiangtan, Hunan, P. R. C.
Phone: (0086-731) 58653019
Fax: (0086-731) 58653019
http://www.hnxg.com.cn



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 证明书号 Certificate No. | B2202309120154 | 交货状态 Condition Of Supply | 热轧(AR) | 车号 Train No. | PACIFIC TAMARITA | 标准 Specification | XYXB2022-187 |
| 订单号 Order No. | 812304K014 | 牌号 Steel Grade | C45 | 发货日期 Date Of Delivery | 20230912162519 | 产品名称 Product | HOT ROLLED ROUND BAR |
| 采购订单号Pur Order No | RB23ITA139-CM | | | | | | |
| 订货单位 Customer | 中联物产有限公司 | | | 运输方式 Transported By | 水运代运 | 许可证号 License No. | |
| 收货单位 Purchaser Product | 中联物产有限公司 | | | 到站 Destination | 上海罗泾港 | 许可证有效期 Valid To | |

| 炉号 Heat No. | 轧制批号 Lot No. | 生产日期 Date Of Production | 规格 Size (mm) | 数量 Quantity 捆 (Bundles) | 重量 Weight (t) | 化学成分 Chemical Compositon, % Cu | C | Si | Mn | P | S | Ni | Cr | Mo | Alt | A22 | 气体量,% Gas content O | N | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | -2 10 | -2 10 | -2 10 | -2 10 | -3 10 | -3 10 | -2 10 | -2 10 | -3 10 | -3 10 | -2 10 | | -4 10 | |
| 23807325 | B22371020 | 20230723 | 200 | 2 | 8.932 | 3 | 43 | 21 | 72 | 12 | 20 | 1 | 6 | 10 | 20 | 8 | | 78 | |

| 炉号 Heat No. | 轧制批号 Lot No. | 屈服强度 Y.S (Mpa) HT 毛坯尺寸mm | 抗拉强度 T.S (Mpa) HT 毛坯尺寸mm | 断后伸长率 A (%) HT 毛坯尺寸mm | 冲击试验 Impact Test HT V型冲击 (J) T= 20℃ °C 毛坯尺寸 mm | 晶粒度 G.S 奥氏体 HT Max | Min |
|---|---|---|---|---|---|---|---|
| 23807325 | B22371020 | 423/414 | 670/634 | 24.0/23.0 | 37.0/37.0/39.0/38.0 | 7 | 7 |

1) NO RUSSIAN PRODUCTS.
2) Name of the plant where production takes place:HUNAN VALIN XIANGTAN IRON AND STEEL CO., LTD. in XIANGTAN city HUNAN Province, China.
3) Name of the country corresponding to the melting ladle (heat number):China .
4) HS code of the product:721499.
5) Name and address of the country and plant for the hot rolling:HUNAN VALIN XIANGTAN IRON AND STEEL CO., LTD. in XIANGTAN city HUNAN Province, China.
6) Scrap was purchased in China with HS code: 7204.
7) UT TEST AS PER EN10308 CLASS 3.
8) Reduction of area,37%.

无内容

| | | | | | |
|---|---|---|---|---|---|
| 合计 (Total) | 2 捆(Bundles) | 小计(Subtotal) 8.932 t /总计(Total) 8.932 t | 探伤检查标准 Detection Standard | 表面Surface<br>内部Inside EN10308 3 | 判定 Determine 合格 |
| 备注 Remarks | A22:Ni+Cr+Mo。热轧态：AR,热处理态：HT。 无放射性， 且无铅、汞等污染元素。。 | | | | |
| 声明 Declaration | 本证明书所列产品均按订单标准进行制造和检验，其结果符合要求，特此证明。<br>WE HEREBY CERTIFY THAT MATERIAL DESCRIBED HEREIN HAS MANUFACTURED AND TESTED WITH SATISFACTORY RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE ABOVE MATERIAL SPECIFICATION. | | 质量管理负责人 Quality Control Principal | | |

棒材产品质量鉴定章

CERTIFICATE NO.:H720116580

**DAYE SPECIAL STEEL CO., LTD.**
NO. 316 HUANGSHI AVENUE, HUANGSHI, HUBEI, CHINA PC:435000

# QUALITY CERTIFICATE

ACC TO EN10204 3.1

DESCRIPTION OF GOODS: HOT ROLLED HIGH QUALITY ALLOY STEEL ROUND BARS
CUSTOM SPECIFICATION:XYGW0366-2013

| Batch No. | Grade | Heat No. | Size(MM) | Pieces | Bundles | Weight(MT) | Total Length(M) | Delivery Condition |
|---|---|---|---|---|---|---|---|---|
| H720116580 | S355J2 | 0014477Z | 240 | 20 | 20 | 40.236 | 112.34 | hot rolled |

I、Chemical Composition:(%):

Ladle: C:0.15 Si:0.30 Mn:1.32 P:0.010 S:0.014 Cr:0.32 Ni:0.04 Mo:0.02 Cu:0.05 Al:0.027 As:0.0052 Sn:0.0052 Pb:0.0005 CEV:0.44 Cr+Mo+Ni:0.38
Product: N:0.0088 radioactivity:0.02 Bq/g

II、Mechanical Properties Examination:

| | | | | | |
|---|---|---|---|---|---|
| 1、tensile test temp: | R.M Temp | | 2、tensile test direction: | longitudinal | |
| 3、tensile test standard: | EN 10002-1 | | 4、yield strength ReH(MPa): | 372 | |
| 5、tensile strength Rm(MPa): | 540 | | 6、elongation after fracture A(%): | 31.5 | |
| 7、impact test temp: | -20℃ | | 8、impact test direction: | longitudinal | |
| 9、impact notch depth: | 2mm | | 10、impact test standard: | EN 10045-1 | |
| 11、charpyimpact absorbed energy KV2(J) : | 162 | 163 164 | | | |

III、Microstructure Examination:

| | | | | | |
|---|---|---|---|---|---|
| 1、inclusion test standard: | ASTM E45 | | 2、A-thin(level): | 2.0 | 2.0 |
| 3、A-thick(level): | 1.0 | 1.0 | 4、B-thin(level): | 1.0 | 0.5 |
| 5、B-thick(level): | 0 | 0 | 6、C-thin(level): | 0 | 0 |
| 7、C-thick(level): | 0 | 0 | 8、D-thin(level): | 0.5 | 0.5 |
| 9、D-thick(level): | 0.5 | 0.5 | 10、grain size test standard: | ASTM E112 | |
| 11、grain size(level): | 8 | | | | |

IV、NDT:

1、UT :good 2、standard:SEP1921-1984 3、level:NC/e

V、Dimensions,Appearance and Surface Quality:

1、dimension,appearance and surface quality: good

VI、Others:

1、reduction ratio:4.8

DAYE SPECIAL STEEL CO., LTD
0036-CPR-M-069-2013

Note:

(1) We hereby certify that the material herein described has been manufactured, sampled, tested and inspected in accordance with the requirements of specifications and purchase order, and meet the requirements
(2) When there is any complaint, you are kindly requested to mark the Steel Grade, Heat No., Size, Delivery Date, Causes and reserve the material in the condition of delivery
(3) Our company's quality management system has been certified by TÜV SÜD for fulfilling all requirements of ISO9001:2015&IATF16949:2016&AS9100D.
The defects per the requirement such as flakes,sub-surface bubble,macro inclusion in macrostructure of acid etched surface are not allowed and we assure the parts quality for delivery.Production standard acc. to EN10025-1、-2 Size tolerance acc. to EN10060 ; Mechanical properties obtained from normalized samples.

Date: 2020-07-15
Inspector: Ming Chao
Manager of Inspection: Liuguanghui

TRAFILIX
INDUSTRIES

**TRAFILIX S.p.A.**
ESINE PRODUCTION UNIT
I-25040 Esine (BS) Via Ruc, 30
Tel. +39 0364 367 600
Fax +39 0364 466 713

P. IVA IT00557640984 | C.F. 00366210177
R.E.A. BS 176980 | Cap. Soc. € 9.669.700 i.v.
info@trafilix.com | trafilix@legalmail.it
società assoggettata a direzione e coordinamento da parte di Lucefin S.p.A.

GRUPPO LUCEFIN

| A06 - Cliente/Customer: | E.F.C. ACCIAI SRL | VIA QUINZANO 84 | _ 25030 - CASTELMELLA | _ITALIA |
|---|---|---|---|---|

| A02 - Tipo di documento di controllo/Type of inspection document | A03 - Numero di documento/Document number | Z02 - Data di emissione/Date of issue |
|---|---|---|
| **2.2 secondo EN 10204:2004/2.2 according to EN 10240:2004** | **CRL2413532164** | 15/07/2024 |

| B02 - Qualità/Grade | B03 - Esecuzione/Execution | B01 - Sezione/Section |
|---|---|---|
| **S355J2C** | **Trafilato/Cold Drawn** | **Tondo/Round** |

| B02 - Norme di riferimento (edizione in vigore alla data dell'ordine)/Standard of reference ( edition in force at the date of the order) | **EN 10277/18** |
|---|---|

| B09 - Misura/Size [mm] | B03 - Tolleranza/Tolerance | B04 - Stato di fornitura/Delivery condition | B05 - Trattamento Termico/Heat treatment |
|---|---|---|---|
| **20** | **h9** | **+C** | **Stato naturale/As rolled** |

| A09 - Designazione articolo del cliente/Customer article designation | B08 - Quantità/Quantity | B10 - Lunghezza/Length [mm] |
|---|---|---|
| | **[kg] 626** | **6000/6200** |

| B07 - Lotto | B07 - Colata/Heat | C70 - Processo elaborazione acciaio/Steelmaking process | C93 - Rapp. di riduz. del lam./Reduct. ratio of the hot rolled |
|---|---|---|---|
| **L24009901** | **815265** | | **91,00** |

| A07 - Vs.ordine/Your Order | A08 - Ns. Conferma/Our Confirmation | A10 - D.D.T. n./Transport document NR. |
|---|---|---|
| **1454** | **TVA2401859** | **TRX2403171 del 15/07/2024** |

**ANALISI DI COLATA/HEAT ANALYSIS**

| C71 | C72 | C73 | C74 | C75 | C76 | C77 | C78 | C79 | |
|---|---|---|---|---|---|---|---|---|---|
| C % | Si % | Mn % | P % | S % | Cr % | Mo % | Ni % | Cu % | CEV |
| **0,1710** | **0,190** | **1,270** | **0,0170** | **0,0220** | **0,110** | **0,0200** | **0,090** | **0,1700** | **0,43** |

**Caratteristiche meccaniche/Mechanical properties**

Prova di trazione secondo norma EN-ISO 6892/Tensile test according to standard EN-ISO 6892

| C12 - Rm [MPa] | C11 - Re-Rp 0,2 (*) [MPa] | C13 - A % 5d (Long) |
|---|---|---|
| **708,0** | **624,0** | **10,90** |

* Secondo quanto previsto dalla norma di riferimento/* According to the reference standard

DUREZZA SECONDO NORMA EN-ISO 6506-1/HARDNESS ACCORDING TO STANDARD EN-ISO 6506-1

| C30 - | HB |
|---|---|
| C42 - | **215** |

Dimensione grano EN ISO 643 **8,00**

Note: dare certificato 2.2 con meccaniche statistiche

**Z01 - Note/Remarks:**

**Il materiale non contiene prodotti di acciaio originari della Russia menzionati nell'Allegato XVII del Regolamento (UE) n. 833/2014 e sue ulteriori modifiche/**
**The material does not contain steel products originating in Russia mentioned in Annex XVII of Regulation (EU) No 833/2014 and its additional amendments.**

**Il prodotto fornito è conforme ai requisiti dell'ordine/The product supplied complies with the requirements of the order.**
**Materiale conforme alla Direttiva 2011/65/EU RoHS II/This product complies with the Directive 2011/65/EU RoHS II**
**Materiale conforme al Regolamento (CE) n. 1907/2006 REACH/ This product complies with the Regulation (EC) n. 1907/2006 REACH**
**Materiale esente da contaminazione radioattiva/Material free from radioactive contamination**

**Paese di produzione: Italia/Country of production: Italy**

A05 - Responsabile controllo qualità/Responsible for quality control
Fulvio Galli

ACCIAIERIE BERTOLI SAFAU
ABSOLUTE STEEL QUALITY
ACCIAIERIE BERTOLI SAFAU SpA
Via Buttrio n.28 - Frazione Cargnacco - 33050 Pozzuolo del Friuli (UD)
Tel. +39 0432 613211 - Fax +39 0432 613209 - www.absacciai.it

# CERTIFICATO DI COLLAUDO

Inspection Certificate 3.1/Certificat de reception 3.1/
Abnahmeprufzeugnis 3.1

N. 255714 / 1
Data 03.03.2020
COLATA N. Heat-Coulee-Schmelze 457170
Pag. 1 / 2

CLIENTE Customer-Client-Besteller
PROFILO Shape-Section-Profili: LAMINATO BARRE TONDO GREZZO 320 MM -
ACCIAIO Steel-Acier-Stahl: ST52.3/S355J2
CAPITOLATO ABS: Technical Specification: ABS
CAPITOLATO DI ANALISI: Material Specification:
CAPITOLATO DI FORNITURA: Technical Delivery Requirements:

ORDINE Order-Commande-Bestellung: ORDINE ST52-3/S355J2
STATO DI FORNITURA SupplyCondition-Etat de livraison: NATURALE
COMESSA/POS Sales Order/Pos: 1065415/80

Rf

## COMPOSIZIONE CHIMICA DI COLATA %

CAST ANALYSIS % - COMPOSITION CHIMIQUE DE COULEE % - SCHMELZE CHEMISCHE ANALYSE %

| | C | Mn | Si | P | S | Cr | Ni | Mo | Al (T) | Cu | Sn | Ti |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Min | | | | | | | | | | | | |
| Max | 0,200 | 1,60 | 0,55 | 0,025 | 0,025 | 0,30 | 0,30 | 0,08 | 0,100 | 0,30 | 0,050 | 0,0500 |
| Colata/Heat | 0,161 | 1,25 | 0,21 | 0,009 | 0,003 | 0,19 | 0,12 | 0,04 | 0,023 | 0,18 | 0,008 | 0,0018 |
| | B (T) | V | Nb | As | Ca | Sb | Co | Pb | O/ppm | H/ppm | C Eq. Formula | |
| Min | | | | | | | | | | | | |
| Max | 0,0008 | 0,100 | 0,060 | 0,050 | 0,0500 | 0,050 | 0,100 | 0,4000 | 20,00 | 2,00 | 0,450 | |
| Colata/Heat | 0,0001 | 0,004 | 0,003 | 0,005 | 0,0014 | 0,001 | 0,008 | 0,0001 | 14,00 | 0,80 | 0,436 | |

## CARATT. MECCANICHE

MECHANICAL PROPERTIES - CARACTERISTIQUES MECANIQUE - MECHANISCHE EIGSNSCHAFTER

TRAZIONE/RESILIENZA DI RIFERIMENTO

TRATTAMENTO TERMICO HEAT TREATMENT
NORMALIZZAZIONE

### TRAZIONE

TENSILE TEST

| | R LONG. | RE LONG. | A%5D LONG. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Min | 490Mpa | 355Mpa | 22% | | | | | | | | | |
| Max | 630Mpa | | | | | | | | | | | |
| Colata/Heat | 516Mpa | 363Mpa | 28,3% | | | | | | | | | |

### RESILIENZE

IMPACT TEST

| | KV -20°C Long | KV -20°C Long | KV -20°C Long | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Min | 27J | 27J | 27J | | | | | | | | | |
| Max | | | | | | | | | | | | |
| Colata/Heat | 130J | 137J | 134J | | | | | | | | | |

### DUREZZE

HARDNESS

| | IN PELLE | | | | | |
|---|---|---|---|---|---|---|
| Min | | | | | | |
| Max | 9.999HB | | | | | |
| Colata/Heat | 140HB | | | | | |

### INCLUSIONI NON METALLICHE

NON METALLIC INCLUSION - INCLUSIONS NON METALLIQUES - PRUFUNG NICHTEMETALLISCHE EINSCHLUSSE

| K4 |
|---|
| 2 |

MICROINCLUSIONI: METODO K
MICROINCLUSIONI: NORMA UNI 3244

### GRANO

GRAIN - GRAIN - KORNGROSSE

GRANO AUSTENITICO: NORMA UNI 3245
GRANO AUSTENITICO: METODO MC QUAID
TEMPERATURA GRANO AUSTENITICO 920 °C
DIMENSIONE GRANO AUSTENITICO 7

ACCIAIERIE BERTOLI SAFAU
ABSOLUTE STEEL QUALITY
ACCIAIERIE BERTOLI SAFAU SpA
Via Buttrio n.28 - Frazione Cargnacco - 33050 Pozzuolo del Friuli (UD)
Tel. +39 0432 613211 - Fax +39 0432 613209 - www.absacciai.it

# CERTIFICATO DI COLLAUDO

Inspection Certificate 3.1/Certificat de reception 3.1/
Abnahmeprufzeugnis 3.1

| | |
|---|---|
| N. | 255714 / 1 |
| Data | 03.03.2020 |
| COLATA N. Heat-Coulée-Schmelze | 457170 |
| Pag. | 2 / 2 |

**ALTRE PROVE**
OTHER TESTS - AUTRES ESSAIS - SONSTIGE PRUFUNGEN

GRADO BANDATURA ASSENTE
BANDATURA NORMA UNI 8449

**NOTE**

DIFETTI INTERNI METODO CONTROLLO US ESEGUITO AL 100%
DIFETTI INTERNI ACC. TO EN 10308 CL.4
ANTIMIX 100 %
R/R = 5
CERTIFICATO REDATTO IN ACCORDO A: EN 10204/3.1
ACCIAIO COMPLETAMENTE CALMATO .
ACCIAIO GRANO FINE .
ACCIAIO ELABORATO AL FORNO ELETTRICO .
ACCIAIO DEGASATO SOTTOVUOTO .
PAESE D'ORIGINE ITALIA
- Materiale esente da piombo, mercurio, cadmio e cromo esavalente (dir. 2000/53/CE - dir. 2011/65/UE e s.m.i.)
- Materiale con radioattivita' non superiore a 0,1Bq/g (d.lgs. 230/1995 e s.m.i.)

**CONTROLLO QUALITA'**
QUALITY CONTROL - CONTROLE DE QUALITE - QUALITATSSTEILE

Azienda con sistema di gestione certificato da IGQ secondo
ISO 9001 e IATF 16949

Verif.:Sabrina Anzile

REMAZEL

# CERTIFICATION LIST

Certificate Nr.: 001/24
Date: 30/10/2024

| Final Customer: | Order Customer: | Object: | Description: | Quantity: | Inspection and Test Plan (ITP): | Our job: |
|---|---|---|---|---|---|---|
| Rosetti Marino | 24006039 'celotti | | Pins/Axis/Shaft | | 1724001010-QC-ITP-00002 | |

## MATERIAL

| Drawing | Pos. | Q.ty | Description | Material | Certificates 3.1 | Order | Heat/Plate ID | Additional Mechanical Test | UT Certificates | Nesting |
|---|---|---|---|---|---|---|---|---|---|---|
| C09-0001-P0050 | 1 | 1 | PINION Ø100mm | 42CRMOS4 | 4883 | 24006039 | 220602441 | TRATTAMENTO | * | |
| C09-0001-P0038 | 1 | 1 | swivel Ø150mm | S355J2 | 429339/1 | 24006039 | 480592 | * | * | |
| C09-0001-P0083 | 1 | 1 | shaft Ø40mm | AISI316 | 2018/003330 | 24006039 | R2LR | * | * | |

EURO sider SCALO S.p.A.
Cap. Soc. € 2.000.000 i.v.
Reg. Imprese Brescia n. 302331
C.F. 02887820179
P.IVA 00701510984

Sede legale e amministrativa:
Via degli Emigranti, 9
25040 Cividate Camuno, BRESCIA
Tel. 0364-340206 Fax 0364-340209
www.eurosiderscalo.com

Azienda con sistema di Gestione Qualità certificato da TUV italia SRL secondo la norma UNI EN 9001:2015

# Certificato di controllo
# Inspection Certificate

| Tipo certificato / Type of certificate | Norma certificato / Certificate norm |
|---|---|
| 3.1 | EN 10204 |
| **Data emissione / Issue date** | **N° certificato / N° of certificate** |
| 05.03.2024 | 4883 |

**Cliente / Customer**
CELOTTI ROBERTO & C. S.R.L.
Via Chiari 49/C
I-25033 COLOGNE BS

| Ordine cliente / Customer order | Data ord. cliente / Client order date |
|---|---|
| 49 | 26.01.2024 |
| **Ordine ESS / ESS Order** | **Data ordine ESS / Ess order date** |
| 101569 | 29.01.2024 |
| **DDT / Delivery note** | **Data DDT / Delivery note's date** |
| 1377 | 05.03.2024 |

| Qualità / Steel grade | Norma / Norm | Stato fornitura / Delivery state | Trattamento termico / Heat treatment | Sezione (mm) / Section (mm) | Rif. Int. / Int. Ref. | Colata / Heat |
|---|---|---|---|---|---|---|
| 42CRMOS4 | EN 10083-1/3 | Barra laminata Grezza | BONIFICATO | 100,00 mm | E26457 | 220602441 |

**ANALISI CHIMICA % / CHEMICAL ANALYSIS %**

| C | Mn | Si | P | S | Cr | Ni | Mo | Al | Cu | V | B | Pb | Co | Nb | Ti | Sn | N [ppm] | Ceq |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,42 | 0,810 | 0,22 | 0,0150 | 0,0270 | 1,070 | 0,020 | 0,170 | 0,0320 | 0,040 | | | | | | | | | 0,80700 |

**CARATTERISTICHE MECCANICHE / MECHANICAL PROPERTIES**

Di riferimento / Reference test piece ☐ — Di prodotto / On the product ☒ — Trattamento termico del provino / Sample's heat — +QT

| Rottura / Tensile strenght | Snervamento / Yield point | Allungamento / Elongation | Resilienza / Impact test | | | | | Strizione / Reduction of area | Durezza / Hardness | | | Controllo ultrasuoni / Ultrasonic test | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N/mm^2 | N/mm^2 | % | Kv (J) | | | | ° C | % | HB | | | Classe / Class | Norma / Norm |
| 920 | 770 | 18 | 1<br>60 | 2<br>59 | 3<br>53 | media / average<br>57,333 | KV-40°CJ | 64 | 1 | 2 | 3 | | |

| Prova Jominy / Jominy test | | | | | | | | | | | | | | Grano austenitico / Grain size | | Inclusioni non metalliche / Not metallic inclusions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 1,5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | JK < | Norma / Norm | K4 < | Norma / Norm |
| HRC | 58,8 | 57,9 | 57,5 | 56,8 | 56,5 | 55,6 | 54,5 | 53,7 | 53,5 | 50,8 | 49,7 | 46,7 | 44,6 | 7 | ASTM E112 | 1.0 | ASTM E381 |

**Note / Note**

Il presente certificato è conforme all'originale archiviato presso la nostra sede.
This certificate is in compliance with the original one stored at our facility.
R/R=8.9

N.B.: I prodotti forniti sono conformi ai requisiti dell'ordine
The products supplied are in compilance with the requirements of the order

EURO sider SCALO S.p.A.
Controllo Qualità – Quality Control
Marco Ravelli

ACCIAIERIE BERTOLI SAFAU
ABSOLUTE STEEL QUALITY
ACCIAIERIE BERTOLI SAFAU SpA
Via Buttrio n.28 - Frazione Cargnacco - 33050 Pozzuolo del Friuli (UD)
Tel. +39 0432 613211 - Fax +39 0432 613209 - www.absacciai.it

# CERTIFICATO DI COLLAUDO

Inspection Certificate 3.1/Certificat de reception 3.1/
Abnahmeprufzeugnis 3.1

N. 429339 / 1
Data 31.10.2024
COLATA N. Heat-Couiée-Schmelze 480592


CLIENTE Customer-Client-Besteller: CELOTTI ROBERTO & C. SRL
ORDINE Order-Commande-Bestellung: 421
PROFILO Shape-Section-Profili: LAMINATO BARRE TONDO GREZZO 150 MM -
STATO DI FORNITURA SupplyCondition-Etat de livraison: NATURALE
ACCIAIO Steel-Acier-Stahl: S355J2+AR / ST52.3
COMESSA/POS Sales Order/Pos: 1111254/10
CAPITOLATO ABS: Technical Specification: ABS
CAPITOLATO DI ANALISI: Material Specification: EN10025-2/DIN17100 (ASQ) REV.0 2022.03
CAPITOLATO DI FORNITURA: Technical Delivery Requirements:

**COMPOSIZIONE CHIMICA DI COLATA %**

CAST ANALYSIS % - COMPOSITION CHIMIQUE DE COULEE % - SCHMELZE CHEMISCHE ANALYSE %

| | C | Mn | Si | P | S | Cr | Ni | Mo | Al (T) | Cu | Sn | Ti |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Min | 0,160 | 0,60 | 0,15 | | 0,020 | | | | 0,015 | | | |
| Max | 0,200 | 1,35 | 0,30 | 0,025 | 0,035 | 0,29 | 0,42 | 0,11 | 0,050 | 0,55 | 0,030 | 0,0200 |
| Colata/Heat | 0,174 | 1,28 | 0,19 | 0,011 | 0,024 | 0,13 | 0,10 | 0,03 | 0,020 | 0,13 | 0,006 | 0,0020 |

| | B (T) | V | Nb | As | Ca | Sb | Co | Pb | O/ppm | H/ppm | N/ppm | C Eq. Formula |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Min | | | | | | | | | | | | |
| Max | 0,0008 | 0,080 | 0,020 | 0,020 | 0,0020 | 0,050 | 0,100 | 0,1000 | 20,00 | 2,00 | 120 | 0,450 |
| Colata/Heat | 0,0001 | 0,003 | 0,002 | 0,004 | 0,0001 | 0,001 | 0,007 | 0,0001 | 10,00 | 0,90 | 73 | 0,435 |

**CARATT. MECCANICHE**

MECHANICAL PROPERTIES - CARACTERISTIQUES MECANIQUE - MECHANISCHE EIGSNSCHAFTER

TRAZIONE/RESILIENZA DI PRODOTTO

TRATTAMENTO TERMICO HEAT TREATMENT

**TRAZIONE**

TENSILE TEST

| | Rm LONG. | REH | A%5D LONG. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Min | 450Mpa | 295Mpa | 18% | | | | | | | | | |
| Max | 600Mpa | | | | | | | | | | | |
| Colata/Heat | 510Mpa | 329Mpa | 25,3% | | | | | | | | | |

**RESILIENZE**

IMPACT TEST

| | KV -20°C Long | KV -20°C Long | KV -20°C Long | KV 0°C Long | KV 0°C Long | KV 0°C Long | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Min | 27J | 27J | 27J | | | | | | | | | |
| Max | | | | | | | | | | | | |
| Colata/Heat | 61J | 75J | 53J | 119J | 126J | 116J | | | | | | |

**DUREZZE**

HARDNESS

| | IN PELLE | IN PELLE | | | | |
|---|---|---|---|---|---|---|
| Min | | | | | | |
| Max | 999HBW | 238HB | | | | |
| Colata/Heat | 165HBW | 165HB | | | | |

RESILIENZE : ACC. TO EN ISO 148-1

TRAZIONE : ACC. TO EN ISO 6892-1

**INCLUSIONI NON METALLICHE**

NON METALLIC INCLUSION - INCLUSIONS NON METALLIQUES - PRUFUNG NICHTEMETALLISCHE EINSCHLUSSE

| | Tipo A Type A | Tipo B Type B | Tipo C Type C | Tipo D Type D |
|---|---|---|---|---|
| Fine Thin | 2 | 0,5 | 0 | 1 |
| Grosso Heavy | 1,5 | 1 | 0 | 0,5 |

MICROINCLUSIONI: METODO A

MICROINCLUSIONI: NORMA ISO 4967/ASTM E45

**GRANO**

GRAIN - GRAIN - KORNGROSSE

GRANO AUSTENITICO: NORMA EN ISO 643/ASTM E45

GRANO AUSTENITICO: METODO MC QUAID

ACCIAIERIE BERTOLI SAFAU
ABSOLUTE STEEL QUALITY
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# CERTIFICATO DI COLLAUDO

Inspection Certificate 3.1/Certificat de reception 3.1/
Abnahmeprufzeugnis 3.1

| | |
|---|---|
| N. | 429339 / 1 |
| Data | 31.10.2024 |
| COLATA N. Heat-Couiée-Schmelze | 480592 |
| Pag. | 2 / 2 |

TEMPERATURA GRANO AUSTENITICO 920 °C

DIMENSIONE GRANO AUSTENITICO 8

**NOTE**

DIFETTI SUPERFICIALI: NESSUNA RIPARAZIONE MEDIANTE SALDATURA

DIFETTI INTERNI METODO CONTROLLO US ESEGUITO AL 100%

DIFETTI INTERNI EN10308 CL.4/SEP1920 CL.C

ANTIMIX 100 %

METODO DI CONTROLLO TRAMITE SPETTROMETRO PORTATILE

R/R = 7

CERTIFICATO REDATTO IN ACCORDO A: EN 10204/3.1

ACCIAIO COMPLETAMENTE CALMATO .

ACCIAIO GRANO FINE .

ACCIAIO ELABORATO AL FORNO ELETTRICO .

ACCIAIO DEGASATO SOTTOVUOTO .

PAESE D'ORIGINE ITALIA

- Materiale esente da piombo, mercurio, cadmio e cromo esavalente (dir. 2000/53/CE - dir. 2011/65/UE e s.m.i.)
- Materiale con radioattivita' non superiore a 0,1Bq/g (d.lgs. 101/2020 e s.m.i.)

- Con la presente dichiariamo che i prodotti sopra descritti sono conformi ai requisiti concordati all'ordine sulla base dei risultati di prova qui inclusi.

**CONTROLLO QUALITA'**

QUALITY CONTROL - CONTROLE DE QUALITE - QUALITATSSTEILE

Azienda con sistema di gestione certificato da IGQ secondo
ISO 9001 e IATF 16949

Verif.:Omar Tonetti

MEGHINOX ACCIAI S.R.L.
Via P. Nenni, 47
24050 Calcinate BG

Barra Inox Tonda Caldopelato/a ricotto/a
A 316L 40,00
Client Order NR. 230
Your Code:
Your Item:
Your Job:

**HEAT:** R2LR **OUR ORDER:** 2018 SC 31084 / 100
**QTY:** NR 4,00 MT KG 431,00

# ROLDAN, S.A. - Stainless Steels

**FACTORY**
Santo Tomás de las Ollas, S/N
Apdo. de Correos 11
PONFERRADA ( LEÓN )
TEL.: +34 987 44 61 00
FAX: +34 987 44 61 01
E-MAIL: rdn_fabrica@acerinox.com

**HEAD OFFICE**
Santiago de Compostela, 100-3º
28035 MADRID (ESPAÑA)
TEL.: +34 913 98 52 57
FAX: +34 913 98 51 93
E-MAIL: roldan@acerinox.com

## INSPECTION CERTIFICATE
3.1
EN 10204

TÜVRheinland® CERT ISO 9001

CE 0432 11 0432-CPR-00190-01

| | | | |
|---|---|---|---|
| **CERTIFICATE Nº** 2018/003330 | **DATE** 25/01/2018 | **SHEET** 1 | **DELIVERY NOTE Nº** 2018/000477 |
| **GRADE** ROLDAMAX-339 | EN10088:3 ( 1.4401/1.4404. ) | | |
| **CUSTOMER** | | | |
| **DIMENSIONS** 40,00 mm. | Surface finish according EN10088-3 Table 7:1X | | |
| **LENGTH** 6.100 mm. | **TOLERANCE** ISO k12 | | |
| **PRODUCT** [30] Round bar, annealed, smooth turned | | | |
| **REQUIREMENTS** EN10088:3 | **CUSTOMER ORDER** 41948/17-207155 | | |
| **TENSILE TEST** EN ISO 6892-1 | | | |
| **ACCORDING TO** EN 10272 | **EDITION** AD-2000 W2 AD-2000 W10 | | |
| **INTERGRANULAR CORROSION** EN ISO 3651-2 method A: SATISFACTORY | WITHOUT OBJETIONS | | |
| **SURFACE AND DIMENSIONS CONTROL** WITHOUT OBJECTIONS | Spektrometrical Identity Test: O.K. | | |
| **IMPACT TEST, SAMPLE DIMENSIONS** EN ISO 148-1 | **MATERIAL FREE FROM RADIOACTIVITY** | EN 10.088:5 | |

| ORDER Nº | WORKS Nº | MARKS / BOX | HEAT NUMBER | SAMPLE | WEIGHT |
|---|---|---|---|---|---|
| DW05567 11 | DW05567 11 1 | 67027 / RI30589 | R2LR | R2LR | 431 |
| | DW05567 11 1 | 67028 / RI30591 | R2LR | | 431 |
| | DW05567 11 1 | 67029 / RI30592 | R2LR | | 431 |
| | DW05567 11 1 | 67030 / RI30602 | R2LR | | 369 |

TD100117145

Tipo:Certificati di origine

**PRODUCTION PROCESS**
EAF + AOD +CC

**TRADE MARK**
RDN

**MARKING**
HEAT NUMBER
GRADE ( ACX-339 )

**INSPECTOR STAMP**
R3

**QUALITY INSPECTOR**
JUAN JOSE ALVAREZ RODRIGUEZ
QUALITY CONTROL REPRESENTATIVE

**MECHANICAL PROPERTIES**

| CAST | SAMPLE | SAMPLE DIMENSIONS mm. | Observ. Tª. | Rm MPa | Rp 0,2% MPa | Rp 1% MPa | Z % | A % L=5Ø | A % L=4Ø | Agt % | IMPACT STRENGHT ISO-V (J) 20°C | IMPACT STRENGHT ISO-V (J) -196°C | | HARDNESS HB | FATIGUE TEST | BEND TEST | CROSS SECTIONAL AREA mm² | Kg / m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R2LR | R2LR | 30,00 | 20°C | 610 | 256 | 300 | 71 | 53 | 55 | | | | | 162 | | | | |
| REQUIREMENTS | | EN ISO 377 | | 500<br>700 | 200 | 235 | | 40 | | | 100 | | | 215 | | | | |

**CHEMICAL COMPOSITION %**

| CAST | C | P | S | Si | Mn | Cr | Ni | Mo | Ti | N | Cu | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R2LR | 0,0260 | 0,0290 | 0,0270 | 0,2960 | 1,5270 | 16,7600 | 10,4900 | 2,0180 | 0,0050 | 0,0470 | 0,4880 | | | | |
| REQUIREMENTS | 0,0300 | 0,0450 | 0,0300 | 1,0000 | 2,0000 | 16,5000<br>18,5000 | 10,0000<br>13,0000 | 2,0000<br>2,5000 | | 0,1000 | | | | | |

**OBSERVATIONS**
ASTM A-182. ASTM A-193 Class 1 Grade B8M. ASTM A-276 Condition A. ASTM A-320 Class 1 Grade B8M. ASTM A-479 Condition A. ASME SA-182. ASME SA-193 Class 1 Grade B8M. ASME SA-320 Class 1 Grade B8M. ASME SA-479 Condition A. AMS 5648. AMS 5653. AMS QQ-S-763. AISI 316/316L. UNS S31600/S31603.
Si dichiara che tutta la materia prima utilizzata per la ns produzione di acciaio inox é esente da conta minazione radioattiva grazie alle nostre procedure di controllo interne. NACE MR0175 & MR0103.

CER_IN4

| | | | |
|---|---|---|---|
| **OTHER TEST RESULTS** | | **REQUIREMENTS** | TRD100 TRB100,AD-2000-W2-W10,2014/68/EU (PED) |
| **HEAT TREATMENT** | 1.050 °C AND WATERCOOLED | Crack tested acc. to EN10277 table 1 class 2 | |

## 12 Ndt Reports

SGPTESTING
VIA J. RESSEL, 2/5/A - 34018 SAN DORLIGO DELLA VALLE - TRIESTE - ITALY
TEL. +39 040 3220841 - info@sgptesting.com - www.sgptesting.com

# RAPPORTO ESAME VISIVO
VISUAL EXAMINATION REPORT

**VT nr. 274 /24** pag. 001 di 001 sheet of

| | | | |
|---|---|---|---|
| cliente / customer | REMAZEL S.p.A. | commessa / project | --- |
| materiale esaminato / examined material | Boom Carpentry | | |
| riferimenti / reference | **Dwg. C09-0001-P0004 rev. E** | particolare / item | 100% Welds |

| | | | | |
|---|---|---|---|---|
| procedura d'esame / examination procedure | UNI EN ISO 17637<br>1724001010-NDT-PRO-00006 | limiti di accettazione / acceptance criteria | UNI EN ISO 5817 Class C<br>1724001010-NDT-PRO-00006 | |
| stato superficiale / surface condition | ☑ saldato / welded | ☐ molato / ground | ☐ lav. di macchina / machined | ☐ forgiato / forged |
| | ☐ fuso / casting | ☐ sabbiato / sandblasted | ☐ verniciato / painted | ☐ finito / finished |

| | | | | |
|---|---|---|---|---|
| metodo d'esame / testing method | ☑ esame visivo diretto / direct testing | ☐ esame visivo remoto / remote testing | | |
| distanza visiva: 30 cm / visual distance | angolo: 30° / visual angle | illuminazione / light | ☐ 500 lux | ☑ 1000 lux |

| | | | | |
|---|---|---|---|---|
| apparecchiature / equipments | ☑ calibro per saldature / welding gauge | ☐ calibro ventesimale / gauge | ☐ metro / rule | ☐ livella / level |
| | ☐ lente / lens | ☐ specchio / mirror | ☐ endoscopio / endoscope | ☐ boroscopio / borescope |

| | | | | |
|---|---|---|---|---|
| esito dell'esame / examination result | ☐ cricca / crack 100 | ☐ cricca da cratere / crater crack 104 | ☐ porosità, soffiature / porosity 2011-2012-2014-2017 | ☐ porosità (nido) / clustered porosity 2013 |
| ☐ cavità allungate (tarli) / elongated cavity 2015-2016-2018 | ☐ inclusioni solide / solid inclusions 300 | ☐ inclusioni di rame / copper inclusions 3042 | ☐ inclusioni di tungsteno / tungsten inclusions 3041 | ☐ mancanza di penetrazione / lack of penetration 402 |
| ☐ mancanza di fusione / lack of fusion 401 | ☐ ripresa carente / lack of recovery 517 | ☐ allineamento non corretto / incorrect root gap 617 | ☐ incisione marginale / undercut 5011-5012 | ☐ sovrametallo eccessivo / excess weld metal 502 |
| ☐ convessità eccessiva / excessive convexity 503 | ☐ altezza di gola maggiore / excess. throat thickness 5214 | ☐ altezza di gola minore / insuff. throat thickness 5213 | ☐ eccesso di penetrazione / excess penetration 504 | ☐ sgocciolamento locale / local drip 5041 |
| ☐ slivellamento / linear misalignment 507 | ☐ riempimento incompleto / incompletely filled groove 511 | ☐ avvallamento / sagging 509 | ☐ asimmetria eccessiva / excessive asymmetry 512 | ☐ insellamento al vertice / root concavity 515 |
| ☐ incisione al vertice / shrinkage groove 5013 | ☐ traboccamento / overlap 506 | ☐ colpo d'arco / stray arc 601 | ☐ spruzzo / spatter 602 | ☐ difetti in sez. trasversale / cross-section imperfections - |

SATISFACTORY

note / remarks

| NDT Operator | QA/QC | Third Party | Client |
|---|---|---|---|
| Name: Mr. Michele Pellis 2nd and 3rd level UNI EN ISO 9712<br>Signature:<br>Place/Date: Trieste, 14.10.2024 | Name:<br>Signature:<br>Date: | Name:<br>Signature:<br>Date: | Name:<br>Signature:<br>Date: |

SGPTESTING
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# RAPPORTO ESAME MAGNETOSCOPICO

MAGNETIC PARTICLE EXAMINATION REPORT

**MT nr. 381 /24**



| | | | |
|---|---|---|---|
| cliente<br>customer | REMAZEL S.p.A. | commessa<br>project | --- |
| materiale esaminato<br>examined material | Boom Carpentry | | |
| riferimenti<br>reference | **Dwg. C09-0001-P0004 rev. E** | particolare<br>item | 100% Welds |

| | | | |
|---|---|---|---|
| procedura d'esame<br>examination procedure | UNI EN ISO 17638<br>1724001010-NDT-PRO-00006 | limiti di accettazione<br>acceptance criteria | EN ISO 23278 - Lev.2<br>1724001010-NDT-PRO-00006 |
| stato superficiale<br>surface condition | ☑ saldato<br>welded | ☐ molato<br>ground | ☐ lav. di macchina<br>machined |
| | | | ☐ forgiato<br>forged |
| temperatura: 15-20 °C<br>test temperature | | ☐ fuso<br>casting | ☐ sabbiato<br>sandblasted |
| | | | ☐ verniciato<br>painted |

| | | | |
|---|---|---|---|
| mezzo di rivelazione<br>detection medium | ☐ a secco<br>dry | ☑ a umido<br>wet | black magnetic powder suspension ELITE BW2 |
| metodo di rivelazione<br>detection method | ☑ contrasto di colore<br>colour contrast | ☐ luce di Wood<br>Wood light | contrast laquer ELITE WBL5 |

| | | | | |
|---|---|---|---|---|
| tipo di corrente<br>current type | ☑ alternata<br>A.C. | ☐ continua<br>D.C. | ☐ raddrizzata<br>rectified | ☐ magnete permanente<br>permanent magnet |
| tipo di magnetizzazione<br>type of magnetization | ☐ longitudinale<br>longitudinal | ☑ giogo<br>yoke | ☐ bobina<br>coil | |
| | ☐ circolare<br>circular | ☐ puntali<br>prods | ☐ conduttore centrale<br>central conductor | ☐ di testa<br>head shot |
| metodo<br>method | ☑ continuo<br>continuous | ☐ residuo<br>residuos | ☐ smagnetizzazione SI<br>smagnetization yes | ☑ smagnetizzazione NO<br>smagnetization no |
| attrezzatura:<br>equipment | Parker B300S | | nr. matricola:<br>serial number | 26166 |
| distanza : 135 mm.<br>distance | intensità corrente: A<br>current intensity | spire:<br>turns | ampere-spire:<br>ampere-turns | |

esito dell'esame
examination result

Acceptable as per specification.

note
remarks

| NDT Operator | QA/QC | Third Party | Client |
|---|---|---|---|
| Name: Mr. Michele Pellis 2nd and 3rd level UNI EN ISO 9712 | Name: | Name: | Name: |
| Signature: | Signature: | Signature: | Signature: |
| Place/Date: Trieste, 14.10.2024 | Date: | Date: | Date: |

SGPTESTING
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TEL. +39 040 3220841 - info@sgptesting.com - www.sgptesting.com

# RAPPORTO ESAMI ULTRASUONI
ULTRASONIC EXAMINATION REPORT

**UT nr. 370 /24** 

cliente / customer: REMAZEL S.p.A.

commessa / project:

materiale esaminato / examined material: Boom Carpentry
plates thk. ≥ 20 mm

riferimenti / reference: **dwg. C09-0001-P0004 rev. E**

particolare / item: 100% surface where accessible
(pos. 3, 4, 5)

procedura d'esame / examination procedure: UNI EN ISO 10160
1724001010-NDT-PRO-00006

limiti di accettazione / acceptance criteria: planar discontinuities research

stato superficiale / surface condition: ☐ saldato / welded ☐ molato / ground ☑ lav. di macchina / machined ☐ forgiato / forged

temperatura / test temperature: 0-10 °C

accoppiante / coupling medium: tjlosa

☐ verniciato / painted ☐ fuso / casting ☐ sabbiato / sandblasted

apparecchiatura / equipment:

☐ Olympus 38 DL Plus ID 120486408
☐ Panametrics 36 DLP ID 992126711
☐ Panametrics Epoch III ID 01457206
☐ Panametrics Epoch IV ID 081590305
☐ Olympus OMNI-MX2 ID 102691-2681
☐ Olympus Epoch 600 ID 120459312
☐ Olympus Epoch 600 ID 120240601
☑ Olympus Epoch 600 ID 130530605

| sonda / transducer | dimensioni / probe size | angolo / angle | frequenza / frequency | dB riferimento / primary ref. | correz. di trasferimento / transfer correction | dB scansione / scanning | dB totali / total dB |
|---|---|---|---|---|---|---|---|
| Krautkramer MB4S-N *sn: 53465* | Ø10 mm | 0° | 4 MHz | 50,8 | <2 | | 50,8 |
| IMG D8-5B *sn: 2389* | Ø10 mm | 0° | 4 MHz | 43,7 | <2 | | 43,7 |
| | | | | | | | |
| | | | | | | | |

blocchi di taratura / reference blocks: IIW Reference Block

metodo di taratura / calibration mode: -

dettaglio / item detail: ---

esito dell'esame / examination result:

Acceptable as per specification.

| NDT Operator | QA/QC | Third Party | Client |
|---|---|---|---|
| Name: Mr. Michele Pellis 2nd and 3rd level UNI EN ISO 9712 | Name: | Name: | Name: |
| Signature: | Signature: | Signature: | Signature: |
| Place/Date: Trieste, 14.10.2024 | Date: | Date: | Date: |

# RAPPORTO DI ESAME Visivo N° 1260/24

**Visual** del of **22/10/2024**
EXAMINATION REPORT
Pag. Sheet 1 di of 1


## ANTARES CONTROL
di Righetto Davide
*Ufficio :* Via Roma, 15/7
36040 Grumolo delle Abbadesse (VI)
*Sede operativa :* Via Galileo Galilei, 1 A6
Zona Nogarazza, 36057 Arcugnano (VI)


**Cliente** Sidertaglio Calandratura S.r.L.
Customer Via Marzotto, 9, 36031 Povolaro VI
**Ordine*** 24005073 **Comm. Vs cliente***
Order* Custoner Job*
**Cliente** REMAZEL ENGINEERING SPA **Comm.*** R0177
Custoner Job
**Incarico** R0177-01
Assignment
**Data/Luogo** 22/10/2024 Sidertaglio Calandratura S.r.L.
Date and place Via Marzotto, 9, 36031 Povolaro VI

**Descrizione del pezzo*** WELDED SHELL Øe 700
Description object* L. 4196, Th 15 mm
**Disegno*** **Quantità** 1
Drawing* Quantity
**Codice pezzo*** 240904R0177A
Code name*
**Materiale*** S355J2+N **Colata***
Material* Heat*
**Tipo Giunto** Testa a Testa
Joint type Butt Weld

**Tipo prodotto** Laminato / Saldato **WPS di riferimento***
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

**Procedura/Cliente*** **Norme di rif. :**
Specification customer* Procedure
**Procedura/Specifica*** ISO 17637
Specification* ***Ultima edizione / Latest edition***
**Classe accettazione*** ISO 5817 LIV. B
Acceptance criteria* ***Ultima edizione / Latest edition***
**Estensione del controllo*** 100% saldatura
Extension examination* weld 100%

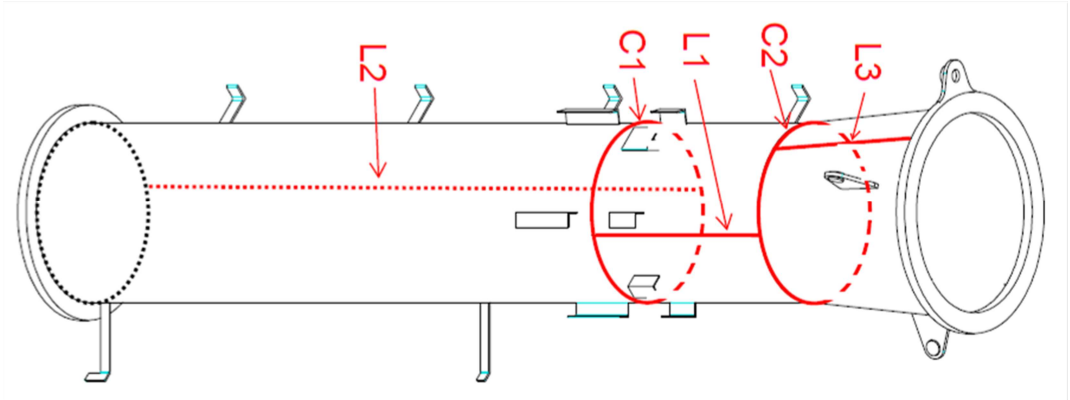
* DATI FORNITI DAL CLIENTE - *THESE DATA ARE SUPPLIED BY THE CUSTOMER Sidertaglio Calandratura S.r.L. Via Marzotto, 9, 36031 Povolaro VI WELDED SHELL Comm. 0 Antares Control Report VT N° 1260/24 22/10/2024

**Tipo luce** Artificiale luce fredda
Light type Artificial cold light
**Illuminamento** Superfice del pezzo >500 LUX
Light Piece surface >500 LUX
**Luxmetro** Delta Ohm ND2102,2 +LP471PHOT
Matricola/ Serial n° 14004390 + 14011722

**Distanza massima 600 mm** **Angolo di visione > 30°**
Max distance 600 mm Visual angle >30°
**Strumenti di controllo**
Equipment
**Controllo** Non assistito **Controllo** Localizzato
Test No support Test Localized


*Ufficio* 3462181857 *Cellulare* 3487376550 *Sito Web* www.antarescontrol.it *E-Mail* antarescontrolli@gmail.com


***Note - schizzo /*** Notes or sketch:




| Risultato / Result | OPERATORE - OPERATOR | RESPONSABILE - WORD REFERENCE | ISPETTORE - INSPECTOR |
|---|---|---|---|
| **Conforme a Norma** Acceptable | Righetto Davide II° LIV. SNT-TC-1A / ISO 9712 | SIDERTAGLIO CALANDRATURA S.R.L. | |

# RAPPORTO DI ESAME MAGNETOSCOPICO

**N° 786/24** del of **22/10/2024**

**MAGNETOSCOPIC** EXAMINATION REPORT

Pag. Sheet 1 di of 1


## ANTARES CONTROL

di Righetto Davide

*Ufficio :* Via Roma, 15/7

36040 Grumolo delle Abbadesse (VI)

*Sede operativa :* Via Galileo Galilei, 1 A6

Zona Nogarazza, 36057 Arcugnano (VI)


**Cliente** Sidertaglio Calandratura S.r.L.
Customer Via Marzotto, 9, 36031 Povolaro VI

**Ordine*** 24005073 **Comm. Vs cliente***
Order* Custoner Job*

**Cliente** REMAZEL ENGINEERING SPA **Comm.*** R0177
Custoner Job

**Incarico** R0177-01
Assignment

**Data/Luogo** 22/10/2024 Sidertaglio Calandratura S.r.L.
Date and place Via Marzotto, 9, 36031 Povolaro VI

**Descrizione del pezzo*** WELDED SHELL Øe 700
Description object* L. 4196, Th 15 mm

**Disegno*** **Quantità** 1
Drawing* Quantity

**Codice pezzo*** 240904R0177A
Code name*

**Materiale*** S355J2+N **Colata***
Material* Heat*

**Tipo Giunto** Testa a Testa
Joint type Butt Weld

**Tipo prodotto** Laminato / Saldato **WPS di riferimento***
Product Type

**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

**Procedura/Cliente***
Specification customer* **Norme di rif. :** Procedure:

**Procedura/Specifica*** UNI EN ISO 17638: 2016
Specification - Standard* ***Ultima edizione / Latest edition***

**Classe accettazione*** UNI EN ISO 23278 Lev. 2:2016
Acceptance criteria* ***Ultima edizione / Latest edition***

**Estensione del controllo*** 100% saldatura
Extension examination* 100% weld




*Ufficio* 3462181857 *Cellulare* 3487376550 *Sito Web* www.antarescontrol.it *E-Mail* antarescontrolli@gmail.com


**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

**Flusso magnetico** Longitudinale
Magnetic flux 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°

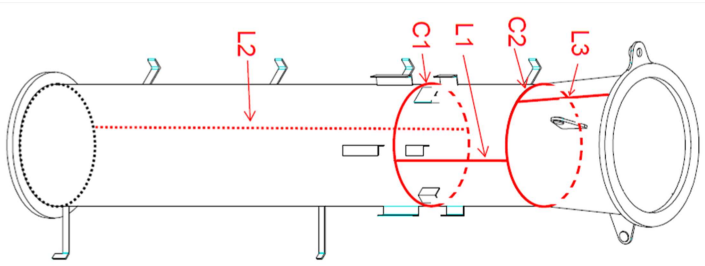
**Produttore** **MR Chemie GmbH**
Productor

**Vernice a contrasto di colore** ***MR 72*** Contrast paint white
White contrast paint ***Lotto - Batch*** ***#01/2022 E:01/2025***

**Mezzo Rilevatore** ***MR 76*** Magnetic poweder suspension black
Detector type ***Lotto - Batch*** ***100581140323***

**Smagnetizzazione** non richiesta
Demagnetization not required

***Note - schizzo /*** Notes or sketch:




| Risultato / Result | OPERATORE - OPERATOR | RESPONSABILE - WORD REFERENCE | ISPETTORE - INSPECTOR |
|---|---|---|---|
| **Conforme a Norma** Acceptable | Righetto Davide II° Liv. SNT-TC1A / ISO 9712 | SIDERTAGLIO CALANDRATURA S.R.L. | |

# RAPPORTO DI PROVA ULTRASUONI N° 782/24

**ULTRASONIC** del of **22/10/2024**
**EXAMINATION REPORT**
*Pag. Sheet* 1 di of 1


## ANTARES CONTROL
di Righetto Davide
*Ufficio :* Via Roma, 15/7
36040 Grumolo delle Abbadesse (VI)
*Sede operativa :* Via Galileo Galilei, 1 A6
Zona Nogarazza, 36057 Arcugnano (VI)


**Cliente** Sidertaglio Calandratura S.r.L.
Customer Via Marzotto, 9, 36031 Povolaro VI
**Ordine*** 24005073 **Comm. Vs cliente***
Order* Custoner Job*
**Cliente** REMAZEL ENGINEERING SPA **Comm.*** R0177
Custoner Job
**Incarico** R0177-01
Assignment
**Data/Luogo** 22/10/2024 Sidertaglio Calandratura S.r.L.
Date and place Via Marzotto, 9, 36031 Povolaro VI

**Descrizione del pezzo*** WELDED SHELL Øe 700
Description object* L. 4196, Th 15 mm
**Disegno*** **Quantità** 1
Drawing* Quantity
**Codice pezzo*** 240904R0177A
Code name*
**Materiale*** S355J2+N **Colata***
Material* Heat*
**Tipo Giunto** testa a testa
Joint type Butt Weld

**Tipo prodotto** Laminato / Saldato **WPS di riferimento***
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

**Procedura/Cliente*** **Norme di rif. :**
Specification customer* Procedure:
**Procedura/Specifica*** UNI EN ISO 17640 liv. B
Specification* ***Ultima edizione / Latest edition***
**Classe accettazione*** UNI EN ISO11666 Lev. 2
Acceptance criteria* ***Ultima edizione / Latest edition***
**Estensione del controllo*** 100% saldatura
Extension examination* weld 100%

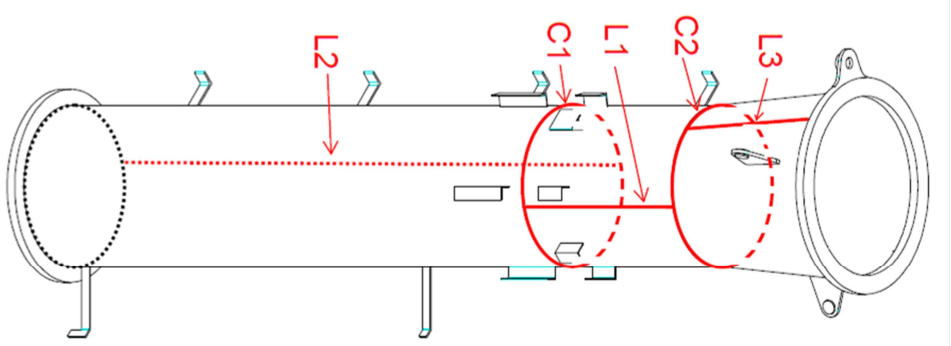
* DATI FORNITI DAL CLIENTE - *THESE DATA ARE SUPPLIED BY THE CUSTOMER Sidertaglio Calandratura S.r.L. Via Marzotto, 9, 36031 Povolaro VI WELDED SHELL Øe 700 Comm. 0 Antares Control Report UT N° 782/24 22/10/2024

**Metodo di controllo** Manuale - contatto **Accoppiante** COUPLANT FYp **Sovrap. Sonda** >20%
Scanning method Manual - contact reflection Coupling medium COUPLANT FYp Overlap
**Strumento tipo** WAVE SONATEST **Cavo** SEKG2 **Vel. di scans.** 150 mm/sec.
Instrument : Type Matricola SN - N° I0202645 Cable L 2000 Scanning velocity
Report taratura/calibration EN n° E240181 scad. 17/09/2025
Report taratura/calibration ASME n° A240203 scad. 04/10/2024
**Sonde piane ad onde long.** PRO NDT MD10-4 N°178220
Probes Long. waves type Matricola - Serial n°
**Dimens. crist.** Ø 10 mm. **freq.** 4 MHZ
Crystal dim. freq.
**Sonde angol. ad onde trasv.** PRO NDT MA45-4 2031 12
Probes Transv. waves type Matricola - Serial n°
**Dimens. crist.** 8 X 9 **freq.** 4 MHZ
Crystal dim. freq.
**Sonde angol. ad onde trasv.** PRO NDT MA60-4 2032 10
Probes Transv. waves type Matricola - Serial n°
**Dimens. crist.** 8 X 9 **freq.** 4 MHZ
Crystal dim. freq.
**Sonde angol. ad onde trasv.** PRO NDT MA70-4 2033 08
Probes Transv. waves type Matricola - Serial n°
**Dimens. crist.** 8 X 9 **freq.** 4 MHZ
Crystal dim. freq.

**Blocco di calibrazione** Eco di fondo/ Back Raflection
Calibration Block
**Foro di Riferimento** FBH Ø 3 mm
Reference pole Sonde piane / Plain Probes
**Curve di riferimento** Curva DAC
Reference curve Sonde piane / Plain Probes
**Limite di Registrazione** -4 dB Curva DAC
Recording level Sonde piane / Plain Probes
**Blocco di calibrazione** V 1 Carbon STEEL
Calibration Block Sonde angolate / Angular Probes
**Foro di Riferimento** SDH Ø 3 mm
Reference pole Sonde angolate / Angular Probes
**Curve di riferimento** Curva DAC
Reference curve Sonde angolate / Angular Probes
**Limite di Registrazione** -4 dB Curva DAC
Recording level Sonde angolate / Angular Probes
**Cavo** MPKLL2 **Vel. di scans.**
Cable L 2000 Scanning velocity


*Ufficio* 3487376550 *Cellulare* 3462181857 *Sito Web* www.antarescontrol.it *E-Mail* antarescontrolli@gmail.com


***Note - schizzo /*** 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** Acceptable | Davide Righetto II° Liv. SNT-TC1A / ISO 9712 | SIDERTAGLIO CALANDRATURA S.R.L. | |

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# RAPPORTO ESAME VISIVO
VISUAL EXAMINATION REPORT

**VT nr. 287 /24** 

| | | | |
|---|---|---|---|
| cliente / customer | REMAZEL S.p.A. | commessa / project | 24-27012 |
| materiale esaminato / examined material | Fixed Column Carpentry | | |
| riferimenti / reference | **Dwg. C09-0001-P0002 rev. E** | particolare / item | 100% Welds |

| | | | | |
|---|---|---|---|---|
| procedura d'esame / examination procedure | UNI EN ISO 17637<br>1724001010-NDT-PRO-00006 | limiti di accettazione / acceptance criteria | UNI EN ISO 5817 Class C<br>1724001010-NDT-PRO-00006 | |
| stato superficiale / surface condition | ☑ saldato / welded | ☐ molato / ground | ☐ lav. di macchina / machined | ☐ forgiato / forged |
| | ☐ fuso / casting | ☐ sabbiato / sandblasted | ☐ verniciato / painted | ☐ finito / finished |

| | | | | |
|---|---|---|---|---|
| metodo d'esame / testing method | ☑ esame visivo diretto / direct testing | ☐ esame visivo remoto / remote testing | | |
| distanza visiva: 30 cm / visual distance | angolo: 30° / visual angle | illuminazione / light | ☐ 500 lux | ☑ 1000 lux |

| | | | | |
|---|---|---|---|---|
| apparecchiature / equipments | ☑ calibro per saldature / welding gauge | ☐ calibro ventesimale / gauge | ☐ metro / rule | ☐ livella / level |
| | ☐ lente / lens | ☐ specchio / mirror | ☐ endoscopio / endoscope | ☐ boroscopio / borescope |

| | | | | |
|---|---|---|---|---|
| esito dell'esame / examination result | ☐ cricca / crack 100 | ☐ cricca da cratere / crater crack 104 | ☐ porosità, soffiature / porosity 2011-2012-2014-2017 | ☐ porosità (nido) / clustered porosity 2013 |
| ☐ cavità allungate (tarli) / elongated cavity 2015-2016-2018 | ☐ inclusioni solide / solid inclusions 300 | ☐ inclusioni di rame / copper inclusions 3042 | ☐ inclusioni di tungsteno / tungsten inclusions 3041 | ☐ mancanza di penetrazione / lack of penetration 402 |
| ☐ mancanza di fusione / lack of fusion 401 | ☐ ripresa carente / lack of recovery 517 | ☐ allineamento non corretto / incorrect root gap 617 | ☐ incisione marginale / undercut 5011-5012 | ☐ sovrametallo eccessivo / excess weld metal 502 |
| ☐ convessità eccessiva / excessive convexity 503 | ☐ altezza di gola maggiore / excess. throat thickness 5214 | ☐ altezza di gola minore / insuff. throat thickness 5213 | ☐ eccesso di penetrazione / excess penetration 504 | ☐ sgocciolamento locale / local drip 5041 |
| ☐ slivellamento / linear misalignment 507 | ☐ riempimento incompleto / incompletely filled groove 511 | ☐ avvallamento / sagging 509 | ☐ asimmetria eccessiva / excessive asymmetry 512 | ☐ insellamento al vertice / root concavity 515 |
| ☐ incisione al vertice / shrinkage groove 5013 | ☐ traboccamento / overlap 506 | ☐ colpo d'arco / stray arc 601 | ☐ spruzzo / spatter 602 | ☐ difetti in sez. trasversale / cross-section imperfections - |

SATISFACTORY

note / remarks

| NDT Operator | QA/QC | Third Party | Client |
|---|---|---|---|
| Name: Mr. Michele Pellis 2nd and 3rd level UNI EN ISO 9712<br>Signature:<br>Place/Date: Trieste, 28.10.2024 | Name:<br>Signature:<br>Date: | Name:<br>Signature:<br>Date: | Name:<br>Signature:<br>Date: |

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# RAPPORTO ESAME MAGNETOSCOPICO

MAGNETIC PARTICLE EXAMINATION REPORT

**MT nr. 392 /24**



| | | | |
|---|---|---|---|
| cliente / customer | REMAZEL S.p.A. | commessa / project | 24-27012 |
| materiale esaminato / examined material | Fixed Column Carpentry | | |
| riferimenti / reference | **Dwg. C09-0001-P0002 rev. E** | particolare / item | 100% Welds |

| | | | |
|---|---|---|---|
| procedura d'esame / examination procedure | UNI EN ISO 17638<br>1724001010-NDT-PRO-00006 | limiti di accettazione / acceptance criteria | EN ISO 23278 - Lev.2<br>1724001010-NDT-PRO-00006 |
| stato superficiale / surface condition | ☑ saldato / welded | ☐ molato / ground | ☐ lav. di macchina / machined ☐ forgiato / forged |
| temperatura: 15-20 °C / test temperature | | ☐ fuso / casting | ☐ sabbiato / sandblasted ☐ verniciato / painted |

| | | | |
|---|---|---|---|
| mezzo di rivelazione / detection medium | ☐ a secco / dry | ☑ a umido / wet | black magnetic powder suspension ELITE BW2 |
| metodo di rivelazione / detection method | ☑ contrasto di colore / colour contrast | ☐ luce di Wood / Wood light | contrast laquer ELITE WBL5 |

| | | | | |
|---|---|---|---|---|
| tipo di corrente / current type | ☑ alternata / A.C. | ☐ continua / D.C. | ☐ raddrizzata / rectified | ☐ magnete permanente / permanent magnet |
| tipo di magnetizzazione / type of magnetization | ☐ longitudinale / longitudinal | ☑ giogo / yoke | ☐ bobina / coil | |
| | ☐ circolare / circular | ☐ puntali / prods | ☐ conduttore centrale / central conductor | ☐ di testa / head shot |
| metodo / method | ☑ continuo / continuous | ☐ residuo / residuos | ☐ smagnetizzazione SI / smagnetization yes | ☑ smagnetizzazione NO / smagnetization no |
| attrezzatura: / equipment | Parker B300S | | nr. matricola: / serial number | 26166 |
| distanza : 135 mm. / distance | intensità corrente: A / current intensity | spire: / turns | ampere-spire: / ampere-turns | |

esito dell'esame / examination result

Acceptable as per specification.

note / remarks

| NDT Operator | QA/QC | Third Party | Client |
|---|---|---|---|
| Name: Mr. Michele Pellis 2nd and 3rd level UNI EN ISO 9712 | Name: | Name: | Name: |
| Signature: | Signature: | Signature: | Signature: |
| Place/Date: Trieste, 28.10.2024 | Date: | Date: | Date: |

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# RAPPORTO ESAMI ULTRASUONI

ULTRASONIC EXAMINATION REPORT

**UT nr. 379 /24** 

| | | | |
|---|---|---|---|
| cliente<br>customer | REMAZEL S.p.A. | commessa<br>project | 24-27012 |
| materiale esaminato<br>examined material | Fixed Column Carpentry | | |
| riferimenti<br>reference | **Dwg. C09-0001-P0002 rev. E** | particolare<br>item | 100% BW where practicable<br>*(as indicated in dwg)* |

| | | | |
|---|---|---|---|
| procedura d'esame<br>examination procedure | UNI EN ISO 17640<br>1724001010-NDT-PRO-00006 | limiti di accettazione<br>acceptance criteria | UNI EN ISO 11666 Liv.2<br>1724001010-NDT-PRO-00006 |

| | | | | |
|---|---|---|---|---|
| stato superficiale<br>surface condition | ☑ saldato<br>welded | ☐ molato<br>grounded | ☐ lav. di macchina<br>machined | ☐ forgiato<br>forged |
| temperatura: 10-15 °C<br>test temperature | accoppiante: tjlosa<br>coupling medium | ☐ verniciato<br>painted | ☐ fuso<br>casting | ☐ sabbiato<br>sandblasted |

| apparecchiatura<br>equipment | | | | |
|---|---|---|---|---|
| ☐ Olympus 38 DL Plus<br>ID 120486408 | ☐ Panametrics 36 DLP<br>ID 992126711 | ☐ Panametrics Epoch III<br>ID 01457206 | ☐ Panametrics Epoch IV<br>ID 081590305 |
| ☐ Olympus OMNI-MX2<br>ID 102691-2681 | ☑ Olympus Epoch 600<br>ID 120459312 | ☐ Olympus Epoch 600<br>ID 120240601 | ☐ Olympus Epoch 600<br>ID 130530605 |

| sonda<br>transducer | dimensioni<br>probe size | angolo<br>angle | frequenza<br>frequency | dB riferimento<br>primary ref. | correz. di trasferimento<br>transfer correction | dB scansione<br>scanning | dB totali<br>total dB |
|---|---|---|---|---|---|---|---|
| Krautkramer MB4S-N<br>*sn: 53465* | Ø10 mm | 0° | 4 MHz | 50,8 | <2 | +6 | 56,8 |
| Krautkramer MWB60-N4<br>*sn: 53476* | 8x9 mm | 60° | 4 MHz | 46,9 | <2 | +6 | 52,9 |
| Krautkramer MWB70-4<br>*sn: 56929-31760* | 8x9 mm | 70° | 4 MHz | 47,6 | <2 | +6 | 53,6 |
| | | | | | | | |

| blocchi di taratura<br>reference blocks | metodo di taratura<br>calibration mode |
|---|---|
| IIW Reference Block<br>SDH Ø3 calibration block | DAC on SDH Ø3 mm + transfer correction |

dettaglio
item detail: Preparation: simm. K - Weld Thickness: 15 mm

esito dell'esame
examination result: Acceptable as per specification.

| NDT Operator | QA/QC | Third Party | Client |
|---|---|---|---|
| Name: Mr. Michele Pellis 2nd and 3rd level UNI EN ISO 9712 | Name: | Name: | Name: |
| Signature: | Signature: | Signature: | Signature: |
| Place/Date: Trieste, 28.10.2024 | Date: | Date: | Date: |

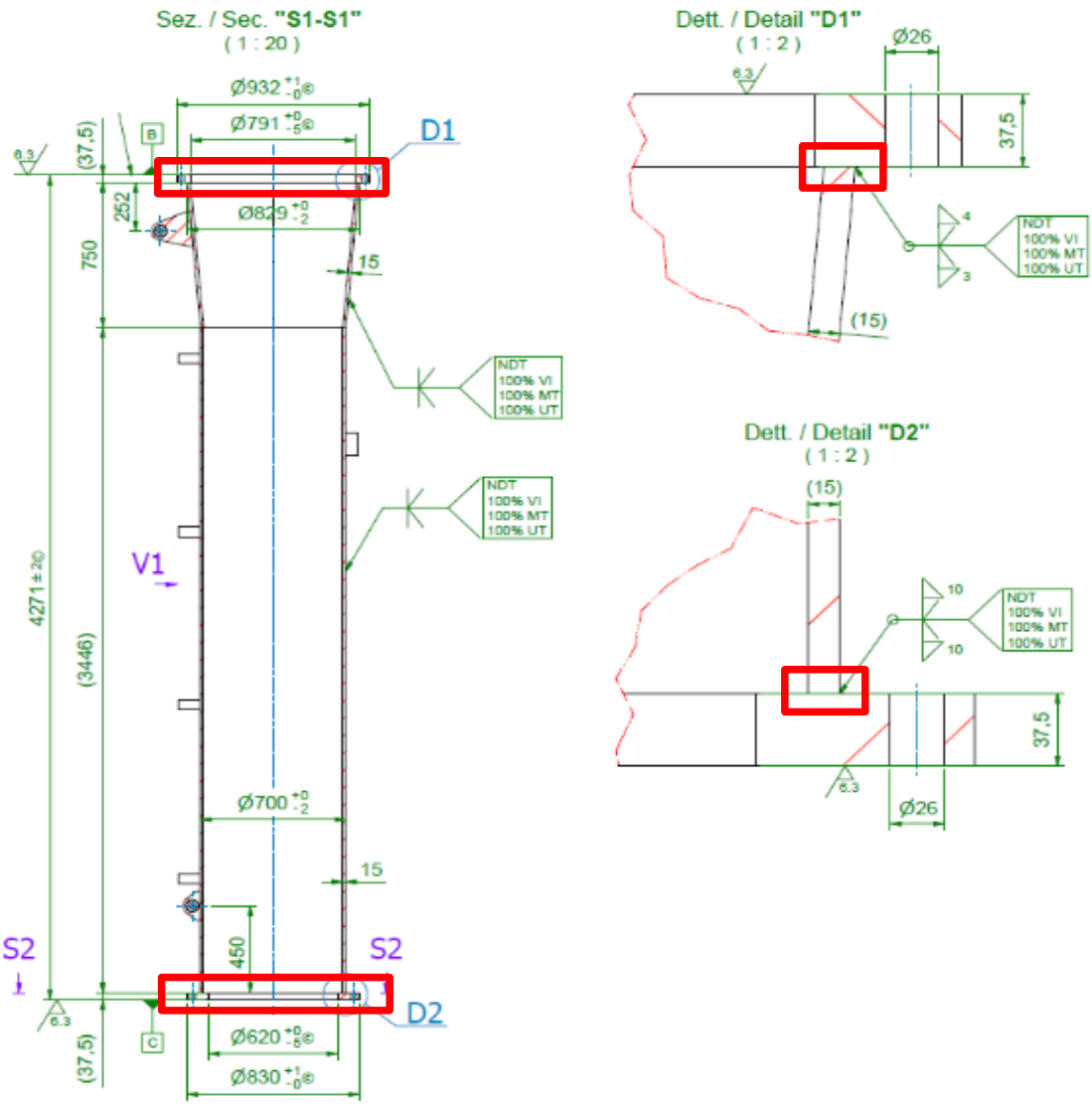
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# RAPPORTO ESAMI ULTRASUONI
ULTRASONIC EXAMINATION REPORT

**UT nr. 379 /24**



esito dell'esame
examination result




| NDT Operator | QA/QC | Third Party | Client |
|---|---|---|---|
| Name: Mr. Michele Pellis 2nd and 3rd level UNI EN ISO 9712 | Name: | Name: | Name: |
| Signature: | Signature: | Signature: | Signature: |
| Place/Date: Trieste, 28.10.2024 | Date: | Date: | Date: |

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# RAPPORTO ESAMI ULTRASUONI

ULTRASONIC EXAMINATION REPORT

**UT nr. 380 /24** 

cliente / customer: REMAZEL S.p.A.

commessa / project: 24-27012

materiale esaminato / examined material: Fixed Column Carpentry
plates thk. ≥ 20 mm

riferimenti / reference: **Dwg. C09-0001-P0002 rev. E**

particolare / item: 100% surface where accessible

procedura d'esame / examination procedure: UNI EN ISO 10160
1724001010-NDT-PRO-00006

limiti di accettazione / acceptance criteria: planar discontinuities research

stato superficiale / surface condition: ☐ saldato / welded ☐ molato / ground ☑ lav. di macchina / machined ☐ forgiato / forged

temperatura / test temperature: 0-10 °C

accoppiante / coupling medium: tjlosa

☐ verniciato / painted ☐ fuso / casting ☐ sabbiato / sandblasted

apparecchiatura / equipment:

☐ Olympus 38 DL Plus ID 120486408
☐ Panametrics 36 DLP ID 992126711
☐ Panametrics Epoch III ID 01457206
☐ Panametrics Epoch IV ID 081590305
☐ Olympus OMNI-MX2 ID 102691-2681
☐ Olympus Epoch 600 ID 120459312
☐ Olympus Epoch 600 ID 120240601
☑ Olympus Epoch 600 ID 130530605

| sonda / transducer | dimensioni / probe size | angolo / angle | frequenza / frequency | dB riferimento / primary ref. | correz. di trasferimento / transfer correction | dB scansione / scanning | dB totali / total dB |
|---|---|---|---|---|---|---|---|
| Krautkramer MB4S-N *sn: 53465* | Ø10 mm | 0° | 4 MHz | 50,8 | <2 | | 50,8 |
| IMG D8-5B *sn: 2389* | Ø10 mm | 0° | 4 MHz | 43,7 | <2 | | 43,7 |
| | | | | | | | |
| | | | | | | | |

blocchi di taratura / reference blocks: IIW Reference Block

metodo di taratura / calibration mode: -

dettaglio / item detail: nom thk 37,5 mm (see page 002 for details)

esito dell'esame / examination result:

Acceptable as per specification.

| NDT Operator | QA/QC | Third Party | Client |
|---|---|---|---|
| Name: Mr. Michele Pellis 2nd and 3rd level UNI EN ISO 9712 | Name: | Name: | Name: |
| Signature: | Signature: | Signature: | Signature: |
| Place/Date: Trieste, 28.10.2024 | Date: | Date: | Date: |

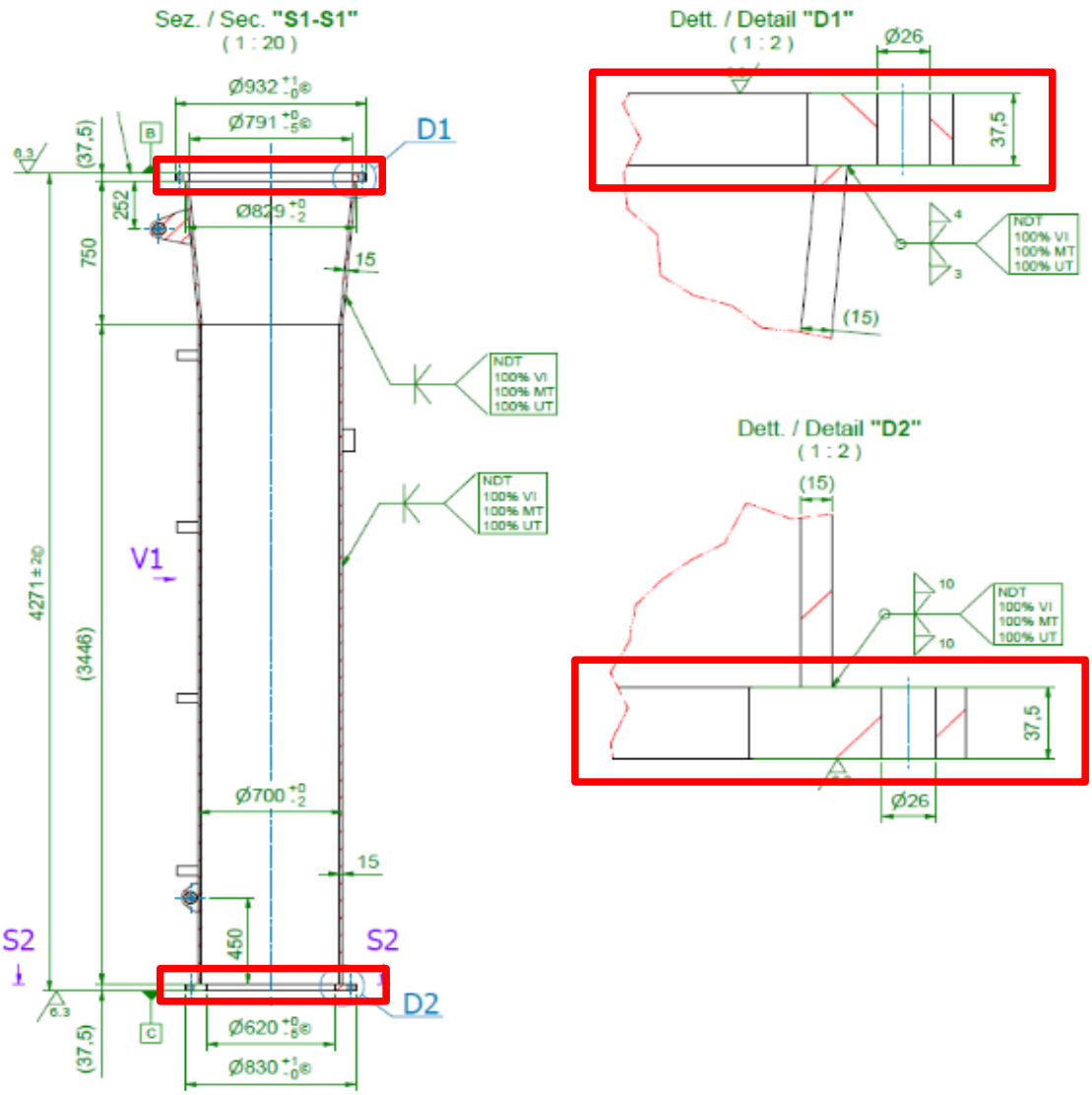
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# RAPPORTO ESAMI ULTRASUONI
ULTRASONIC EXAMINATION REPORT

**UT nr. 380 /24**



esito dell'esame
examination result




| NDT Operator | QA/QC | Third Party | Client |
|---|---|---|---|
| Name: Mr. Michele Pellis 2nd and 3rd level UNI EN ISO 9712 | Name: | Name: | Name: |
| Signature: | Signature: | Signature: | Signature: |
| Place/Date: Trieste, 28.10.2024 | Date: | Date: | Date: |

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# RAPPORTO ESAME VISIVO
VISUAL EXAMINATION REPORT

**VT nr. 272 /24** pag. 001 di 001 sheet of

| | | | |
|---|---|---|---|
| cliente / customer | REMAZEL S.p.A. | commessa / project | --- |
| materiale esaminato / examined material | Pedestral Carpentry | | |
| riferimenti / reference | **Dwg. C09-0001-P0001 rev. D** | particolare / item | 100% Welds |

| | | | | |
|---|---|---|---|---|
| procedura d'esame / examination procedure | UNI EN ISO 17637<br>1724001010-NDT-PRO-00006 | limiti di accettazione / acceptance criteria | UNI EN ISO 5817 Class C<br>1724001010-NDT-PRO-00006 | |
| stato superficiale / surface condition | ☑ saldato / welded | ☐ molato / ground | ☐ lav. di macchina / machined | ☐ forgiato / forged |
| | ☐ fuso / casting | ☐ sabbiato / sandblasted | ☐ verniciato / painted | ☐ finito / finished |

| | | | | |
|---|---|---|---|---|
| metodo d'esame / testing method | ☑ esame visivo diretto / direct testing | ☐ esame visivo remoto / remote testing | | |
| distanza visiva: 30 cm / visual distance | angolo: 30° / visual angle | illuminazione / light | ☐ 500 lux | ☑ 1000 lux |

| | | | | |
|---|---|---|---|---|
| apparecchiature / equipments | ☑ calibro per saldature / welding gauge | ☐ calibro ventesimale / gauge | ☐ metro / rule | ☐ livella / level |
| | ☐ lente / lens | ☐ specchio / mirror | ☐ endoscopio / endoscope | ☐ boroscopio / borescope |

| | | | | |
|---|---|---|---|---|
| esito dell'esame / examination result | ☐ cricca / crack 100 | ☐ cricca da cratere / crater crack 104 | ☐ porosità, soffiature / porosity 2011-2012-2014-2017 | ☐ porosità (nido) / clustered porosity 2013 |
| ☐ cavità allungate (tarli) / elongated cavity 2015-2016-2018 | ☐ inclusioni solide / solid inclusions 300 | ☐ inclusioni di rame / copper inclusions 3042 | ☐ inclusioni di tungsteno / tungsten inclusions 3041 | ☐ mancanza di penetrazione / lack of penetration 402 |
| ☐ mancanza di fusione / lack of fusion 401 | ☐ ripresa carente / lack of recovery 517 | ☐ allineamento non corretto / incorrect root gap 617 | ☐ incisione marginale / undercut 5011-5012 | ☐ sovrametallo eccessivo / excess weld metal 502 |
| ☐ convessità eccessiva / excessive convexity 503 | ☐ altezza di gola maggiore / excess. throat thickness 5214 | ☐ altezza di gola minore / insuff. throat thickness 5213 | ☐ eccesso di penetrazione / excess penetration 504 | ☐ sgocciolamento locale / local drip 5041 |
| ☐ slivellamento / linear misalignment 507 | ☐ riempimento incompleto / incompletely filled groove 511 | ☐ avvallamento / sagging 509 | ☐ asimmetria eccessiva / excessive asymmetry 512 | ☐ insellamento al vertice / root concavity 515 |
| ☐ incisione al vertice / shrinkage groove 5013 | ☐ traboccamento / overlap 506 | ☐ colpo d'arco / stray arc 601 | ☐ spruzzo / spatter 602 | ☐ difetti in sez. trasversale / cross-section imperfections - |

SATISFACTORY

note / remarks

| NDT Operator | QA/QC | Third Party | Client |
|---|---|---|---|
| Name: Mr. Michele Pellis 2nd and 3rd level UNI EN ISO 9712<br>Signature:<br>Place/Date: Trieste, 14.10.2024 | Name:<br>Signature:<br>Date: | Name:<br>Signature:<br>Date: | Name:<br>Signature:<br>Date: |

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# RAPPORTO ESAME MAGNETOSCOPICO

MAGNETIC PARTICLE EXAMINATION REPORT

**MT nr. 379 /24**



| | | | |
|---|---|---|---|
| cliente / customer | REMAZEL S.p.A. | commessa / project | --- |
| materiale esaminato / examined material | Pedestral Carpentry | | |
| riferimenti / reference | **Dwg. C09-0001-P0001 rev. D** | particolare / item | 100% Welds |

| | | | | | |
|---|---|---|---|---|---|
| procedura d'esame / examination procedure | UNI EN ISO 17638<br>1724001010-NDT-PRO-00006 | limiti di accettazione / acceptance criteria | EN ISO 23278 - Lev.2<br>1724001010-NDT-PRO-00006 | | |
| stato superficiale / surface condition | ☑ saldato / welded | ☐ molato / ground | ☐ lav. di macchina / machined | ☐ forgiato / forged | |
| temperatura: 15-20 °C / test temperature | | ☐ fuso / casting | ☐ sabbiato / sandblasted | ☐ verniciato / painted | |

| | | | |
|---|---|---|---|
| mezzo di rivelazione / detection medium | ☐ a secco / dry | ☑ a umido / wet | black magnetic powder suspension ELITE BW2 |
| metodo di rivelazione / detection method | ☑ contrasto di colore / colour contrast | ☐ luce di Wood / Wood light | contrast laquer ELITE WBL5 |

| | | | | | |
|---|---|---|---|---|---|
| tipo di corrente / current type | ☑ alternata / A.C. | ☐ continua / D.C. | ☐ raddrizzata / rectified | ☐ magnete permanente / permanent magnet | |
| tipo di magnetizzazione / type of magnetization | ☐ longitudinale / longitudinal | ☑ giogo / yoke | ☐ bobina / coil | | |
| | ☐ circolare / circular | ☐ puntali / prods | ☐ conduttore centrale / central conductor | ☐ di testa / head shot | |
| metodo / method | ☑ continuo / continuous | ☐ residuo / residuos | ☐ smagnetizzazione SI / smagnetization yes | ☑ smagnetizzazione NO / smagnetization no | |
| attrezzatura: / equipment | Parker B300S | | nr. matricola: / serial number | 26166 | |
| distanza : 135 mm. / distance | intensità corrente: A / current intensity | spire: / turns | ampere-spire: / ampere-turns | | |

esito dell'esame / examination result

Acceptable as per specification.

note / remarks

| NDT Operator | QA/QC | Third Party | Client |
|---|---|---|---|
| Name: Mr. Michele Pellis 2nd and 3rd level UNI EN ISO 9712 | Name: | Name: | Name: |
| Signature: | Signature: | Signature: | Signature: |
| Place/Date: Trieste, 14.10.2024 | Date: | Date: | Date: |

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# RAPPORTO ESAMI ULTRASUONI
ULTRASONIC EXAMINATION REPORT

**UT nr. 368 /24** 

cliente / customer: REMAZEL S.p.A.

commessa / project:

materiale esaminato / examined material: Pedestral Carpentry plates thk. ≥ 20 mm

riferimenti / reference: **dwg. C09-0001-P0001 rev. D**

particolare / item: 100% surface where accessible (pos. 1, 2)

procedura d'esame / examination procedure: UNI EN ISO 10160 1724001010-NDT-PRO-00006

limiti di accettazione / acceptance criteria: planar discontinuities research

stato superficiale / surface condition: ☐ saldato / welded ☐ molato / ground ☑ lav. di macchina / machined ☐ forgiato / forged

temperatura / test temperature: 0-10 °C

accoppiante / coupling medium: tjlosa

☐ verniciato / painted ☐ fuso / casting ☐ sabbiato / sandblasted

apparecchiatura / equipment:

☐ Olympus 38 DL Plus ID 120486408 ☐ Panametrics 36 DLP ID 992126711 ☐ Panametrics Epoch III ID 01457206 ☐ Panametrics Epoch IV ID 081590305

☐ Olympus OMNI-MX2 ID 102691-2681 ☐ Olympus Epoch 600 ID 120459312 ☐ Olympus Epoch 600 ID 120240601 ☑ Olympus Epoch 600 ID 130530605

| sonda / transducer | dimensioni / probe size | angolo / angle | frequenza / frequency | dB riferimento / primary ref. | correz. di trasferimento / transfer correction | dB scansione / scanning | dB totali / total dB |
|---|---|---|---|---|---|---|---|
| Krautkramer MB4S-N *sn: 53465* | Ø10 mm | 0° | 4 MHz | 50,8 | <2 | | 50,8 |
| IMG D8-5B *sn: 2389* | Ø10 mm | 0° | 4 MHz | 43,7 | <2 | | 43,7 |
| | | | | | | | |
| | | | | | | | |

blocchi di taratura / reference blocks: IIW Reference Block

metodo di taratura / calibration mode: -

dettaglio / item detail: ---

esito dell'esame / examination result:

Acceptable as per specification.

| NDT Operator | QA/QC | Third Party | Client |
|---|---|---|---|
| Name: Mr. Michele Pellis 2nd and 3rd level UNI EN ISO 9712 | Name: | Name: | Name: |
| Signature: | Signature: | Signature: | Signature: |
| Place/Date: Trieste, 14.10.2024 | Date: | Date: | Date: |

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# RAPPORTO ESAMI ULTRASUONI
ULTRASONIC EXAMINATION REPORT

**UT nr. 371 /24** 

cliente / customer: REMAZEL S.p.A.
commessa / project: ---

materiale esaminato / examined material: Pedestral Carpentry

riferimenti / reference: **Dwg. C09-0001-P0001 rev. D**
particolare / item: 100% BW where practicable *(as indicated in dwg)*

procedura d'esame / examination procedure: UNI EN ISO 17640 — 1724001010-NDT-PRO-00006
limiti di accettazione / acceptance criteria: UNI EN ISO 11666 Liv.2 — 1724001010-NDT-PRO-00006

stato superficiale / surface condition: ☑ saldato / welded ☐ molato / grounded ☐ lav. di macchina / machined ☐ forgiato / forged
temperatura / test temperature: 10-15 °C
accoppiante / coupling medium: tjlosa
☐ verniciato / painted ☐ fuso / casting ☐ sabbiato / sandblasted

apparecchiatura / equipment:
☐ Olympus 38 DL Plus ID 120486408
☐ Panametrics 36 DLP ID 992126711
☐ Panametrics Epoch III ID 01457206
☐ Panametrics Epoch IV ID 081590305
☐ Olympus OMNI-MX2 ID 102691-2681
☑ Olympus Epoch 600 ID 120459312
☐ Olympus Epoch 600 ID 120240601
☐ Olympus Epoch 600 ID 130530605

| sonda / transducer | dimensioni / probe size | angolo / angle | frequenza / frequency | dB riferimento / primary ref. | correz. di trasferimento / transfer correction | dB scansione / scanning | dB totali / total dB |
|---|---|---|---|---|---|---|---|
| Krautkramer MB4S-N *sn: 53465* | Ø10 mm | 0° | 4 MHz | 50,8 | <2 | +6 | 56,8 |
| Krautkramer MWB60-N4 *sn: 53476* | 8x9 mm | 60° | 4 MHz | 46,9 | <2 | +6 | 52,9 |
| Krautkramer MWB70-4 *sn: 56929-31760* | 8x9 mm | 70° | 4 MHz | 47,6 | <2 | +6 | 53,6 |
| | | | | | | | |

blocchi di taratura / reference blocks: IIW Reference Block; SDH Ø3 calibration block

metodo di taratura / calibration mode: DAC on SDH Ø3 mm + transfer correction

dettaglio / item detail: Preparation: simm. K - Weld Thickness: 20 mm

esito dell'esame / examination result: Acceptable as per specification.

| NDT Operator | QA/QC | Third Party | Client |
|---|---|---|---|
| Name: Mr. Michele Pellis 2nd and 3rd level UNI EN ISO 9712 | Name: | Name: | Name: |
| Signature: | Signature: | Signature: | Signature: |
| Place/Date: Trieste, 14.10.2024 | Date: | Date: | Date: |

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E-mail: galptech@galptech.com - www.galperti.com

# HARDNESS TEST CERTIFICATE

| | |
|---|---|
| ***Certificate No.:*** | 240413-001 h001 |
| ***Revision No.:*** | 0 |
| ***Date :*** | 14/11/2024 |

## *Main Information*

| | |
|---|---|
| **Client Name:** | REMAZEL ENGINEERING SPA |
| **Client P.O.:** | 24004009 |
| **Supplier Ref.:** | 240413 Pos. 001 |
| **Customer Job:** | 24-27012 |
| **Drawing No.:** | V41-0979-013-COMM Rev.1 |

## *Procedure*

| | |
|---|---|
| **Examination Procedure:** | HT 002 Rev.1 |
| **Applicable Specification:** | \ |
| **Acceptance Criteria:** | V41-0979-013-COMM Rev.1 |
| **Customer Specification:** | 24-27012_ITP-001 |

## *Examination Material*

| | | | | | |
|---|---|---|---|---|---|
| **GTFP Ref.:** | 0003 | **Dimensions:** | 979x809x70 | **Quantity:** | 1 pc |
| **GTFP Ref.:** | 0006 | **Dimensions:** | 811x684x63 | **Quantity:** | 1 pc |
| **Product Form:** | Inner and outer rings | | **Material Type:** | 42CrMo4 Q+T | |
| **Area of Test:** | Gear induction hardened area | | **Surface Condition:** | Final machining | |

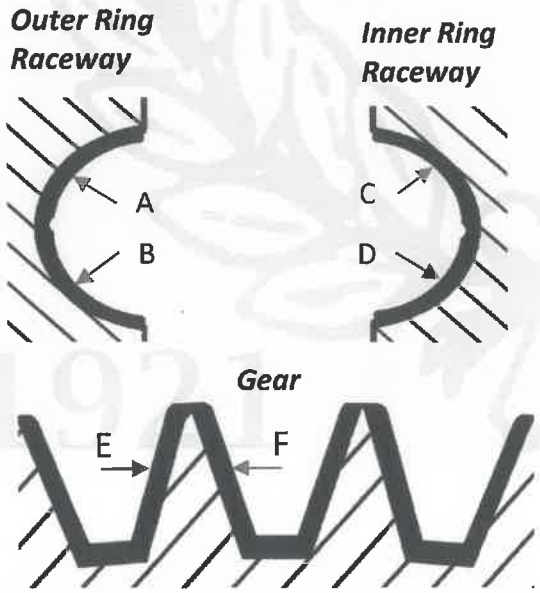
## *Equipment Details / Technique*

| | | | |
|---|---|---|---|
| **Instrument Type:** | Portable Hardness Instrument | **Instrument SN:** | E301-002-0028 |
| **Instrument Manufacturer:** | Equotip | | |

## *Items Description / Result*

**Items:** **240413-001 (1 pc) 4-Points Contact Ball Bearing V41-0979-013-COMM Rev.1**

**Sketch (Area to be inspected):**




**Results:**

| PCS SN | Req. Hardness (HRC) | Detected values (HRC) | Location: |
|---|---|---|---|
| 24/03784 | 58 +3/0 | OK | A - B |
| | 58 +3/0 | OK | C - D |
| | 55 ±5 | OK | E - F |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**Result:** Material found 100% in compliance with relevant specifications/drawings

## *Operator / Inspection*

| | |
|---|---|
| **Tested by:** | Acquistapace Thomas |
| **Level:** | - |
| **Date:** | 14/11/2024 |
| **Verified By:** | Panzeri Luca |
| **Date:** | 14/11/2024 |

21-11-2024
FRANCO CORBELLINI
QBQ
CROSSWIND
External Inspector:
REMAZEL
C. Zber
W R

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# HARDNESS DEPTH TEST CERTIFICATE

| | |
|---|---|
| ***Certificate No.:*** | 240413-001 hd001 |
| ***Revision No.:*** | 0 |
| ***Date :*** | 14/11/2024 |

## *Main Information*

| | |
|---|---|
| **Client Name:** | REMAZEL ENGINEERING SPA |
| **Client P.O.:** | 24004009 |
| **Supplier Ref.:** | 240413 Pos. 001 |
| **Customer Job:** | 24-27012 |
| **Drawing No.:** | V41-0979-013-COMM Rev.1 |

## *Procedure*

| | |
|---|---|
| **Examination Procedure:** | HT 001 Rev.0 |
| **Applicable Specification:** | \ |
| **Acceptance Criteria:** | V41-0979-013-COMM Rev.1 |
| **Customer Specification:** | 24-27012_ITP-001 |

## *Examination Material*

| | | | | | |
|---|---|---|---|---|---|
| **GTFP Ref.:** | 0003 | **Dimensions:** | 979x809x70 | **Quantity:** | 1 pc |
| **GTFP Ref.:** | 0006 | **Dimensions:** | 811x684x63 | **Quantity:** | 1 pc |
| **Product Form:** | Inner and outer rings | | **Material Type:** | 42CrMo4 Q+T | |
| **Area of Test:** | Gear induction hardened area | | **Surface Condition:** | Final machining | |

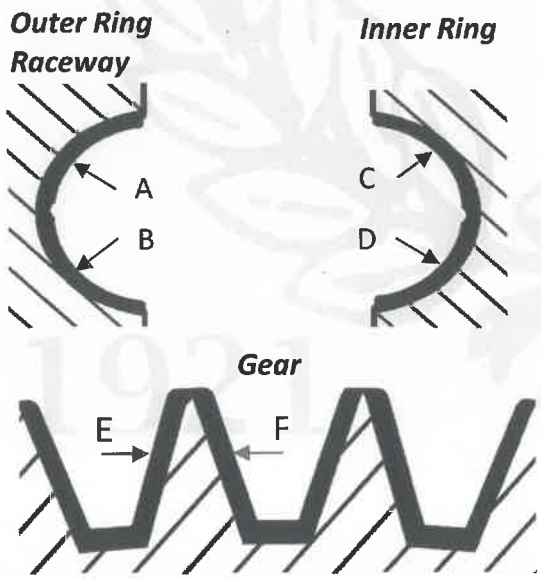
## *Equipment Details / Technique*

| | | | |
|---|---|---|---|
| **Instrument Type:** | Ultrasonic Instrument | **Instrument SN:** | P3121-01143 |
| **Instrument Manufacturer:** | Q-Net | | |

## *Items Description / Result*

**Items:** **240413-001 (1 pc) 4-Points Contact Ball Bearing V41-0979-013-COMM Rev.1**

**Sketch (Area to be inspected):**




**Results:**

| PCS SN | Req. Hardness Depth (mm) | Detected values (mm) | Location: |
|---|---|---|---|
| 24/03784 | 5 Min. | OK | A - B |
| | 5 Min. | OK | C - D |
| | 1.5 Min. | OK | E - F |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**Result:** Material found 100% in compliance with relevant specifications/drawings

## *Operator / Inspection*

| | |
|---|---|
| **Tested by:** | Acquistapace Thomas |
| **Level:** | - |
| **Date:** | 14/11/2024 |
| **Verified By:** | Panzeri Luca |
| **Date:** | 14/11/2024 |

21-11-2024
FRANCO CORBELLINI
QBQ
CROSSWIND

External Inspector:

REMAZEL
C. Ziber
W R

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# MAGNETIC PARTICLE EXAMINATION REPORT

| | |
|---|---|
| ***Certificate No.:*** | 240413-001 mt001 |
| ***Revision No.:*** | 0 |
| ***Date :*** | 14/11/2024 |

## *Main Information*

| | |
|---|---|
| **Client Name:** | REMAZEL ENGINEERING SPA |
| **Client P.O.:** | 24004009 |
| **Supplier Ref.:** | 240413 Pos. 001 |
| **Customer Job:** | 24-27012 |
| **Drawing No.:** | V41-0979-013-COMM Rev.1 |

## *Procedure*

| | |
|---|---|
| **Examination Procedure:** | MT1-3-22 Rev.0 |
| **Applicable Specification:** | UNI EN 10228-1 |
| **Acceptance Criteria:** | UNI EN 10228-1 Quality Class 3 |
| **Customer Specification:** | 24-27012_ITP-001 |

## *Examination Material*

| | | | | | |
|---|---|---|---|---|---|
| **GTFP Ref.:** | 0003 | **Dimensions:** | 979x809x70 | **Quantity:** | 1 pc |
| **GTFP Ref.:** | 0006 | **Dimensions:** | 811x684x63 | **Quantity:** | 1 pc |

| | | | |
|---|---|---|---|
| **Product Form:** | Inner and outer rings | **Material Type:** | 42CrMo4 Q+T |
| **Area of Test:** | 100% of the piece | **Surface Condition:** | Final machining |

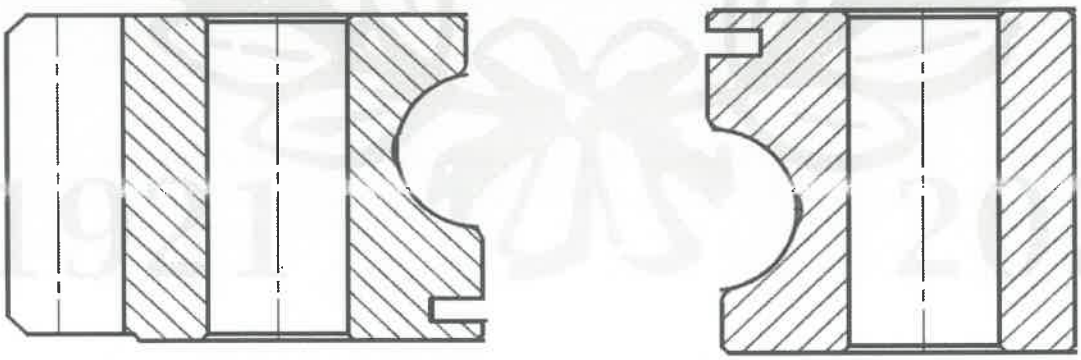
## *Equipment Details / Technique*

| | | | |
|---|---|---|---|
| **Magnetic Particles:** | CGM LK31-73S | **Type:** | Fluorescent Method |
| **Powder solution in:** | Kerosenoil | **Ambient light:** | <20 Lux |
| **Type method:** | Yoke | **Serial No.:** | 1400150 |
| **Magnetizing current:** | 90 - 110 A/inch | **Current type:** | AC |
| **Demagnatization:** | Not necessary | **Surface cleaning after test:** | Cleaned and degreased with Vel-Net (CGM) |
| **Lifting Force:** | 4,5 Kg | **Surface light intensity:** | Light intensity >10 W/m2 at a distance of 15 inch. from the lamp. |

## *Items Description / Result*

**Items:** **240413-001 (1 pc) 4-Points Contact Ball Bearing V41-0979-013-COMM Rev.1**

**Sketch (area to be inspected):**



**Result:** Material found 100% in compliance with relevant specifications

## *Operator / Inspection*

| | |
|---|---|
| **Tested by:** | Tengattini Simone |
| **Level:** | UNI EN ISO 9712 lvl 2 |
| **Date:** | 14/11/2024 |
| **Verified By:** | Acquistapace Thomas |
| **Date:** | 14/11/2024 |

21-11-2024
FRANCO CORBELLINI
QBQ
CROSSWIND
External Inspector:

REMAZEL Engineering

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E-mail: galptech@galptech.com - www.galperti.com

# ULTRASONIC EXAMINATION REPORT

| | |
|---|---|
| ***Certificate No.:*** | 240413-001 us001 |
| ***Revision No.:*** | 0 |
| ***Date :*** | 28/10/2024 |

## *Main Information*

| | |
|---|---|
| **Client Name:** | REMAZEL ENGINEERING SPA |
| **Client P.O.:** | 24004009 |
| **Supplier Ref.:** | 240413 Pos. 001 |
| **Customer Job:** | 24-27012 |
| **Drawing No.:** | V41-0979-013-COMM Rev.1 |

## *Procedure*

| | |
|---|---|
| **Examination Procedure:** | UT1-3-02 Rev.1 |
| **Applicable Specification:** | UNI EN 10228-3 |
| **Acceptance Criteria:** | UNI EN 10228-3 Quality Class 2 |
| **Customer Specification:** | 24-27012_ITP-001 |

## *Examination Material*

| | | | | | |
|---|---|---|---|---|---|
| **GTFP Ref.:** | 0003 | **Dimensions:** | 979x809x70 | **Quantity:** | 1 pc |
| **GTFP Ref.:** | 0006 | **Dimensions:** | 811x684x63 | **Quantity:** | 1 pc |

| | | | |
|---|---|---|---|
| **Product Form:** | Forged Rings | **Material Type:** | 42CrMo4 Q+T |
| **Area of Test:** | 100 % of all accessible surface | **Surface Condition:** | Pre-Machined Conditions (<12.5 Ra) |

## *Equipment Details/Tecnique*

| | | | |
|---|---|---|---|
| **Type of Apparatus:** | Epoc4 Plus - SN 81573801 | **Made by:** | Olympus |
| **Couplant:** | GEL | **Examination Tecnique:** | Contact Examination |
| **Scanning Method:** | Manual | **Scanning Overlap:** | 15% Min. |
| **Cable Type:** | LEMO | **Cable Length:** | 150cm |

| Trasducers Name | Type | Serial Number | Frequency | Dimension | Position |
|---|---|---|---|---|---|
| B2S (GE) | Straight beam | SN 57745 - 57441 | 2 Mhz (±0,1) | 24 mm | P1-P2 |
| SEB 4 (GE) | Dual Element beam | SN 57469 - 53211 | 4 Mhz (±0,1) | 6 x 20 mm | P1 |
| WB 45-4 (GE) | Angle beam | SN 56927 - 17872 | 4 Mhz (±0,1) | 8 x 9 mm | P2 |

## *Calibration Data*

| | | | |
|---|---|---|---|
| **Calibration Block Type:** | V1 | **Curve Construction Method:** | DGS Method |
| **Sizing of Indications:** | -6db | | |

## *Items Description / Result*

**Items:** **Forged Rings for V41-0979-013-COMM Rev.1**

**Scan Plan:**




**Result:** Material found 100% in compliance with relevant specifications

## *Operator / Inspection*

| | |
|---|---|
| **Tested by:** | Tengattini Simone |
| **Level:** | UNI EN ISO 9712 lvl 2 |
| **Date:** | 28/10/2024 |
| **Verified By:** | Acquistapace Thomas |
| **Date:** | 28/10/2024 |

21-11-2024
FRANCO CORBELLINI
QBQ
CROSSWIND

*External Inspector:*

REMAZEL
Caliber
DW DR

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E-mail: galptech@galptech.com - www.galperti.com

# DIMENSIONAL CERTIFICATE

| | |
|---|---|
| ***Certificate No.:*** | 240413-001 d001 |
| ***Revision No.:*** | 0 |
| ***Date :*** | 15/11/2024 |

## *Main Information*

| | |
|---|---|
| **Client Name:** | REMAZEL ENGINEERING SPA |
| **Client P.O.:** | 24004009 |
| **Supplier Ref.:** | 240413 Pos. 001 |
| **Customer Job:** | 24-27012 |
| **Drawing No.:** | V41-0979-013-COMM Rev.1 |

## *Procedure*

| | |
|---|---|
| **Examination Procedure:** | \ |
| **Applicable Specification:** | UNI EN 22768-1 |
| **Acceptance Criteria:** | V41-0979-013-COMM Rev.1 |
| **Customer Specification:** | 24-27012_ITP-001 |

## *Examination Material*

| | | | |
|---|---|---|---|
| **Item ID:** | 24/03784 | **Quantity:** | 1 pc |
| **Product Form:** | 4-Points Contact Ball Bearing | **Material Type:** | 42CrMo4 Q+T |
| **Area of Test:** | 100% of the piece | **Surface Condition:** | Final machining |

## *Equipment Details / Technique*

| | | | | | |
|---|---|---|---|---|---|
| **Instrument Type:** | Digital Balls Calliper | **Instrument SN:** | 80297/01 | **Instrument Manufacturer:** | Bocchi |
| **Instrument Type:** | Digital Calliper | **Instrument SN:** | 0036579 | **Instrument Manufacturer:** | Mitutoyo |

## *Items Description / Result*

**Items:** **240413-001 (1 pc) 4-Points Contact Ball Bearing V41-0979-013-COMM Rev.1**

| Item | Description | Required | Toll. | 24/03784 | | | |
|---|---|---|---|---|---|---|---|
| 01 | Base Tangent Length Over 13 Teeth | 389,542<br>389,354 | Max.<br>Min. | OK | | | |
| 02 | Total Thickness | 79 | ±1 | OK | | | |
| 03 | Inner Ring Thickness | 63 | ±0.5 | OK | | | |
| 04 | Outer Ring Thickness | 70 | ±0.5 | OK | | | |
| 05 | Inner Diameter | Ø 684 | ±1 | OK | | | |
| 06 | Tip Diameter | Ø 979 | 0/-1 | OK | | | |
| 07 | Holes Number Inner Ring | No. 32 | \ | OK | | | |
| 08 | Holes Number Outer Ring | No. 32 | \ | OK | | | |
| 09 | Holes Diameter Inner Ring | Ø 26 | ±0,2 | OK | | | |
| 10 | Holes Diameter Outer Ring | Ø 26 | ±0,2 | OK | | | |
| 11 | Pitch Circle Holes Inner Ring | Ø 736 | ±0,6 | OK | | | |
| 12 | Pitch Circle Holes Outer Ring | Ø 884 | ±0,6 | OK | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Note:** • All values where not specified are expressed in mm

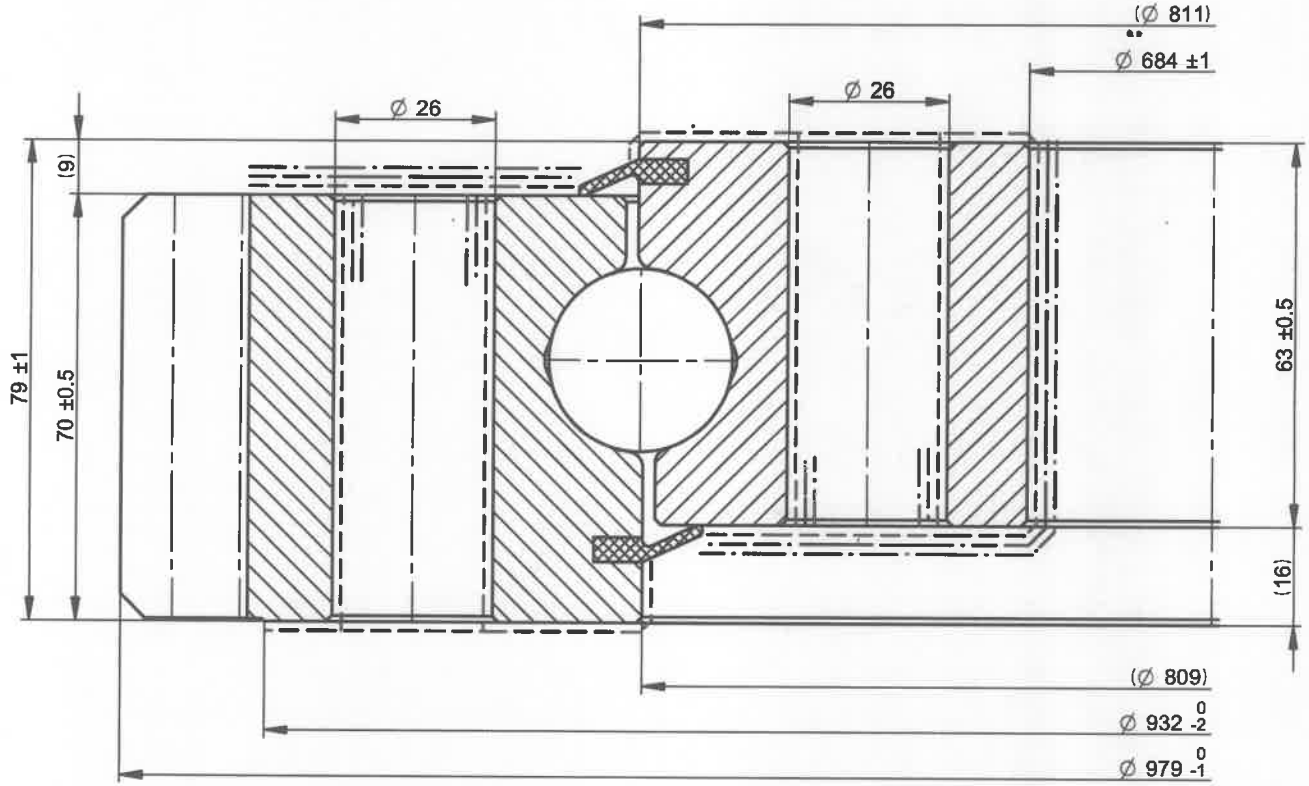
**Result:** Material found 100% in compliance with relevant specifications/drawings

## *Operator / Inspection*

| | |
|---|---|
| **Tested by:** | Tengattini Simone |
| **Level:** | - |
| **Date:** | 15/11/2024 |
| **Verified By:** | Acquistapace Thomas |
| **Date:** | 15/11/2024 |

21-11-2024
FRANCO CORBELLINI
OBJ
CROSSWIND
External Inspector:

REMAZEL Elber W R




Base coat: Zinc Rich Epoxy Primer

Second Coat: Epoxy coat sealer

Top Coat: Polyurethane
agate grey RAL 7038

Painting according to procedure P04 001

Note: dimensions and tolerances before painting

| Ref | Description | Date | Drawn | Approved |
|---|---|---|---|---|
| 1 | Modified paint in holes area | 27/09/24 | S.F. | C.C. |

REVISIONS

For bearing general assembly see drawing:
V41-0979-013-COMM

| Date | Drawn | Checked | Approved |
|---|---|---|---|
| 27/08/24 | S.F. | C.C. | |

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Dimensions without tolerance UNI EN 22768-1-1989

| Class | Allowances: Over 120 up to 400 | Over 400 up to 1000 | Over 1000 up to 2000 |
|---|---|---|---|
| m | ±0.5 | ±0.8 | ±1.2 |

Scale -

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Code: V41 0979 013 21 30 0810

Drawing: SKV-V41-0979-013

Description: 8 Point contact ball bearing

Weight Kg: 165 kg

Sheet A3 — 1 of 1

Sizes in mm

| Revision level | |
|---|---|
| 1 | 6 |
| 2 | 7 |
| 3 | 8 |
| 4 | 9 |
| 5 | 10 |

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# RAPPORTO ESAME VISIVO
VISUAL EXAMINATION REPORT

**VT nr. 273 /24** pag. 001 di 001 sheet of

| | | | |
|---|---|---|---|
| cliente / customer | REMAZEL S.p.A. | commessa / project | --- |
| materiale esaminato / examined material | Travelling Trolley Carpentry | | |
| riferimenti / reference | **Dwg. C09-0001-P0006 rev. C** | particolare / item | 100% Welds |

| | | | | |
|---|---|---|---|---|
| procedura d'esame / examination procedure | UNI EN ISO 17637<br>1724001010-NDT-PRO-00006 | limiti di accettazione / acceptance criteria | UNI EN ISO 5817 Class C<br>1724001010-NDT-PRO-00006 | |
| stato superficiale / surface condition | ☑ saldato / welded | ☐ molato / ground | ☐ lav. di macchina / machined | ☐ forgiato / forged |
| | ☐ fuso / casting | ☐ sabbiato / sandblasted | ☐ verniciato / painted | ☐ finito / finished |

| | | | | |
|---|---|---|---|---|
| metodo d'esame / testing method | ☑ esame visivo diretto / direct testing | ☐ esame visivo remoto / remote testing | | |
| distanza visiva: 30 cm / visual distance | angolo: 30° / visual angle | illuminazione / light | ☐ 500 lux | ☑ 1000 lux |

| | | | | |
|---|---|---|---|---|
| apparecchiature / equipments | ☑ calibro per saldature / welding gauge | ☐ calibro ventesimale / gauge | ☐ metro / rule | ☐ livella / level |
| | ☐ lente / lens | ☐ specchio / mirror | ☐ endoscopio / endoscope | ☐ boroscopio / borescope |

| | | | | |
|---|---|---|---|---|
| esito dell'esame / examination result | ☐ cricca / crack 100 | ☐ cricca da cratere / crater crack 104 | ☐ porosità, soffiature / porosity 2011-2012-2014-2017 | ☐ porosità (nido) / clustered porosity 2013 |
| ☐ cavità allungate (tarli) / elongated cavity 2015-2016-2018 | ☐ inclusioni solide / solid inclusions 300 | ☐ inclusioni di rame / copper inclusions 3042 | ☐ inclusioni di tungsteno / tungsten inclusions 3041 | ☐ mancanza di penetrazione / lack of penetration 402 |
| ☐ mancanza di fusione / lack of fusion 401 | ☐ ripresa carente / lack of recovery 517 | ☐ allineamento non corretto / incorrect root gap 617 | ☐ incisione marginale / undercut 5011-5012 | ☐ sovrametallo eccessivo / excess weld metal 502 |
| ☐ convessità eccessiva / excessive convexity 503 | ☐ altezza di gola maggiore / excess. throat thickness 5214 | ☐ altezza di gola minore / insuff. throat thickness 5213 | ☐ eccesso di penetrazione / excess penetration 504 | ☐ sgocciolamento locale / local drip 5041 |
| ☐ slivellamento / linear misalignment 507 | ☐ riempimento incompleto / incompletely filled groove 511 | ☐ avvallamento / sagging 509 | ☐ asimmetria eccessiva / excessive asymmetry 512 | ☐ insellamento al vertice / root concavity 515 |
| ☐ incisione al vertice / shrinkage groove 5013 | ☐ traboccamento / overlap 506 | ☐ colpo d'arco / stray arc 601 | ☐ spruzzo / spatter 602 | ☐ difetti in sez. trasversale / cross-section imperfections - |

SATISFACTORY

note / remarks

| NDT Operator | QA/QC | Third Party | Client |
|---|---|---|---|
| Name: Mr. Michele Pellis 2nd and 3rd level UNI EN ISO 9712<br>Signature:<br>Place/Date: Trieste, 14.10.2024 | Name:<br>Signature:<br>Date: | Name:<br>Signature:<br>Date: | Name:<br>Signature:<br>Date: |

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# RAPPORTO ESAME MAGNETOSCOPICO

MAGNETIC PARTICLE EXAMINATION REPORT

**MT nr. 380 /24**



| | | | |
|---|---|---|---|
| cliente<br>customer | REMAZEL S.p.A. | commessa<br>project | --- |
| materiale esaminato<br>examined material | Travelling Trolley Carpentry | | |
| riferimenti<br>reference | **Dwg. C09-0001-P0006 rev. C** | particolare<br>item | 100% Welds |

| | | | |
|---|---|---|---|
| procedura d'esame<br>examination procedure | UNI EN ISO 17638<br>1724001010-NDT-PRO-00006 | limiti di accettazione<br>acceptance criteria | EN ISO 23278 - Lev.2<br>1724001010-NDT-PRO-00006 |
| stato superficiale<br>surface condition | ☑ saldato<br>welded | ☐ molato<br>ground | ☐ lav. di macchina<br>machined |
| | | ☐ forgiato<br>forged | |
| temperatura: 15-20 °C<br>test temperature | | ☐ fuso<br>casting | ☐ sabbiato<br>sandblasted |
| | | ☐ verniciato<br>painted | |

| | | | |
|---|---|---|---|
| mezzo di rivelazione<br>detection medium | ☐ a secco<br>dry | ☑ a umido<br>wet | black magnetic powder suspension ELITE BW2 |
| metodo di rivelazione<br>detection method | ☑ contrasto di colore<br>colour contrast | ☐ luce di Wood<br>Wood light | contrast laquer ELITE WBL5 |

| | | | | |
|---|---|---|---|---|
| tipo di corrente<br>current type | ☑ alternata<br>A.C. | ☐ continua<br>D.C. | ☐ raddrizzata<br>rectified | ☐ magnete permanente<br>permanent magnet |
| tipo di magnetizzazione<br>type of magnetization | ☐ longitudinale<br>longitudinal | ☑ giogo<br>yoke | ☐ bobina<br>coil | |
| | ☐ circolare<br>circular | ☐ puntali<br>prods | ☐ conduttore centrale<br>central conductor | ☐ di testa<br>head shot |
| metodo<br>method | ☑ continuo<br>continuous | ☐ residuo<br>residuos | ☐ smagnetizzazione SI<br>smagnetization yes | ☑ smagnetizzazione NO<br>smagnetization no |
| attrezzatura:<br>equipment | Parker B300S | | nr. matricola:<br>serial number | 26166 |
| distanza : 135 mm.<br>distance | intensità corrente: A<br>current intensity | spire:<br>turns | ampere-spire:<br>ampere-turns | |

esito dell'esame
examination result

Acceptable as per specification.

note
remarks

| NDT Operator | QA/QC | Third Party | Client |
|---|---|---|---|
| Name: Mr. Michele Pellis 2nd and 3rd level UNI EN ISO 9712 | Name: | Name: | Name: |
| Signature: | Signature: | Signature: | Signature: |
| Place/Date: Trieste, 14.10.2024 | Date: | Date: | Date: |

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# RAPPORTO ESAMI ULTRASUONI
ULTRASONIC EXAMINATION REPORT

**UT nr. 369 /24** 

cliente / customer: REMAZEL S.p.A.

commessa / project:

materiale esaminato / examined material: Travel Trolley Carpentry
plates thk. ≥ 20 mm

riferimenti / reference: **dwg. C09-0001-P0006 rev. C**

particolare / item: 100% surface where accessible
(pos. 1)

procedura d'esame / examination procedure: UNI EN ISO 10160
1724001010-NDT-PRO-00006

limiti di accettazione / acceptance criteria: planar discontinuities research

stato superficiale / surface condition: ☐ saldato / welded ☐ molato / ground ☑ lav. di macchina / machined ☐ forgiato / forged

temperatura / test temperature: 0-10 °C

accoppiante / coupling medium: tjlosa

☐ verniciato / painted ☐ fuso / casting ☐ sabbiato / sandblasted

apparecchiatura / equipment:

☐ Olympus 38 DL Plus ID 120486408
☐ Panametrics 36 DLP ID 992126711
☐ Panametrics Epoch III ID 01457206
☐ Panametrics Epoch IV ID 081590305
☐ Olympus OMNI-MX2 ID 102691-2681
☐ Olympus Epoch 600 ID 120459312
☐ Olympus Epoch 600 ID 120240601
☑ Olympus Epoch 600 ID 130530605

| sonda / transducer | dimensioni / probe size | angolo / angle | frequenza / frequency | dB riferimento / primary ref. | correz. di trasferimento / transfer correction | dB scansione / scanning | dB totali / total dB |
|---|---|---|---|---|---|---|---|
| Krautkramer MB4S-N *sn: 53465* | Ø10 mm | 0° | 4 MHz | 50,8 | <2 | | 50,8 |
| IMG D8-5B *sn: 2389* | Ø10 mm | 0° | 4 MHz | 43,7 | <2 | | 43,7 |
| | | | | | | | |
| | | | | | | | |

blocchi di taratura / reference blocks: IIW Reference Block

metodo di taratura / calibration mode: -

dettaglio / item detail: ---

esito dell'esame / examination result:

Acceptable as per specification.

| NDT Operator | QA/QC | Third Party | Client |
|---|---|---|---|
| Name: Mr. Michele Pellis 2nd and 3rd level UNI EN ISO 9712 | Name: | Name: | Name: |
| Signature: | Signature: | Signature: | Signature: |
| Place/Date: Trieste, 14.10.2024 | Date: | Date: | Date: |

REMAZEL

Quality System

# RAPPORTO DI CONTROLLO VISIVO

VISUAL TEST REPORT

| Mod. | 154 |
|---|---|
| Rev. | 2.0 |

| N° certificate | 24-27012 - VT 4 | | Date | 14/11/2024 | Sheet | 1/1 |
|---|---|---|---|---|---|---|

## DATI GENERALI general data

| CLIENTE Client | Rosetti Marino | LUOGO Place | Trieste | COMMESSA Job | 24-27012 | |
|---|---|---|---|---|---|---|
| DESCRIZIONE ESAME Test Details | Visual Inspection of welds | | | ORD order | 17240010101 23A90A | Q.TA' Q.ty 1 |
| DOC. DI RIFERIMENTO Reference Documents | 1724001010-NDT-PRO-00006 | | | ACCETTABILITA' Acceptance Criteria | EN ISO 5817 Lev.C | |
| COSTRUTTORE Manufacturer | Remazel | | | ITP | 24-27012_ITP-001 | |

## COMPONENTE ESAMINATO examined part

| NUMERO DI FABBRICA Serial Number | P0085 | COLATA Heat N. | \ | MATERIALE Material | S355J2+N | DIS. Dwg | C09-0001-P0085 |
|---|---|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| ESECUZIONE DEL TEST Test Carried Out | ☐ PRIMA PWHT Before PWHT | ☐ DOPO HT After HT | ☐ PRIMA PROVA IDRAULICA Before Hydraulic Test | ☐ DOPO PROVA IDRAULICA After Hydraulic Test | |
| SUPERFICIE Surface | ☐ LAMINATA As Rolled | ☐ GREZZA Rough | ☐ MOLATA Ground | ☐ SABBIATA Sand Blasted | ☐ LAVORATA DI MACCHINA Machined |
| SOVRAMETALLO SALDATURA Welding Reinforcement | ■ COME SALDATO As Welded | ☐ LAVORATO DI MACCHINA Machined | ■ MOLATO Ground | ■ RACCORDATO Blended | |

## TECNICA Technique

| METODO Method | ■ DIRETTO Direct | ☐ INDIRETTO Indirect | STRUMENTO Instrument | Gauge / Mirror / Endoscope |
|---|---|---|---|---|
| CONDIZIONI DI ILLUMINAMENTO Lighting conditions | ☐ LUCE NERA Black light | ■ LUCE BIANCA Light | ■ NATURALE Natural<br>☐ ARTIFICIALE Artificial | 550 lux |

## INDICAZIONI DA REGISTRARE Indications to be Recorded

| Weld Nr. | WPS | Surface Condition | Dimensional | Indication | Weld Zone | Evaluation | Note |
|---|---|---|---|---|---|---|---|
| ALL | ** | SC2 | OK | NONE | ALL | A | \ |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

*EVALUATION:* A : ACCEPTED / accettato R : REFUSED / rifiutato

*SURFACE CONDITIONS:*
SC1 : SANDBLASTED / sabbiata
SC2 : GRINDED / molato
SC3: BRUSHED / spazzolata

*WELD ZONE:* WJ : WELD JOINT zona saldatura
HAZ : HEAT AFFECTED ZONE zona termicamente alterata

*INDICATION ISO 6520-1:*
100 : CRACKS / cricche
5011 - 5012 : UNDERCUT / incisioni
516 : POROSITY / porosità
401 : INCOMPLETELY LACK FUSION mancanza di fusione
507 :MISALIGNMENT / sfivellamento
5013 :ROOT CONCAVITY / incisione al vertice
504 :EXCESS OF PENETRATION eccesso di penetrazione

## NOTE Remarks

** 1724001010-WEL-PRO-00005

■ RISULTATI CONFORMI AI REQUISITI
Results Conforming to the Specified Requirements

☐ RISULTATI NON CONFORMI AI REQUISITI
Results Not Conforming to the Specified Requirements

| DATA Date | 14/11/2024 | LUOGO Place | Trieste | OPERATORI Operators | Estevan Natale |
|---|---|---|---|---|---|

| II LEVEL | CLIENTE Customer | ENTE DI COLLAUDO Inspecting Authority |
|---|---|---|
| E. Natale<br>2° LIVELLO UNI EN ISO 9712<br>VT-MT | | |

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# RAPPORTO ESAME MAGNETOSCOPICO

MAGNETIC PARTICLE EXAMINATION REPORT

**MT nr. 445 /24** 

| | | | |
|---|---|---|---|
| cliente<br>customer | Remazel SpA | commessa<br>project | C.24-27012 |
| materiale esaminato<br>examined material | Winch Box | | |
| riferimenti<br>reference | Dwg nr. C09-0001-P0085 Rev.B | particolare<br>item | 100% welds |

| | | | | |
|---|---|---|---|---|
| procedura d'esame<br>examination procedure | UNI EN ISO 17638 | limiti di accettazione<br>examination procedure | EN ISO 23278 - Lev.2 | |
| stato superficiale<br>surface condition | ☑ saldato<br>welded | ☐ molato<br>ground | ☐ lav. di macchina<br>machined | ☐ forgiato<br>forged |
| temperatura: 15-20 °C<br>test temperature | | ☐ fuso<br>casting | ☐ sabbiato<br>sandblasted | ☐ verniciato<br>painted |

| | | | |
|---|---|---|---|
| mezzo di rivelazione<br>detection medium | ☐ a secco<br>dry | ☑ a umido<br>wet | black magnetic powder suspension ELITE BW2 |
| metodo di rivelazione<br>detection method | ☑ contrasto di colore<br>colour contrast | ☐ luce di Wood<br>Wood light | contrast laquer ELITE WBL5 |

| | | | | |
|---|---|---|---|---|
| tipo di corrente<br>current type | ☑ alternata<br>A.C. | ☐ continua<br>D.C. | ☐ raddrizzata<br>rectified | ☐ magnete permanente<br>permanent magnet |
| tipo di magnetizzazione<br>type of magnetization | ☐ longitudinale<br>longitudinal | ☑ giogo<br>yoke | ☐ bobina<br>coil | |
| | ☐ circolare<br>circular | ☐ puntali<br>prods | ☐ conduttore centrale<br>central conductor | ☐ di testa<br>head shot |
| metodo<br>method | ☑ continuo<br>continuous | ☐ residuo<br>residuos | ☐ smagnetizzazione SI<br>smagnetization yes | ☑ smagnetizzazione NO<br>smagnetization no |
| attrezzatura:<br>equipment | Parker B300S | | nr. matricola: 26166<br>serial number | |
| distanza : 135 mm.<br>distance | intensità corrente: A<br>current intensity | spire:<br>turns | ampere-spire:<br>ampere-turns | |

esito dell'esame
examination result

Acceptable as per specification.



note
remarks

| NDT Operator | QA/QC | Third Party | Client |
|---|---|---|---|
| Name: **Eric Marini**<br>2nd level SNT-TC-1A<br>2nd level ISO9712 | Name: | Name: | Name: |
| Signature: | Signature: | Signature: | Signature: |
| Place/Date: Trieste, 18/11/2024 | Date: | Date: | Date: |

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# RAPPORTO ESAME MAGNETOSCOPICO

MAGNETIC PARTICLE EXAMINATION REPORT

**MT nr. 443 /24**



| | | | |
|---|---|---|---|
| cliente<br>customer | Remazel SpA | commessa<br>project | C.24-27012 |
| materiale esaminato<br>examined material | Chassis Winch Carpentry | | |
| riferimenti<br>reference | Dwg nr. C09-0001-P0005 | particolare<br>item | 100% welds |

| | | | | |
|---|---|---|---|---|
| procedura d'esame<br>examination procedure | UNI EN ISO 17638 | limiti di accettazione<br>examination procedure | EN ISO 23278 - Lev.2 | |
| stato superficiale<br>surface condition | ☑ saldato<br>welded | ☐ molato<br>ground | ☐ lav. di macchina<br>machined | ☐ forgiato<br>forged |
| temperatura: 15-20 °C<br>test temperature | | ☐ fuso<br>casting | ☐ sabbiato<br>sandblasted | ☐ verniciato<br>painted |

| | | | |
|---|---|---|---|
| mezzo di rivelazione<br>detection medium | ☐ a secco<br>dry | ☑ a umido<br>wet | black magnetic powder suspension ELITE BW2 |
| metodo di rivelazione<br>detection method | ☑ contrasto di colore<br>colour contrast | ☐ luce di Wood<br>Wood light | contrast laquer ELITE WBL5 |

| | | | | |
|---|---|---|---|---|
| tipo di corrente<br>current type | ☑ alternata<br>A.C. | ☐ continua<br>D.C. | ☐ raddrizzata<br>rectified | ☐ magnete permanente<br>permanent magnet |
| tipo di magnetizzazione<br>type of magnetization | ☐ longitudinale<br>longitudinal | ☑ giogo<br>yoke | ☐ bobina<br>coil | |
| | ☐ circolare<br>circular | ☐ puntali<br>prods | ☐ conduttore centrale<br>central conductor | ☐ di testa<br>head shot |
| metodo<br>method | ☑ continuo<br>continuous | ☐ residuo<br>residuos | ☐ smagnetizzazione SI<br>smagnetization yes | ☑ smagnetizzazione NO<br>smagnetization no |
| attrezzatura:<br>equipment | Parker B300S | | nr. matricola: 26166<br>serial number | |
| distanza : 135 mm.<br>distance | intensità corrente: A<br>current intensity | spire:<br>turns | ampere-spire:<br>ampere-turns | |

esito dell'esame
examination result

Acceptable as per specification.



note
remarks

| NDT Operator | QA/QC | Third Party | Client |
|---|---|---|---|
| Name: **Eric Marini**<br>2nd level SNT-TC-1A<br>2nd level ISO9712 | Name: | Name: | Name: |
| Signature: | Signature: | Signature: | Signature: |
| Place/Date: Trieste, 18/11/2024 | Date: | Date: | Date: |

REMAZEL

Quality System

# RAPPORTO DI CONTROLLO VISIVO
VISUAL TEST REPORT

Mod. 154 | Rev. 2.0

| N° certificate | 24-27012 - VT 3 | Date | 14/11/2024 | Sheet | 1/1 |
|---|---|---|---|---|---|

## DATI GENERALI general data

| | | | | | |
|---|---|---|---|---|---|
| CLIENTE Client | Rosetti Marino | LUOGO Place | Trieste | COMMESSA Job | 24-27012 |
| DESCRIZIONE ESAME Test Details | Visual Inspection of welds | | | ORD order | 17240010101 23A90A |
| | | | | Q.TA' Q.ty | 1 |
| DOC. DI RIFERIMENTO Reference Documents | 1724001010-NDT-PRO-00006 | ACCETTABILITA' Acceptance Criteria | EN ISO 5817 Lev.C | | |
| COSTRUTTORE Manufacturer | Remazel | ITP | 24-27012_ITP-001 | | |

## COMPONENTE ESAMINATO examined part

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| NUMERO DI FABBRICA Serial Number | P0005 | COLATA Heat N. | \ | MATERIALE Material | S355J2+N | DIS. Dwg | C09-0001-P0005 |

| | | | | |
|---|---|---|---|---|
| ESECUZIONE DEL TEST Test Carried Out | ☐ PRIMA PWHT Before PWHT | ☐ DOPO HT After HT | ☐ PRIMA PROVA IDRAULICA Before Hydraulic Test | ☐ DOPO PROVA IDRAULICA After Hydraulic Test |
| SUPERFICIE Surface | ☐ LAMINATA As Rolled | ☐ GREZZA Rough | ☐ MOLATA Ground | ☐ SABBIATA Sand Blasted | ☐ LAVORATA DI MACCHINA Machined |
| SOVRAMETALLO SALDATURA Welding Reinforcement | ■ COME SALDATO As Welded | ☐ LAVORATO DI MACCHINA Machined | ■ MOLATO Ground | ■ RACCORDATO Blended | |

## TECNICA Technique

| | | | | |
|---|---|---|---|---|
| METODO Method | ■ DIRETTO Direct | ☐ INDIRETTO Indirect | STRUMENTO Instrument | Gauge / Mirror / Endoscope |
| CONDIZIONI DI ILLUMINAMENTO Lighting conditions | ☐ LUCE NERA Black light | ■ LUCE BIANCA Light | ■ NATURALE Natural<br>☐ ARTIFICIALE Artificial | 550 lux |

## INDICAZIONI DA REGISTRARE Indications to be Recorded

| Weld Nr. | WPS | Surface Condition | Dimensional | Indication | Weld Zone | Evaluation | Note |
|---|---|---|---|---|---|---|---|
| ALL | ** | SC2 | OK | NONE | ALL | A | \ |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

*EVALUATION:* A : ACCEPTED / accettato R : REFUSED / rifiutato

*SURFACE CONDITIONS:*
SC1 : SANDBLASTED / sabbiata
SC2 : GRINDED / molato
SC3: BRUSHED / spazzolata

*WELD ZONE:* WJ : WELD JOINT zona saldatura
HAZ : HEAT AFFECTED ZONE zona termicamente alterata

*INDICATION ISO 6520-1:*
100 : CRACKS / cricche
5011 - 5012 : UNDERCUT / incisioni
516 : POROSITY / porosità
401 : INCOMPLETELY LACK FUSION mancanza di fusione
507 :MISALIGNMENT / sfivellamento
5013 :ROOT CONCAVITY / incisione al vertice
504 :EXCESS OF PENETRATION eccesso di penetrazione

## NOTE Remarks

** 1724001010-WEL-PRO-00005

■ RISULTATI CONFORMI AI REQUISITI
Results Conforming to the Specified Requirements

☐ RISULTATI NON CONFORMI AI REQUISITI
Results Not Conforming to the Specified Requirements

| DATA Date | 14/11/2024 | LUOGO Place | Trieste | OPERATORI Operators | Estevan Natale |
|---|---|---|---|---|---|

| II LEVEL | CLIENTE Customer | ENTE DI COLLAUDO Inspecting Authority |
|---|---|---|
| E. Natale 2° LIVELLO UNI EN ISO 9712 VT-MT | | |

SGPTESTING
VIA J. RESSEL, 2/5/A - 34018 SAN DORLIGO DELLA VALLE - TRIESTE - ITALY
TEL. +39 040 3220841 - info@sgptesting.com - www.sgptesting.com

# RAPPORTO ESAMI ULTRASUONI

ULTRASONIC EXAMINATION REPORT

**UT nr. 445 /24** 

cliente / customer: REMAZEL S.p.A.

commessa / project: 24-27012

materiale esaminato / examined material: Chassis Winch Carpentry

riferimenti / reference: **Dwg nr. C09-0001-P0005 rev.A**

particolare / item: 100% surface where accessible

procedura d'esame / examination procedure: UNI EN ISO 10160
1724001010-NDT-PRO-00006

limiti di accettazione / acceptance criteria: planar discontinuities research

stato superficiale / surface condition: ☐ saldato / welded ☐ molato / ground ☑ lav. di macchina / machined ☐ forgiato / forged

temperatura / test temperature: 10-15 °C

accoppiante / coupling medium: tjlosa

☐ verniciato / painted ☐ fuso / casting ☐ sabbiato / sandblasted

apparecchiatura / equipment:

☐ Olympus 38 DL Plus ID 120486408
☐ Panametrics 36 DLP ID 992126711
☐ Panametrics Epoch III ID 01457206
☐ Panametrics Epoch IV ID 081590305
☐ Olympus OMNI-MX2 ID 102691-2681
☐ Olympus Epoch 600 ID 120459312
☐ Olympus Epoch 600 ID 120240601
☑ Olympus Epoch 600 ID 130530605

| sonda / transducer | dimensioni / probe size | angolo / angle | frequenza / frequency | dB riferimento / primary ref. | correz. di trasferimento / transfer correction | dB scansione / scanning | dB totali / total dB |
|---|---|---|---|---|---|---|---|
| Krautkramer MB4S-N *sn: 53465* | Ø10 mm | 0° | 4 MHz | 50,8 | <2 | | 50,8 |
| IMG D8-5B *sn: 2389* | Ø10 mm | 0° | 4 MHz | 43,7 | <2 | | 43,7 |
| | | | | | | | |
| | | | | | | | |

blocchi di taratura / reference blocks: IIW Reference Block

metodo di taratura / calibration mode: -

dettaglio / item detail: nom thk 38 mm (see page 002 for details)

esito dell'esame / examination result:

Acceptable as per specification.

| NDT Operator | QA/QC | Third Party | Client |
|---|---|---|---|
| Name: **Eric Marini** 2nd level SNT-TC-1A 2nd level ISO9712 | Name: | Name: | Name: |
| Signature: | Signature: | Signature: | Signature: |
| Place/Date: Trieste, 18/11/2024 | Date: | Date: | Date: |

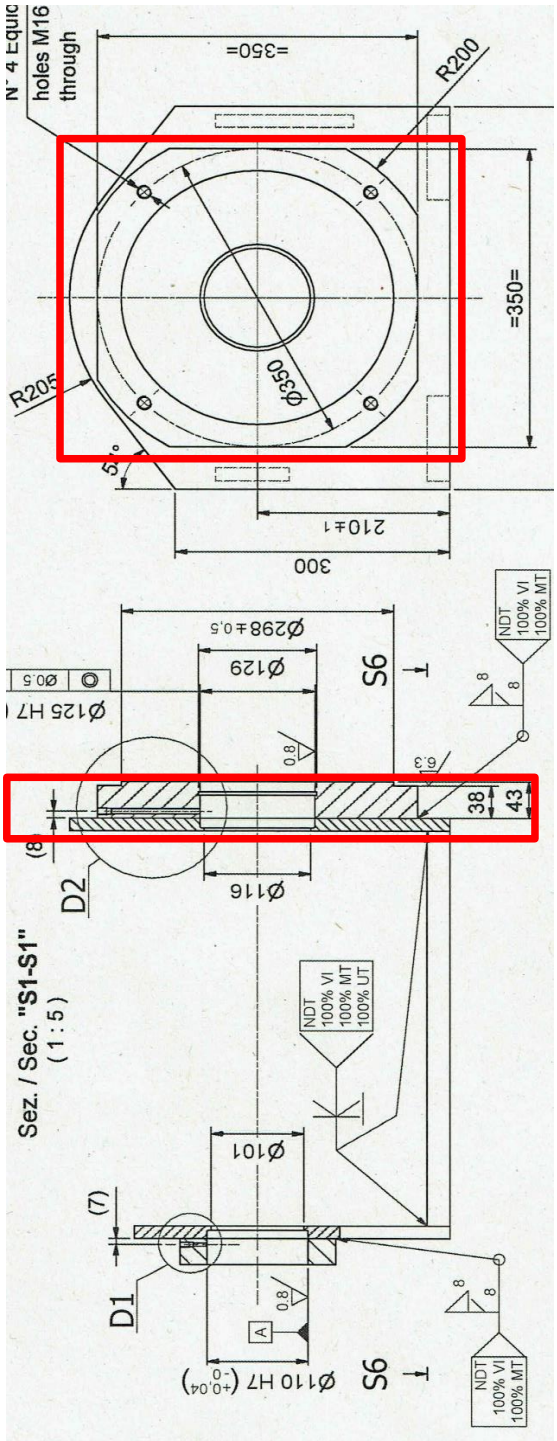
SGPTESTING
VIA J. RESSEL, 2/5/A - 34018 SAN DORLIGO DELLA VALLE - TRIESTE - ITALY
TEL. +39 040 3220841 - info@sgptesting.com - www.sgptesting.com

# RAPPORTO ESAMI ULTRASUONI

ULTRASONIC EXAMINATION REPORT

**UT nr. 445 /24** 

esito dell'esame
examination result




| NDT Operator | QA/QC | Third Party | Client |
|---|---|---|---|
| Name: **Eric Marini**<br>2nd level SNT-TC-1A<br>2nd level ISO9712 | Name: | Name: | Name: |
| Signature: | Signature: | Signature: | Signature: |
| Place/Date: Trieste, 18/11/2024 | Date: | Date: | Date: |

| REMAZEL ENGINEERING | DIMENSIONAL CONTROL CERTIFICATE | Certificate N° | |
|---|---|---|---|
| | | DimAM002 | |
| | | Date | 18/10/2024 |

| | | | |
|---|---|---|---|
| **Supplier** | Rosetti Marino | **Order N°** | 1724001010123A90A |
| **Job** | 24-27012 | **Drawing** | C09-0001-P0006 Rev. C |
| **Project** | DAVIT CRANE | **Serial N°** | / |
| **QCP** | 24-27012_ITP-001 | **Phase** | 6.01 |

| Nominal Dimension | Real Dimension | Instruments |
|---|---|---|
| 560mm | 560mm | Tape meter |
| 428,5 | 427,5mm | Tape meter |
| 440mm | 440mm | Tape meter |
| Ø65mm | Ø65mm | CAL-0106 |
| Ø65 (+1;-0)mm | Ø65mm | CAL-0106 |
| 384mm | 383,8mm | CAL-0111 |
| 171,5mm | 171,15mm | Checked during machining |
| Ø42mm (+0,003) | Ø42,03mm | Checked during machining |
| Ø50mm (+0,003) | Ø50,03mm | MEC-0131 |
| Ø80mm (+0,003) | Ø80,03mm | MEC-0131 |

| | | |
|---|---|---|
| Result | Accepted | X |
| | Not Accepted | |

**Note:**

| Supplier | Client | Customer |
|---|---|---|
| REMAZEL C. Faber ☒W ☐R | | MARZIO MEDERICI CRASSWIND ☐ REVIEWED ☒ WITNESSED NAME: MARZIO MEDERICI DATE: 18-10-2024 SIGNATURE: |

| REMAZEL ENGINEERING | DIMENSIONAL CONTROL CERTIFICATE | Certificate N° | |
|---|---|---|---|
| | | DimAM004 | |
| | | Date | 31/10/2024 |

| | | | |
|---|---|---|---|
| **Supplier** | Rosetti Marino | **Order N°** | 1724001010123A90A |
| **Job** | 24-27012 | **Drawing** | C09-0001-P0002 Rev. E |
| **Project** | DAVIT CRANE | **Serial N°** | / |
| **QCP** | 24-27012_ITP-001 | **Phase** | 6.01 |

| Nominal Dimension | Real Dimension | Instruments |
|---|---|---|
| Ø932mm (+1;-0) | Ø932,6mm | CAL-0111 |
| 4271mm (+15;-0) | 4280mm | Tape meter |
| Ø830mm (+1;-0) | Ø829,8mm | CAL-0111 |
| Ø26mm | Ø26mm | CAL-0106 |
| 37,5mm | 37,4mm | CAL-0106 |
| 2495mm (±1) | 2495mm | Tape meter |
| 386mm (±1) | 387mm | Tape meter |
| 625mm (±1) | 626mm | Tape meter |
| 900mm (±1) | 900mm | Tape meter |
| 900mm (±1) | 900mm | Tape meter |
| 900mm (±1) | 900mm | Tape meter |
| 457mm (±1) | 457mm | Tape meter |

| | | |
|---|---|---|
| Result | Accepted | X |
| | Not Accepted | |

**Note:**

| Supplier | Client | Customer |
|---|---|---|
| REMAZEL C. Ziber ☐W ☐R | | Marzio Mederici obo CROSSWIND<br>☐ REVIEWED ☒ WITNESSED<br>NAME: MARZIO MEDERICI<br>DATE: 31-10-2024<br>SIGNATURE: Mederici |

| REMAZEL ENGINEERING | DIMENSIONAL CONTROL CERTIFICATE | Certificate N° | |
|---|---|---|---|
| | | DimAM003 | |
| | | Date | 18/10/2024 |

| | | | |
|---|---|---|---|
| **Supplier** | Rosetti Marino | **Order N°** | 1724001010123A90A |
| **Job** | 24-27012 | **Drawing** | C09-0001-P0001 Rev. D |
| **Project** | DAVIT CRANE | **Serial N°** | / |
| **QCP** | 24-27012_ITP-001 | **Phase** | 6.01 |

| Nominal Dimension | Real Dimension | Instruments |
|---|---|---|
| Ø830mm (+1;-0) | Ø830mm | CAL-0111 |
| 500mm (+1;-0) | 500mm | CAL-0111 |
| Ø700mm (+0;-2) | Ø698mm | CAL-0111 |
| Ø26mm | Ø26mm | CAL-0106 |
| Ø775mm (+1;-0) | Ø775mm | Tape meter |
| | | |

| | | |
|---|---|---|
| Result | Accepted | X |
| | Not Accepted | |

**Note:**

| Supplier | Client | Customer |
|---|---|---|
| REMAZEL C. Ider ☐W ☐R | | MARZIO MEDERICI DDO CROSS WIDD ☐ REVIEWED ☒ WITNESSED NAME: MARZIO MEDERICI DATE: 18-10-2024 SIGNATURE: Mederici |

| REMAZEL ENGINEERING | DIMENSIONAL CONTROL CERTIFICATE | Certificate N° | |
|---|---|---|---|
| | | DimAM001 | |
| | | Date | 18/10/2024 |

| | | | |
|---|---|---|---|
| **Supplier** | Rosetti Marino | **Order N°** | 1724001010123A90A |
| **Job** | 24-27012 | **Drawing** | C09-0001-P0004 Rev. G |
| **Project** | DAVIT CRANE | **Serial N°** | / |
| **QCP** | 24-27012_ITP-001 | **Phase** | 6.01 |

| Nominal Dimension | Real Dimension | Instruments |
|---|---|---|
| 10700mm (±2) | 10698mm | Tape meter |
| 568mm (±1) | 568mm | Tape meter |
| Ø200mm (±1) | Ø200mm | CAL-0111 |
| Ø736mm (±1) | Ø736mm | CAL-0111 |
| Ø26mm | Ø26mm | CAL-0106 |
| 280mm (±1) | 280mm | Tape meter |
| 48,5mm | 49,5mm | Tape meter |
| Ø60mm (+1/-0) | Ø60mm | CAL-0106 |
| Ø679mm (+0/-5) | Ø679mm | Tape meter |
| | | |

| Result | | |
|---|---|---|
| | Accepted | X |
| | Not Accepted | |

**Note:**

| Supplier | Client | Customer |
|---|---|---|
| REMAZEL C. Zuber ☐W ☐R | | MARZIO MEDERICI DLGS CROSSWIND ☐ REVIEWED ☒ WITNESSED NAME: MARZIO MEDERICI DATE: 18-10-2024 SIGNATURE: Mederici |

| REMAZEL ENGINEERING | DIMENSIONAL CONTROL CERTIFICATE | Certificate N° | |
|---|---|---|---|
| | | DimAM005 | |
| | | Date | 18/11/2024 |

| | | | |
|---|---|---|---|
| **Supplier** | Rosetti Marino | **Order N°** | 1724001010123A90A |
| **Job** | 24-27012 | **Drawing** | C09-0001-P0085 Rev. A |
| **Project** | DAVIT CRANE | **Serial N°** | / |
| **QCP** | 24-27012_ITP-001 | **Phase** | 6.01 |

| Nominal Dimension | Real Dimension | Instruments |
|---|---|---|
| 393mm (+1) | 393mm | CAL-0105 |
| 423mm | 421mm | CAL-0105 |
| Ø65mm (±0,5) | Ø65mm | CAL-0105 |
| Ø71mm (±0,5) | Ø70,5mm | CAL-0105 |
| Ø273mm | Ø272,8mm | CAL-0105 |
| Ø214mm | Ø214mm | Tape meter |

| | | |
|---|---|---|
| Result | Accepted | X |
| | Not Accepted | |

**Note:**

| Supplier | Client | Customer |
|---|---|---|
| REMAZEL C. Taber ☐W ☐R | | Marzio Mederici obo CROSSWIND ☐ REVIEWED ☒ WITNESSED NAME: MARZIO MEDERICI DATE: 18-11-2024 SIGNATURE: |

| REMAZEL ENGINEERING | DIMENSIONAL CONTROL CERTIFICATE | Certificate N° | |
|---|---|---|---|
| | | DimAM006 | |
| | | Date | 18/11/2024 |

| | | | |
|---|---|---|---|
| **Supplier** | Rosetti Marino | **Order N°** | 1724001010123A90A |
| **Job** | 24-27012 | **Drawing** | C09-0001-P0005 Rev. A |
| **Project** | DAVIT CRANE | **Serial N°** | / |
| **QCP** | 24-27012_ITP-001 | **Phase** | 6.01 |

| Nominal Dimension | Real Dimension | Instruments |
|---|---|---|
| 567mm | 567,4mm | CAL-0105 |
| 464mm | 464mm | CAL-0105 |
| Ø125mm (±0,04) | Ø124,9mm | CAL-0106 |
| Ø110mm (±0,04) | Ø109,98mm | CAL-0106 |
| Ø298mm | Ø298mm | CAL-0105 |
| Ø101mm | Ø100,85mm | CAL-0106 |
| VERIFICA FORATURE BULLONERIE | OK | Tape meter/CAL-0106 |

| | | |
|---|---|---|
| Result | Accepted | X |
| | Not Accepted | |

**Note:**

| Supplier | Client | Customer |
|---|---|---|
| REMAZEL C. Ziber ☐W ☐R | | Marzio Mederici obo CROSSWIND ☐ REVIEWED X WITNESSED NAME: MARZIO MEDERICI DATE: 18-11-2024 SIGNATURE: |

## 13 Painting reports

| SEA METAL SRL | PAINTING REPORT<br>Rapporto di pitturazione | M 02 Rev. 02<br>del 12/05/2023 | | |
|---|---|---|---|---|
| | | PR: | 32/2024 | Date: 22/10/2024 |

| | | | |
|---|---|---|---|
| Customer: | Remazel | Painting Procedure: | 24-27012-PP-001 |
| Project : | Davit Crane | Place of Activities: | Sea Metal |
| Purchase order: | 240005843 | Item: | C09-0001-P0004 - Boom carpentry<br>C09-0001-P0006 - Travelling trolley carpentry |

**ITEM INSPECTED:**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| STEEL PREPARATION (ISO 8501-3 - GRADE Sa 2 1/2) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| VISUAL CHECK PRIOR TO BLASTING : | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| CLEANING OF PIECE BEFORE BLASTING : | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| SURFACE CLEANLINESS: (ISO 8501-1) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| SURFACE CLEANLINESS: (ISO 8502-3 RATING 2) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| ROUGHNESS : (profile : 67 µm - Medium G) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |

| Tape 1: | Tape 2: | Tape 3: |
|---|---|---|
| | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SALT TEST: (ISO 8502-6, ISO8502-9 ) | <30 mg/m² | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ |
| Result 12 (mg/m²) | Result (mg/m²) | Result (mg/m²) | | Result (mg/m²) | | | |
| VISUAL CHECK AFTER TO BLASTING : | | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ |

**EXPOSED EXTERIOR AND INTERIOR SURFACES:**

**FIRST LAYER**

| | | | | |
|---|---|---|---|---|
| DATE : 22/10/24 | HOUR : 9:00 | HUMIDITY : | < 85% | 60,1 |
| TYPE OF COAT : Jotamastic 90 Alu | | AIR TEMP.: | > 5°C | 21,4 |
| PAINT BATCH NUMBER BASE: 3405346-1-*-1:3 | | STEEL TEMP.: | MIN. DEW P. + 3 °C. | 22,7 |
| PAINT BATCH NUMBER CURING AGENT: 3463065-1-*-1:2 | | DEW POINT : | | 13,3 |
| NDFT: 150 µm | | THICKNESS RESULT : | | |
| Used paint: | | N° OF READING: 30 | MIN (Range: -___/+___ of NDFT) | 150 |
| | | | AVERAGE (Range: -___/+___ of NDFT) | 177 |
| RESULT : ACCEPTABLE ☑ NOT ACCEPTABLE ☐ | | | MAX (Range: -___/+___ of NDFT) | 228 |

**SECOND LAYER**

| | | | | |
|---|---|---|---|---|
| DATE : 23/10/24 | HOUR : 9:00 | HUMIDITY : | < 85% | 66,9 |
| TYPE OF COAT : Jotamastic 90 Alu | | AIR TEMP.: | > 5°C | 19,5 |
| PAINT BATCH NUMBER BASE: 3405346-1-*-1:3 | | STEEL TEMP.: | MIN. DEW P. +3°C. | 19,6 |
| PAINT BATCH NUMBER CURING AGENT: 3463065-1-*-1:2 | | DEW POINT : | | 13,2 |
| NDFT: 150 µm | | THICKNESS RESULT : | | |
| Used paint: | | N° OF READING: 30 | MIN (Range: -___/+___ of NDFT) | 300 |
| | | | AVERAGE (Range: -___/+___ of NDFT) | 339 |
| RESULT : ACCEPTABLE ☑ NOT ACCEPTABLE ☐ | | | MAX (Range: -___/+___ of NDFT) | 387 |

**THIRD LAYER**

| | | | | |
|---|---|---|---|---|
| DATE : 24/10/24 | HOUR : 9:30 | HUMIDITY : | < 85% | 65,5 |
| TYPE OF COAT : Hardtop XP RAL 7038 | | AIR TEMP.: | > 5°C | 19,4 |
| PAINT BATCH NUMBER BASE: 3656202-1-*-1:3 | | STEEL TEMP.: | MIN. DEW P. +3°C. | 19,1 |
| PAINT BATCH NUMBER CURING AGENT: 3614977-1-*-1:2 | | DEW POINT : | | 12,8 |
| NDFT: 60 µm | | THICKNESS RESULT : | | |
| Used paint: | | N° OF READING: | MIN (Range: -___/+___ of NDFT) | 334 |
| | | | AVERAGE (Range: -___/+___ of NDFT) | 416 |
| RESULT : ACCEPTABLE ☑ NOT ACCEPTABLE ☐ | | | MAX (Range: -___/+___ of NDFT) | 490 |

**FOURTH LAYER**

| | | | | |
|---|---|---|---|---|
| DATE : | HOUR : | HUMIDITY : | < 85% | |
| TYPE OF COAT : | | AIR TEMP.: | > 5°C | |
| PAINT BATCH NUMBER BASE: | | STEEL TEMP.: | MIN. DEW P. +3°C. | |
| PAINT BATCH NUMBER CURING AGENT: | | DEW POINT : | | |
| NDFT: µm | | THICKNESS RESULT : | | |
| Used paint: | | N° OF READING: | MIN (Range: -___/+___ of NDFT) | 0 |
| | | | AVERAGE (Range: -___/+___ of NDFT) | 0 |
| RESULT : ACCEPT. ☐ NOT ACCEPT. ☐ N.A. ☐ | | | MAX (Range: -___/+___ of NDFT) | 0 |

DUST TEST : DUST QUANTITY RATE(1÷5):1 DUST PARTICLE SIZE (1÷5):1

TEST

REMAZEL C. Arber QAW QR

NOTE:

DFT equipment : Thickness gauge Elcometer RE06311 Calibration on smooth surface (correction value=25 µm)

*REMARKS:*

| REDATTO DA<br>*COMPILED FROM* | ISPETTORE<br>*INSPECTOR* | ISPETTORE<br>*INSPECTOR* | CLIENTE<br>*CUSTOMER* |
|---|---|---|---|
| Sea Metal S.r.l. | FROSIO Gruppo IanAc<br>Matteo Biancolillo<br>Frosio Certified # 12558 | N°5402<br>Luca Tripoli<br>Frosio Certified # 5402 | ROSETTI MARINO SpA<br>Michele Sacchi<br>Quality Control Dept.<br>NACE # 35 444 |

| SEA METAL SRL | PAINTING REPORT<br>Rapporto di pitturazione | M 02 Rev. 02<br>del 12/05/2023 | | | |
|---|---|---|---|---|---|
| | | PR: | 31/2024 | Date: | 22/10/2024 |

| | | | |
|---|---|---|---|
| **Customer:** | Remazel | **Painting Procedure:** | 24-27012-PP-001 |
| **Project :** | Davit Crane | **Place of Activities:** | Sea Metal |
| **Purchase order:** | 240005843 | **Item:** | C09-0001-P0001 - Pedestral |

**ITEM INSPECTED:**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| STEEL PREPARATION (ISO 8501-3 - GRADE Sa 2 1/2) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| VISUAL CHECK PRIOR TO BLASTING : | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| CLEANING OF PIECE BEFORE BLASTING : | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| SURFACE CLEANLINESS: (ISO 8501-1) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| SURFACE CLEANLINESS: (ISO 8502-3 RATING 2) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| ROUGHNESS : (profile : 67 µm - Medium G) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |

| Tape 1: | Tape 2: | Tape 3: |
|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SALT TEST: (ISO 8502-6, ISO8502-9 ) | <30 mg/m² | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ |
| Result 12 (mg/m²) | Result (mg/m²) | Result (mg/m²) | | Result (mg/m²) | | | |
| VISUAL CHECK AFTER TO BLASTING : | | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ |

**EXPOSED EXTERIOR AND INTERIOR SURFACES:**

**FIRST LAYER**

| | | | | | |
|---|---|---|---|---|---|
| DATE : 22/10/24 | HOUR : 9:00 | HUMIDITY : | < 85% | | 60,1 |
| TYPE OF COAT : Jotamastic 90 Alu | | AIR TEMP.: | > 5°C | | 21,4 |
| PAINT BATCH NUMBER BASE: 3405346-1-*-1:3 | | STEEL TEMP.: | MIN. DEW P. + 3 °C. | | 22,7 |
| PAINT BATCH NUMBER CURING AGENT: 3463065-1-*-1:2 | | DEW POINT : | | | 13,3 |
| NDFT: 150 µm | | THICKNESS RESULT : | | | |
| Used paint: | | N° OF READING: 30 | MIN | (Range: -___ /+ ___ of NDFT) | 150 |
| | | | AVERAGE | (Range: -___ /+ ___ of NDFT) | 177 |
| RESULT : ACCEPTABLE ☑ NOT ACCEPTABLE ☐ | | | MAX | (Range: -___ /+ ___ of NDFT) | 228 |

**SECOND LAYER**

| | | | | | |
|---|---|---|---|---|---|
| DATE : HOUR : | | HUMIDITY : | < 85% | | |
| TYPE OF COAT : | | AIR TEMP.: | > 5°C | | |
| PAINT BATCH NUMBER BASE: | | STEEL TEMP.: | MIN. DEW P. +3°C. | | |
| PAINT BATCH NUMBER CURING AGENT: | | DEW POINT : | | | |
| NDFT: µm | | THICKNESS RESULT : | | | |
| Used paint: | | N° OF READING: 30 | MIN | (Range: -___ /+ ___ of NDFT) | 0 |
| | | | AVERAGE | (Range: -___ /+ ___ of NDFT) | 0 |
| RESULT : ACCEPTABLE ☐ NOT ACCEPTABLE ☐ | | | MAX | (Range: -___ /+ ___ of NDFT) | 0 |

**THIRD LAYER**

| | | | | | |
|---|---|---|---|---|---|
| DATE : HOUR : | | HUMIDITY : | < 85% | | |
| TYPE OF COAT : | | AIR TEMP.: | > 5°C | | |
| PAINT BATCH NUMBER BASE: | | STEEL TEMP.: | MIN. DEW P. +3°C. | | |
| PAINT BATCH NUMBER CURING AGENT: | | DEW POINT : | | | |
| NDFT: µm | | THICKNESS RESULT : | | | |
| Used paint: | | N° OF READING: | MIN | (Range: -___ /+ ___ of NDFT) | |
| | | | AVERAGE | (Range: -___ /+ ___ of NDFT) | |
| RESULT : ACCEPTABLE ☐ NOT ACCEPTABLE ☐ | | | MAX | (Range: -___ /+ ___ of NDFT) | |

**FOURTH LAYER**

| | | | | | |
|---|---|---|---|---|---|
| DATE : HOUR : | | HUMIDITY : | < 85% | | |
| TYPE OF COAT : | | AIR TEMP.: | > 5°C | | |
| PAINT BATCH NUMBER BASE: | | STEEL TEMP.: | MIN. DEW P. +3°C. | | |
| PAINT BATCH NUMBER CURING AGENT: | | DEW POINT : | | | |
| NDFT: µm | | THICKNESS RESULT : | | | |
| Used paint: | | N° OF READING: | MIN | (Range: -___ /+ ___ of NDFT) | 0 |
| | | | AVERAGE | (Range: -___ /+ ___ of NDFT) | 0 |
| RESULT : ACCEPT. ☐ NOT ACCEPT. ☐ N.A. ☐ | | | MAX | (Range: -___ /+ ___ of NDFT) | 0 |

DUST TEST : DUST QUANTITY RATE(1÷5):1 DUST PARTICLE SIZE (1÷5):1

TEST

NOTE:

REMAZEL C. Aper

DFT equipment : Thickness gauge Elcometer RE06311 Calibration on smooth surface (correction value=25 µm)

***REMARKS:***

| REDATTO DA<br>*COMPILED FROM* | ISPETTORE<br>*INSPECTOR* | ISPETTORE<br>*INSPECTOR* | CLIENTE<br>*CUSTOMER* |
|---|---|---|---|
| Sea Metal S.r.l. | Matteo Biancolillo<br>Frosio Certified # 12558 | Luca Tripoli<br>Frosio Certified # 5402 | ROSETTI MARINO SpA<br>Michele Secchi<br>Quality Control Dept.<br>NACE # 25744 |

**GALPERTI TECH FORGED PRODUCTS S.p.A.**
Capitale Sociale € 4.000.000,00 interamente versato
*Sede legale e Amministrativa:*
**23823 COLICO (LC)** - Via Ombriano, 14
C.C.I.A.A Lecco n. 03800290136 – R.E.A. 326757
C.F. 03800290136 -P.IVA IT03800290136
Tel. 0341-930186 - Fax 0341-930252
E-mail: galptech@galptech.com - www.galperti.com

# PAINTING REPORT

| | |
|---|---|
| ***Certificate No.:*** | 240413-001 p001 |
| ***Revision No.:*** | 0 |
| ***Date :*** | 21/11/2024 |

## *Main Information*

| | |
|---|---|
| **Client Name:** | REMAZEL ENGINEERING SPA |
| **Client P.O.:** | 24004009 |
| **Supplier Ref.:** | 240413 Pos. 001 |
| **Customer Job:** | 24-27012 |
| **Drawing No.:** | V41-0979-013-COMM Rev.1 |

## *Procedure*

| | |
|---|---|
| **Examination Procedure:** | P04 001 Rev.2 |
| **Applicable Specification:** | \ |
| **Acceptance Criteria:** | P04 001 Rev.2 Section 4 - SKV-V41-0979-013-R01 |
| **Customer Specification:** | \ |

## *Examination Material*

| | | | |
|---|---|---|---|
| **Item ID:** | 24/03784 | **Quantity:** | 1 pc |
| **Product Form:** | 4-Points Contact Ball Bearing | **Material Type:** | 42CrMo4 Q+T |
| **Area of Test:** | External surface | **Surface Condition:** | Final machining |

## *Equipment Details / Technique*

| | | | |
|---|---|---|---|
| **Instrument Type:** | Thickness gauge for dry film thickness | **Instrument SN:** | 376919 |
| **Instrument Type:** | Dewpoint meter | **Instrument SN:** | WC20988 |
| **Instrument Type:** | Conductivity Meter | **Instrument SN:** | 1100 |

## *Surface Preparation*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Surface Preparation [ISO 8501-1]** | | | | **Surface Profile [ISO 85032]** | | | |
| **Requested:** | SA3 | **Obtained:** | SA3 | **Requested:** | 50 - 85 µm | **Obtained:** | Medium G [70 Avg. |
| **Salt Contamination [ISO 8502-6/9]** | | | | **Dust Test [ISO 8502-3]** | | | |
| **Requested:** | ≤20 mg/m2 | **Obtained:** | 12 mg/m2 | **Requested:** | Level 2 | **Obtained:** | Level 1 |
| **Blotter Test [ASTM D 4285]** | Satisfactory | | | | | | |

## *Items Description / Result*

**Items:** **240413-001 (1 pc) 4-Points Contact Ball Bearing V41-0979-013-COMM Rev.1**

**Coating**

| **Coat No.** | **1st Coat** | **2nd Coat** | **3rd Coat** |
|---|---|---|---|
| **Date** | 18/11/2024 | 19/11/2024 | 20/11/2024 |
| **Application Method** | Air mix | Air mix | Air mix |
| **Painting Name** | Avantguard 750 | Multi 500 | Hempathane 55610 |
| **Painting Color** | Grey | Ligth Grey | RAL 7038 |
| **Batch Number** | 043117377 (A) - 043116254 (B) | 223085103 (A) - 224056096 (B) | 223105735 (A) - 224025127 (B) |
| **Dry Film Thickness Required** | 60 µm Min. | 240 µm Min. | 320 µm Min. |
| **Dry Film Thickness Obtained (ISO 19840)** | Min. 62 µm<br>Avg. 76 µm<br>Max. 97 µm | Min. 233 µm<br>Avg. 262 µm<br>Max. 298 µm | Min. 336 µm<br>Avg. 350 µm<br>Max. 403 µm |
| **Air Temperature** | 19,2°C | 16,3°C | 17,5°C |
| **Surface Temperature** | 19,1°C | 16,1°C | 17,2°C |
| **Humidity** | 34,30% | 39,90% | 29,10% |
| **Dew Point** | 3,1°C | 2,5 °C | -0,7°C |
| **Visual Check** | Satisfactory | Satisfactory | Satisfactory |

## *Operator / Inspection*

| | |
|---|---|
| **Tested by:** | Cusini Alex |
| **Level:** | - |
| **Date:** | 21/11/2024 |
| **Verified By:** | Acquistapace Thomas |
| **Date:** | 21/11/2024 |

21-11-2024
FRANCO CORBELLINI
CSQ
CROSSWIND

*External Inspector:* REMAZEL Caliber OW OR

GIACOMO MAZZ... NI
NACE COATING INSP... OR
LEVEL 2 CERTIFIED
CIP No. 18715

ROSETTI MARINO SpA
Michele Sacchi
Quality Control Dept.
NACE #15846

Sign:
Date:

| SEA METAL SRL | PAINTING REPORT<br>Rapporto di pitturazione | M 02 Rev. 02<br>del 12/05/2023 | | |
|---|---|---|---|---|
| | | PR: | 32/2024 | Date: 22/10/2024 |

| | | | |
|---|---|---|---|
| *Customer:* | Remazel | *Painting Procedure:* | 24-27012-PP-001 |
| *Project :* | Davit Crane | *Place of Activities:* | Sea Metal |
| *Purchase order:* | 240005843 | *Item:* | C09-0001-P0004 - Boom carpentry<br>C09-0001-P0006 - Travelling trolley carpentry |

***ITEM INSPECTED:***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| STEEL PREPARATION (ISO 8501-3 - GRADE Sa 2 1/2) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| VISUAL CHECK PRIOR TO BLASTING : | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| CLEANING OF PIECE BEFORE BLASTING : | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| SURFACE CLEANLINESS: (ISO 8501-1) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| SURFACE CLEANLINESS: (ISO 8502-3 RATING 2) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| ROUGHNESS : (profile : 67 µm - Medium G) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |

| Tape 1: | Tape 2: | Tape 3: |
|---|---|---|
| | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SALT TEST: (ISO 8502-6, ISO8502-9 ) | <30 mg/m² | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ |
| Result 12 (mg/m²) | Result (mg/m²) | Result (mg/m²) | | Result (mg/m²) | | | |
| VISUAL CHECK AFTER TO BLASTING : | | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ |

**EXPOSED EXTERIOR AND INTERIOR SURFACES:**

**FIRST LAYER**

| | | | | |
|---|---|---|---|---|
| DATE : 22/10/24 | HOUR : 9:00 | HUMIDITY : | < 85% | 60,1 |
| TYPE OF COAT : Jotamastic 90 Alu | | AIR TEMP.: | > 5°C | 21,4 |
| PAINT BATCH NUMBER BASE: 3405346-1-*-1:3 | | STEEL TEMP.: | MIN. DEW P. + 3 °C. | 22,7 |
| PAINT BATCH NUMBER CURING AGENT: 3463065-1-*-1:2 | | DEW POINT : | | 13,3 |
| NDFT: 150 µm | | THICKNESS RESULT : | | |
| Used paint: | | N° OF READING: 30 | MIN (Range: -___/+___ of NDFT) | 150 |
| | | | AVERAGE (Range: -___/+___ of NDFT) | 177 |
| RESULT : ACCEPTABLE ☑ NOT ACCEPTABLE ☐ | | | MAX (Range: -___/+___ of NDFT) | 228 |

**SECOND LAYER**

| | | | | |
|---|---|---|---|---|
| DATE : 23/10/24 | HOUR : 9:00 | HUMIDITY : | < 85% | 66,9 |
| TYPE OF COAT : Jotamastic 90 Alu | | AIR TEMP.: | > 5°C | 19,5 |
| PAINT BATCH NUMBER BASE: 3405346-1-*-1:3 | | STEEL TEMP.: | MIN. DEW P. +3°C. | 19,6 |
| PAINT BATCH NUMBER CURING AGENT: 3463065-1-*-1:2 | | DEW POINT : | | 13,2 |
| NDFT: 150 µm | | THICKNESS RESULT : | | |
| Used paint: | | N° OF READING: 30 | MIN (Range: -___/+___ of NDFT) | 300 |
| | | | AVERAGE (Range: -___/+___ of NDFT) | 339 |
| RESULT : ACCEPTABLE ☑ NOT ACCEPTABLE ☐ | | | MAX (Range: -___/+___ of NDFT) | 387 |

**THIRD LAYER**

| | | | | |
|---|---|---|---|---|
| DATE : 24/10/24 | HOUR : 9:30 | HUMIDITY : | < 85% | 65,5 |
| TYPE OF COAT : Hardtop XP RAL 7038 | | AIR TEMP.: | > 5°C | 19,4 |
| PAINT BATCH NUMBER BASE: 3656202-1-*-1:3 | | STEEL TEMP.: | MIN. DEW P. +3°C. | 19,1 |
| PAINT BATCH NUMBER CURING AGENT: 3614977-1-*-1:2 | | DEW POINT : | | 12,8 |
| NDFT: 60 µm | | THICKNESS RESULT : | | |
| Used paint: | | N° OF READING: | MIN (Range: -___/+___ of NDFT) | 334 |
| | | | AVERAGE (Range: -___/+___ of NDFT) | 416 |
| RESULT : ACCEPTABLE ☑ NOT ACCEPTABLE ☐ | | | MAX (Range: -___/+___ of NDFT) | 490 |

**FOURTH LAYER**

| | | | | |
|---|---|---|---|---|
| DATE : | HOUR : | HUMIDITY : | < 85% | |
| TYPE OF COAT : | | AIR TEMP.: | > 5°C | |
| PAINT BATCH NUMBER BASE: | | STEEL TEMP.: | MIN. DEW P. +3°C. | |
| PAINT BATCH NUMBER CURING AGENT: | | DEW POINT : | | |
| NDFT: µm | | THICKNESS RESULT : | | |
| Used paint: | | N° OF READING: | MIN (Range: -___/+___ of NDFT) | 0 |
| | | | AVERAGE (Range: -___/+___ of NDFT) | 0 |
| RESULT : ACCEPT. ☐ NOT ACCEPT. ☐ N.A. ☐ | | | MAX (Range: -___/+___ of NDFT) | 0 |

DUST TEST : DUST QUANTITY RATE(1÷5):1 DUST PARTICLE SIZE (1÷5):1

TEST

REMAZEL C. Arber QAW QR

NOTE:

DFT equipment : Thickness gauge Elcometer RE06311 Calibration on smooth surface (correction value=25 µm)

***REMARKS:***

| REDATTO DA<br>*COMPILED FROM* | ISPETTORE<br>*INSPECTOR* | ISPETTORE<br>*INSPECTOR* | CLIENTE<br>*CUSTOMER* |
|---|---|---|---|
| Sea Metal S.r.l. | FROSIO Gruppo IanAc<br>Matteo Biancolillo<br>Frosio Certified # 12558 | N°5402<br>Luca Tripoli<br>Frosio Certified # 5402 | ROSETTI MARINO SpA<br>Michele Sacchi<br>Quality Control Dept.<br>NACE # 35 444 |

| SEA METAL SRL | PAINTING REPORT<br>Rapporto di pitturazione | M 02 Rev. 02<br>del 12/05/2023 | | | |
|---|---|---|---|---|---|
| | | PR: | 49/2024 | Date: | 22/11/2024 |

| | | | |
|---|---|---|---|
| *Customer:* | Remazel | *Painting Procedure:* | 24-27012-PP-001 |
| *Project :* | Davit Crane | *Place of Activities:* | Sea Metal |
| *Purchase order:* | 240005843 | *Item:* | C09-0001-P0005+C09-0001-P0007+C09-0001-P0085+C09-0001-P0034+C09-0001-P0076+C09-0001-P0022+C09-0001-P0007+C09-0001-P0023+C09-0001-P0024+C09-0001-P0025+C09-0001-P0028+C09-0001-P0084+C09-0001-P0056+C09-0001-P0057+C09-0001-P0088+C09-0001-P0096 |

***ITEM INSPECTED:***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| STEEL PREPARATION (ISO 8501-3 - GRADE Sa 2 1/2) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| VISUAL CHECK PRIOR TO BLASTING : | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| CLEANING OF PIECE BEFORE BLASTING : | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| SURFACE CLEANLINESS: (ISO 8501-1) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| SURFACE CLEANLINESS: (ISO 8502-3 RATING 2) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| ROUGHNESS : (profile : 75 µm - Medium G) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |

| Tape 1: | Tape 2: | Tape 3: |
|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SALT TEST: (ISO 8502-6, ISO8502-9 ) | <30 mg/m² | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ |
| Result 4,8 (mg/m²) | Result (mg/m²) | Result (mg/m²) | | Result (mg/m²) | | | |
| VISUAL CHECK AFTER TO BLASTING : | | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ |

**EXPOSED EXTERIOR AND INTERIOR SURFACES:**

**FIRST LAYER**

| | | | | |
|---|---|---|---|---|
| DATE : 22/11/24 HOUR : 9:00 | HUMIDITY : | < 85% | | 66,2 |
| TYPE OF COAT : Jotamastic 90 Alu | AIR TEMP.: | > 5°C | | 12,9 |
| PAINT BATCH NUMBER BASE: 3674207-1-*-1:2 | STEEL TEMP.: | MIN. DEW P. + 3 °C. | | 12,8 |
| PAINT BATCH NUMBER CURING AGENT: 3650855-1-*-1:2 | DEW POINT : | | | 6,7 |
| NDFT: 150 µm | THICKNESS RESULT : | | | |
| Used paint: | N° OF READING: 30 | MIN | (Range: -___/+___ of NDFT) | 150 |
| | | AVERAGE | (Range: -___/+___ of NDFT) | 180 |
| RESULT : ACCEPTABLE ☑ NOT ACCEPTABLE ☐ | | MAX | (Range: -___/+___ of NDFT) | 206 |

**SECOND LAYER**

| | | | | |
|---|---|---|---|---|
| DATE : 25/11/24 HOUR : 9:00 | HUMIDITY : | < 85% | | 67,5 |
| TYPE OF COAT : Jotamastic 90 Alu | AIR TEMP.: | > 5°C | | 12,9 |
| PAINT BATCH NUMBER BASE: 3405346-1-*-1:3 | STEEL TEMP.: | MIN. DEW P. +3°C. | | 12,5 |
| PAINT BATCH NUMBER CURING AGENT: 3650855-1-*-1:2 | DEW POINT : | | | 7,0 |
| NDFT: 150 µm | THICKNESS RESULT : | | | |
| Used paint: | N° OF READING: 30 | MIN | (Range: -___/+___ of NDFT) | 294 |
| | | AVERAGE | (Range: -___/+___ of NDFT) | 335 |
| RESULT : ACCEPTABLE ☑ NOT ACCEPTABLE ☐ | | MAX | (Range: -___/+___ of NDFT) | 396 |

**THIRD LAYER**

| | | | | |
|---|---|---|---|---|
| DATE : 26/11/24 HOUR : 9:30 | HUMIDITY : | < 85% | | 68,0 |
| TYPE OF COAT : Hardtop XP RAL 7038 | AIR TEMP.: | > 5°C | | 13,6 |
| PAINT BATCH NUMBER BASE: 3689831-1-*-1:2 | STEEL TEMP.: | MIN. DEW P. +3°C. | | 13,4 |
| PAINT BATCH NUMBER CURING AGENT: 3685294-1-*-1:2 | DEW POINT : | | | 7,9 |
| NDFT: 60 µm | THICKNESS RESULT : | | | |
| Used paint: | N° OF READING: | MIN | (Range: -___/+___ of NDFT) | 336 |
| | | AVERAGE | (Range: -___/+___ of NDFT) | 400 |
| RESULT : ACCEPTABLE ☑ NOT ACCEPTABLE ☐ | | MAX | (Range: -___/+___ of NDFT) | 494 |

**FOURTH LAYER**

| | | | | |
|---|---|---|---|---|
| DATE : HOUR : | HUMIDITY : | < 85% | | |
| TYPE OF COAT : | AIR TEMP.: | > 5°C | | |
| PAINT BATCH NUMBER BASE: | STEEL TEMP.: | MIN. DEW P. +3°C. | | |
| PAINT BATCH NUMBER CURING AGENT: | DEW POINT : | | | |
| NDFT: µm | THICKNESS RESULT : | | | |
| Used paint: | N° OF READING: | MIN | (Range: -___/+___ of NDFT) | 0 |
| | | AVERAGE | (Range: -___/+___ of NDFT) | 0 |
| RESULT : ACCEPT. ☐ NOT ACCEPT. ☐ N.A. ☐ | | MAX | (Range: -___/+___ of NDFT) | 0 |

DUST TEST : DUST QUANTITY RATE(1÷5):1 DUST PARTICLE SIZE (1÷5):1

TEST

NOTE:

REMAZEL G. Alber ☐W ☐R

DFT equipment : Thickness gauge Elcometer RE06311 Calibration on smooth surface (correction value=25 µm)

*REMARKS:*

| REDATTO DA<br>*COMPILED FROM* | ISPETTORE<br>*INSPECTOR* | ISPETTORE<br>*INSPECTOR* | CLIENTE<br>*CUSTOMER* |
|---|---|---|---|
| LUCA TRIPOLI AWS 5402 Sea Metal S.r.l. FROSIO LEVEL III | Data emissione 27/11/2024<br>Matteo Biancolillo<br>Frosio Certified # 12558 | Luca Tripoli<br>Frosio Certified # 5402 | ROSETTI MARINO SpA<br>Michele Sacchi<br>Quality Control Dept. |

NACE # 35744
REVIEW 16-12-2024

| SEA METAL SRL | PAINTING REPORT<br>Rapporto di pitturazione | M 02 Rev. 02<br>del 12/05/2023 | | |
|---|---|---|---|---|
| | | PR: | 50/2024 | Date: 22/11/2024 |

| | | | |
|---|---|---|---|
| *Customer:* | Remazel | *Painting Procedure:* | 24-27012-PP-001 |
| *Project :* | Davit Crane | *Place of Activities:* | Sea Metal |
| *Purchase order:* | 240005843 | *Item:* | C09-0001-P0008+C09-0001-P0010+C09-0001-P0074+C09-0001-P0075+C09-0001-P0078 |

***ITEM INSPECTED:***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| STEEL PREPARATION (ISO 8501-3 - GRADE Sa 2 1/2) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| VISUAL CHECK PRIOR TO BLASTING : | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| CLEANING OF PIECE BEFORE BLASTING : | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| SURFACE CLEANLINESS: (ISO 8501-1) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| SURFACE CLEANLINESS: (ISO 8502-3 RATING 2) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| ROUGHNESS : (profile : 75 µm - Medium G) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |

| Tape 1: | Tape 2: | Tape 3: |
|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SALT TEST: (ISO 8502-6, ISO8502-9 ) | <30 mg/m² | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ |
| Result 4,8 (mg/m²) | Result (mg/m²) | Result (mg/m²) | | Result (mg/m²) | | | |
| VISUAL CHECK AFTER TO BLASTING : | | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ |

***EXPOSED EXTERIOR AND INTERIOR SURFACES:***

**FIRST LAYER**

| | | | | |
|---|---|---|---|---|
| DATE : 22/11/24 HOUR : 9:00 | HUMIDITY : | < 85% | | 66,2 |
| TYPE OF COAT : Jotamastic 90 Alu | AIR TEMP.: | > 5°C | | 12,9 |
| PAINT BATCH NUMBER BASE: 3674207-1-*-1:2 | STEEL TEMP.: | MIN. DEW P. + 3 °C. | | 12,8 |
| PAINT BATCH NUMBER CURING AGENT: 3650855-1-*-1:2 | DEW POINT : | | | 6,7 |
| NDFT: 150 µm | THICKNESS RESULT : | | | |
| Used paint: | N° OF READING: | MIN | (Range: -___/+___ of NDFT) | 150 |
| RESULT : ACCEPTABLE ☑ NOT ACCEPTABLE ☐ | 30 | AVERAGE | (Range: -___/+___ of NDFT) | 180 |
| | | MAX | (Range: -___/+___ of NDFT) | 206 |

**SECOND LAYER**

| | | | | |
|---|---|---|---|---|
| DATE : 25/11/24 HOUR : 9:00 | HUMIDITY : | < 85% | | 67,5 |
| TYPE OF COAT : Jotamastic 90 Alu | AIR TEMP.: | > 5°C | | 12,9 |
| PAINT BATCH NUMBER BASE: 3405346-1-*-1:3 | STEEL TEMP.: | MIN. DEW P. +3°C. | | 12,5 |
| PAINT BATCH NUMBER CURING AGENT: 3650855-1-*-1:2 | DEW POINT : | | | 7,0 |
| NDFT: 150 µm | THICKNESS RESULT : | | | |
| Used paint: | N° OF READING: | MIN | (Range: -___/+___ of NDFT) | 294 |
| RESULT : ACCEPTABLE ☑ NOT ACCEPTABLE ☐ | 30 | AVERAGE | (Range: -___/+___ of NDFT) | 335 |
| | | MAX | (Range: -___/+___ of NDFT) | 396 |

**THIRD LAYER**

| | | | | |
|---|---|---|---|---|
| DATE : 26/11/24 HOUR : 9:30 | HUMIDITY : | < 85% | | 68,0 |
| TYPE OF COAT : Hardtop XP RAL 1023 | AIR TEMP.: | > 5°C | | 13,6 |
| PAINT BATCH NUMBER BASE: 3689831-1-*-1:2 | STEEL TEMP.: | MIN. DEW P. +3°C. | | 13,4 |
| PAINT BATCH NUMBER CURING AGENT: 3685294-1-*-1:2 | DEW POINT : | | | 7,9 |
| NDFT: 60 µm | THICKNESS RESULT : | | | |
| Used paint: | N° OF READING: | MIN | (Range: -___/+___ of NDFT) | 340 |
| RESULT : ACCEPTABLE ☑ NOT ACCEPTABLE ☐ | | AVERAGE | (Range: -___/+___ of NDFT) | 413 |
| | | MAX | (Range: -___/+___ of NDFT) | 468 |

**FOURTH LAYER**

| | | | | |
|---|---|---|---|---|
| DATE : HOUR : | HUMIDITY : | < 85% | | |
| TYPE OF COAT : | AIR TEMP.: | > 5°C | | |
| PAINT BATCH NUMBER BASE: | STEEL TEMP.: | MIN. DEW P. +3°C. | | |
| PAINT BATCH NUMBER CURING AGENT: | DEW POINT : | | | |
| NDFT: µm | THICKNESS RESULT : | | | |
| Used paint: | N° OF READING: | MIN | (Range: -___/+___ of NDFT) | 0 |
| RESULT : ACCEPT. ☐ NOT ACCEPT. ☐ N.A. ☐ | | AVERAGE | (Range: -___/+___ of NDFT) | 0 |
| | | MAX | (Range: -___/+___ of NDFT) | 0 |

DUST TEST : DUST QUANTITY RATE(1÷5):1 DUST PARTICLE SIZE (1÷5):1

TEST

NOTE:

DFT equipment : Thickness gauge Elcometer RE06311 Calibration on smooth surface (correction value=25 µm) ☐ W ☐ R

***REMARKS:***

REMAZEL
C. Ziber

| REDATTO DA<br>*COMPILED FROM* | ISPETTORE<br>*INSPECTOR* | ISPETTORE<br>*INSPECTOR* | CLIENTE<br>*CUSTOMER* |
|---|---|---|---|
| Sea Metal S.r.l.<br>Luca Tripoli N°5402 FROSIO LEVEL III | Data emissione: 27/11/2024<br>Matteo Biancolillo<br>Frosio Certified # 12558 | Luca Tripoli<br>Frosio Certified # 5402 | ROSETTI MARINO SpA<br>Michele Sacchi<br>Quality Control Dept.<br>NACE #35744<br>Review 16-12-2024 |

## 10 Commercial items

| X-99001 | | | | | |
|---|---|---|---|---|---|
| **Description** | **Model** | **Manufacturer** | **Q.ty** | **S/N** | **Certificate** |
| | | | | | |
| Hook | S319CN 5t Carbon Shank Hook | CROSBY | 1 | 1028550 | CC8-2024112700053 |
| Wire Rope | 35xK7 | SIRTEF | 4 | 654/24 | 18455/24 |
| Slew bolts | HEX.HEAD SCREW | VIPA | 32 | V2N01586 | 1061/24 |
| Translation Gearbox | G MR ICI 80 UO3A 52 B3 | ROSSI | 1 | 8425792 | 2763177 |
| Lifting Gearbox | G MR 140 U03D 40,6 B3 | ROSSI | 1 | 8425678 | 2763176 |
| Rotation Gearbox | ET3065/MR/208.2/6110460069 0V5 | DANA | 1 | 7017447 | QCMAT31TT0 |
| Rotation Electrical Motor | BAH 100 LB4 | MGM | 1 | 24451509 | \ |
| Hoisting Electrical Motor | BAHK2E 132 MC4 | MGM | 1 | 24451424 | \ |
| Translation Electrical Motor | BAH 90 SA | MGM | 1 | 24451337 | \ |
| Load Cell | PRN 4000kg | PAVONE SISTEMI | 4 | 202415225 | 321386 |

COMPANY WITH
QUALITY SYSTEM
CERTIFIED BY DNV GL
= ISO 9001 =

Crosby Europe N.V.
Leuvensebaan 51
2580 Putte (Mechelen) Belgium
www.thecrosbygroup.com

# Certificate of Conformance

Certificate Number: CC8-2024112700053
Location of Issue: SIRTEF S.r.l.
Via dei Lavoratori 1, Zona Industriale di Calvignasco
Calvignasco (MI), I-20080 Italy
Phone: +39 02 90 059 273 Fax: +39 02 90 059 258

Stock No: 1028550
Description of Gear: S319CN 5t Carbon Shank Hook (JC)
Working Load Limit: 5t | Max. Allowed Proof Load: 10t
t indicates metric tons
Comments: 5:1 Design Factor.
Note: Meets the requirements of ASME B30.10 - Hooks
Has not been contaminated by Mercury or Asbestos in the manufacturing process.
Number of Pieces: 1 Hook: 5WB
PICs are based on visual observation
Certificate based on item being the Crosby product described above.

Mentioned products are in conformity to the Crosby literature available at the time of manufacture. We hereby certify that the above described material was manufactured and processed in a manner compatible to meeting the specified load ratings when used under normal and proper applications. This product at the time of manufacture does not contain any ozone-depleting substances.

This product at the time of manufacture does not exceed the threshold for any of the hazardous listed chemicals in Appendix 1 of MEPC.269(68) 2015 Guidelines.

For Product Delivered To: REMAZEL Engineering S.p.A.
Viale Bianca Maria 25
MILANO (MI) 20122

Supplier (Distributor) Order Number: **4125**
Customer (User) Order Number: **24005969**

Date: November 27, 2024
Date of Issuance

Signature: Lillemor Hjalmefjord
Lillemor Hjalmefjord, Quality Assurance

Robbie x CROSSWIND
27/11/24 R

CERT PRO

Crosby

Scanned image of original Material Chemistry Report for

**Hook of S319CN 5t Carbon Shank Hook (JC) with PIC: 5WB and Heat #: 58037678**

THIS MATERIAL CERTIFICATE DOCUMENT MEETS THE REQUIREMENT OF INSPECTION CERTIFICATE "TYPE 3.1" PER EN 10204

# KREHER STEEL COMPANY, LLC.

**CROSBY-LEBUS MFG.**
HOT ROLLED ROUNDS PCS 1035
1.8750 X 17.5000"
PART NO. 1506693

PO/Rel P065328

I hereby certify that this data is correct as contained in the records of this company.
I hereby certify that no mercury came in contact with or no weld repair was done to this product while in our possession.
Attn:

## Certificate of Mill Test Results

SO 1 -330644-001 22Feb19 Pg 1/1

CERTIFIED MATERIAL TEST REPORT

Page 1/1

GERDAU

US-ML-MIDLOTHIAN
300 WARD ROAD
MIDLOTHIAN, TX 76065
USA

| CUSTOMER SHIP TO | CUSTOMER BILL TO |
|---|---|
| SPECIAL METALS INC<br>6406 S EASTERN AVE<br>OKLAHOMA CITY,OK 73149-5134<br>USA | KREHER STEEL CO LLC<br>1550 N 25TH AVE<br>MELROSE PARK,IL 60160-1801<br>USA |

| GRADE | SHAPE / SIZE | DOCUMENT ID: |
|---|---|---|
| 1035RAF | Round Bar / 1 7/8" | 0000304562 |

| LENGTH | WEIGHT | HEAT / BATCH |
|---|---|---|
| 23'02" | 41,325 LB | 58037678/04 |

| SALES ORDER | CUSTOMER MATERIAL N° |
|---|---|
| 7356230/000010 | B HOT |

SPECIFICATION / DATE or REVISION
ASTM A29-16
ASTM A576-90B(2012)

| CUSTOMER PURCHASE ORDER NUMBER | BILL OF LADING | DATE |
|---|---|---|
| 56385 | 1327-0000314670 | 03/12/2019 |

CHEMICAL COMPOSITION

| C % | Mn % | P % | S % | Si % | Cu % | Ni % | Cr % | Mo % | Sn % | V % | Nb % | Al % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.36 | 0.71 | 0.009 | 0.009 | 0.26 | 0.22 | 0.08 | 0.13 | 0.009 | 0.004 | 0.002 | 0.000 | 0.033 |

CHEMICAL COMPOSITION

| Ti % | B % |
|---|---|
| 0.001 | 0.0006 |

GEOMETRIC CHARACTERISTICS
R:R
1.53

METALLURGICAL CHARACTERISTICS

| FinsGr | E381 S | E381 R | E381-C | E45M-C S | E45M-C O |
|---|---|---|---|---|---|
| OK | 1 | 1 | 1 | 0 | 0 |

HARDENABILITY
DI A255
Inch
1.12

COMMENTS / NOTES

CG-L-3

The above figures are certified chemical and physical test records as contained in the permanent records of company. We certify that these data are correct and in compliance with specified requirements. This material, including the billets, was melted and manufactured in the USA. CMTR complies with EN 10204 3.1.

BHASKAR YALAMANCHILI
QUALITY DIRECTOR
Phone: (409) 267-1071 Email: Bhaskar.Yalamanchili@gerdau.com

WADE LUMPKINS
QUALITY ASSURANCE MGR
Phone: 972-779-3118 Email: Wade.Lumpkins@gerdau.com

Doc No. 1-

27/11/24

# QUALITY CONTROL

| RAPPORTO DI PROVA N. *Test Report No.* | 24/1886RP01 | DATA *Date* | 22/11/2024 | CAMPIONE N. *Sample No.* | --- | PAGINA *Page* | 1 | DI *of* | 3 |
|---|---|---|---|---|---|---|---|---|---|

Laboratory of Medolago, Via Roma 79 - 24030 Medolago (BG) t.+39 035 901473 e-mail:info@qualitycontrolgroup.com website: www.qualitycontrolgroup.com

**ORDINE** / *Order* 2617
*Data ordine / Order date* 19/11/2024

**RIFERIMENTO** / *Reference* *3977/BM*
*Data riferimento / Reference date* *15/11/2024*

**DATA DI RICEZIONE** *Reception date* 20/11/2024

CLIENTE / Customer

**SIRTEF S.r.l.**
Via dei Lavoratori, 1 – Zona Industriale
20080 Calvignasco (MI)

**DATA DI ACCETTAZIONE** *Acceptance date* 20/11/2024

**OGGETTO** 100% Controllo UT e MT
**Subject** *100% UT & MT examination*

| ELENCO DELLE PROVE / List of tests | Metodo / *Method* | Saggio / *Test* | Pagina / *Sheet* |
|---|---|---|---|
| Controllo mediante ultrasuoni *Ultrasonic examination* | EN 10228.3 | - | 2 |
| Controllo magnetoscopico *Magnetic particle examination* | EN 10228.1 | - | 3 |
| - | - | - | - |
| - | - | - | - |
| - | - | - | - |
| - | - | - | - |
| - | - | - | - |
| - | - | - | - |

Alessandro Donadoni Vice Direttore Tecnico / Technical Deputy Manager

La firma digitale o la firma autografa sul rapporto certifica la sua validità. L'originalità del rapporto è garantita dalla tracciabilità nel sistema PEC utilizzata per la sua consegna al cliente / *The digital or hand-written signature on report certifies its validity. The originality of the relationship is guaranteed by the traceability of the PEC system used for delivery to customer.*
La regola decisionale utilizzata dal laboratorio quando fornisce dichiarazioni di conformità a norme o specifiche è riportata nel sito web www.qualitycontrolgroup.com / *The decision rule used by the laboratory when providing declarations of compliance with standards or specifications is shown in www.qualitycontrolgroup.com website.*
Il campionamento è effettuato dal cliente; i risultati delle prove si riferiscono al campione così come ricevuto / *Sampling is carried out by the customer; test results refer to the sample as received.*
Il laboratorio è responsabile di ogni informazione riportata nel presente rapporto di prova ad eccezione delle informazioni fornite dal cliente rispetto alle quali declina ogni responsabilità / *The laboratory is responsible for any information reported in this report except for the information provided by the customer with the respect to which it disclaims any responsibility.*

CARATTERISTICHE DEL CAMPIONE DICHIARATE DAL CLIENTE / Features of sample declared by customer

| | Descrizione *Description* | Dimensioni *Dimension* | Fornitore *Supplier* | Colata/Lotto *Heat/Lot* | Certificato *Certificate* | Data *Date* |
|---|---|---|---|---|---|---|
| Parent material | - | - | - | - | - | - |

Other features
No.1 CROSBY SHANK HOOK S 319-C
SWL 5 T. S.N.1028550
**SIRTEF JOB: 4125**

Il presente rapporto di prova riguarda esclusivamente il campione esaminato, non può essere riprodotto neanche parzialmente senza l'autorizzazione del Laboratorio ed è conservato in copia conforme all'originale nell'archivio del Laboratorio. I tempi di conservazione dei rapporti, dei documenti e delle parti dei saggi e delle provette sono riportate nel sito web www.qualitycontrolgroup.com / *This test report only concerns the examined sample, it can not be even partially reproduced without the authorization of the Laboratory and his certified copy is stored in the original in the archive of the Laboratory. The storage times of reports, documents and parts of the sample and the test piece are shown in www.qualitycontrolgroup.com website.*

Tutte le prove riportate nelle pagine seguenti sono state eseguite presso SIRTEF S.r.l.
*All tests reported in the following pages were carried out at SIRTEF S.r.l.*

Robbi x CROSSWIND
27/11/24

Ente di Collaudo / Surveyor Ente di Collaudo / Surveyor

Laboratory of Medolago, Via Roma 79 - 24030 Medolago (BG) t.+39 035 901473 e-mail:info@qualitycontrolgroup.com website: www.qualitycontrolgroup.com

## ESAME MEDIANTE ULTRASUONI
*ULTRASONIC EXAMINATION*

| | |
|---|---|
| **Specifica di riferimento** *Reference standard* | - |
| **Criterio di accettabilità** *Acceptance criteria* | EN 10228.3 cl.3 |
| **Stadio di lavorazione** *Working step* | FINITO / FINISHED |
| **Condizioni superficiali** *Surface conditions* | GRILLO/GREEN PIN MOLATO (Grinded) PERNO/PIN VERNICIATO (painted) |

**Strumento utilizzato** */ Instrument used*

| Costruttore/Manufacture | Tipo/Type | Nr.Serie/SN | Ident Q.C. |
|---|---|---|---|
| GE TECHN. | USM GO | 10010308 | SA 135 |

**Blocco di riferimento** *Reference block*

☒ IIW V1 ☐ IIW V2

**Riflettore di riferimento** *Reference reflector*

☐ BW Amp. 80% ☒ FBH 3 mm Amp. 80% ☐ SDH 2.5 mm Amp. 80% ☒ Intaglio Notch Tipo type ret Profondità Depth 5 %sp. %Thk Amp. 80%

**Accoppiante** */ Couplant*

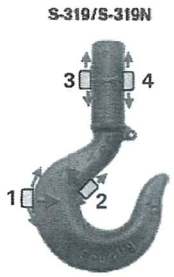
☐ Acqua / Water ☐ Glicerina / Glycerin ☒ Gel ☐ Cellulosa / Tylose

**Sonde utilizzate, posizione di scansione** */ Search units used and scanning position*

| Costruttore *Manufacturer* | Tipo *Type* | Dimensioni *Dimensions* | Numero di serie *Serial Number* | Tipo e lunghezza cavo *Type and length of cable* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S&T | SDUT 4P3,5x10 | Ø10 | 160123 | Coaxiale L= 2000 mm | X | X | X | X | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

La tabella soprastante fa riferimento alle posizioni di scansione indicate nello schizzo sotto / The above matrix referes to the scanning position number showed on the sketch below

**Schizzo posizioni di scansione / Scanning position sketch**




**Regolazione Strumenti / Instruments setting**

| | | | |
|---|---|---|---|
| Sonda *Search unit* | SDUT 4P3,5x10 | Sonda *Search unit* | Sonda *Search unit* |
| Pos. di scansione nr. *Scanning position No.* | 1-2-3-4 | Pos. di scansione nr. *Scanning position No.* | Pos. di scansione nr. *Scanning position No.* |
| Scala / *Range* | 120 | Scala / *Range* | Scala / *Range* |
| Ritardo / *Delay* | 10164 µs | Ritardo / *Delay* | Ritardo / *Delay* |
| Guadagno / *Gain* | 59,1 dB | Guadagno / *Gain* | Guadagno / *Gain* |
| Rip. Imp. / *PRF* | 500 Hz | Rip. Imp. / *PRF* | Rip. Imp. / *PRF* |
| Damping | 1000 Ohm | Damping | Damping |
| Soglia / *Reject* | 0 | Soglia / *Reject* | Soglia / *Reject* |
| Banda / *Band* | 4 Mhz | Banda / *Band* | Banda / *Band* |

**RISULTATI/***Result* L'esame NON ha evidenziato indicazioni rilevanti / *Examination has not shown relevant indication*

**Dichiarazione di conformità**
La superficie esaminata risulta conforme ai requisiti previsti dalle norme di accettabilità summenzionate
**Statement of Conformity**
The examined surface comply with the requirements of the acceptability standards mentioned above

Data inizio prova *Test start date* **21/11/2024** Data fine prova *Test end date* **21/11/2024** Tecnico qualificato *Qualified technician* Cortinovis Andrea Liv.2 - ISQ9712 IIºLiv. SNT-TC-1A RT - MT - UT Apparecchiatura *Equipment* ---

Ente di Collaudo / Surveyor Ente di Collaudo / Surveyor

Laboratory of Medolago, Via Roma 79 - 24030 Medolago (BG) t.+39 035 901473 e-mail:info@qualitycontrolgroup.com website: www.qualitycontrolgroup.com

# ESAME MAGNETOSCOPICO - UNI EN 10228.1

*MAGNETIC PARTICLE INSPECTION - UNI EN 10228.1*

| | |
|---|---|
| **Specifica di riferimento** *Reference standard* | ------ |
| **Criterio di accettabilità** *Acceptance criteria* | UNI EN 10228.1 Lev.3 |
| **Stadio di lavorazione** *Working step* | FINITO / FINISHED |
| **Condizioni superficiali** *Surface conditions* | GRILLO/GREEN PIN MOLATO (Grinded) - PERNO/PIN VERNICIATO (painted) |

## TECNICA / *TECHNIQUE*

| | ■ Giogo *Yoke* | □ Puntali *Prods* | □ Bobina *Coil* | □ Contatto diretto *Direct contact* | □ Condut. centrale *Central conductor* |
|---|---|---|---|---|---|
| **Tipo di corrente** *Current type* | ■ CA AC □ CC DC | □ CA AC □ CC DC | □ CA AC □ CC DC | □ CA AC □ CC DC | □ CA AC □ CC DC |
| **Intensità** *Intensity* | Non applicabile *Not applicable* | A | A-spire *A-turns* | A | A |
| **Strumento** *Equipment* | TWIST YOKE | | | | |
| **Nr. di serie** *Serial number* | SA104 | | | | |
| **Dimensioni** *Size* | Distanza poli *Pole spacing* 180 mm | Distanza puntali *Prod spacing* mm | Diametro bobina *Coil diameter* 350 mm | | |
| **Altro** *Other* | Verificato potere di sollevamento a *Lifting power verified at* 4,5 Kg | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **RIVELATORE** *MEDIUM* | | □ Secco *Dry* | ■ Umido *Wet* | | |
| **Produttore** *Manufacturer* | NDT ITALIANA | **Tipo** *Type* | FW1 (batch 160218s) | **Colore** *Colour* | NERO |
| **Strumento di illuminazione** / *Lighting equipment* | Bulb Lamp | | | | |
| **Intensità di luce sulla superficie** / *Light intensity on the surface* | ≥1100 Lux | | | | |

## ALTRI STRUMENTI UTILIZZATI / *OTHER USED EQUIPMENTS*

| | **Produttore** / *Manufacturer* | **Tipo** / *Type* | **Nr. di serie** / *Serial nr.* |
|---|---|---|---|
| **Indicatore** / *Field indicator* | NDT Italiana | INDICATORE DI CAMPO OTTOGONALE | 1009113 (SA169) |
| **Luxmetro/Radiometro** / *Radiometer* | Delta Ohm | Delta Ohm HD2302.0 | 16001682 (SA136) |

☒ CONFORME *Conform* ☐ NON CONFORME *Not Conform*

Discontinuità rilevate / *Detected discontinuities:* Nessuna discontinuità rilevata / *absence of surface discontinuities*

NOTE: Magnetismo residuo zero
*residual magnetism zero*

**Risultato** / ***results*** ***CONFORME*** / ***conform***

Data inizio prova / *Test start date* **21/11/2024** Data fine prova / *Test end date* **21/11/2024** Tecnico qualificato / *Qualified technician* **Cortinovis Andrea** *Liv.2 - ISO9712 Liv. SNT-TC-1A RT - MT - UT* Apparecchiatura / *Equipment* ---

***FINE RAPPORTO*** / *END REPORT*

Ente di Collaudo / Surveyor

Ente di Collaudo / Surveyor

CROSSWIND

# Certificate of Conformity

SIRTEF s.r.l.
20080 Calvignasco (MI) - Via dei Lavoratori, 1

Dichiarazione di conformità CE in accordo al D.Lgs 17/2010 e alla direttiva 2006/42/CE
Declaration EC of conformity according to D.Lgs 17/2010 and directive 2006/42/EC

| | |
|---|---|
| Calvignasco, | 17-12-24 |
| **Certificato / Certificate** | 20643/24 |
| DdT / Document Num. | 4408/BM |
| Ordine / Purchase Order | 24007371 |

Cliente / Customer
REMAZEL Engineering Spa
Via Carlo Ottavio Cornaggia, 10
20123 MILANO (MI)

| | | |
|---|---|---|
| QUANTITÀ / QUANTITY | m. | 107 |
| BOBINA / REEL | N. | 1331 |
| DIAMETRO NOMINALE / NOMINAL DIAMETER | mm. | 10,000 |
| MASSA NOMINALE/ NOMINAL WEIGHT | kg/mt | 0,490 |
| RIVESTIMENTO / COATING | | GALVANIZED LUBRICATED |
| PREFORMAZIONE / PREFORMED | | NO |
| FORMAZIONE / CONSTRUCTION | | VEROTOP |
| AVVOLGIMENTO / TYPE OF LAY | | RHLL |
| RESISTENZA DEI FILI / TENSILE STRENGTH | N/mmq | 1.960,000 |
| CARICO DI ROTTURA MINIMO / M.B.L.* | kN | 95,400 |
| NORMA RIFERIMENTO / STANDARD | | EN 12385-4 / EN 13411-4 |

NOTE / REMARKS POS 1 Cod. 002-0011-C1956 CSS 299 AT ONE END ONLY

*M.B.L.: Minimum Breaking Load

I Prodotti forniti sono marcati in accordo alle normative tecniche di riferimento.
The products supplied are marked according to the reference technical standards.

**DICHIARAZIONE CE DI CONFORMITÀ / CE DECLARATION OF CONFORMITY**

Si dichiara che il materiale descritto risponde ed è conforme alla vigente Direttiva Comunitaria Macchine 2006/42/CE. Si segnala inoltre che non ne è consentito un utilizzo diverso da quello indicato nelle istruzioni di assemblaggio ed utilizzo consultabili al sito internet www.sirtef.it. Il fascicolo tecnico è disponibile presso la nostra sede.
We declare under our sole responsibility that the product to which this declaration relates is in conformity with the regulation of 2006/42/CE. It is a precondition to put it into service that the instructions for use has been read and understood. Instructions for use available on our site www.sirtef.it for your convenience. The relevant technical documentation is available upon request.

Questo prodotto al momento della manifattura non eccede le soglie massime di nessuna delle sostanze chimiche pericolose contenute nel documento MEPC.269(68) 2015 Appendice 1
This product at the time of manufacture does not exceed the threshold for any of the hazardous listed chemicals in Appendix 1 of MEPC.269(68) 2015 Guidelines.

SIRTEF s.r.l
General Manager
Dott. M. Martucci

Member of CISQ Federation RINA CERTIFIED MANAGEMENT SYSTEM ISO 9001

Si dichiara inoltre che SIRTEF S.r.l. opera in conformità ai requisiti del proprio sistema di qualità Aziendale, realizzato in accordo alla normativa EN ISO 9001-2015 di riferimento.
We also declare that SIRTEF S.r.l. operates in compliance with the requirements of its corporate quality system, created in accordance with the reference standard EN ISO 9001-2015

# INSPECTION CERTIFICATE 3.1

**This certificate is issued in accordance with: EN 10204 3.1**
**Certificato emesso in accordo a: EN 10204 3.1**

SIRTEF

Client / Cliente:

REMAZEL ENGINEERING
Via Caboto, 26
34147 TRIESTE (TS)

Spett.
REMAZEL Engineering Spa
Via Carlo Ottavio Cornaggia, 10
20123 MILANO (MI)

| No. 20643/24 | Data: 17/12/2024 |
|---|---|

| | |
|---|---|
| **Descrizione / Description** | POS 1 Cod. 002-0011-C1956 CSS 299 AT ONE END ONLY |
| **Specifiche Cliente / Customer specification** | POS 1 Cod. 002-0011-C1956 |

| | |
|---|---|
| **Ordine Num./ PO No.** | 24007371 |
| **DDT / delivery note** | 4408/BM |

| | |
|---|---|
| **Bobina No.** | **1331** |
| **Reel No.** | |

| | |
|---|---|
| **Articolo / Article** | HFAZD10RALLA |
| **Diametro Nominale / Nominal Diameter** | mm 10 |
| **Peso al metro / Weight per meter** | Kg/m 0,490 |
| **Finitura filo elementare / surface Finish of wire** | GALVANIZED LUBRICATED |
| **Lubrificazione / Lubrication** | A4 |
| **Formazione / Construction** | VEROTOP |
| **Preformazione / Preforming** | NO |
| **Avvolgimento / Type of lay** | RHLL |
| **Materiale fili / Wire Material** | EN 10264-2 |
| **Resistenza dei fili / Rope grade** | N/mmq 1960 |
| **Carico di rottura Minimo / Min. Breaking Load** | kN 95,400 |
| **Gruppo RCN / RCN class** | |

| **Specifiche di fornitura / Supply specification** | |
|---|---|
| **Lunghezza Fune / Rope length** | 107 |
| **Applicazioni / application** | CSS 299 AT ONE END ONLY ID. CD0991 |
| **Efficienza terminazione / termination efficiency** | Testa fusa / Socketing = 100 % of/di MBF |
| | Pressatura / swaging = 90 % of/di MBF |

| **Extra / Extra requirement** | |
|---|---|
| **Carico di rottura effettivo / Actual breaking load** | kN |
| **Diametro effettivo / Actual diameter** | mm 10,40 |
| **Marcature aggiuntive / additional Marking** | SIRTEF 20643/24-1 |

SIRTEF s.r.l
General Manager
Dott. M. Martucci

Via dei Lavoratori, 1
20080 Calvignasco (MI) - Zona Industriale
Tel.: 0290059273 (6 linee ric. aut.) - Telefax 0290059258
Filiale di Roma: Via Libero Leonardi, 4 - 00173 ROMA - Tel. 06266098 - Fax. 062677606
Filiale di Udine: Via G. D'Annunzio, 9/8 - Loc. Crosada - 33050 S.Maria La Longa (UD)
Tel. 0432.685022 - Fax. 0432685033

verope
rely on

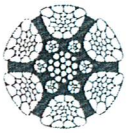
# Certificate

**Sirtef Srl**
**Zona Industriale**
**Via dei Lavoratori 1**
**IT-20080 Calvignasco**

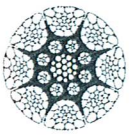
**Ship-to:**
Sirtef Srl
Zona Industriale
Via dei Lavoratori 1
IT-20080 Calvignasco

**Your Reference:** P.O.N.19.736
**Our Reference:** AB36404
**Invoice No:** 48046

**Zug, 09.03.18**

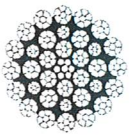


**Serial No:** 328966
N° Série, Serie-Nr., Numéro de serie, Numero di lotto



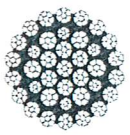
**Reel No:** 3100-5
N° bobine, Rollen Nr., Bobina numéro, Bobina numero

**Product:** Verotop, 10mm, galv. 1960, RHLL
Produit, Produkt, Producto, Articolo



**Construction:**
Construction, Konstruktion, Construcción, Costruzione

**Your Article No.:** AAZWT3710D
Votre numéro d'article, Ihre Artikel Nr., Su número de articulo, Vostro codice articolo



**Length:** 3'000 M
Longueur, Länge, Longitud, Lunghezza



**Minimum Breaking Load:** 95.4 kN
Charge de rupture minimale, Mindest Bruchkraft, Carga mínima de rotura, Carico minimo di rottura

**Calculated Breaking Load:** 113.6 kN
Charge de rupture calculée, Rechnerische Bruchkraft, Carga calculada de rotura, Carico di rottura calcolato



**Actual Breaking Load:** 97.3 kN
Charge de rupture à l'essai, Effektive Bruchkraft, Carga de rotura actual, Carico di rottura effettivo

**Wgt per m:** 0.490 kg
Poids métrique, Gewicht pro Meter, Peso por metro, Peso al metro



**Test Date:** 21.12.17
Date d'essai, Test Datum, Fecha de la prueba, Data collaudo

**Production Reference:**
Référence de production, Produktions-Referenz, Referencia de producción, Riferimento di produzione

**Remarks:** Ends: fused and tapered
Actual diam: 10.31mm
Remarques, Bemerkungen, Observaciones, Commenti

CE

The certificate was issued in accordance with DIN EN 10204 3.1
Ce certificat est établi conformément la norme DIN EN 10204 3.1
Dieses Zertifikat wurde erstellt aufgrund der Bestimmungen von DIN EN 10204 3.1
Este certificado fué expedido en concordancia con la norma DIN EN 10204 3.1
Questo certificado è stato emesso in accordo alla norma DIN EN 10204 3.1

verope
St. Antons Gasse 4a
CH-6300 Zug ZG
Switzerland
Tel: +41 41 72 80 880

Signature
Pierre Verreet
CEO

KISWIRE
25, Hamansandan 4-gil, Gunbuk-myeon, Haman-gun, Gyeongsangnam-do, 52061, Korea
TEL:+82-55-583-0475 FAX:+82-55-585-0475 www.kiswire.com

INVOICE NO. CW-7122/10 DATE *Jan. 10, 2018*

# MILL TEST CERTIFICATE

**THIS IS TO CERTIFY THAT THE MATERIAL DESCRIBED BELOW WAS MANUFACTURED IN ACCORDANCE WITH KISWIRE LTD SPECIFICATION AND APPLICABLE SECTIONS OF BUYER SPEC ( 1960 N/sq.mm )**

TO MESSRS VEROPE AG

MATERIAL DESCRIPTION VEROTOP (GALVANIZED)

3000 M X 1 REEL

EX NO. CW-7122/10

ORDER NO. 3100 REEL NO. 5 SAMPLING NO. 5

DIAMETER OF ROPE 10.00 mm TYPE OF CORE

ACTUAL DIAMETER 10.30 - 10.36 mm

SPECIFIED BREAKING LOAD 95.4 kN SAMPLE BROKE AT 97.3 kN

WT. OF ZINC COATING OF OUTER WIRE MIN. 68.000 g/㎡

ROPE LAY RHLL LAY LENGTH 64.68 mm

LUBRICATION A-4

Tested following ASTM A 931

CHEMICAL ANALYSIS OF WIRE ROD

| CHARGE NO. | C X 100 | Si X 100 | Mn X 100 | P X 1000 | S X 1000 |
|---|---|---|---|---|---|
| M47485 | 83 | 19 | 49 | 13 | 4 |

DATE OF SAMPLE TEST *Dec. 21, 2017*

Kang . S . H

Approved by Q.C Manager S.H.KANG
KISWIRE LTD., KOREA

ABS KR NK. G.Lloyd's DNV L.R BV

# Declaration of compliance with the order

EN 10204 Type 2.1

Certificate no. : **C00-33887**

**General information**

| | | | |
|---|---|---|---|
| Customer | : Sirtef S.R.L. | Ropeblock sales order no. | : 225062 |
| Purchase order no. | : 29991 | | |
| P.O. date | : Nov-2022 | | |
| Quantity | : 10 | | |

**Ropeblock Product information**

Ropeblock article code : CSS 299.GAL

Description : Galvanised closed spelter socket, quenched and tempered cast steel, no. 299.
For wire rope ø14-16mm (9/16"-5/8"). MBL 25 mT.

| Description | Quantity | Heat No. / Marking | Remarks |
|---|---|---|---|
| Closed spelter socket | 9 | CD0991 | |
| Closed spelter socket | 1 | CD1085 | |

**We hereby certify that:**

The above mentioned product is in accordance with the requirements of the sales order confirmation

**EC:**

The undersigned certifies on behalf of his company, that the above mentioned product is correct and that the intended hoisting equipment or application continued can be declared according the regulations of the Machine Directive2006/42/EC, appendix II-A or II-B, after assembly. Products must not be put in service until the final application has been declared in conformity with the provisions in the2006/42/EC directive.

**Reference standards, used (partly or as whole) where applicable and considered state of the art:**

- EN 13001, 13135, 13411, 818, 1677, 13889
- ISO 4301, 4308, 8087, 3189, 9927, 17558
- NEN 3318, NEN 3320, 3508, 3305, 2729
- Standards and rules as mentioned in the contract and/ or drawings.
- DIN 15400, 15401, 15402, 15018, 15020, 15061, 15063, 82017
- FEM 1.001, 5.004
- US Fed. Spec. RR-S550D, RR-C-271

**Signed for and on behalf of Ropeblock B.V. / The Netherlands**

**Name:** G. Boevenbrink / Quality Manager

**Date:** 09-Jan-2023

# Inspection Certificate

EN 10204 - 3.1

ROPEBLOCK

| Description | Material | Heat No. / Marking |
|---|---|---|
| CSS 299 | A352 Gr.LCC | CD0991 |

## Mechanical Properties

| Heat No. / Marking | $R_m$ (Tensile strength) (N/mm²) | $R_e$ (Yield) (N/mm²) | A (Elongation) (%) | Z (Reduction of area) (%) | Impact test (ISO V) | | Hardness (HB) |
|---|---|---|---|---|---|---|---|
| | | | | | T (°C) | (J) | |
| CD0991 | 575 | 345 | 28 | 57 | -40 | 56-58-57 | 157 |

## Chemical Analysis

| Heat No. / Marking | C % | Si % | Mn % | S % | P % | Ni % | Cr % | Mo % | Cu % | Va % | Nb % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CD0991 | 0,19 | 0,453 | 1,2 | 0,021 | 0,011 | 0,108 | 0,029 | 0,008 | 0,239 | 0,002 | |

## Remarks

MT/UT: Satisfactory, free of internal cracks/ seperations which may effect utilization.

## We hereby certify that:

- The reported values are strictly in accordance with the original mill certificates.

**Signed for and on behalf of Ropeblock B.V. / The Netherlands**

**Name:** G.Boevenbrink / Quality Manage

**Date:** 27-9-2022

MANAGEMENTSYSTEEM CERTIFICATIE DNV·GL ISO 9001

4.811/6

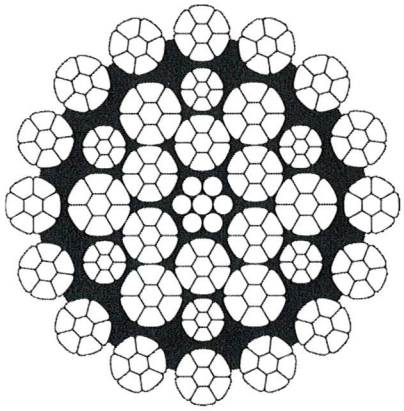
| SIRTEF<br>UNI EN ISO 9001:2015 with Rina Service<br>Certificates n° 666/97/S | TRADE OF STEEL WIRE ROPES, FIBRE BELTS AND ROPES, ALLOY STEEL ACCESSORIES, H.R. CHAINS. PRODUCTION OF STEEL WIRE SLINGS AND WEBBING SLINGS. LIFTING MATERIALS TESTING AND INSPECTION. TRAINING COURSES DEDICATED TO THE USE AND MAINTENANCE OF ROPES AND LIFTING ACCESSORIES<br>Web site: https://www.sirtef.it | | Nr Document<br>**16/R/2025** |
|---|---|---|---|
| | **FUNI DI ACCIAIO: CERTIFICATO DI PROVA**<br>Steel Wire Rope: Test Certificate | | Foglio - Sheet |
| | Module Nr: QA/200 | date: 27/06/2023 Rev 00 | **1 - 1** |

| | | | |
|---|---|---|---|
| CLIENTE<br>Customer | REMAZEL Engineering S.p.A. | COMMESSA SIRTEF<br>Sirtef Job | 4875 |
| ORDINE CLIENTE<br>Customer Order | 24007371 | NUMERO DI PRATICA ENTE TERZO<br>Third party file no. | - |

| | |
|---|---|
| DESCRIZIONE<br>Description | Cod. 002-0011-C1956<br>Nr. 1 Galvanized steel wire rope VEROTOP D. 10 mm. res. 1960 N/mm² RHLL MBL 95,4 kN with CSS 299 (Batch: **CD0991**) at one end, other end free.<br>L=107 m. |

**DATI DELLA FUNE**
Rope data

| | |
|---|---|
| BOBINA<br>Reel | 1331 |
| DIAMETRO NOMINALE<br>Nominal diameter | 10 mm. |
| FINITURA FILO ELEMENTARE<br>Surface finish of wire | ZINCATA LUBRIFICATA / Galvanized lubricated |
| LUBRIFICAZIONE<br>Lubrication | A4 |
| FORMAZIONE<br>Construction | Verotop (class 35xK7) |
| PREFORMAZIONE<br>Preforming | NON PREFORMATA / Not preformed |
| AVVOLGIMENTO<br>Type of Lay | PARALLELO DESTRO / RHLL |
| MATERIALE FILI<br>Wire material | EN 10264-2 |
| RESISTENZA DEI FILI<br>Rope grade | 1960 N/mm² |
| CARICO DI ROTTURA MINIMO<br>Minimum breaking load | 95,4 kN |
| CERT. DEL PRODUTTORE<br>Manufacturer certificate | VEROPE N.328966 reel n.3100-5 dated 06.10.2017 |



| | |
|---|---|
| MARCATURE<br>Marking | SIRTEF CE 20643/24 |

| **DATI RILEVATI - Recorded data** | |
|---|---|
| DIAMETRO RILEVATO (1/10 M.B.L.)<br>Actual diameter (1/10 M.B.L.) | 10,2 mm. |
| CARICO DI ROTTURA EFFETTIVO<br>Actual breaking strenght | 107,2 kN |

| **STRUMENTI UTILIZZATI – Instrument used** | | | |
|---|---|---|---|
| STRUMENTO<br>Intrument | BANCO PROVA MPT 01<br>Test bench MPT 01 | CALIBRO DIGITALE CA 01<br>Digital caliper CA 01 | BINDELLA METRICA BM 01<br>Rule BM 01 |
| CERT. TARATURA<br>Calibration cert. | TMT 42984 dated 16/01/2025 | Calibration card January 2025 | Initial calibration |

| | |
|---|---|
| NOTE<br>Remark | |

**ESITO DELLE PROVE – Test outcome**

| ☒ CONFORME - COMPLIANT | ☐ NON CONFORME – NON-COMPLIANT |
|---|---|

| DATA<br>Date | RESPONSABILE C.Q.<br>Quality Manager | ISPETTORI<br>Inspector |
|---|---|---|
| 28/01/2025 | SIRTEF S.r.l. - Certified Quality - BERTOLOTTI | Crosswind 28/1/25 |

Il presente documento è di proprietà esclusiva della ditta SIRTEF S.r.l. Tale documento non può essere modificato in nessuna sua parte né può essere usato diversamente per lo scopo per cui è stato creato senza permesso scritto della ditta stessa.
This document is the exclusive property of SIRTEF S.r.l. This document cannot be modified in any part nor can it be used otherwise for the purpose for which it was created without the written permission of the company itself.

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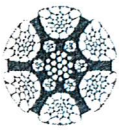
# Certificate

Sirtef Srl
Zona Industriale
Via dei Lavoratori 1
IT-20080 Calvignasco

Ship-to:
Sirtef Srl
Zona Industriale
Via dei Lavoratori 1
IT-20080 Calvignasco

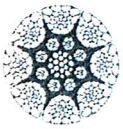
Your Reference: P.O.N.19.736
Our Reference: AB36404
Invoice No: 48046

Zug, 09.03.18



**Serial No:** 328966
N° Série, Serie-Nr., Numéro de serie, Numero di lotto

**Reel No:** 3100-5
N° bobine, Rollen Nr., Bobina numéro, Bobina numero



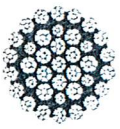
**Product:** Verotop, 10mm, galv. 1960, RHLL
Produit, Produkt, Producto, Articolo

**Construction:**
Construction, Konstruktion, Construcción, Costruzione



**Your Article No.:** AAZWT3710D
Votre numéro d'article, Ihre Artikel Nr., Su número de articulo, Vostro codice articolo

**Length:** 3'000 M
Longueur, Länge, Longitud, Lunghezza



**Minimum Breaking Load:** 95.4 kN
Charge de rupture minimale, Mindest Bruchkraft, Carga mínima de rotura, Carico minimo di rottura

**Calculated Breaking Load:** 113.6 kN
Charge de rupture calculée, Rechnerische Bruchkraft, Carga calculada de rotura, Carico di rottura calcolato



**Actual Breaking Load:** 97.3 kN
Charge de rupture à l'essai, Effektive Bruchkraft, Carga de rotura actual, Carico di rottura effettivo

**Wgt per m:** 0.490 kg
Poids métrique, Gewicht pro Meter, Peso por metro, Peso al metro



**Test Date:** 21.12.17
Date d'essai, Test Datum, Fecha de la prueba, Data collaudo

**Production Reference:**
Référence de production, Produktions-Referenz, Referencia de producción, Riferimento di produzione

**Remarks:** Ends: fused and tapered
Actual diam: 10.31mm
Remarques, Bemerkungen, Observaciones, Commenti

CE

The certificate was issued in accordance with DIN EN 10204 3.1
Ce certificat est établi conformément la norme DIN EN 10204 3.1
Dieses Zertifikat wurde erstellt aufgrund der Bestimmungen von DIN EN 10204 3.1
Este certificado fué expedido en concordancia con la norma DIN EN 10204 3.1
Questo certificado è stato emesso in accordo alla norma DIN EN 10204 3.1

verope
St. Antons Gasse 4a
CH-6300 Zug ZG
Switzerland
Tel: +41 41 72 80 880

Signature
Pierre Verreet
CEO

TRUE COPY
OF THE ORIGINAL
SIRTEF S.r.l.

28/1/25 R

KISWIRE
25, Hamansandan 4-gil, Gunbuk-myeon, Haman-gun, Gyeongsangnam-do, 52061, Korea
TEL:+82-55-583-0475 FAX:+82-55-585-0475 www.kiswire.com

INVOICE NO. CW-7122/10 DATE *Jan. 10, 2018*

# MILL TEST CERTIFICATE

**THIS IS TO CERTIFY THAT THE MATERIAL DESCRIBED BELOW WAS MANUFACTURED IN ACCORDANCE WITH KISWIRE LTD SPECIFICATION AND APPLICABLE SECTIONS OF BUYER SPEC ( 1960 N/sq.mm )**

TO MESSRS VEROPE AG

MATERIAL DESCRIPTION VEROTOP (GALVANIZED)

3000 M X 1 REEL

EX NO. CW-7122/10

ORDER NO. 3100 REEL NO. 5 SAMPLING NO. 5

DIAMETER OF ROPE 10.00 mm TYPE OF CORE

ACTUAL DIAMETER 10.30 - 10.36 mm

SPECIFIED BREAKING LOAD 95.4 kN SAMPLE BROKE AT 97.3 kN

WT. OF ZINC COATING OF OUTER WIRE MIN. 68.000 g/㎡

ROPE LAY RHLL LAY LENGTH 64.68 mm

LUBRICATION A-4

Tested following ASTM A 931

CHEMICAL ANALYSIS OF WIRE ROD

| CHARGE NO. | C X 100 | Si X 100 | Mn X 100 | P X 1000 | S X 1000 |
|---|---|---|---|---|---|
| M47485 | 83 | 19 | 49 | 13 | 4 |

DATE OF SAMPLE TEST *Dec. 21, 2017*

Kang . S . H

Approved by Q.C Manager S.H.KANG
KISWIRE LTD., KOREA

ABS KR NK. G.Lloyd's DNV L.R BV

Rotor x CROSSWIND
28/1/25 R

# Declaration of compliance with the order

EN 10204 Type 2.1

ROPEBLOCK

Certificate no. : **C00-33887**

**General information**

| | | | |
|---|---|---|---|
| Customer | : Sirtef S.R.L. | Ropeblock sales order no. | : 225062 |
| Purchase order no. | : 29991 | | |
| P.O. date | : Nov-2022 | | |
| Quantity | : 10 | | |

**Ropeblock Product information**

Ropeblock article code : CSS 299.GAL

Description : Galvanised closed spelter socket, quenched and tempered cast steel, no 299.
For wire rope ø14-16mm (9/16"-5/8"). MBL 25 mT.

| Description | Quantity | Heat No. / Marking | Remarks |
|---|---|---|---|
| Closed spelter socket | 9 | CD0991 | |
| Closed spelter socket | 1 | CD1085 | |

**We hereby certify that:**

The above mentioned product is in accordance with the requirements of the sales order confirmation

**EC:**

The undersigned certifies on behalf of his company, that the above mentioned product is correct and that the intended hoisting equipment or application continued can be declared according the regulations of the Machine Directive2006/42/EC, appendix II-A or II-B, after assembly. Products must not be put in service until the final application has been declared in conformity with the provisions in the2006/42/EC directive.

**Reference standards, used (partly or as whole) where applicable and considered state of the art:**

- EN 13001, 13135, 13411, 818, 1677, 13889
- ISO 4301, 4308, 8087, 3189, 9927, 17558
- NEN 3318, NEN 3320, 3508, 3305, 2729
- Standards and rules as mentioned in the contract and/ or drawings.
- DIN 15400, 15401, 15402, 15018, 15020, 15061, 15063, 82017
- FEM 1.001, 5.004
- US Fed. Spec. RR-S550D, RR-C-271

fobbn x CROSSWIND
28/1/25 R

TRUE COPY
OF THE ORIGINAL
SIRTEF S.r.l.

**Signed for and on behalf of Ropeblock B.V. / The Netherlands**

**Name:** G. Boevenbrink / Quality Manager

**Date:** 09-Jan-2023

# Inspection Certificate

EN 10204 - 3.1

ROPEBLOCK

| Description | Material | Heat No. / Marking |
|---|---|---|
| CSS 299 | A352 Gr.LCC | CD0991 |

## Mechanical Properties

| Heat No. / Marking | $R_m$ (Tensile strength) (N/mm²) | $R_e$ (Yield) (N/mm²) | A (Elongation) (%) | Z (Reduction of area) (%) | Impact test (ISO V) T (°C) | Impact test (ISO V) (J) | Hardness (HB) |
|---|---|---|---|---|---|---|---|
| CD0991 | 575 | 345 | 28 | 57 | -40 | 56-58-57 | 157 |

## Chemical Analysis

| Heat No. / Marking | C % | Si % | Mn % | S % | P % | Ni % | Cr % | Mo % | Cu % | Va % | Nb % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CD0991 | 0,19 | 0,453 | 1,2 | 0,021 | 0,011 | 0,108 | 0,029 | 0,008 | 0,239 | 0,002 | |

## Remarks

MT/UT: Satisfactory, free of internal cracks/ seperations which may effect utilization.

**We hereby certify that:**

- The reported values are strictly in accordance with the original mill certificates.

**Signed for and on behalf of Ropeblock B.V. / The Netherlands**

**Name:** G.Boevenbrink / Quality Manage

**Date:** 27-9-2022

CROSSWIND
28/1/25

4.811/6

DNV·GL ISO 9001

# Certificate of Conformity

SIRTEF s.r.l.
20080 Calvignasco (MI) - Via dei Lavoratori, 1

Dichiarazione di conformità CE in accordo al D.Lgs 17/2010 e alla direttiva 2006/42/CE
Declaration EC of conformity according to D.Lgs 17/2010 and directive 2006/42/EC

Calvignasco, 17-12-24
**Certificato / Certificate** 20643/24
DdT / Document Num. 4408/BM
Ordine / Purchase Order 24007371

Cliente / Customer
REMAZEL Engineering Spa
Via Carlo Ottavio Cornaggia, 10
20123 MILANO (MI)

| | | |
|---|---|---|
| QUANTITÀ / QUANTITY | m. | 107 |
| BOBINA / REEL | N. | 1331 |
| DIAMETRO NOMINALE / NOMINAL DIAMETER | mm. | 10,000 |
| MASSA NOMINALE/ NOMINAL WEIGHT | kg/mt | 0,490 |
| RIVESTIMENTO / COATING | | ZINCATA LUBRIFICATA / GALVANIZED LUBRICATED |
| PREFORMAZIONE / PREFORMED | | NO |
| FORMAZIONE / CONSTRUCTION | | VEROTOP |
| AVVOLGIMENTO / TYPE OF LAY | | PARALLELO DESTRO / RHLL |
| RESISTENZA DEI FILI / TENSILE STRENGTH | N/mmq | 1.960,000 |
| CARICO DI ROTTURA MINIMO / M.B.L.* | kN | 95,400 |
| NORMA RIFERIMENTO / STANDARD | | EN 12385-4 / EN 13411-4 |

NOTE / REMARKS Cod. 002-0011-C1956
Nr. 1 Galvanized steel wire rope VEROTOP D. 10 mm. res. 1960 N/mm2 RHLL MBL 95,4 kN with CSS 299 (Batch: CD0991) at one end, other end free. L=107 m.

VEROPE CERTIFICATE No. 328966 reel n.3100-5 dated 06.10.2017

*M.B.L.: Minimum Breaking Load

I Prodotti forniti sono marcati in accordo alle normative tecniche di riferimento.
The products supplied are marked according to the reference technical standards.

**DICHIARAZIONE CE DI CONFORMITÀ / CE DECLARATION OF CONFORMITY**

Si dichiara che il materiale descritto risponde ed è conforme alla vigente Direttiva Comunitaria Macchine 2006/42/CE. Si segnala inoltre che non ne è consentito un utilizzo diverso da quello indicato nelle istruzioni di assemblaggio ed utilizzo consultabili al sito internet www.sirtef.it. Il fascicolo tecnico è disponibile presso la nostra sede.
We declare under our sole responsibility that the product to which this declaration relates is in conformity with the regulation of 2006/42/CE. It is a precondition to put it into service that the instructions for use has been read and understood. Instructions for use available on our site www.sirtef.it for your convenience. The relevant technical documentation is available upon request.

Questo prodotto al momento della manifattura non eccede le soglie massime di nessuna delle sostanze chimiche pericolose contenute nel documento MEPC.269(68) 2015 Appendice 1
This product at the time of manufacture does not exceed the threshold for any of the hazardous listed chemicals in Appendix 1 of MEPC.269(68) 2015 Guidelines.

SIRTEF s.r.l
General Manager
Dott. M. Martucci

Robot x CROSSWIND
28/1/25

Si dichiara inoltre che SIRTEF S.r.l. opera in conformità ai requisiti del proprio sistema di qualità Aziendale, realizzato in accordo alla normativa EN ISO 9001-2015 di riferimento.
We also declare that SIRTEF S.r.l. operates in compliance with the requirements of its corporate quality system, created in accordance with the reference standard EN ISO 9001-2015

BOLLETTINO DI COLLAUDO INTERNO N. 103/18 DEL 09-03-18

| | | | | |
|---|---|---|---|---|
| BOBINA | 1331 | | | |
| LUNGHEZZA | Mt. 3.000,000 | | | |
| DIAMETRO NOMINALE | mm. 10,000 | | | |
| DIAMETRO RILEVATO SU BOBINA | mm. 10,400 | | | |
| DIAMETRO RILEVATO AD 1/10 C.R | mm. | | | |
| PESO NOMINALE | Kg/Mt | | | |
| PESO EFFETTIVO | Kg/Mt | | | |
| FORMAZIONE | VEROTOP 35X7 ANTIGIREVOLE / NON ROTATING | | | |
| AVVOLGIMENTO | PARALLELO DESTRO | | | |
| ZINCATA | SI | | | |
| GRADO ZINCATURA | B | | | |
| COMPATTATA | SI | | | |
| RESISTENZA UNITARIA | 1.960 | | | |
| DIAMETRO FILI ELEMENTARE | mm. | | | |
| CARICO DI ROTTURA MINIMO | 9.727,938 | KG | 95,400 | KN |
| CARICO DI ROTTURA EFFETTIVO | 9.921,681 | KG | 97,300 | KN |
| CARICO DI ROTTURA ADDIZIONALE | | KG | | KN |
| RILEVATO DA | Produttore | | | |
| PROVE ESEGUITE | Rottura | | | |
| ESITO | | | | |
| FORNITORE | Verope AG | | | |
| **NUMERO CERTIFICATO FORNITORE** | N.328966 reel n.3100-5 del 06.10.2017 | | | |

Il Responsabile
di Laboratorio
G.F. CALAMITA

Il Responsabile
Garanzia Qualità
A. BERTOLOTTI

TRASDUTTORI MISURE TARATURE

T.M.T. s.r.l.
Via Reano, 5
10040 RIVALTA DI TORINO (TO)
Tel. 011 90 91 004 - E-mail: info@tmt-tarature.it

**Centro di Taratura LAT 017**
*Calibration Centre*
**Laboratorio Accreditato di Taratura**
*Accredited Calibration Laboratory*

ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO

LAT 017
Membro degli Accordi di Mutuo Riconoscimento EA, IAF, e ILAC
Signatory of EA, IAF and ILAC Mutual Recognition Agreements



# CERTIFICATO DI TARATURA LAT 017 N. 42984
*Certificate of Calibration*

- data di emissione / *date of issue*: 2025/01/16
- cliente / *customer*: **SIRTEF s.r.l.**
  Zona Industriale - Via dei Lavoratori, 1
  20080 CALVIGNASCO (MI)
- destinatario / *receiver*: **SIRTEF s.r.l.**
  Zona Industriale - Via dei Lavoratori, 1
  20080 CALVIGNASCO (MI)

Il presente certificato di taratura è emesso in base all'accreditamento LAT 017 rilasciato in accordo ai decreti attuativi della legge n.273/1991 che ha istituito il Sistema Nazionale di Taratura (SNT). ACCREDIA attesta le capacità di misura e di taratura, le competenze metrologiche del Centro e la riferibilità delle tarature eseguite ai campioni nazionali e internazionali delle unità di misura del Sistema Internazionale delle Unità (SI).
Questo certificato non può essere riprodotto in modo parziale, salvo espressa autorizzazione scritta da parte del Centro.

*This certificate of calibration is issued in compliance with the accreditation LAT 017 granted according to decrees connected with Italian law No. 273/1991 which has established the National Calibration System. ACCREDIA attests the calibration and measurement capability, metrological competence of the Centre and the traceability of calibration results to the national and international standards of the International System of Units (SI).*
*This certificate may not be partially reproduced, except with the prior written permission of the issuing Centre.*

**Si riferisce a**
*Referring to*

| | |
|---|---|
| - oggetto / *item* | MACCHINA DI PROVA MATERIALI |
| - costruttore / *manufacturer* | VENETA FUNI |
| - modello / *model* | BP150 |
| - matricola / *serial number* | MT113 |
| - data di ricevimento oggetto / *date of receipt of item* | // |
| - data delle misure / *date of measurements* | 2025/01/16 |
| - registro di laboratorio / *laboratory reference* | M09 pag. 281 ÷ 284 |

I risultati di misura riportati nel presente Certificato sono stati ottenuti applicando le procedure di taratura citate alla pagina seguente, dove sono specificati anche i campioni o gli strumenti che garantiscono la catena di riferibilità del Centro e i rispettivi certificati di taratura in corso di validità. Essi si riferiscono esclusivamente all'oggetto in taratura e sono validi nel momento e nelle condizioni di taratura, salvo diversamente specificato.
*The measurement results reported in this Certificate were obtained following the calibration procedures given in the following page, where the reference standards or instruments are indicated which guarantee the traceability chain of the laboratory, and the related calibration certificates in the course of validity are indicated as well. They relate only to the calibrated item and they are valid for the time and conditions of calibration, unless otherwise specified.*

Le incertezze di misura dichiarate in questo documento sono state determinate conformemente alla Guida ISO/IEC 98 e al documento EA-4/02. Solitamente sono espresse come incertezza estesa ottenuta moltiplicando l'incertezza tipo per il fattore di copertura k corrispondente ad un livello di fiducia di circa il 95 %. Normalmente tale fattore k vale 2.
*The measurement uncertainties stated in this document have been determined according to the ISO/IEC Guide 98 and to EA-4/02. Usually, they have been estimated as expanded uncertainty obtained multiplaying the standard uncertainty by the coverage factor k corresponding to a confidence level of about 95 %. Normally, this factor k is 2.*

Direzione Tecnica
*Approving Officer*
**M.Vattasso**

CERTIFICATO DI TARATURA LAT 017 N. 42984
*Certificate of Calibration*

**I risultati di misura riportati nel presente Certificato sono stati ottenuti applicando le procedure N.**
*The measurement results reported in this certificate were obtained following procedures No.*
PF/2 rev.5 (UNI EN ISO 7500-1/2018)

**Strumenti/campioni che garantiscono la catena della riferibilità del Centro;**
*Instruments or measurement standards which guarantee the traceability chain of the Centre*
BVK CT1

**Estremi dei certificati di taratura di tali campioni e l'Ente che li ha emessi;**
*Relevant calibration certificates of those standards with the issuing Body;*
24-0199-02 (I.N.RI.M. / CIPM MRA) 22-0704-04 (I.N.RI.M.)

**Luogo di taratura:** *Site of calibration:* effettuata presso il destinatario indicato a pagina 1

**IMPIANTO DI PROVA:**

**Costruttore** VENETA FUNI **Tipo** BP150 **Matricola** MT113

**CARATTERISTICHE:**

**Portata** 1500 kN
**Principio di funzionamento** elettro-idraulico
**Per prove a** trazione ad asse orizzontale

**MISURATORE :** dinamometro TMT tipo T/S serie n.AQG portata 1500 kN

**INDICATORE :** numerico dell'amplificatore-condizionatore TMT tipo DM20000-F20 serie n.SFF

**CLASSIFICAZIONE secondo NORMA UNI EN ISO 7500-1** [§ 7 tab.2]**:**

**SCALA 1500 kN** (*)
**Classe 0,5** per forze da 200 kN a 1000 kN
Il segnale di calibrazione è risultato nel corso della verifica corrispondente a 1132,4 kN

**SCALA 1000 kN**
**Classe 0,5** per forze ≥ 100 kN
Il segnale di calibrazione è risultato nel corso della verifica corrispondente a 779,6 kN

**SCALA 400 kN**
**Classe 0,5** per forze ≥ 40 kN
Il segnale di calibrazione è risultato nel corso della verifica corrispondente a 305,9 kN

**SCALA 100 kN**
**Classe 2** per forze ≥ 5 kN
**Classe 1** per forze ≥ 10 kN
**Classe 0,5** per forze ≥ 20 kN
Il segnale di calibrazione è risultato nel corso della verifica corrispondente a 77,75 kN

(*) il controllo della scala 1500 kN è stata fatta fino alla forza massima di 1000 kN come concordato in fase d'ordine

Nei controlli preliminari è stata fatta l'ispezione generale dell'impianto di prova; non sono state riscontrate anomalie

**I valori riportati nel certificato sono quelli rilevati nella condizione "come trovato"**

il relatore
M. Brunetto

28/1/25

# CERTIFICATO DI TARATURA LAT 017 N. 42984
*Certificate of Calibration*



*Tabella 1*

**MACCHINA DI PROVA MATERIALI** VENETA FUNI **Serie n.** MT113 **Portata** 1500 kN

**MISURATORE:** dinamometro TMT tipo T/S serie n.AQG portata 1500 kN

**INDICATORE:** condizionatore TMT tipo DM20000-F20 serie n.SFF

**Scala** 1500 kN **1 divisione =** 200 N **Risoluzione** (r) 200 N

**CONTROLLO A :** TRAZIONE **Validità del controllo:** TRAZIONE

| Forza indicata $F_i$ [kN] | Forza misurata [kN] | | | Media forze misurate $\overline{F}_{123}$ [kN] | Incertezza U * [ % ] | Errore relativo [ % ] | |
|---|---|---|---|---|---|---|---|
| | Ciclo 1 $F_1$ | Ciclo 2 $F_2$ | Ciclo 3 $F_3$ | | | ripetibilità $b$ | accuratezza $q$ |
| 200 | 200,15 | 200,09 | 200,38 | 200,21 | 0,16 | 0,14 | -0,10 |
| 400 | 400,30 | 400,06 | 400,42 | 400,26 | 0,12 | 0,09 | -0,06 |
| 600 | 600,35 | 600,12 | 600,54 | 600,34 | 0,11 | 0,07 | -0,06 |
| 800 | 799,61 | 799,52 | 799,77 | 799,63 | 0,10 | 0,03 | 0,05 |
| 1000 | 998,6 | 998,5 | 998,8 | 998,6 | 0,10 | 0,03 | 0,14 |
| | Errore relativo dello zero $f_0$ [%] | | | | | | |
| | 0,00 | 0,02 | 0,00 | | | | |

| | | |
|---|---|---|
| **Risoluzione relativa** (a) ≤ 0,10 % | **Temperatura** (9 ±1) °C | **Tecnico** MB |

**CLASSIFICAZIONE SECONDO NORMA UNI EN ISO 7500-1** [§ 7 tab.2] **- CLASSE** 0,5

segnale di calibrazione = 1132,4 kN

28/1/15

* U incertezza estesa di taratura (k=2) relativa alla media delle forze misurate determinata secondo le indicazioni riportate nell'allegato C della norma UNI EN ISO 7500-1

**DINAMOMETRI CAMPIONI UTILIZZATI**

| Costruttore | Matricola n° | Portata [kN] | Certificato N° | Scadenza Cert. | Classe |
|---|---|---|---|---|---|
| T.M.T. | BVK | 1000 | 24-0199-02 (INRIM / CIPM MRA) | 26/04/2026 | 0,5/1 |

41851

# CERTIFICATO DI TARATURA LAT 017 N. 42984
*Certificate of Calibration*



*Tabella 2*

**MACCHINA DI PROVA MATERIALI** VENETA FUNI **Serie n.** MT113 **Portata** 1500 kN

**MISURATORE:** dinamometro TMT tipo T/S serie n.AQG portata 1500 kN

**INDICATORE:** condizionatore TMT tipo DM20000-F20 serie n.SFF

**Scala** 1000 kN **1 divisione =** 200 N **Risoluzione** (*r*) 200 N

**CONTROLLO A :** TRAZIONE **Validità del controllo:** TRAZIONE

| Forza indicata $F_i$ [kN] | Forza misurata [kN] | | | Media forze misurate $\overline{F}_{123}$ [kN] | Incertezza U * [ % ] | Errore relativo [ % ] | |
|---|---|---|---|---|---|---|---|
| | Ciclo 1 $F_1$ | Ciclo 2 $F_2$ | Ciclo 3 $F_3$ | | | ripetibilità *b* | accuratezza *q* |
| 100 | 100,36 | 100,08 | 100,29 | 100,24 | 0,25 | 0,28 | -0,24 |
| 200 | 200,36 | 200,24 | 200,20 | 200,27 | 0,14 | 0,08 | -0,13 |
| 400 | 400,38 | 400,17 | 400,25 | 400,27 | 0,11 | 0,05 | -0,07 |
| 600 | 600,32 | 599,85 | 600,05 | 600,07 | 0,11 | 0,08 | -0,01 |
| 800 | 799,45 | 799,62 | 799,55 | 799,54 | 0,10 | 0,02 | 0,06 |
| 1000 | 998,9 | 998,3 | 998,9 | 998,7 | 0,11 | 0,06 | 0,13 |
| | Errore relativo dello zero $f_0$ [%] | | | | | | |
| | 0,00 | 0,00 | 0,00 | | | | |

| | | |
|---|---|---|
| **Risoluzione relativa** (*a*) ≤ 0,20 % | **Temperatura** (9 ±1) °C | **Tecnico** MB |

**CLASSIFICAZIONE SECONDO NORMA UNI EN ISO 7500-1** [§ 7 tab.2] **- CLASSE** vedere pag.2

segnale di calibrazione = 779,6 kN

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28/1/25 R

* U incertezza estesa di taratura (k=2) relativa alla media delle forze misurate determinata secondo le indicazioni riportate nell'allegato C della norma UNI EN ISO 7500-1

**DINAMOMETRI CAMPIONI UTILIZZATI**

| Costruttore | Matricola n° | Portata [kN] | Certificato N° | Scadenza Cert. | Classe |
|---|---|---|---|---|---|
| T.M.T. | BVK | 1000 | 24-0199-02 (INRIM / CIPM MRA) | 26/04/2026 | 0,5/1 |

41851

# CERTIFICATO DI TARATURA LAT 017 N. 42984
*Certificate of Calibration*



*Tabella 3*

**MACCHINA DI PROVA MATERIALI** VENETA FUNI **Serie n.** MT113 **Portata** 1500 kN

**MISURATORE:** dinamometro TMT tipo T/S serie n.AQG portata 1500 kN

**INDICATORE:** condizionatore TMT tipo DM20000-F20 serie n.SFF

**Scala** 400 kN **1 divisione =** 100 N **Risoluzione** (r) 100 N

**CONTROLLO A :** TRAZIONE **Validità del controllo:** TRAZIONE

| Forza indicata $F_i$ [kN] | Forza misurata [kN] Ciclo 1 $F_1$ | Ciclo 2 $F_2$ | Ciclo 3 $F_3$ | Media forze misurate $\overline{F}_{123}$ [kN] | Incertezza U * [%] | Errore relativo [%] ripetibilità $b$ | accuratezza $q$ |
|---|---|---|---|---|---|---|---|
| 40 | 39,845 | 39,986 | 39,997 | 39,943 | 0,33 | 0,38 | 0,14 |
| 80 | 79,833 | 80,003 | 80,087 | 79,974 | 0,24 | 0,32 | 0,03 |
| 80 | 80,019 | 79,819 | 79,844 | 79,894 | 0,21 | 0,25 | 0,13 |
| 160 | 159,90 | 159,66 | 159,76 | 159,77 | 0,14 | 0,15 | 0,14 |
| 240 | 239,53 | 239,63 | 239,62 | 239,59 | 0,11 | 0,04 | 0,17 |
| 320 | 319,54 | 319,40 | 319,43 | 319,46 | 0,11 | 0,04 | 0,17 |
| 400 | 399,32 | 399,36 | 399,23 | 399,30 | 0,10 | 0,03 | 0,17 |
| | Errore relativo dello zero $f_0$ [%] | | | | | | |
| | 0,03 | 0,00 | 0,00 | | | | |

**Risoluzione relativa** (a) ≤ 0,25 % **Temperatura** (9 ±1) °C **Tecnico** MB

**CLASSIFICAZIONE SECONDO NORMA UNI EN ISO 7500-1** [§ 7 tab.2] **- CLASSE** vedere pag.2

segnale di calibrazione = 305,9 kN

28/1/25

* U incertezza estesa di taratura (k=2) relativa alla media delle forze misurate determinata secondo le indicazioni riportate nell'allegato C della norma UNI EN ISO 7500-1

**DINAMOMETRI CAMPIONI UTILIZZATI**

| Costruttore | Matricola n° | Portata [kN] | Certificato N° | Scadenza Cert. | Classe |
|---|---|---|---|---|---|
| TMT<br>T.M.T. | BGI<br>BVK | 100<br>1000 | 190-2024 (T.M.T. / ACCREDIA LAT 017)<br>24-0199-02 (INRIM / CIPM MRA) | 17/11/2026<br>26/04/2026 | 0,5<br>0,5/1 |

41851

# CERTIFICATO DI TARATURA LAT 017 N. 42984
*Certificate of Calibration*



*Tabella 4*

**MACCHINA DI PROVA MATERIALI** VENETA FUNI **Serie n.** MT113 **Portata** 1500 kN

**MISURATORE:** dinamometro TMT tipo T/S serie n.AQG portata 1500 kN

**INDICATORE:** condizionatore TMT tipo DM20000-F20 serie n.SFF

**Scala** 100 kN **1 divisione =** 50 N **Risoluzione** (r) 50 N

**CONTROLLO A :** TRAZIONE **Validità del controllo:** TRAZIONE

| Forza indicata $F_i$ [kN] | Forza misurata [kN] Ciclo 1 $F_1$ | Ciclo 2 $F_2$ | Ciclo 3 $F_3$ | Media forze misurate $\overline{F}_{123}$ [kN] | Incertezza U * [ % ] | Errore relativo [ % ] ripetibilità $b$ | accuratezza $q$ |
|---|---|---|---|---|---|---|---|
| 5 | 4,9532 | 4,9876 | 4,9481 | 4,9630 | 0,96 | 0,80 | 0,75 |
| 10 | 9,911 | 9,938 | 9,916 | 9,922 | 0,45 | 0,27 | 0,79 |
| 20 | 19,963 | 19,956 | 19,981 | 19,967 | 0,24 | 0,13 | 0,17 |
| 40 | 39,947 | 39,951 | 39,962 | 39,953 | 0,14 | 0,04 | 0,12 |
| 60 | 59,951 | 59,943 | 59,982 | 59,959 | 0,13 | 0,07 | 0,07 |
| 80 | 79,937 | 79,903 | 79,971 | 79,937 | 0,12 | 0,09 | 0,08 |
| 100 | 99,89 | 99,90 | 99,96 | 99,92 | 0,12 | 0,07 | 0,08 |
| | Errore relativo dello zero $f_0$ [%] 0,00 | 0,05 | 0,00 | | | | |

**Risoluzione relativa** (a) ≤ 1,00 % | **Temperatura** (9 ±1) °C | **Tecnico** MB

**CLASSIFICAZIONE SECONDO NORMA UNI EN ISO 7500-1** [§ 7 tab.2] - **CLASSE** vedere pag.2

segnale di calibrazione = 77,75 kN

Roberto + CROSSWIND
28/1/25

* U incertezza estesa di taratura (k=2) relativa alla media delle forze misurate determinata secondo le indicazioni riportate nell'allegato C della norma UNI EN ISO 7500-1

**DINAMOMETRI CAMPIONI UTILIZZATI**

| Costruttore | Matricola n° | Portata [kN] | Certificato N° | Scadenza Cert. | Classe |
|---|---|---|---|---|---|
| TMT | BGI | 100 | 190-2024 (T.M.T. / ACCREDIA LAT 017) | 17/11/2026 | 0,5 |

41851

# SIRTEF s.r.l.

| SCHEDA TARATURA STRUMENTO | DOC. QA 11A<br>Rev.0 |
|---|---|

| | |
|---|---|
| TIPO STRUMENTO<br>**Calibro digitale** | PROCEDURA DI TARATURA<br>**SP 002** |
| MATRICOLA<br>**CA 01 (SERIALE: 2102912)** | VERIFICA<br>**Mesi 12** |
| CAMPO DI MISURA **0-100 mm.** | VERIFICATO IL<br>**14.01.2025** |
| REPARTO<br>**Laboratorio Collaudi** | PROSSIMA VERIFICA<br>**14.01.2026** |
| NORMATIVA | FIRMA C.Q. |
| STRUMENTO UTILIZZATO PER LA TARATURA<br>**Blocchetti pianparalleli BJ 01 (SERIALE 302214), certificato mec control s.r.l. nr.48789** | |
| NOTE | |

| QUOTA NOMINALE mm. | VALORE NOMINALE mm. | TOLLERANZA INFERIORE AMMESSA mm. | TOLLERANZA SUPERIORE AMMESSA mm. | MISURATO mm. | IDONEO | DATA E FIRMA VERIFICATORE |
|---|---|---|---|---|---|---|
| 1,03 | 1,03 | 5/100 | 5/100 | 1,03 | SI | |
| 1,60 | 1,60 | 5/100 | 5/100 | 1,60 | SI | |
| 2,00 | 2,00 | 5/100 | 5/100 | 2,00 | SI | |
| 3,00 | 3,00 | 5/100 | 5/100 | 3,00 | SI | |
| 5,00 | 5,00 | 5/100 | 5/100 | 5,00 | SI | |
| 7,00 | 7,00 | 5/100 | 5/100 | 7,00 | SI | |
| 9,00 | 9,00 | 5/100 | 5/100 | 9,00 | SI | |
| 12,00 | 12,00 | 5/100 | 5/100 | 12,00 | SI | |
| 15,00 | 15,00 | 5/100 | 5/100 | 15,00 | SI | |
| 16,00 | 16,00 | 5/100 | 5/100 | 16,00 | SI | |
| 19,00 | 19,00 | 5/100 | 5/100 | 19,00 | SI | |
| 23,00 | 23,00 | 5/100 | 5/100 | 22,99 | SI | |
| 25,00 | 25,00 | 5/100 | 5/100 | 24,99 | SI | |
| 50,00 | 50,00 | 5/100 | 5/100 | 49,99 | SI | |
| 75,00 | 75,00 | 5/100 | 5/100 | 74,99 | SI | |
| 100,00 | 100,00 | 5/100 | 5/100 | 99,99 | SI | |

Robbi x CROSSWIND
28/1/25 R

**VIPA S.p.A.**
via Cantonazzo 20/22
42047 Rolo -RE-
Tel: +39(0)522 658900
Fax: +39(0)522 015338
E-mail: info@vipaspa.it
Website: www.vipaspa.it

By VIPA buy better

**UNI EN ISO 9001:2015 CERTIFIED**

## CERTIFICATO DI COLLAUDO/ EN 10204 Cert.n° 1061/24

*INSPECTION CERTIFICATE*

**(vers. 3.1)**

Cliente / Customer : **VITERIE BAL.BI SRL**

Si certifica che il/i prodotto/i sotto indicato/i consegnato/i dalla ditta VIPA S.p.A. con DDT n° CF324-040859 del 04/11/24 è conforme alle norme UNI, DIN, ISO, EN riportate. E' stato adottato un piano di campionamento conforme alla ANSI/ASME B18. 18. 2M. Sono state effettuate le prove dimensionali e le tolleranze riscontrate sono conformi alla normativa UNI EN ISO 898-1:2013. Rientrano altresì in detta normativa i materiali ed i trattamenti superficiali relativi.
*We certify that the product we delivered along with our transport document n° CF324-040859 dated 04/11/24 is tested and suits the Standards UNI, ISO, DIN, EN indicated.*
*We have made all dimensional tests on the lot we produced, tolerances we measured are conform to the norm UNI EN ISO 898-1:2013. Steel and surface treatments comply the above mentioned standards.*

Descrizione / *Description* : **VITE TESTA ESAGONALE / HEX. HEAD SCREW UNI 5739**
Classe / *Class of material* : **10.9**
Misura / *Size* : **M24x140**
Trattamento / *Surface treatment* : **GREZZO / PLAIN**
Lotto / *Lot* : **V2N01586**
Marcatura / *Marking* : ◊◊

In particolare l'acciaio impiegato rientra nella seguente composizione / *The steel used has given the following analysis*

| | | | |
|---|---|---|---|
| **C** | *0.2188 %* | **S** | *0.0081 %* |
| **P** | *0.0115 %* | **B** | *0.0016 %* |
| **Mn** | *0.804 %* | **Si** | *0.203 %* |
| **Cr** | *1.01 %* | **Ti** | *0.0283 %* |
| **Ni** | *0.017 %* | **Cu** | *0.016 %* |

Le prove meccaniche eseguite hanno dato i seguenti valori /
*Mechanical tests made on the products included into following additional test*

| | | | **Prescritti** Nominal | **Verificati** Inspection |
|---|---|---|---|---|
| Carico di rottura / *Tensile Ultimate Load* | N | Min. | 367000 | **393402 – 393489** |
| Durezza a cuore / *Core Hardness* | HRC | Min. | 32 | **35 – 36** |
| | | Max. | 39 | |

Rolo, lì 09/12/2024

VIPA Spa
Quality System Manager
Vilson Poppi

| | | |
|---|---|---|
| Rossi | DICHIARAZIONE DI CONFORMITà<br>*COMPLIANCE DECLARATION*<br><br>UNI EN 10204, ref. 3.1 | **F1.83**<br>Rev. 3 del 08/10/22<br>Data rapporto: *Report date:* **14/10/2024** |

| | | | | | |
|---|---|---|---|---|---|
| Cliente: *Customer:* | **RAMAZEL ENGINEERING** | Ordine vendita: *Sales Order:* | **24037173-2** | Q.tà lotto: *Batch Q.ty:* | **1** |
| Cod. prodotto: *Product code:* | **R000308177** | Seriale o Item *Serial or Item:* | **8425792** | | |
| WA: *Work Assembly:* | **2763177** | Descrizione Prodotto: *Product description:* | **G MR ICI 80 UO3A 52 B3** | | |

| **COLLAUDI STANDARD ESEGUITI** ***PERFORMED STANDARD TESTS*** | Docum. Rifer. *Ref. Docum.* | Conf. | Non Conf. | N.A. | Note / Notes |
|---|---|---|---|---|---|
| Controllo funzionamento generale<br>*General operation check* | FPP1.I.4<br>FPP1.I.15 | ✓ | | | |
| Test di tenuta con aria, statico<br>*Air leakage test, static* | FPP1.I.102 | ✓ | | | |
| Verifica visiva della tenuta dinamica olio<br>*Visual check of the dinamic oil seal* | FPP1.I.15 | ✓ | | | |
| Rapporto di trasmissione con rilievo di n1 e n2<br>*Trasmission ratio with n1 & n2 measurement* | FPP1.I.15 | ✓ | | | |

| General notes | Emesso da: Issued by: | **G.Mongelli** |
|---|---|---|

| | | |
|---|---|---|
| Rossi | DICHIARAZIONE DI CONFORMITà<br>*COMPLIANCE DECLARATION*<br><br>UNI EN 10204, ref. 3.1 | **F1.83**<br>Rev. 3 del 08/10/22<br>Data rapporto: *Report date:* **10/09/2024** |

| | | | | | |
|---|---|---|---|---|---|
| Cliente: *Customer:* | **RAMAZEL ENGINEERING** | Ordine vendita: *Sales Order:* | **24037173-1** | Q.tà lotto: *Batch Q.ty:* | **1** |
| Cod. prodotto: *Product code:* | **R000308176** | Seriale o Item *Serial or Item:* | **8425678** | | |
| WA: *Work Assembly:* | **2763176** | Descrizione Prodotto: *Product description:* | **G MR ICI 140 UO3D 40,6 B3** | | |

| **COLLAUDI STANDARD ESEGUITI** ***PERFORMED STANDARD TESTS*** | Docum. Rifer. *Ref. Docum.* | Conf. | Non Conf. | N.A. | Note / Notes |
|---|---|---|---|---|---|
| Controllo funzionamento generale<br>*General operation check* | FPP1.I.4<br>FPP1.I.15 | ✓ | | | |
| Test di tenuta con aria, statico<br>*Air leakage test, static* | FPP1.I.102 | ✓ | | | |
| Verifica visiva della tenuta dinamica olio<br>*Visual check of the dinamic oil seal* | FPP1.I.15 | ✓ | | | |
| Rapporto di trasmissione con rilievo di n1 e n2<br>*Trasmission ratio with n1 & n2 measurement* | FPP1.I.15 | ✓ | | | |

| General notes | Emesso da: Issued by: | **G.Mongelli** |
|---|---|---|

# ATTESTATO DI CONFORMITA' - EN 10204 - 2.1

*DECLARATION OF COMPLIANCE - EN 10204 - 2.1 / ATTESTATION DE CONFORMITE - EN 10204 - 2.1 / WERKSBESCHEINIGUNG - EN 10204 - 2.1 / CERTIFICADO DE CONFORMIDAD - EN 10204 - 2.1 / CONFORMITEITSATTEST - EN 10204 - 2.1 / ДЕКЛАРАЦИЯ О СООТВЕТСТВИИ- EN 10204 - 2.1 合格证明- EN 10204 - 2.1*

| | | | |
|---|---|---|---|
| Customer: | **43840 REMAZEL ENGINEERING SPA** | | Quantity: **1** |
| Order line: | **50533327** | **10** | **ZOG** |
| Customer PO: | **24004219 DEL** | | |
| Ship to: | **219934, REMAZEL ENGINEERING S.P.A.** | | |
| ARTICLE CODE: | **B2045232** | | |
| DESCRIPTION: | **ET3065/MR/208.2/61104600690 V5** | | |

**SERIAL NUMBERS:** 07017447

Dana Motion Systems Italia s.r.l dichiara sotto la propria responsabilità, sulla base dei risultati ottenuti dai test standard di verifica effettuati sui prodotti costruiti con gli stessi materiali e con lo stesso metodo di produzione, che i prodotti specificati sopra, sono conformi alle prescrizioni dell'ordine ed alle regole tecniche corrispondenti ai regolamenti ufficiali.

Dana Motion Systems Italia s.r.l under its own responsibility, based on results of its standard tests aimed to verify products manufactured using the same materials and production method, declares that the products hereabove specified fully comply with order prescriptions and with all technical norms corresponding to official regulations.

La Sté Dana Motion Systems Italia s.r.l déclare sous son entière et seule responsabilité, sur la base des résultats obtenus suite aux tests standard de contrôle effectués sur les produits fabriqués à partir des mêmes matériaux et des mêmes procédés de fabrication, que les produits spécifiés précédentement sont conformes aux prescriptions de la commande et aux standards techniques des réglementations officielles.

Dana Motion Systems Italia s.r.l erklärt hiermit vollverntworltlich, auf der Grund der erzielten Ergebnisse der Standard-Prüftests, welche mitgleichen materialen und mit der selben Produktionmethode hergestellten Produkte durchgefuhrt wurden, dass das vorgenannte Produkt den auftragsmassigen Vorschriften, sowie den technischnen Vorschriften der entsprechenden technischen Regeln entspricht.

Dana Motion Systems Italia s.r.l declara bajo su propia responsabilidad, sobre la base de los resultados obtenidos de los ensayos standard de verificación efectuados en los productos fabricados con los mismos materiales y con el mismo método de producción, que los productos ante especificados cumplen las prescripciones del pedido y las reglas técnicas correspondientes a los reglamentos oficiales.

Dana Motion Systems Italia s.r.l. verklaart onder eigen verantwoordelijkheid,alleen op basis van de behaalde resultaten volgendestandaard tests van de controle op producten die zijn vervaardigd uit hetzelfde materiaal en dezelfde fabricageprocessen, dat de hierboven vermelde producten voldoen aan de eisen van de bestelling en technische normen van de officiële regelgeving.

Reggio Emilia,

30.07.2024

DIRETTORE DI PRODUZIONE
*MANUFACTURING DIRECTOR*
DIRECTEUR DE PRODUCTION
*PRODUKTIONSLEITERS*
DIRECTOR DE PRODUCCIÓN

**Fracchioni Claudio**

**Dana Motion Systems Italia S.r.l.**
Via Luciano Brevini, 1/A
42124 REGGIO EMILIA - ITALY
Tel. +39 0522 9281 Fax +39 0522 928200
www.brevini.com

# RAPPORTO DI PROVA - EN 10204 - 2.2
## *TEST REPORT - EN 10204 - 2.2*

| | | | |
|---|---|---|---|
| **CLIENTE:** *CUSTOMER :* | **REMAZEL ENGINEERING SPA** | **CONFERMA D'ORDINE - RIGA:** *ORDER CONFIRMATION - LINE:* | **50533327 ZOG** |
| **ORDINE CLIENTE:** *CUSTOMER ORDER:* | **24004219 DEL** | **DESTINAZIONE FINALE:** *SHIP TO:* | **REMAZEL ENGINEERING S.P.A.** |
| **CODICE ARTICOLO:** *ARTICLE CODE:* | **B2045232** | **QUANTITA':** *QUANTITY:* | **1** |
| **DESCRIZIONE ARTICOLO :** *DESCRIPTION CODE:* | **ET3065/MR/208.2/61104600690 V5** | **ORDINE DI PRODUZIONE:** *MANUFACTURING ORDER:* | **11427171** |

| | |
|---|---|
| **MATRICOLE :** *SERIAL NUMBERS:* | **07017447** |

La Dana Motion Systems Italia s.r.l dichiara sotto la propria responsabilità, sulla base dei risultati ottenuti dai test standard di verifica effettuati sui prodotti costruiti con gli stessi materiali e con lo stesso metodo di produzione, che i prodotti specificati sopra, sono conformi alle prescrizioni dell'ordine ed alle regole tecniche corrispondenti ai regolamenti ufficiali.

*Dana Motion Systems Italia s.r.l under its own responsibility, based on results of its standard tests aimed to verify products manufactured using the same materials and production method, declares that the products hereabove specified fully comply with order prescriptions and with all technical norms corresponding to official regulations.*

Sono stati eseguiti i seguenti test standard non specifici:
*The following non-specific inspection tests were performed:*

| **DESCRIZIONE DEI TEST** *TEST DESCRIPTION* | **RISULTATO** *RESULTS* |
|---|---|
| Prova di tenuta secondo SP001<br>*Seal Test according to SP001* | Approvato<br>*Approved* |
| Prova di rotazione a vuoto secondo SP001<br>*Rotation with no load according to SP001* | Approvato<br>*Approved* |
| Prova del senso di rotazione secondo SP001<br>*Free rotation test according to SP001* | Approvato<br>*Approved* |
| Verifica verniciatura/protettivo secondo SP017<br>*Paint/protective check according to SP017* | Approvato<br>*Approved* |

Quando applicabile:
*Where applicable:*

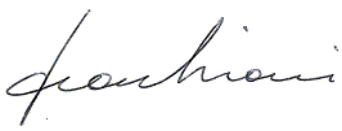
| | |
|---|---|
| Prova di apertura e tenuta freno secondo SP001<br>*Brake engagement and seal test according to SP001* | Approvato<br>*Approved* |
| Verifica livello olio<br>*Oil level check* | Approvato<br>*Approved* |

Reggio Emilia

30.07.2024

DIRETTORE DI PRODUZIONE
MANUFACTURING DIRECTOR
DIRECTEUR DE PRODUCTION
PRODUKTIONSLEITERS
DIRECTOR DE PRODUCCIÓN

**Fracchioni Claudio**



**Dana Motion Systems Italia S.r.l.**
Via Luciano Brevini, 1/A
42124 REGGIO EMILIA - ITALY
Tel. +39 0522 9281 Fax +39 0522 928200
www.brevini.com

**M.G.M. motori elettrici S.p.A.**

**Head Office and Production:**
S.R. 435 Lucchese Km. 31
51034 - Serravalle Pistoiese, Italy
Tel. +39 (0573) 91511
Fax +39 (0573) 518138
http: //www.mgmrestop.com
E-mail: mgm@mgmrestop.com

# Dichiarazione di Conformità UE

Il costruttore:

**M.G.M. motori elettrici S.p.A.**
S.R. 435 Lucchese Km. 31
51034 - Serravalle Pistoiese (PT) **-** ITALY

sotto la propria esclusiva responsabilità, dichiara che i motori asincroni trifase e autofrenanti appartenenti alle tipologie sotto indicate:

**BM / BMX 56÷280**
**BMBM / BMBMX 71÷315**
**BA / BAH / BAX / BAHX 71÷315**
**SM / SMX 56÷315**
**SMR / BAR / BMR 56÷132**

(lettere addizionali che se presenti indicano la presenza di opzioni o varianti: **D**: motore doppia velocità con collegamento Dalhander, **DA:**motore doppia velocità con due avvolgimenti separati, **E**: Encoder, **SV**: servoventilazione radiale, **AV**:servoventilazione assiale, **PV**:volano, **P**:rotore P, **K**:disco K, **F**:doppio disco freno, **G**:carcassa in ghisa, **A**:carcassa in alluminio, **S**:senza ventola di raffreddamento)

sono conformi alle seguenti direttive:

**2014/35/EU** "Bassa tensione"
**2014/30/EU** "Compatibilità elettromagnetica"
**2009/125/EC** "Ecodesign"– Regolamento **(UE) 2019/1781** e successive modifiche
(solo per i motori serie SMX-BAX-BMX-BAHX con potenza nominale 0,12kW≤P<0,75kW e classe di efficenza almeno IE2 e con potenza nominale P ≥0,75 kW con classe di efficenza almeno IE3)
**2011/65/UE** 'Rohs' e successive modifiche

e sono conformi alle seguenti norme:

**EN 60034-1:2010, EN 60034-1:2010/AC:2010; EN IEC 63000:2018;**
**EN 60034-5:2001, EN 60034-5:2001/A1:2007; EN 60034-30-1:2014; EN 60034-2-1:2014**

Informazioni aggiuntive:
L'installazione e la manutenzione del motore devono essere realizzate in conformità a quanto indicato sul manuale d'uso e manutenzione e sulla norma EN 60204 "Equipaggiamento elettrico delle macchine".
Le prescrizioni di compatibilità elettromagnetica (norma EN 60034-1) si applicano ai motori forniti direttamente all'utente finale (per i motori autofrenanti con freno DC può essere richiesto un filtro opzionale, Vi preghiamo di contattarci per maggiori informazioni). I motori destinati ad essere incorporati come componenti in un macchinario il cui involucro ed assemblaggio finale influenzino le emissioni EMC sono soggetti a norme EMC relative al prodotto finale

Luogo e data di rilascio: Serravalle Pistoiese - ITALIA, 01/07/2021

Il Responsabile della Qualità
Ing. Francesco Ghieri



**M.G.M. motori elettrici S.p.A.**

**Head Office and Production:**
S.R. 435 Lucchese Km. 31
51034 - Serravalle Pistoiese, Italy
Tel. +39 (0573) 91511
Fax +39 (0573) 518138
http: //www.mgmrestop.com
E-mail: mgm@mgmrestop.com

# EU Declaration of Conformity

The Manufacturer:

**M.G.M. motori elettrici S.p.A.**
S.R. 435 Lucchese Km. 31
51034 Serravalle Pistoiese (PT) – ITALY

under the sole own responsibility, hereby declares that the three phase asynchronous motors and the brake motors belonging to the following series:

**BM / BMX 56÷280**
**BMBM / BMBMX 71÷315**
**BA / BAH / BAX / BAHX 71÷315**
**SM / SMX 56÷315**
**SMR / BAR / BMR 56÷132**

(additional letters in the motor type code can be added and they identify versions or options eventually installed: **D**:double speed motor with Dalhander connection, **DA:**double speed motor with two separete windings, **E**:Encoder, **SV**:radial forced ventilation, **AV**:axial forced ventilation, **PV**:flywheel, **P**:P rotor, **K**:K brake disk, **F**:double brake disk, **G**:cast iron motor housing, **A**:die cast aluminum housing, **S**:without cooling fan)

comply with the provisions of the following Union harmonisation legislations:

**2014/35/EU** "Low voltage"
**2014/30/EU** "Electromagnetic compatibility"
**2009/125/EC** "Ecodesign"- Commission Regulation (**EU) 2019/1781** and following amendments.
(only for motors belonging to SMX-BAX-BMX-BAHX series with rated power 0,12kW≤P<0,75kW and at least IE2 efficiency level and with rated power P ≥0,75 kW and at least IE3 efficiency level).
**2011/65/EU** "Rohs" and following amendments

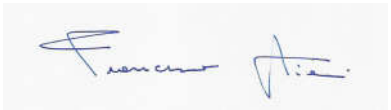
and are in conformity with the following standards:

**EN 60034-1:2010, EN 60034-1:2010/AC:2010; EN IEC 63000:2018;**
**EN 60034-5:2001, EN 60034-5:2001/A1:2007; EN 60034-30-1:2014; EN 60034-2-1:2014**

Additional information:
The motor installation and its maintenance must be realised in conformity with the requirements stated in the use and maintenance booklet and with the EN 60 204 "Electrical Equipment of Industrial Machines" standard.
The Electromagnetic compatibility (EMC) requirements (standard EN 60034-1) apply to motors that are supplied directly to the end-user (for brake motors with DC brake an optional filter could be required. Please contact us for further information).
Motors that are intended for incorporation as components in a machinery, where the enclosure and assembly will affect the EMC emissions, are covered by the EMC standard that relates to the final product.

Place and date of issue: Serravalle Pistoiese, 01/07/2021

Eng. Francesco Ghieri
Quality Manager



Made in Germany

ABNAHMEPRÜFZEUGNIS EN 10204
INSPECTION CERTIFICATE ACCORDING TO 3.1
CERTIFICAT DE RECEPTION

Deutsche Edelstahlwerke

| | |
|---|---|
| Hersteller / Manufacteur / Producteur | Deutsche Edelstahlwerke<br>Specialty Steel GmbH & Co. KG<br>D-57012 SIEGEN |
| Uns. Auftr.-Nr. / Order-No. / Notre Com. No. | 1937569 |
| Besteller / Customer / Client | Swiss Steel Italia Srl |
| Bestell_Nr. / Order-No. / Commande No. | 2058037449 |

SWISS STEEL ITALIA SRL

VIA PRIVATA BERETTA 7
IT-24030-MEDOLAGO

zertifiziert nach: DIN EN ISO 9001
IATF 16949
ISO 14001
DGR 2014/68/EU
PED 2014/68/EU

**Zeugnisnr. 380530 / Seite Page / Page 1 / 4**

| | |
|---|---|
| Werkstoff / Quality / Nuance | 1.4542 /<br>X5CRNICUNB16-4<br>TYPE 630<br>SUS630 |
| Gießverfahren / Casting process / Procédé de coulée | Strangguss<br>Continuous casting<br>Coulée Continue |
| Erschmelzungsart / Melting Furnance / Mode de fusion | Elektrostahl<br>Electric-arc-furnace steel<br>Acier électrique |

| | |
|---|---|
| Vertriebstext / Product / Produit | Stabstahl aus nichtrostendem Stahl<br>Acidur 4542, X5CRNICUNB16-4, 1.4542,<br>TYPE 630 / SUS630<br>gewalzt, abgeschreckt, gerichtet,<br>geschält |

weitere Anforderungen vorhanden, siehe Zusatztexte

| Schmelzen-Nr. Cast No./Coulée No. | Proben-Nr. Test N./Eprouv.N. | Fertigungsauftrag Lot no./Lot fabr. | Pos. Item/Poste | Abmessung Dimensions/Dimensions mm | Stückzahl Quantity / Nombre | Gewicht Weight / Masse KG | Stempel Abnahmebeauftragter Inspector's stamp |
|---|---|---|---|---|---|---|---|
| 115552 | 540205 | 540205 | 001 | 40,00 +0,250/-0,000 RD | | 3834 | WA |

| Schmelzen-Nr. Cast No/Coulée No | % C | % SI | % MN | % P | % S | % CR | % MO | % NI | % V | % W | % CO | % CU | % N | % AL | % NB | % TA | % TA+NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 115552 | 0,023 | 0,32 | 0,64 | 0,018 | <0,001 | 15,18 | 0,170 | 4,49 | 0,050 | 0,02 | 0,041 | 3,14 | 0,0220 | <0,002 | 0,210 | <0,005 | 0,210 |

| Proben-Nr. Test No. Eprouv.N. | Ref. Zust | Probenabm. Samp.Dim. Dim.d'epr. | Problg. Spec.Pos. Pos.d'epr | Zugversuch Tensile test / Essai de traction | | | | | | | | Kerbschlagversuch Impact test / Essai de résilience | | | | | Härteprüfung Hardness Dureté | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Temp °C | RP0,2 MPA | RP1,0 MPA | RM MPA | A5 % | A2" % | Z % | | °C | JOULE | JOULE | JOULE | | | |
| 540205 | R01 | 12.50 mm | L | 23 | 1162 | 1227 | 1231 | 14.5 | 19.4 | 60 | | 23 | 161 | 164 | 165 | DIN EN ISO 148-1 Charpy-V | 332HB | |
| | | 12.47 mm | L | 23 | 811 | 1012 | 1107 | 12.0 | | 40 | | 23 | 105 | 89 | 123 | DIN EN ISO 148-1 Charpy-V | | |

**Schmelze wurde VOD behandelt.**
**Max. 38 HRC**
**H1025/P1070**
**H1025/P1070**
**100% RISSGEPRUEFT OHNE BEANSTANDUNG**

**100% SURFACE CRACK TEST WITHOUT INDICATION**

Das Zeugnis wurde maschinell erstellt und ist gemäß EN 10204 ohne Unterschrift rechtsverbindlich.
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Ce certificat a été établ sur systéme informatique et est valable selon EN 10204 sans signature.

Tel: 0271/808-3918
Fax: 0271/808-2521
Email: daniel.pohl@dew-stahl.com

Datum: 01.04.2022
Pohl
**(Abnahmebeauftragter/ Inspector)**

**Made in Germany**

ABNAHMEPRÜFZEUGNIS — EN 10204
INSPECTION CERTIFICATE ACCORDING TO — 3.1
CERTIFICAT DE RECEPTION

Deutsche Edelstahlwerke

Zeugnisnr. 380530 / Seite Page / Page 2 / 4

| | | | |
|---|---|---|---|
| Besteller / Customer / Client | Swiss Steel Italia Srl | Bestell Nr. / Order-No. / Commande No. | 2058037449 |
| Hersteller / Manufacteur / Producteur | Deutsche Edelstahlwerke Specialty Steel GmbH & Co. KG<br>D-57012 SIEGEN | Uns. Auftr.-Nr. / Order-No. / Notre Com. No. | 1937569/001 |
| | | Proben-Nr. / Test N. / Eprouv.N. | 540205 |

CONTROLE A FISSURE DE 100% SANS DETECTION
Die Lieferung wurde 100 % US-geprüft nach EN 10308 Typ 1a, Tab.2, Qk.4: ohne Beanstandung.
Delivery 100 % US-checked acc. to EN 10308 Typ 1a, Tab.2, Qk.4: satisfactory.
Livraison controlé par 100 % ultrasons selon EN 10308 Typ 1a, Tab.2, Qk.4: satisfaisant.
entspricht auch/also corresponding to/correspond
aussi a: EN 10228-3, Typ 1a, Tab.5, Kl.4/ASTM
A 388/ASME SA 388
Material ist frei von Quecksilberverunreinigungen.
MATERIAL IS FREE FROM MERCURY CONTAMINATION
CWH:
Produit exampt de mercure.
am Material wurde nicht reparaturgeschweißt
no weld repair
Absence de réparation par soudure sur la matière.
MASS UND OBERFLAECHENKONTROLLE: KEINE BEANSTANDUNG
DIMENSIONS AND SURFACE INSPECTION: SATISFACTORY

DIMENSIONS ET SURFACE CONTROLE: SATISFAISANTS
WIR BESTAETIGEN, DASS DIESE LIEFERUNG DEN SCHRIFTLICHEN
VEREINBARUNGEN BEI DER BESTELLUNG ENTSPRICHT
We confirm the production of your order is according to the written
agreement of our order acknowledgement
Nous certifions que la livraison est conforme aux accords
complémentaires par écrit convenus à la commande.
DAS MATERIAL IST FREI VON RADIOAKTIVITÄT
(<0,1Bq/g bezogen auf Co-60).

Herstellland: Deutschland
THE PRODUCT IS FREE FROM RADIOACTIVITY.
(<0,1Bq/g based on Co-60).

Location of production: Germany
LE MATÉRIEL N`EST PAS RADIOACTIF
(<0,1Bq/g basé sur Co-60).

Pays de production: Allemagne
PRUEF. AUF WERKSTOFFIDENTITAET:100% SPEKTROSKOP.OB
TEST TO VERIFY QUAL.:100% SPECTROSC. WITHOUT INDIC.

CONTROLE D'IDENTITE:100% SPECTROS. PAS D'OBJECTION
weitere Anforderungen:
gemäß
EN 10088-3 12-2014 +AT

Das Zeugnis wurde maschinell erstellt und ist gemäß EN 10204 ohne Unterschrift rechtsverbindlich.
This certificate was generated by a data system, acc. to EN 10204, it is valid without signature.
Ce certificat a été établ sur systéme informatique et est valable selon EN 10204 sans signature.

Tel: 0271/808-3918
Fax: 0271/808-2521
Email: daniel.pohl@dew-stahl.com

Datum: 01.04.2022
Pohl
(Abnahmebeauftragter/ Inspector)

**Made in Germany**

ABNAHMEPRÜFZEUGNIS EN 10204
INSPECTION CERTIFICATE ACCORDING TO 3.1
CERTIFICAT DE RECEPTION

Deutsche Edelstahlwerke

**Zeugnisnr. 380530 / Seite Page / Page 3 / 4**

Besteller / Customer / Client: Swiss Steel Italia Srl

Bestell Nr. / Order-No. / Commande No.: 2058037449

Hersteller / Manufacteur / Producteur: Deutsche Edelstahlwerke Specialty Steel GmbH & Co. KG
D-57012 SIEGEN

Uns. Auftr.-Nr. / Order-No. / Notre Com. No.: 1937569/001

Proben-Nr. / Test N. / Eprouv.N.: 540205

EN 10088-5 07-2009
ASTM A564M-19A 09-2019 Condition A
ASME BPVC S.2 P.A SA-564M 07-2019
ASTM F899 12-2012
Analyse gemäß
JIS G 4303 09-2012

---

bar steel made of stainless steel
Acidur 4542, X5CRNICUNB16-4, 1.4542,
TYPE 630 / SUS630
hot rolled, quenched, straightened,
peeled
according to
EN 10088-3 12-2014 +AT
EN 10088-5 07-2009
ASTM A564M-19A 09-2019 Condition A
ASME BPVC S.2 P.A SA-564M 07-2019
ASTM F899 12-2012
analysis acc. to
JIS G 4303 09-2012

---

barre en acier inoxydable
Acidur 4542, X5CRNICUNB16-4, 1.4542,
TYPE 630 / SUS630
laminé, hypertrempe, dressé, écroûté
selon
EN 10088-3 12-2014 +AT
EN 10088-5 07-2009
ASTM A564M-19A 09-2019 Condition A
ASME BPVC S.2 P.A SA-564M 07-2019
ASTM F899 12-2012
analyse suivant
JIS G 4303 09-2012

---

VERFORMUNGSGRAD / HOT FORMING RATIO: 52:1

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This certificate was generated by a data system, acc. to EN 10204, it is valid without signature.
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Datum: 01.04.2022
Pohl
**(Abnahmebeauftragter/ Inspector)**

**Made in Germany**

ABNAHMEPRÜFZEUGNIS
INSPECTION CERTIFICATE ACCORDING TO
CERTIFICAT DE RECEPTION

EN 10204
3.1

Deutsche Edelstahlwerke

**Zeugnisnr. 380530 / Seite Page / Page 4 / 4**

| | | | |
|---|---|---|---|
| **Besteller**<br>**Customer**<br>**Client** | Swiss Steel Italia Srl | **Bestell Nr.**<br>**Order-No.**<br>**Commande No.** | 2058037449 |
| **Hersteller**<br>**Manufacteur**<br>**Producteur** | Deutsche Edelstahlwerke Specialty Steel GmbH & Co. KG<br>D-57012 SIEGEN | **Uns. Auftr.-Nr.**<br>**Order-No.**<br>**Notre Com. No.** | 1937569/001 |
| | | **Proben-Nr.**<br>**Test N.**<br>**Eprouv.N.** | 540205 |

CE

22

0432-CPR-00150-01/02

**Deutsche Edelstahlwerke**
**Specialty Steel GmbH & Co. KG**
**Auestrasse 4**
**Witten**

**1.4542 1X - EN 10088-5**

**warmgewalzter Stab, rund, geschält**
**aus korrossionsbest. Stahl**
**Stahlbauwerken, Metall-/Beton-**
**Verbundbauwerken, Hochbauten**
**und Ingenieurbauwerken**

Leistungserklärung (LE) 1.4542 1X

Die Leistungserklärung (LE) ist zu finden unter: www.dew-stahl.com/1.4542 1X

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Datum: 01.04.2022
Pohl
**(Abnahmebeauftragter/ Inspector)**

**PAVONESISTEMI**

**Pesatura Elettronica Industriale dal 1963**
Via Tiberio Bianchi 11/13/15 - 20863 CONCOREZZO (MB)
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Member of CISQ Federation
RINA CERTIFIED MANAGEMENT SYSTEM ISO 9001

Destinatario 108889
REMAZEL ENGINEERING SPA
VIA CARLO OTTAVIO CORNAGGIA 10
20123 MILANO (MI)

Destinazione merce
REMAZEL ENGINEERING
VIA CABOTO 26
34147 TRIESTE (TS)

| DOCUMENTO DI TRASPORTO (DPR 472 DEL 14/08/96) | N. 3178 | Data 22/11/2024 | Cod. Fornitore | Pag. 1 |
|---|---|---|---|---|

| Articolo | Descrizione | UM | | |
|---|---|---|---|---|
| | Saldo vs. ordine 24005940 18-10-24 | | | |
| APCP0080 | Cella di carico a perno modello PRN<br>in acciaio inox. Portata 4000 kg<br>Fornita con certificato di calibrazione | nr | √ | 2,00 |
| | Acconto vs. ordine 24006389 08-11-24 | | | |
| PSDA0014 | Limitatore di carico digitale modello LC 200<br>per trasduttori estensimetrici.<br>Risoluzione interna 24 bit. | nr | √ | 4,00 |

PAVONE SISTEMI S.r.
RENO0498957
Remazel 24007761
DATA R 26/11/2024

REMAZEL ENGINEERING S.p.A.
RIC. IL 26 NOV 2024
C. SC. Firma
Per accettazione U. L. di Trieste
CON RISERVA DI CONTROLLO

| Causale del Trasporto | | Data e Ora inizio Trasporto |
|---|---|---|
| VENDITA | | |
| Colli: 01 / Peso: 3 | Aspetto dei beni: [ ] SCATOLA DI CARTONE [ ] BANCALE [ ] A VISTA | Firma del Conducente |
| Vettore: DHL EXPRESS SRL | Spedizione: MEZZO CORRIERE<br>Resa: PORTO ASSEGNATO | Firma del Destinatario<br>Firma Vettore |

# CERTIFICATO DI CALIBRAZIONE DI CELLA DI CARICO N. 321386
## Load cell certificate of calibration

| | | | |
|---|---|---|---|
| MODELLO | Model | PRN 4000 | |
| N. DI SERIE | Serial N. | 202415225 | |
| PORTATA NOMINALE | Capacity | 4000,00 | kg |
| SENSIBILITA' NOMINALE | Nom. sensitivity | 1,0000 | mV/V |
| COMPENSAZIONE IN TEMP | Temp compensated | -10 ÷ +50 | °C |
| ALIMENTAZIONE | Supply | 2,00 ÷ 15,00 | Vcc |
| ISOLAMENTO | Insulation | > 5000 | MOhm |
| RESISTENZA INGRESSO | Input resistance | 701 | Ohm |
| RESISTENZA USCITA | Output resistance | 702 | Ohm |
| SEGNALE DI ZERO | Zero signal | -0,0041 | mV/V |

### CURVA DI RISPOSTA
Response curve

| % | CARICO Load kg | USCITA Output mV/V |
|---|---|---|
| 0 | 0,00 | 0,0000 |
| 50 | 2000,00 | 0,4989 |
| 100 | 4000,00 | 0,9992 |

### CODICE COLORI
Colour code

SCHERMO NON COLLEG. AL CORPO CELLA
Screen non connected to load cell

| | | | |
|---|---|---|---|
| BIANCO | White | - SEGNALE | Signal |
| VERDE | Green | + SEGNALE | Signal |
| NERO | Black | - ALIM. | Supply |
| ROSSO | Red | + ALIM. | Supply |
| MARRONE | Brown | - RIFER | Refer. |
| BLU | Blue | + RIFER. | Refer. |

| | | |
|---|---|---|
| TEMPERATURA DI PROVA | Test temperature | 20 °C |
| MODO DI PROVA | Test mode | COMPRESSIONE |
| MATERIALE | Material | ACCIAIO INOX 17-4-PH |
| DISEGNO N. | Drawing N. | C.322 |

NOTE

DATA Date 23/10/2024 OPERATORE Operator LB

# CERTIFICATO DI CALIBRAZIONE DI CELLA DI CARICO N. 321385
## Load cell certificate of calibration

| | | | |
|---|---|---|---|
| MODELLO | Model | PRN 4000 | |
| N. DI SERIE | Serial N. | 202415224 | |
| PORTATA NOMINALE | Capacity | 4000,00 | kg |
| SENSIBILITA' NOMINALE | Nom. sensitivity | 1,0000 | mV/V |
| COMPENSAZIONE IN TEMP | Temp compensated | -10 ÷ +50 | °C |
| ALIMENTAZIONE | Supply | 2,00 ÷ 15,00 | Vcc |
| ISOLAMENTO | Insulation | > 5000 | MOhm |
| RESISTENZA INGRESSO | Input resistance | 702 | Ohm |
| RESISTENZA USCITA | Output resistance | 703 | Ohm |
| SEGNALE DI ZERO | Zero signal | 0,0012 | mV/V |

### CURVA DI RISPOSTA
Response curve

| % | CARICO Load kg | USCITA Output mV/V |
|---|---|---|
| 0 | 0,00 | 0,0000 |
| 50 | 2000,00 | 0,4999 |
| 100 | 4000,00 | 0,9990 |

### CODICE COLORI
Colour code

SCHERMO NON COLLEG. AL CORPO CELLA
Screen non connected to load cell

| | | | |
|---|---|---|---|
| BIANCO | White | - SEGNALE | Signal |
| VERDE | Green | + SEGNALE | Signal |
| NERO | Black | - ALIM. | Supply |
| ROSSO | Red | + ALIM. | Supply |
| MARRONE | Brown | - RIFER | Refer. |
| BLU | Blue | + RIFER. | Refer. |

| | | |
|---|---|---|
| TEMPERATURA DI PROVA | Test temperature | 20 °C |
| MODO DI PROVA | Test mode | COMPRESSIONE |
| MATERIALE | Material | ACCIAIO INOX 17-4-PH |
| DISEGNO N. | Drawing N. | C.322 |

NOTE

DATA Date 23/10/2024 OPERATORE Operator LB

# Base Load Power Hub (BLPH)

MASTER

## DAVIT CRANE
## FAT PROCEDURE

Document Number: 1724001010-QC-PRO-00008

Document Class: 2

LINARI STEFANO
Rosetti Marino
16/12/2024


REMAZEL ENGINEERING S.p.A.
Soc. soggetta all'attività di direzione
e coordinamento di FINCANTIERI S.p.A
Sede operativa: Via Portici Manarini 41/A,
24060 Chiuduno (BG), Italia
Sede legale: Via Carlo Ottavio Cornaggia 10,
20123 Milano (MI), Italia
C.F. e P. IVA: 01023830167


ROSETTI MARINO

| | |
|---|---|
| 1 | NO COMMENTS - APPROVED - WORK MAY PROCEED |
| 2 | MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED |
| 3 | MAJOR COMMENTS – REJECTED – DO NOT PROCEED |
| 4 | APPROVAL NOT REQUIRED |

*NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.*

| Sign | Date |
|---|---|
| M. Di Scipio | 29/11/2024 |

| Rev. | Date | Description | Prepared | Reviewed | Approved |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| 02 | 26/11/2024 | Accepted for Construction (AFC) | IZ | MP | MT |
| 01 | 08/11/2024 | Issue for Review (IFR) | IZ | MP | MT |
| 00 | 01/10/2024 | Issue for Review (IFR) | IZ | MP | MT |

REMAZEL ENGINEERING

MARZIO MEDERICI ob. CROSSWIND
X REVIEWED ☐ WITNESSED
NAME: MARZIO MEDERICI
DATE: 16/12/2024
SIGNATURE:


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*File: 1724001010-QC-PRO-00008.docx*

## Revision / Change Log

| Rev. | Description |
|---|---|
| 00 | Issue for Review (IFR) |
| 01 | Issue for Review (IFR) |
| 02 | Accepted for Construction (AFC) |
| | |
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| | |
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| | |
| | |

## HOLDS LIST

| No. | Description |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |

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# Table of contents


1 INTRODUCTION 5

1.1 PROJECT OVERVIEW ..... 5

1.1.1 Project Location ..... 5

1.1.2 Project Concept ..... 6

2 DOCUMENT SCOPE 8

2.1 REFERENCES ..... 8

2.2 DEFINITIONS AND ABBREVIATIONS ..... 8

3 FAT Procedure

1 Scope ..... 13

2 Definition and abbreviations ..... 13

3 Documents reference ..... 13

4 Introduction ..... 14

5 Tests to be performed ..... 14

6 Equipment main characteristics ..... 15

7 Equipment Data and Testing Loads ..... 16

8 Safety check ..... 16

9 Measurement instruments ..... 16

10 Preliminary controls ..... 17

11 Testing ..... 20

12 Punch List ..... 24



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## List of Figures


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map ..... 5
Figure 2 - Wind Park Details ..... 6
Figure 3 – BLPH Concept ..... 6


## List of tables


Table 1 - Reference Documents ..... 8
Table 2 - Definitions and Abbreviations ..... 8


## List of Attachments


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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*


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*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.

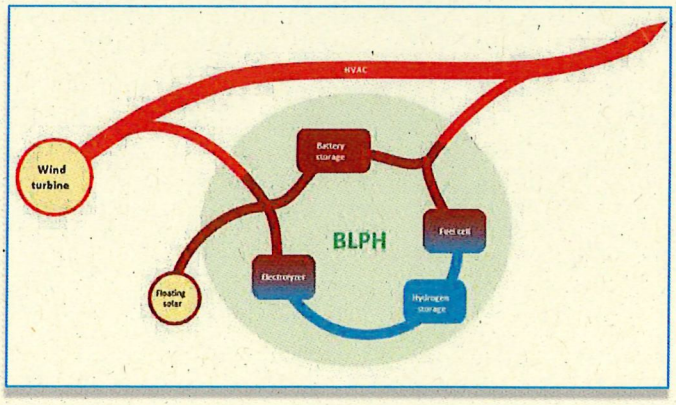



*Figure 3 – BLPH Concept*

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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.

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# 2 DOCUMENT SCOPE

The purpose of the document is to draw up a procedure suitable for verifying all the functions of the crane, its safety devices, and its structural strength

## 2.1 REFERENCES

| Doc. No. | Description |
|---|---|
| 1724001010-MAC-DA-00009 | CRANE GENERAL ARRANGEMENT DRAWINGS AND DATA SHEETS AND LOAD CHART-DAVIT CRANE |
| 1724001010-MAC-DG-00012 | WIRING DIAGRAM -DAVIT CRANE |
| 123A90-DDL-MAC-SP-50034 | Technical Specification for DAVIT CRANE |

*Table 1 - Reference Documents*

## 2.2 DEFINITIONS AND ABBREVIATIONS

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

*Table 2 - Definitions and Abbreviations*

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# 3 FAT PROCEDURE

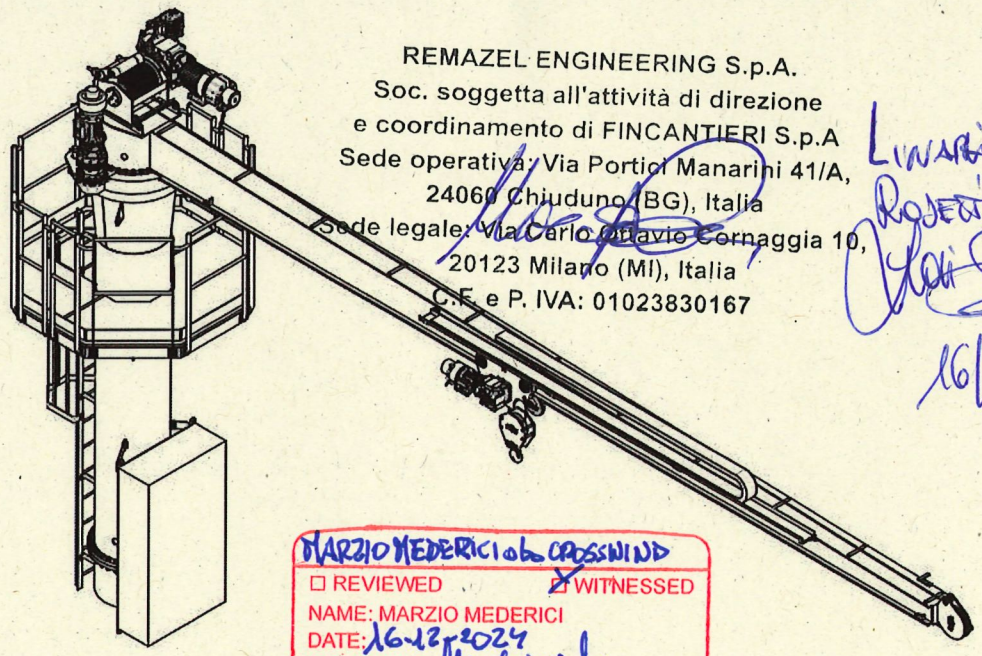
1 Scope ..... 13
2 Definition and abbreviations ..... 13
3 Documents reference ..... 13
4 Introduction ..... 14
5 Tests to be performed ..... 14
6 Equipment main characteristics ..... 15
7 Equipment Data and Testing Loads ..... 16
8 Safety check ..... 16
9 Measurement instruments ..... 16
10 Preliminary controls ..... 17
11 Testing ..... 20
12 Punch List ..... 24

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# BASE LOAD POWER HUB (BLPH) DAVIT CRANE C09-0001

# JOB 24-27012

# FACTORY ACCEPTANCE TEST (FAT) PROCEDURE



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20123 Milano (MI), Italia
C.F. e P. IVA: 01023830167

LIVIABI STEFANO
ROSETTI MARINO
16/12/2024

MARZIO MEDERICI obo CROSSWIND
☐ REVIEWED ☑ WITNESSED
NAME: MARZIO MEDERICI
DATE: 16-12-2024
SIGNATURE: Mederici

| Rev. | Modify description | Issue | Approval | Date |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| 02 | Revision based on client comments | MPU | MTO | 26/11/2024 |
| 01 | Revision based on client comments | MPU | MTO | 08/11/2024 |
| 00 | First issue | IZA | MTO | 30/09/2024 |

Signatures area

## SUMMARY OF REVISION

| Rev. | Date | Revised chapters | Revision description | Reason for revision |
|---|---|---|---|---|
| 00 | 30/09/2024 | All | First Issue | For approval |
| 01 | 07/11/2024 | All | Revision based on client comments | For approval |
| 02 | 26/11/2024 | All | Revision based on client comments | For approval |

Signatures area

## Summary


1 Scope ..... 4

2 Definition and abbreviations ..... 4

3 Documents reference ..... 4

4 Introduction ..... 5

5 Tests to be performed ..... 5

6 Equipment main characteristics ..... 6

7 Equipment Data and Testing Loads ..... 7

8 Safety check ..... 7

9 Measurement instruments ..... 7

10 Preliminary controls ..... 8

11 Testing ..... 11

12 Punch List ..... 15


Signatures area

## 1 Scope

The scope of this document is to define the tests that will be performed for the following customer and project:

| Customer | Hull/Project | Company |
|---|---|---|
| ROSETTI MARINO | HOLLANDSE KUST NOORD WIND PARK Project | CROSSWIND |

## 2 Definition and abbreviations

| | |
|---|---|
| **FAT** | Factory Acceptance Test |
| **CL** | Rosetti Marino – Customer |
| **RMZ** | Remazel |
| **SWL** | Safety Working Load |
| **PL** | Proof Load |
| **HKN** | Hollandse Kust Noord |
| **HSE** | Health, Safety and Environment |
| **CW** | Clockwise |
| **CCW** | Counter-Clockwise |
| **AOPS** | Automatic Overload Protection System |
| **MOPS** | Manual Overload Protection System |
| **DAF** | Dynamic Amplification Factor |

## 3 Documents reference

The last available revision of the documents below will be at disposal before the start of the FAT procedure.

| REF. | DOCUMENT | REMAZEL CODE | ROSETTI MARINO CODE |
|---|---|---|---|
| [1] | CRANE GENERAL ARRANGEMENT DRAWINGS | 24-27012-GA-001 | 1724001010-MAC-DA-00009 |
| [2] | WIRING DIAGRAM incl JB TERMINALS | 24-27012-WD-001 | 1724001010-MAC-LIS-00014 |
| [3] | I/O LIST | 24-27012-IOL-001 | 1724001010-MAC-DG-00012 |
| [4] | HOOK ASSEMBLY | C09-0001-A0007 | |

Signatures area

## 4 Introduction

The "Attendees" are people involved during the test.

| Attendees | Name | Title | Signature |
|---|---|---|---|
| REMAZEL | MARCO PUZZER | PROJECT MANAGER | |
| REMAZEL | | | |
| ROSETTI MARINO | STEFANO LINARI | SQL | |
| ROSETTI MARINO | MICHELE SACCHI | QC Painting | |
| CROSSWIND | MARZIO MEDICI | INSPECTOR | |
| CROSSWIND | | | |

## 5 Tests to be performed

1. Dimensional control
2. Check of decals and nameplates
3. Electrical board checks
4. Electrical test power supply
5. Power up procedure
6. Power up stop circuit procedure
7. Crane readiness check
8. Traslation, hoisting and slewing limit switch
9. MOPS testing
10. Load test at 3.5t and 1t
11. Blackout test at 3.5t and 1t
12. Emergency operation at 3.5t and 1t
13. Movement and speed checks at 3.5t and 1t
14. Overload device 110% of 3.5t and 1t
15. AOPS testing 140% of 3.5t and 1t
16. Overload test 3.5t and 1t
17. Final check of the crane
18. Electrical test on motors

Signatures area

## 6 Equipment main characteristics

Below the main characteristic of the BLHP Davit Crane.

| TECHNICAL DATA | | | |
|---|---|---|---|
| **Type** | | DAVIT CRANE | |
| Customer TAG | | X-99001 | |
| General assembly | Drawing | C09-0001-A0002 | |
| **DESIGN CRITERIA** | | DNV-ST-0378 | |
| Category of crane | | Offshore crane | |
| Ambient working temperature (min/max) | °C | -8°C to +25°C | |
| Wind speed at davit crane[1] | m/s | Operative: 24<br>Out of service: 44 | |
| Crane static inclination angle heel/trim | deg | List / Trim = 0° / 0° | |
| **MECHANISMS CLASSIFICATION** | | | |
| According to European Federation of Handling Industries FEM - 1.001 (10.1998)-Rules for design of hoisting appliances. | Equipment | A4 | |
| | Mechanism | M4 | |
| **HOISTING** | | | |
| **General data** | | | |
| Boom height from deck | m | 4.85 | |
| Deck height from sea level | m | 30.13 | |
| Max cargo lift | SWL | 3.5 ton @ 5m | 1.0 ton @ 10m |
| Significant wave height | Hs | 1.5 | |
| Hoisting 1st speed | m/min | 3.75 | |
| Hoisting 2nd speed | m/min | 15 | |
| Minimum Outreach | m | 1.5 | |
| Maximum Outreach | m | 10 | |
| Maximum hook stroke | m | 40 | |
| Personnel handling | | NO | |
| AOPS | | YES | |
| MOPS | | YES | |
| **Hook trolley (radial movement)** | | | |
| 1st speed | m/min | 2 | |
| 2nd speed | m/min | 8 | |
| **Slewing** | | | |
| Slewing 1st speed | rpm | 0. 5 | |
| Slewing 2nd speed | rpm | 1 | |
| Slewing range angle (continuous) | deg | +/-90° | |
| **Electric motors** | | | |
| Installed power (N. of motors x unitary power) | kW | 1 x 15 for winch<br>1 x 4 for slewing<br>2 x1.5 for trolley and auxiliaries | |

[1] Wind conditions have been considered as per DNV-ST-0378 Appendix A, Table A-2 to be more conservative.

Signatures area

## 7 Equipment Data and Testing Loads

Below the main characteristics tested during FAT.

| Items | Q.ty | Crane RMZ TAG (S/N) | ROSETTI MARINO TAG | SWL |
|---|---|---|---|---|
| BLPH DAVIT CRANE | 1 | 4366 | X-99001 | 3.5t @ 5m / 1.0t @ 10m |

| Overload test (static) | Overload device alarm | AOPS Testing | MOPS Testing |
|---|---|---|---|
| 5.3t @ 5m / 1.7t @ 10m | 110% of SWL<br>3.85t @ 5m / 1.1t @ 10m | 140% of SWL<br>4.9t @ 5m / 1.4t @10m | 0.5t @ any outreach |

## 8 Safety check

As soon as entering in the workshop and test bench area, as first, please check that all safety measure has been taken:

| ID | Step/Test | Result | |
|---|---|---|---|
| 8.1 | Check all people involved wear proper PPE (protective shoes, hard hat, glasses, safety gloves, high visibility jacket) | OK | NOT OK |
| 8.2 | All persons involved in the test have received all information on the safety instructions to be given during test | OK | NOT OK |
| 8.3 | Check that the test area is identified, delimited, clean from residues or other clutter | OK | NOT OK |
| 8.4 | Check the workshop layout and identify emergency exits. | OK | NOT OK |

## 9 Measurement instruments

Below the list of the tool and instruments used during the FAT with the related serial numbers and the relevant information.

| Instrument | Maker | Serial Number | Remazel ID number | Calibration | | |
|---|---|---|---|---|---|---|
| | | | | Cert. No. | Issue Date | Expire Date |
| Dynamometer 9t | Dini Argeo Srl | 0722200887 | DNM-0015 | 2795/24 | 04/03/2024 | 04/03/2025 |
| Voltage tester | Hioki | 020431607 | NDT-0036 | 2793/24 | 04/03/2024 | 04/03/2025 |
| Insulation tester | Hioki | 020504304 | NDT-0037 | 2794/24 | 04/03/2024 | 04/03/2025 |
| Rib | Stanley | 34-296 | NDT-0039 | REM.815552 | 24/04/2024 | 24/04/2025 |
| Current clamp meter | HT Italia | 66401785 | PZA-0016 | 1038-2022-9 | 06/05/2022 | 06/05/2025 |

Signatures area

## 10 Preliminary controls

Before testing the crane, personnel must execute the following controls:

| 10.1 | INTERNAL TEST REPORT REVIEW | | | | |
|---|---|---|---|---|---|
| 10.1.1 | Review of mechanical checks | | OK | NOT OK | see Internal Mech. check attached |
| 10.1.2 | Review of functional tests | | OK | NOT OK | see attached internal test procedure |
| **10.2** | **DIMENSIONAL CONTROL** | | | | |
| **ID** | **Test** | **Expected value** | **Result** | | **Notes** |
| 10.2.1 | Verify the distance from the center of the fixed pedestal to the hook with the trolley in first position (absolute minimum outreach) | 1.5m (+50mm/-0mm) | OK | NOT OK | |
| 10.2.2 | Verify the distance from the center of the fixed pedestal to the hook with the trolley in second position (maximum outreach 3.5t) | 5.0m (+50mm/-0mm) | OK | NOT OK | |
| 10.2.3 | Verify the distance from the center of the fixed pedestal to the hook with the trolley in third position (absolute maximum outreach) | 10.0m (+50mm/-0mm) | OK | NOT OK | |
| **10.3** | **CHECK OF DECALS AND NAMEPLATES** | | | | |
| **ID** | **Test** | **Expected value** | **Result** | | **Notes** |
| 10.3.1 | RMZ decal fitted to crane | N/A | OK | NOT OK | |
| 10.3.2 | SWL decal fitted to crane | N/A | OK | NOT OK | |
| 10.3.3 | RMZ nameplate fitted to crane. Check it is legible and undamaged | N/A | OK | NOT OK | |
| 10.3.4 | Hazard warning decals fitted to, or adjacent to, electrical components | N/A | OK | NOT OK | |
| **10.4** | **ELECTRICAL BOARD CHECKS** | | | | |
| **ID** | **Test** | **Expected value** | **Result** | | **Notes** |
| 10.4.1 | Check for earth bonding between control panel enclosure / backplate and door | N/A | OK | NOT OK | see attached internal test proc. |
| 10.4.2 | Visual and dimensional check | N/A | OK | NOT OK | |
| 10.4.3 | Dielectric test | N/A | OK | NOT OK | see attached internal test proc. |
| 10.4.4 | Insulation test | N/A | OK | NOT OK | " |
| **10.5** | **ELECTRICAL TEST POWER SUPPLY** | | | | |
| **ID** | **Test** | **Expected value** | **Result** | | **Notes** |
| 10.5.1 | Crane to be connected to power supply | N/A | OK | NOT OK | |

Signatures area

| | | | | | |
|---|---|---|---|---|---|
| 10.5.2 | Measurement of the voltage on the main switch | 400V ±10% at 50Hz | OK | NOT OK | |
| **10.6** | **POWER UP PROCEDURE** | | | | |
| **ID** | **Test** | **Expected value** | **Result** | | **Notes** |
| 10.6.1 | Rotate the main switch from O position to I position | L1, L2 and L3 lights are on | OK | NOT OK | |
| **10.7** | **POWER UP STOP CIRCUIT PROCEDURE** | | | | |
| **ID** | **Test** | **Expected value** | **Result** | | **Notes** |
| 10.7.1 | Press RESET button on the electrical cabinet door | RESET blue blinking light turns off | OK | NOT OK | |
| 10.7.2 | Press EMERGENCY STOP button on electrical cabinet door | RESET light turns on | OK | NOT OK | |
| 10.7.3 | Press manouver buttons | Crane does not move | OK | NOT OK | |
| 10.7.4 | Release EMERGENCY STOP button on electrical cabinet door | RESET light starts blinking | OK | NOT OK | |
| 10.7.5 | Press manouver buttons | Crane does not move | OK | NOT OK | |
| 10.7.6 | Press RESET button on the electrical cabinet door | RESET blue blinking light turns off and crane is ready to start | OK | NOT OK | |
| 10.7.7 | Press manouver buttons (hoisting or traslation) | Crane does move | OK | NOT OK | |
| **10.8** | **CRANE READINESS CHECK** | | | | |
| **ID** | **Test** | **Expected value** | **Result** | | **Notes** |
| 10.8.1 | Remove slewing locking pin | Pin engaged light turns off | OK | NOT OK | |
| 10.8.2 | Check that either 1t or 3.5t light is on | N/A | OK | NOT OK | |
| **10.9** | **TRASLATION, HOISTING and SLEWING LIMIT SWITCH (no load)** | | | | |
| **ID** | **Test** | **Expected value** | **Result** | | **Notes** |
| 10.9.1 | Simulate 3.5t on hook and test the traslation forward limit switch | Trolley in second position | OK | NOT OK | |
| 10.9.2 | Remove the simulation of 3.5t and test the traslation forward limit switch | Trolley in third position | OK | NOT OK | |
| 10.9.3 | Test the traslation backward limit switch | Trolley in first position | OK | NOT OK | |
| 10.9.4 | Test the CW rotation limit switch | Boom +90° | OK | NOT OK | |
| 10.9.5 | Test the CCW rotation limit switch | Boom -90° | OK | NOT OK | |
| 10.9.6 | Test the hoisting up limit switch, verify clearance between hook center and pavement | Hook up, 4.0m | OK | NOT OK | |
| 10.9.7 | Test the hoisting down limit switch, verify 40m of rope are out and at least 3 dead coils are left on the winch | Hook down, 40m | OK | NOT OK | |

see attached automatic test proc. load FAT has been done only with

Signatures area

| | | | | | |
|---|---|---|---|---|---|
| 10.9.8 | Hoist up the hook and verify engagement of anti-to-block system | Anti-to-block system engages correctly | OK | NOT OK | |

Signatures area

## 11 Testing

| 11.1 | MOPS TESTING | | | | |
|---|---|---|---|---|---|
| **ID** | **Test** | **Expected value** | **Result** | | **Notes** |
| 11.1.1 | With no load, push the MOPS switch, start the 5 minutes timer and manually pull the hook down. Leave the MOPS switch in position for 5 minutes. | After 5 minutes the hook can still be pulled down, MOPS is functioning correctly | OK | NOT OK | |
| 11.1.2 | Apply 0.5t on the hook, turn off the power supply to the crane and operate the MOPS switch | The winch will release the load and the MOPS alarm will sound | OK | NOT OK | |
| 11.1.3 | Repeat the test for 3 times | UPS is expected to last for the whole duration of the tests | OK | NOT OK | |
| **11.2** | **LOAD TEST (SWL 3.5t) at outreach = 5m** | | | | |
| **ID** | **Test** | **Expected value** | **Result** | | **Notes** |
| 11.2.1 | Hoist about 2m up the SWL | Verify load force of 3.5t has been applied | OK | NOT OK | |
| 11.2.2 | Traslate the trolley about 1m forward | Verify movement forward under load | OK | NOT OK | |
| 11.2.3 | Traslate the trolley about 1m backward | Verify movement backward under load | OK | NOT OK | |
| **11.3** | **BLACKOUT TEST (SWL 3.5t) at outreach = 5m** | | | | |
| **ID** | **Test** | **Expected value** | **Result** | | **Notes** |
| 11.3,.1 | Lift the nominal load (3.5t) with the winch, disconnect the main power line (blackout simulation). | The load will remain motionless due to the negative brake action of the winch | OK | NOT OK | See external test procedure |
| **11.4** | **EMERGENCY OPERATION (SWL 3.5t) at outreach = 5m** | | | | |
| **ID** | **Test** | **Expected value** | **Result** | | **Notes** |
| 11.4.1 | With the nominal load (3.5t) hanged, act the levers on the hoisting motors to de-activate the brakes | The load can be lowered | OK | NOT OK | |
| 11.4.2 | With the nominal load (3.5t) hanged, act the levers on the slewing motors to de-activate the brakes and move the crane | Crane can rotate | OK | NOT OK | |

Signatures area

| 11.5 | MOVEMENT AND SPEED CHECKS (SWL 3.5t) at outreach = 5m | | | | |
|---|---|---|---|---|---|
| **ID** | **Test** | **Expected value** | **Result** | | **Notes** |
| 11.5.1 | With 3.5t on the hook, time how long it takes to lift the load through 1m in first speed<br>Note, do not time from a starting start. | ~~4.5~~ 3.75 m/min ± 5% | (OK) | NOT OK | 16 sec. |
| 11.5.2 | With 3.5t on the hook, time how long it takes to lift the load through 1m in second speed<br>Note, do not time from a starting start. | 15 m/min. ± 5% | (OK) | NOT OK | without load 6.3 sec. |
| 11.5.3 | With 3.5t on the hook, rotate the boom clockwise 90° and time it. If necessary, repeat the operation by rotating the boom counter-clockwise. | 0,5 rpm ± 5% | (OK) | NOT OK | |
| 11.5.4 | With 3.5t on the hook, move the trolley in first speed and time it | 2 m/min ± 5% | (OK) | NOT OK | |
| 11.5.5 | With 3.5t on the hook, move the trolley in second speed and time it | 8 m/min ± 5% | (OK) | NOT OK | |
| 11.5.6 | Check the current intensity during hoisting | < /= motor nominal current | 27.3 A | | |
| 11.5.7 | Check the current intensity during slewing | < /= motor nominal current | 4.20 A | | |
| 11.5.8 | Check the current intensity during traslation | < /= motor nominal current | 2 A | | |
| **11.6** | **OVERLOAD DEVICE (110% of NOMINAL LOAD 3.5t = 3.85t) at outreach = 5m** | | | | |
| **ID** | **Test** | **Expected value** | **Result** | | **Notes** |
| 11.6.1 | Apply on the hook 3.85t and try to lift with the winch only | The winch will not lift the load and the OVERLOAD alarm will sound | (OK) | NOT OK | Sound ok |
| **11.7** | **AOPS TESTING (140% of NOMINAL LOAD 3.5t = 4.9t) at outreach = 5m** | | | | |
| **ID** | **Test** | **Expected value** | **Result** | | **Notes** |
| 11.7.1 | From deck level, apply 4.9t on the hook, check that the load is still. | The AOPS is disabled so the winch will not release the load. | (OK) | NOT OK | |
| 11.7.2 | Simulate off-board position, apply 4.9t on the hook, check that the load is lowering | The AOPS is enabled so the winch will release the load. | (OK) | NOT OK | |
| **11.8** | **OVERLOAD TEST (1.25x0,75xDAFxSWL 3.5t) – (DAF=Dynamic Amplification Factor) at outreach = 5m** | | | | |
| **ID** | **Test** | **Expected value** | **Result** | | **Notes** |
| 11.8.1 | Apply on the hook 5.3t (1.25x0.75x1.6x3.5t) without using the winch. Leave for 5 minutes | Load is supported for 5 minutes. No visible damage to the crane. | (OK) | NOT OK | |

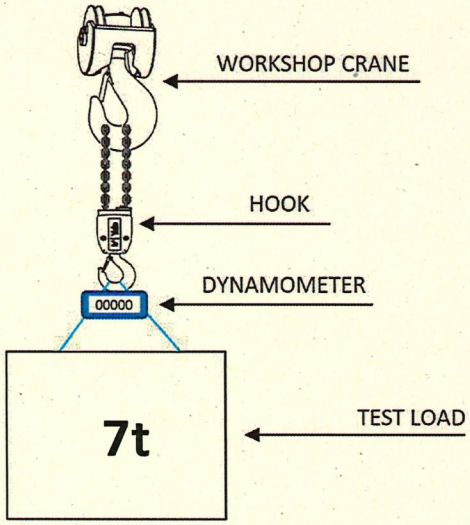
Signatures area

| 11.9 | LOAD TEST (SWL 1t) at outreach = 10m | | | | |
|---|---|---|---|---|---|
| ID | Test | Expected value | Result | | Notes |
| 11.9.1 | Hoist about 2m up the SWL | Verify load force of 1t has been applied | OK | NOT OK | |
| 11.9.2 | Traslate the trolley about 1m forward | Verify movement forward under load | OK | NOT OK | |
| 11.9.3 | Traslate the trolley about 1m backward | Verify movement backward under load | OK | NOT OK | |
| 11.10 | OVERLOAD DEVICE (110% of NOMINAL LOAD 1t = 1.1t) at outreach = 10m | | | | |
| ID | Test | Expected value | Result | | Notes |
| 11.10.1 | Apply on the hook ~~1t~~ 1.1t and try to lift with the winch only | The winch will not lift the load and the OVERLOAD alarm will sound | OK | NOT OK | |

| 11.11 | AOPS TESTING (140% of NOMINAL LOAD 1t = 1.4t) at outreach = 10m | | | | |
|---|---|---|---|---|---|
| ID | Test | Expected value | Result | | Notes |
| 11.11.1 | From deck level, apply ~~1t~~ 1.4t on the hook, check that the load is still. | The AOPS is disabled so the winch will not release the load. | OK | NOT OK | |
| 11.11.2 | Simulate off-board position, apply ~~1t~~ 1.4t on the hook, check that the load is lowering | The AOPS is enabled so the winch will release the load. | OK | NOT OK | be interval test procedure |
| 11.12 | OVERLOAD TEST (1.25x0,75xDAFxSWL 1t) at outreach = 10m | | | | |
| ID | Test | Expected value | Result | | Notes |
| 11.12.1 | Apply on the hook 1.7t (1.25x0.75x1.8x1t) without using the winch. Leave for 5 minutes | Load is supported for 5 minutes. No visible damage to the crane. | OK | NOT OK | |
| 11.13 | FINAL CHECK OF THE CRANE | | | | |
| ID | Test | Expected value | Result | | Notes |
| 11.13.1 | Visual check the components of the davit after testing to ensure the crane is in good condition and fit to operate | Crane is in good state | OK | NOT OK | |

Signatures area

| 11.14 | ELECTRICAL TEST ON MOTORS | | | | |
|---|---|---|---|---|---|
| ID | Test | Expected value | Result | | Notes |
| 11.14.1 | Perform dielectric test on motors for 60" | 2000V | OK | NOT OK | see internal test procedure |
| 11.14.2 | Perform electric insulation test on motors | > 10 Mohm | OK | NOT OK | |
| **11.15** | **HOOK TEST (2xSWL)** | | | | |
| ID | Test | Expected value | Result | | Notes |
| 11.15.1 | Hang 7t on the hook for 60" (hook will be tested disassembled from the crane) | Hook supports the load and is in a good state after the test | OK | NOT OK | see attached certificate |




Signatures area .

## 12 Punch List

| ITEM | PUNCH POINT DESCRIPTION | PUNCH POINT SOLUTION | COMPANY IN CHARGE OF RESOLVING | PERSON RESPONSIBLE FOR THE SOLUTION |
|---|---|---|---|---|
| 4366 | WIRE Rope installed wrong dimention (11mm) to be Replace with 10 mm | WIRE Rope To be Replace | Remazel | Quality / Workshop |
| 4366 | JB cabling To be fix inside | cable to be dress | Remazel | Quality / Workshop |
| 4366 | Label for panel and JB to be installed | labels to be installed | Remazel | Quality / Workshop |
| 4366 | Main data plate to be installed | label to be installed | Remazel | Quality / Workshop |

20/12/24 All points closed by involved parties, see e-mail dated 20/12/2024 Object ROSETTI MARINO P.O. 1724001010 DAVIT CRANE/24-27012/TOUCH POINT

REMAZEL
C. Ziber
☐W ☐R
20/12/24

Signatures area

| SIGNATURE FOR APPROVAL | | | | | |
|---|---|---|---|---|---|
| | REMAZEL | ROSETTI MARINO | ROSETTI MARINO | CROSSWIND | CROSSWIND |
| Name | MARCO PUZZER | STEFANO LINARI | MICHELE SACCHI | MARZIO MEDERICI | |
| Signature | | | | | |
| Position | PROJECT MANAGER | SQL | QC COATING | INSPECTOR | |
| Date | 16/12/2024 | 16/12/2024 | 16-12-2024 | 16/12/2024 | |

Signatures area


SWL 1 t
SWL 3.5 t | 5m
LeciTrailer


CO1-JB-0002


REMAZEL
ENGINEERING
SERIAL N°
YEAR
MAIN VOLTAGE (V)
AUX. VOLTAGE (V)
POWER (kW)
RATED CURRENT (A)
FREQUENCY (Hz)
PROTECTION RATING (IP)
C01-EP-0001
JB-200E3



1.Scope

In this section we are going to respond to the crs' comments.
the reply to the comment is included in the corresponding bookmark,
when the comment reference is not present as a bookmark, check the answer directly in the crs.

# Comment Response Sheet Hollandse Kust Noord

| | |
|---|---|
| **CRS document name / Aconex unique number:**<br>1724001010-QC-DB-00004-EQUIPMENT MANUFACTURER RECORD BOOK -DAVIT CRANE (REMAZEL) CRS / CWHKN-INN-BPH-CRS-01540 | |
| **Reviewed Document(s) / Aconex unique number(s):**<br>ROSMA-INN-BPH-CER-00023 04 1724001010-QC-DB-00004-EQUIPMENT MANUFACTURER RECORD BOOK - DAVIT CRANE (REMAZEL) | |
| **Reference Document(s) / Aconex unique numbers(s):** | |
| **Interface information:** | |
| **Remarks on transmittal:** | |
| **Document review status (by Engineer / Engineer's Assistant(s)):** | **CODE 3 - FAIL** |

| No. | Reference | Comment | Comment made by | Comment status |
|---|---|---|---|---|
| 1. | Part 1 Design Dossier | Installation, Operating & Maintenance Manual 1724001 010-MAC-MAN-0001 Rev 02, the revision held by Crosswind is Rev 03.<br>Correct, rev.03 of Intallation,Operating& Maintenance manual was approved after the 1724001010-QC-DB-00004-EQUIPMENT MANUFACTURER RECORD BOOK -DAVIT CRANE was issued.<br>Noted, revised. | AGI | CLOSED |
| 2. | Part 2 Certification Dossier | Weld Map Traveling Trolley DWG C09-0001-P0006 Rev A, is this the current revision as Material Certification List (Page 535) details this should be REVISION C<br>Revision C of the drawing has no impact on welding book<br>Response rejected, include Revision C and resubmit<br>All welding activities were carried out of the approved welding book. Welding book it's an approved document not editable. The drawing revision the one applicable for the welding activities. | AGI | OPEN |
| 3. | Part 2 Certification Dossier | Weld Map BOOM DWG C09-0001-P0004 Rev A, is this the current revision as Material Certification List (Page 256) details this should be REVISION D<br>Revision D of the drawing has no impact on welding book<br>Response rejected, include Revision D and resubmit<br>All welding activities were carried out of the approved welding book. Welding book it's an approved document not editable. The drawing revision the one applicable for the welding activities. | AGI | OPEN |

# Comment Response Sheet Hollandse Kust Noord

| No. | Reference | Comment | Comment made by | Comment status |
|---|---|---|---|---|
| 4. | Part 2 Certification Dossier | Weld Book Fixed Column DWG C09-0001-P0002 Rev D (Page 349), the GA DWG details this should be E<br>Revision E of the drawing has no impact on welding book<br>Response rejected, include Revision E and resubmit<br>All welding activities were carried out of the approved welding book. Welding book it's an approved document not editable. The drawing revision the one applicable for the welding activities. | AGI | OPEN |
| 5. | Part 2 Certification Dossier | Pedestal Certification List details certificate 16624400805 has a Heat/Plate No. 441908. The certification list details additional mechanical testing 240902, where are these records<br>These are typo mystake made when compiling the traceability list: they are the supplier's internal item codes.<br>Response rejected - If these are the supplier internal reference code's then why is there no traceability between the material certificate and the internal code detailed.<br>Supplier Typo, will be revised the certification list. | AGI | OPEN |
| 6. | Part 2 Certification Dossier | MARCEGAGLIA Pedestal Certification List details certificate 16624563335 has a Heat/Plate No. 2461219. The certification list details additional mechanical testing 240896, where are these records<br>These are typo mystake made when compiling the traceability list: they are the supplier's internal item codes.<br>Response rejected - If these are the supplier internal reference code's then why is there no traceability between the material certificate and the internal code detailed.<br>Supplier Typo, will be revised the certification list. | AGI | OPEN |
| 7. | Part 2 Certification Dossier | MARCEGAGLIA Pedestal Certification List details certificate 16624421397 has a Heat/Plate No. 442151. The certification list details additional mechanical testing 240905, where are these records<br>These are typo mystake made when compiling the traceability list: they are the supplier's internal item codes.<br>Response rejected - If these are the supplier internal reference code's then why is there no traceability between the material certificate and the internal code detailed.<br>Supplier Typo, will be revised the certification list. | AGI | OPEN |
| 8. | Part 2 Certification Dossier | MARCEGAGLIA Pedestal Certification List details certificate 16624421397 has a Heat/Plate No. 442151. The certification list details additional mechanical testing 240906, 204908, 240910,240911, 240912 and 240913 where are these records<br>These are typo mystake made when compiling the traceability list: they are the supplier's internal item codes. | AGI | OPEN |

| No. | Reference | Comment | Comment made by | Comment status |
|---|---|---|---|---|
| | | Response rejected - If these are the supplier internal reference code's then why is there no traceability between the material certificate and the internal code detailed.<br>Supplier Typo, will be revised the certification list. | | |
| 9. | Part 2 Certification Dossier | ACCIAIERIA ARVEDI Pedestal Certification List details certificate 664290 has a Heat/Plate No. 122771. The certification list details additional mechanical testing 240900, 204899, 240914,240916 and 240917 where are these records<br>These are typo mystake made when compiling the traceability list: they are the supplier's internal item codes.<br>Response rejected - If these are the supplier internal reference code's then why is there no traceability between the material certificate and the internal code detailed.<br>Supplier Typo, will be revised the certification list. | AGI | OPEN |
| 10. | Part 2 Certification Dossier | GABRIELLI Pedestal Certification List details certificate 5394/3016 has a Heat/Plate No. 565503. The certification list details additional mechanical testing 240899 and 240915 where are these records<br>These are typo mystake made when compiling the traceability list: they are the supplier's internal item codes.<br>Response rejected - If these are the supplier internal reference code's then why is there no traceability between the material certificate and the internal code detailed.<br>Supplier Typo, will be revised the certification list. | AGI | OPEN |
| 11. | Part 2 Certification Dossier | Pedestal Certification List details that GABRIELLI certificate 5394/3016 and ACCIAIERIA ARVEDI certificate 664290 both have additional mechanical testing 240899 – HOW CAN THIS BE???<br>These are typo mystake made when compiling the traceability list: they are the supplier's internal item codes.<br>Response rejected - If these are the supplier internal reference code's then why is there no traceability between the material certificate and the internal code detailed.<br>Supplier Typo, will be revised the certification list. | AGI | OPEN |
| 12. | Part 2 Certification Dossie | FABBRICA ITALIANO LAMIERE srl Pedestal Certification List details certificate 2400000042290 has a Heat/Plate No. 322347. The certification list details additional mechanical testing 240918 and 240919 where are these records<br>These are typo mystake made when compiling the traceability list: they are the supplier's internal item codes.<br>Response rejected - If these are the supplier internal reference code's then why is there no traceability between the material certificate and the internal code detailed.<br>Supplier Typo, will be revised the certification list. | AGI | OPEN |

# Comment Response Sheet Hollandse Kust Noord

| No. | Reference | Comment | Comment made by | Comment status |
|---|---|---|---|---|
| 13. | Part 2 Certification Dossier | FABBRICA ITALIANO LAMIERE srl Pedestal Certification List details certificate 2400000005205 has a Heat/Plate No. 316829 – WHERE ARE THESE MATERIAL CERTIFICATES<br>Records on page 603 | AGI | CLOSED |
| 14. | Part 2 Certification Dossier | FABBRICA ITALIANO LAMIERE srl Pedestal Certification List details certificate 2400000005205 has a Heat/Plate No. 316829 – where is UT Report 267 referenced for this material<br>Noted, added | AGI | CLOSED |
| 15. | Part 2 Certification Dossier | FABBRICA ITALIANO LAMIERE srl Pedestal Certification List details certificate 2400000005205 has a Heat/Plate No. 316829 – where is the additional mechanical testing 240898 referenced for this material<br>These are typo mystake made when compiling the traceability list: they are the supplier's internal item codes.<br>Response rejected - If these are the supplier internal reference code's then why is there no traceability between the material certificate and the internal code detailed.<br>Supplier Typo, will be revised the certification list. | AGI | OPEN |
| 16. | Part 2 Certification Dossier | COSME Winch Box Certification section is missing the following Material Certificates:<br>- Cert 24066181/Colata 3300962 – Quality control level c3 applicable, not subject to Quality control plan.<br>Response rejected, where is it detailed on the Bill of Materials or within the ITP that this item is a Level c3 and certification isn't required.<br>Cert 24066181 refer to DWG C09-0001-P0003 (rope end)<br>The Rope end is classified QCL3 as per DWG ( ITP not applicable for QCL3)<br>- Cert 627031/Colata STAD49 - Noted, added | AGI | OPEN |
| 17. | Part 2 Certification Dossier | Pin/Shaft/Pulley/Wheel Certification List is missing the following 3.1 material certificates:<br>- Roller Bearing Swivels – Cert 429339/1/Heat 480592<br>- Trolley Pinion M=6 Z=13 – Cert 4883/Heat 220602441<br>Please see Page 689,690,691 | AGI | CLOSED |
| 18. | Part 2 Certification Dossier | Pin/Shaft/Pulley/Wheel Certification List is missing the following 3.1 material certificates:<br>- Ø279*35 – Cert 1154/4/Heat 1240905<br>- Ø127*30 – Cert 1253/3/Heat 1241244<br>Please refer to Winch box certification List page 644 | AGI | CLOSED |

# Comment Response Sheet Hollandse Kust Noord

| No. | Reference | Comment | Comment made by | Comment status |
|---|---|---|---|---|
| 19. | Part 2 Certification Dossier | Page 654 Certification List (DWG C09-0001-P0013, C09-0001-P0014, C09-0001-P0016, C09-0001-P0037 and C09-0001-P0040) would benefit from a Description and ITP reference<br>Noted, added | AGI | CLOSED |
| 20. | Part 2 Certification Dossier | Page 689 Certification List (DWG C09-0001-P0050, C09-0001-P0038 and C09-0001-P0083) would benefit from a Description and ITP reference<br>Noted, added | AGI | CLOSED |
| 21. | Part 2 Certification Dossier | Page 689 Certification List (DWG C09-0001-P0050, C09-0001-P0038 and C09-0001-P0083) details that Additional Testing was carried out by TRATTAMENTO, where are these records?<br>Noted, added | AGI | CLOSED |
| 22. | Part 2 NDE Colum | ANTARES CONTROL NDE reports do not reference a recognised drawing or any Material Heats<br>Dwg as per Sidertaglio WeldingBook page 348. This NDE report refer to the welds indicated in the page 349 of the WB. Heat number as per Certification List C09-0001-P0002 at page 567 | AGI | CLOSED |
| 23. | Part 2 NDE | ANTARES CONTROL NDE reports do not reference a recognised drawing or any Material Heats=<br>Dwg as per Sidertaglio WeldingBook page 348. This NDE report refer to the welds indicated in the page 349 of the WB. Heat number as per Certification List C09-0001-P0002 at page 567 | AGI | CLOSED |
| 24. | Part 2 NDE | SGP Testing BOOM NDE Reports reference DWG C09-0001-P0004 Rev E, the Weld Map (Page 256) references DWG C09-0001-P0004 Rev A and the Material Certification List references DWG C09-0001-P0004 Rev D. This MRB would benefit from including the current revision of the DRAWINGS<br>Noted, the revision is linked to minor changes. No impact on the documents cited above.<br>Response rejected, include Revision E and resubmit<br>All activities were performed in accordance with the design in the applicable revision. | AGI | OPEN |
| 25. | Part 2 NDE | SGP Testing TROLLEY NDE Reports reference DWG C09-0001-P0006 Rev C, the Weld Map (Page 256) references DWG C09-0001-P0006 Rev A and the Material Certification List references DWG C09-0001-P0004 Rev C. This MRB would benefit from including the current revision of the DRAWINGS<br>Noted, the revision is linked to minor changes. No impact on the documents cited above.<br>Response rejected, include Revision C and resubmit<br>All activities were performed in accordance with the design in the applicable revision. | AGI | OPEN |
| 26. | Part 2 NDE | SGP Testing Winch Box NDE Reports reference DWG C09-0001-P0085 and no revision status<br>Noted,revised | AGI | CLOSED |

# Comment Response Sheet Hollandse Kust Noord

| No. | Reference | Comment | Comment made by | Comment status |
|---|---|---|---|---|
| 27. | Part 2 NDE | SGP Testing WINCH NDE Reports reference DWG C09-0001-P0006 Rev A, the Dimensional Control Certificate (Page 726) references DWG C09-0001-P0006 Rev C and the Weld Map (Page 260) references DWG C09-0001-P0006 Rev A. This MRB would benefit from including the current revision of the DRAWINGS<br>Noted, the revision is linked to minor changes. No impact on the documents cited above<br>Response rejected, include Revision C and resubmit<br>All activities were performed in accordance with the design in the applicable revision. | AGI | OPEN |
| 28. | Part 2 NDE | SGP Testing Winch Box NDE MPI Reports reference DWG C09-0001-P0006 and no revision status<br>C09-0001-P0006 refer to Travelling Trolley and has the revision drawing | AGI | CLOSED |
| 29. | Part 2 NDE | Please provide ANTARES CONTROL NDE operator qualifications for Davide Righetto<br>Noted, added | AGI | CLOSED |
| 30. | Part 2 NDE | Please provide GALPERTI NDE operator qualifications for Simone Tengattini<br>Noted, added | AGI | CLOSED |
| 31. | Part 2 NDE | Please provide SIDERTAGLIO LAMIERE S.R.L. NDE operator qualifications for Alessandro Callegari<br>Noted, added | AGI | CLOSED |
| 32. | Part 2 NDE | Please provide COGNE ACCIAI SPECIALI S.P.A. NDE operator qualifications for Simone Nadalin and Marco Baisotti<br>Noted, will be added , request for documentation forwarded to supplier<br>Will review further after Marco Baisotti qualification are added<br>Noted, added qualification requested. | AGI | OPEN |
| 33. | Part 2 Dimensional Reports | Dimensional Report DimAM006 references DWG C09-0001-P0006 Rev C, is this the correct revision as the Weld Map details Rev A and the Manufacturer Record Book (Page 531) details Rev D<br>Noted, the revision is linked to minor changes. No impact on the documents cited above<br>Response rejected, include Revision D and resubmit<br>All activities were performed in accordance with the design in the applicable revision. | AGI | OPEN |
| 34. | Part 2 Dimensional Reports | Dimensional Report DimAM001 references DWG C09-0001-P0004 Rev G, is this the correct revision as the Weld Map details Rev A and the Manufacturer Record Book (Page 527) details Rev C, SGP Testing NDE reports detail Rev E and the Certification List (Page 535) details Rev D<br>Noted, the revision is linked to minor changes. No impact on the documents cited above<br>Response rejected, include Revision G and resubmit | AGI | OPEN |

| No. | Reference | Comment | Comment made by | Comment status |
|---|---|---|---|---|
| | | All activities were performed in accordance with the design in the applicable revision. | | |
| 35. | Part 2 Commercial Items - HOOK | The Crosby Hook Certificate of Conformity is only supported by a Mill Certificate which contains only chemistry and cannot be considered supplied in accordance with EN 10204 : 3.1<br>Pages 741 Crosby certifies that the characteristics of the material are in accordance with those of the reference standard | AGI | CLOSED |
| 36. | Part 2 Commercial Items - HOOK | Presumably the Crosby Hook was subject to Heat Treatment and mechanical testing, include these records<br>Added Test report and Datasheet with reference about tratements | AGI | CLOSED |
| 37. | Part 2 Commercial Items - HOOK | The material certification in this section comprises of a round bar Mill Cert, the Inspection & Test Plan details there should be Forgings, Plates and Round Bar material certificates.<br>It is a forged hook, the ITP section refers the possible checks depending on the type of base material, in this case the check was done according EN 10228.1 and 3 | AGI | CLOSED |
| 38. | Part 2 Commercial Items - HOOK | The Inspection & Test Plan details there should be material traceability through a certification list, include this | AGI | CLOSED |
| 39. | Part 2 Commercial Items - HOOK | The Inspection & Test Plan details there should be a CE Declaration and should be marked as such, where is this documentation<br>For this type of hook, since it is a lifting component that cannot be used individually, the CE marking is not foreseen, but must be covered by the certification of the assembly or machine.<br>As a result, neither we nor Crosby can affix the CE marking to the component. The only solution is to integrate it into the machine certification. I cannot propose alternatives, as this is the expected practice for this type of product.<br>Response rejected, why is this stated as a requirement within your ITP when it isn't required<br>Typo during ITP drafting | AGI | OPEN |
| 40. | Part 2 Commercial Items - HOOK | The Inspection & Test Plan details there should be a dimensional report, include this and any relevant drawing.<br>Added | AGI | CLOSED |
| 41. | Part 2 Commercial Items - HOOK | Presumably the Crosby Hook comes with a Type Approval Certificate, include this<br>Not applicable no type approval certification was required | AGI | CLOSED |
| 42. | Part 2 Commercial Items - HOOK | Does the Crosby Hook come with the Optional Safety Latch, not clear from the certification and records<br>The Hook was supplied with a safety lock | AGI | CLOSED |
| 43. | Part 2 Commercial Items - HOOK | Include NDE Operator qualification for Andrea Cortinovis<br>Noted, added | AGI | CLOSED |

# Comment Response Sheet Hollandse Kust Noord

| No. | Reference | Comment | Comment made by | Comment status |
|---|---|---|---|---|
| 44. | Part 2 Commercial Items – Wire Rope & Socket | The Inspection & Test Plan details there should be a Certificate of Test & Thorough Examination of the wire rope, this is generally performed by a IVA/IVB/NOBO - where is this report<br>At page 751 | AGI | CLOSED |
| 45. | Part 2 Commercial Items – Translation Gearbox | The Translation Gearbox Declaration of Conformity details it is in accordance with EN 10204 : 3.1, provide the necessary records to support this<br>At page 766 + comment 46<br>Response rejected, how does the material certificate in addition 46 correspond, trace back to the Rossi Declaration of Conformity<br>Will be added traceability received from supplier. | AGI | OPEN |
| 46. | Part 2 Commercial Items – Translation Gearbox | The Inspection & Test Plan details that the Chemical Analysis & Mechanical properties will be provided for the gearbox Torque Items, where is this certification<br>Noted, added<br>Response rejected, how does the material certificate in addition 46 correspond, trace back to the Rossi Declaration of Conformity<br>Will be added traceability received from supplier. | AGI | OPEN |
| 47. | Part 2 Commercial Items – Translation Gearbox | This section would benefit from a drawing, include<br>Noted, added | AGI | CLOSED |
| 48. | Part 2 Commercial Items – Lifting Gearbox | The Lifting Gearbox Declaration of Conformity details it is in accordance with EN 10204 : 3.1, provide the necessary records to support this<br>Noted, added<br>Response rejected, how does the material certificate in addition 48 correspond, trace back to the Rossi Declaration of Conformity<br>Will be added traceability received from supplier. | AGI | OPEN |
| 49. | Part 2 Commercial Items – Lifting Gearbox | The Inspection & Test Plan details that the Chemical Analysis & Mechanical properties will be provided for the gearbox Torque Items, where is this certification<br>Noted, added refer to comment 48<br>Response rejected, how does the material certificate in addition 48 correspond, trace back to the Rossi Declaration of Conformity<br>Will be added traceability received from supplier. | AGI | OPEN |
| 50. | Part 2 Commercial Items – Lifting Gearbox | This section would benefit from a drawing, include<br>Noted, added | AGI | CLOSED |
| 51. | Part 2 Commercial Items – Rotation Gearbox | The Rotation Gearbox Declaration of Conformity details it is in accordance with EN 10204 : 2.2, provide the necessary records to support this<br>Noted, added | AGI | CLOSED |
| 52. | Part 2 Commercial Items – Rotation Gearbox | This section would benefit from a drawing, include<br>Noted,Added | AGI | CLOSED |

# Comment Response Sheet Hollandse Kust Noord

| No. | Reference | Comment | Comment made by | Comment status |
|---|---|---|---|---|
| 53. | Part 2 Commercial Items – Rotation Gearbox | The Inspection & Test Plan details that the Chemical Analysis & Mechanical properties will be provided for the gearbox Torque Items, where is this certification<br>Noted, added – refer to comment 51 | AGI | CLOSED |
| 54. | Part 2 Commercial Items – Rotation Gearbox | The Inspection & Test Plan details that all Gearboxes are in accordance with 3.1, why is this one 2.2<br>Noted, added refer to comment 51 | AGI | CLOSED |
| 55. | Part 2 Commercial Items – Electric Motor | The Electric Motor CE Declaration & Declaration of Conformity do not advise if the motor is ATEX compliant, all equipment to be used in Hazardous areas are to be supplied with ATEX certification<br>Not applicabile as per Email , it was defined as a safe area and not an ATEX zone | AGI | CLOSED |
| 56. | Part 2 Commercial Items – Load Cell | The Inspection & Test Plan details that NDE reports will be include, where are these<br>Please refer to 3.1 certificate page 772<br>Response rejected, where???<br>Ut performed on base material please refer to 3.1 material page 773<br>Mt not applicable for hot rolled bars. | AGI | OPEN |
| 57. | Part 2 Commercial Items – Load Cell | The Inspection & Test Plan details that Dimensional reports will be include, where are these<br>The request for the dimensional certificate of the cell is made by us to the supplier to ensure that it is supplied in compliance and does not have problems during assembly.<br>Response rejected, please include<br>Noted, will be added | AGI | OPEN |
| 58. | Part 2 Commercial Items – Frequency Converters | Where is the CE Declaration and Declaration of Conformity<br>Noted, added | AGI | CLOSED |
| 59. | Part 2 – Section 13 Paint Reports | Section 6 of the Inspection & Test Plan details the following will have Paint Reports:<br>- Boom (Verified)<br>- Trolley (Verified)<br>- Pedestal Verified)<br>- Column (Missing)added<br>- Slew Bearing (Missing)page 735<br>- Pulley (Missing) typo reported twice code C09-0001-P0007, corrected page 963<br>- Drum (Missing) page 738<br>- Shoulder (Missing) page 738 | AGI | CLOSED |
| 60. | | | | |
| 61. | | | | |

# CERTIFICATO DI CONTROLLO ULTRASONORO
# ULTRASONIC INSPECTION CERTIFICATE

Controlli effettuati su lamiera ante-taglio
Checks carried out on pre-cutting Steel Plate

| Cliente / Customer | Vs Ordine / Order |
|---|---|
| **SIDERTAGLIO LAMIERE S.R.L.** | |

Documento Nr / Document No
267
25/03/2024

| Dimensioni / Dimension | Cod. Interno / Code |
|---|---|
| **12080X2460** | **25729** |
| Colata / Heat No | Cert. Nr. / Cert. No |
| **.** | |

Spessore / Thik
**20**

| Materiale / Material | Oggetto / Object |
|---|---|
| **S355J2+N** | **Steel plate** |
| Stadio di Lavorazione / Working step | Particolare / Detail |
| **As conditions of supply** | |
| Posizione di controllo / Scanning position | Condizioni Superficiali / Surface condition |
| **100x100** | **As rolled** |

| Specifica di rif. / Specification Ref. | Classe accettabilità / Acceptance criterie |
|---|---|
| **EN 10160** | **S2E3** |
| Apparecchio Tipo / Instrument model | Mezzo accoppiamento / |
| **GILARDONI RDG 450** | **Water** |
| Blocco Campione / Reference Block | Perdite di trasferimento / Transfre lossee |
| **V1** | |

Taratura sensibilità d'esame / Sensibility range test
**Flat bottomed holes Ø 5 mm**

| TRASDUTTORI search units | ONDE waves | TIPO type | FREQUENZA | SEZIONE (mm) size (mm) | ANGOLO angle | DIAMETRO diameter | FABBRICANTE manufacturer |
|---|---|---|---|---|---|---|---|
| | **LONGIT** | **D25/4** | **4MHz** | | | **Ø25** | **IMG** |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

| IDENTIFICAZIONE identification | AREA / TRATTO Area/section | TIPO DISCONT. discontinuity | AMPIEZZA amplitude | LUNGHEZZA length | PROFONDITA' depth | NOTE remark | RISULTATO examination result |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

| | | |
|---|---|---|
| Risultato dell'esame | X | **Satisfactory / Conforme** |
| Examination result | | **Unsatisfactory / NON Conforme** |

Emesso da
Esaminatore

SIDERTAGLIO LAMIERE s.r.l.
Alessandro Callegari
UNI EN ISO 9712:2012 level II
Cert. Nr. DTG-END-A00562-14

| Ispettore Cliente / Ente terzo | Controllo qualità |
|---|---|
| | |

Sidertaglio Lamiere srl

Taglio plasma
Ossitaglio
fino a 500mm

**TAGLIO E COMMERCIO DI LAMIERE**
Via dell'Agricoltura 8/D - 36040 Meledo di Sarego (VI) - Tel. 0444 823059
Fax Amm. 0444 823364 - Uff. Tec. 0444 823201 - Email: info@sidertaglio.com - Web: www.sidertaglio.com
Reg. Imp. VI 33000/1996 - R.E.A. 236444 - Cod. Fisc. e P.IVA 02510610245

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.: 627031

Z02 Data / Date: 28/10/2024

A08 N° Ordine Trametal / Works order: 32405089

A07 N° Ordine cliente / Customer's order: 193

DDT: BOL 32420896

del / date: 25/10/2024

Pratica / File no.:

del / date:

B01/B02/B03

Prodotto / Product: Lamiere / Hot rolled plates

Qualità / Steel grade: S355J2+N

Normativa / Specification: EN10025-2:2019

A06 Cliente / Customer

**COSME GROUP SRL**

**Via dei platani 15/2**
**33050 SANTA MARIA LA LONGA 33050 IT**

**UD 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

| 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 | B05 PWHT TEMPERATURA INIZIO °C | B05 PWHT HEATING RATE °C/h | B05 PWHT VELOCITA' RISCALDO | B05 PWHT TEMPERATURE TREATMENT °C | B05 PWHT TEMPERATURA TRATTAMENTO | B05 PWHT HOLDING TIME | B05 PWHT PERMANENZA Min | B05 PWHT COOLING RATE °C/h | B05 PWHT VELOCITA' RAFFREDDAMENTO | B05 PWHT END TEMPERATURE °C | B05 PWHT TEMPERATURA FINE | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | STAD490209A | 1982187 | 10.00X3000X12000 | 2,83 | 801905 | BO | N* | [ZH736] | | | | | | | | | | | | | | | | | | | | | | |

## 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S355J2+N Min 0.00 - 30.00 | | | | | | | | | | | | | | | | | | | | | |
| S355J2+N Max 0.00 - 30.00 | 0,20 | 1,60 | 0,55 | 0,025 | 0,025 | 0,550 | | | | | | | | | | | | | | 0,45 | |
| STAD49 | 0,15 | 1,40 | 0,19 | 0,016 | 0,003 | 0,010 | 0,010 | 0,020 | <0.005 | 0,038 | 0,002 | 0,003 | 0,002 | <0.005 | 0,0000 | 0,0025 | 0,0002 | 0,0000 | 0,38 | 0,39 | 0,23 |

| C00 CAMPIONE SAMPLE | C01 SPESSORE LAMIERA PLATE THICKNESS | 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 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S355J2+N Min 0.00 - 16.00 | | | | | 20 | 355 | 470 | | 20,0 | | | | | | | | | | | | | | | | | | | |
| S355J2+N Max 0.00 - 16.00 | | | | | 20 | | 630 | | | | | | | | | | | | | | | | | | | | | |
| S355J2+N Min 6.00 - 999.00 | | | | | | | | | | | | | L | -20 | | | 27 | | | | | | | | | | | |
| ZH736 | 8,00 | 2 | P | T | 20 | 393 | 524 | 0,75 | 32,1 | | P | 7,50 | L | -20 | P | 118 98 83 | 100 | | | | | | | | | | | |

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** |
| 3 | | EN 10029 CL.A | -0+100 MM | -0+200 MM | EN 10163/2 CL A1 | 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** |
| | **TIMBRO DELL'ISPETTORE STAMP OF THE INSPECTION REPRESENTATIVE** | METINVEST TRAMETAL S.p.a/ F. Andrian CQ Manager |

DDT. 3614 DEL 12/11/2024 VS. ORDINE 2400610 DEL 28/10/2024

COSME GROUP SRL
VIA DEI PLATANI, 138
33050 SANTA MARIA LA LONGA (UD)
Tel. 0432 801333 - Fax 0432 801991
P.IVA - C.F. - R.I. di Udine 02815120304
www.cosmegroup.it e-mail: info@cosmegroup.it

# DICHIARAZIONE DI CONFORMITÀ

**CERTIFICATO N.** 180/2024 **DEL** 20/11/2024

**CLIENTE** CELOTTI ROBERTO & C. SRL

**N.DDT E DATA** 6133 DEL 21/11/2024

**DESCRIZIONE**

**CODICE** C09-0001-P0050

**MATERIALE** **QUANTITÀ** N.1

**TRATTAMENTO E CARATTERISTICHE RICHIESTE**

42NICRMO4 TAF HRC 54 0/+5

**TRATTAMENTO ESEGUITO E CARATTERISTICHE RISCONTRATE**

TAF HRC 57

FIRMA
T.T.G. S.r.l.
Via A. Moro, 24/26
25033 COLOGNE (Brescia)
Partita IVA 02150740989
R.E.A. 424201

# NDT OPERATOR QUALIFICATION CERTIFICATE

No. **24TO00050CE1/RC**

| | | | |
|---|---|---|---|
| Operator | **RIGHETTO DAVIDE** | | |
| Born in | **VICENZA (VI)** | on | **16/11/1988** |
| Employed by | **ANTARES CONTROL DI RIGHETTO DAVIDE** | | |
| Located in | **Grumolo Delle Abbadesse (VI)** | | |

this is to certify that the non destructive test operator is qualified by examinations at the level 2 according to ISO 9712:2021 standard and to RINA Rule RC/C 14

in the method:

**ULTRASONIC**

for the following industrial sectors:

**PRE AND IN-SERVICE TESTING (s)**

| | | | |
|---|---|---|---|
| This certificate is valid from | **4 February 2024** | to | **3 February 2029** |
| Issued at | **GENOVA** | on | **4 February 2024** |

The above mentioned Operator is approved for the Method and Level specified, according to Par. 3.1.3 of Annex I 2014/68/EU Directive (CEN/TR 15589 Route A)

Filippo Lago
(Italy Industrial & Personnel Certification Services Director)

**Operator**

This certificate consist of 1 page

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO

**PRS N° 066 C**

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

**RINA Services S.p.A.**
**RTPO 2014/68/EU Directive, Art. 20**
**Via Corsica 12 - 16128 Genova**

# CERTIFICATO DI QUALIFICA DI OPERATORE PER CND

N. **24TO00050CE1/RC**

| | | | |
|---|---|---|---|
| Operatore | **RIGHETTO DAVIDE** | | |
| Nato a | **VICENZA (VI)** | il | **16/11/1988** |
| Impiegato presso | **ANTARES CONTROL DI RIGHETTO DAVIDE** | | |
| Con sede in | **Grumolo Delle Abbadesse (VI)** | | |

si certifica che, a seguito degli esami sostenuti, l'operatore addetto alle prove non distruttive è qualificato al livello 2 in conformità alla norma ISO 9712:2021 ed al Regolamento RINA RC/C 14

nel metodo:

**ULTRASONORO**

per i seguenti settori industriali:

**PROVA PRE-SERVIZIO E IN SERVIZIO (s)**

| | | | |
|---|---|---|---|
| Il presente certificato è valido dal | **4 Febbraio 2024** | fino al | **3 Febbraio 2029** |
| Rilasciato a | **GENOVA** | il | **4 Febbraio 2024** |

Il suddetto Operatore è approvato per Metodo e Livello specificati in accordo al Par. 3.1.3 Allegato I della Direttiva 2014/68/UE (CEN/TR 15589 Route A)

Filippo Lago
(Italy Industrial & Personnel Certification Services Director)

**Operatore**

Questo certificato è composto di 1 pagina

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO
**PRS N° 066 C**
Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC

**RINA Services S.p.A.**
**RTPO 2014/68/EU Directive, Art. 20**
**Via Corsica 12 - 16128 Genova**



PRS N° 076C

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

PROVE NON DISTRUTTIVE: Certificato di Qualifica Operatore
*NON-DESTRUCTIVE TESTING: Operator Qualification Certificate*

**N° IND-23-01472-R**

Si certifica la qualifica in Prove Non Distruttive al Livello 2
*It certifies the qualification for Non-Destructive Testing at the level 2*

Titolare del certificato / *Certificate holder*
Simone Tengattini (ID # 1842)

Nato a / *born in*: Bellano (CO) Italy

Il / *on*: 31 Mar 1991

Per il metodo / *For the method*
Visual Testing (VT)

Per i settori / *For the sectors*
Pre- and in-service testing which includes manufacturing

Il presente certificato viene rilasciato in conformità alla Norma UNI EN ISO 9712:2012 e Regolamento Bureau Veritas IT-IND-REG-01_NDT.IND
*This certificate is issued according to UNI EN ISO 9712:2012 and Bureau Veritas Rule IT-IND-REG-01_NDT.IND*

Data ultima revisione / *Date last revision*: ----------

Emesso / *Issued*: 16 May 2023

Valido dal / *Valid from*: 16 May 2023

Scadenza / *Expiry date*: 15 May 2028

Firma titolare del certificato
*Signature of certificate holder*

Responsabile Tecnico di Schema
*NDT Scheme Chief*
Luca Rossi

**to check the certificate: https://bvchecker.revo.network**

© BUREAU VERITAS ITALIA S.p.A. Viale Monza, 347, 20126 Milano



PRS N° 076C

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

PROVE NON DISTRUTTIVE: Certificato di Qualifica Operatore
*NON-DESTRUCTIVE TESTING: Operator Qualification Certificate*

**N° IND-23-01473-R**

Si certifica la qualifica in Prove Non Distruttive al Livello 2
*It certifies the qualification for Non-Destructive Testing at the level 2*

Titolare del certificato / *Certificate holder*
Simone Tengattini (ID # 1842)

Nato a / *born in*: Bellano (CO) Italy

Il / *on*: 31 Mar 1991

Per il metodo / *For the method*
Penetrant Testing (PT)

APPROVAZIONE PER ESECUZIONE DI PROVE NON DISTRUTTIVE secondo l'Allegato I paragrafo 3.1.3 della direttiva attrezzature a pressione 2014/68/UE PED (CEN/TR 15589 Route A)
*APPROVAL FOR EXECUTION OF NON-DESTRUCTIVE TESTING as per Annex I paragraph 3.1.3 of pressure equipment directive 2014/68/UE PED (CEN/TR 15589 Route A)*

Per i settori / *For the sectors*
Pre- and in-service testing which includes manufacturing

Il presente certificato viene rilasciato in conformità alla Norma UNI EN ISO 9712:2012 e Regolamento Bureau Veritas IT-IND-REG-01_NDT.IND
*This certificate is issued according to UNI EN ISO 9712:2012 and Bureau Veritas Rule IT-IND-REG-01_NDT.IND*

Data ultima revisione / *Date last revision*: ----------

Emesso / *Issued*: 16 May 2023

Valido dal / *Valid from*: 16 May 2023

Scadenza / *Expiry date*: 15 May 2028

Firma titolare del certificato
*Signature of certificate holder*

Responsabile Tecnico di Schema
*NDT Scheme Chief*
Luca Rossi

**to check the certificate: https://bvchecker.revo.network**

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PRS N° 076C

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

PROVE NON DISTRUTTIVE: Certificato di Qualifica Operatore
*NON-DESTRUCTIVE TESTING: Operator Qualification Certificate*

**N° IND-23-01474-R**

Si certifica la qualifica in Prove Non Distruttive al Livello 2
*It certifies the qualification for Non-Destructive Testing at the level 2*

Titolare del certificato / *Certificate holder*
Simone Tengattini (ID # 1842)

Nato a / *born in*: Bellano (CO) Italy

Il / *on*: 31 Mar 1991

Per il metodo / *For the method*
Magnetic Testing (MT)

Per i settori / *For the sectors*
Pre- and in-service testing which includes manufacturing

Il presente certificato viene rilasciato in conformità alla Norma UNI EN ISO 9712:2012 e Regolamento Bureau Veritas IT-IND-REG-01_NDT.IND
*This certificate is issued according to UNI EN ISO 9712:2012 and Bureau Veritas Rule IT-IND-REG-01_NDT.IND*

Data ultima revisione / *Date last revision*: ----------

Emesso / *Issued*: 16 May 2023

Valido dal / *Valid from*: 16 May 2023

Scadenza / *Expiry date*: 15 May 2028

Firma titolare del certificato
*Signature of certificate holder*

Responsabile Tecnico di Schema
*NDT Scheme Chief*
Luca Rossi

**to check the certificate: https://bvchecker.revo.network**

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PRS N° 076C

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

PROVE NON DISTRUTTIVE: Certificato di Qualifica Operatore
*NON-DESTRUCTIVE TESTING: Operator Qualification Certificate*

**N° IND-23-02492-R**

Si certifica la qualifica in Prove Non Distruttive al Livello 2
*It certifies the qualification for Non-Destructive Testing at the level 2*

Titolare del certificato / *Certificate holder*
Simone Tengattini (ID # 1842)

Nato a / *born in*: Bellano (CO) Italy

Il / *on*: 31 Mar 1991

Per il metodo / *For the method*
Ultrasonic Testing (UT)

Per i settori / *For the sectors*
Pre- and in-service testing which includes manufacturing

Il presente certificato viene rilasciato in conformità alla Norma UNI EN ISO 9712:2012 e Regolamento Bureau Veritas IT-IND-REG-01_NDT.IND
*This certificate is issued according to UNI EN ISO 9712:2012 and Bureau Veritas Rule IT-IND-REG-01_NDT.IND*

Data ultima revisione / *Date last revision*: ----------

Emesso / *Issued*: 26 Jun 2023

Valido dal / *Valid from*: 26 Jun 2023

Scadenza / *Expiry date*: 25 Jun 2028

Firma titolare del certificato
*Signature of certificate holder*

Responsabile Tecnico di Schema
*NDT Scheme Chief*
Luca Rossi

**to check the certificate: https://bvchecker.revo.network**

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IWELD
ORGANISMO DI CERTIFICAZIONE

# NDT OPERATOR QUALIFICATION CERTIFICATE

*Certificato di qualifica operatore per CND*

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO

PRS N° 0090 C

Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC

Signatory of EA, IAF and ILAC Mutual Recognition Agreements

**CERTIFICATE No** *Certificato N.* **IW0506-CND-003** Rev. **1**





**Operator** *Operatore* **CALLEGARI ALESSANDRO**

**Date and place of birth** *Data e luogo di nascita* **04.03.1983 ARZIGNANO (VI–I)**

**Examining body name and address** *Nome e indirizzo dell'Ente Esaminante:* **INTERNATIONAL WELD S.R.L. VIA DIVIGLIO, 243 int. 2 – 36030 CALDOGNO (VI)**

**Is certified according to** *È certificato in conformità* **UNI EN ISO 9712: 2022**

**For the level** *Per il livello* **2**

**For the method** *Per il metodo* **Ultrasonic Testing (UT)**

**For the industrial sectors** *Per i settori industriali* **Manufacturing (m)**

**For the product sectors** *Per i settori di prodotto* **Wrought products (wp)**

**Limitations to the certification (if applicable)** *Limitazione nell'applicazione (se applicabile)* -

**This certificate is issued according to International Weld's rule RG-14**
*Il presente certificato è rilasciato in conformità al regolamento di International Weld RG-14*

**Date of validity** *Data di inizio validità* **08.10.2014***

**Date of issue** *Data di rilascio* **10.12.2024**

**Valid until** *Valido fino* **07.10.2029**

**Certification Body**
*Organismo di Certificazione*

IWELD ORGANISMO DI CERTIFICAZIONE

Firmato digitalmente da:
BENOZZATO CATERINA
Firmato il 10/12/2024 14:27
Seriale Certificato: 3706513
Valido dal 04/07/2024 al 04/07/2027
InfoCamere Qualified Electronic Signature CA

**The certified person**
*La persona certificata*

**Employer authorizing**
*Autorizzazione del datore di lavoro*

* *Recertification performed from certificate n° IW0506-CND-003 R.0 issued by INTERNATIONAL WELD S.R.L*

MD 03.02-02 R.6

IWELD
ORGANISMO DI CERTIFICAZIONE

Caldogno, lì 10 dicembre 2024

Alla c.a. Sig. Alessandro Callegari

Spett.le
SIDERTAGLIO LAMIERE S.R.L.
Via Agricoltura, 9
36040 Sarego (VI)

Off. Rif. Convenzione S.S.S.&C. S.R.L.

**OGGETTO:** **Certificazione del personale addetto ai controlli non distruttivi**

Con riferimento a quanto in oggetto, abbiamo il piacere di trasmetterVi la documentazione di certificazione in seguito elencata.
Le modalità di convalida della documentazione (timbro e firma) sono riportate in tabella.

| N° documento | Tipo Certificato | Firma Convalida |
|---|---|---|
| IW0506-CND-003 R.1 | ISO 9712 | Datore di Lavoro & Personale Addetto |

A disposizione per ulteriori chiarimenti e in attesa di un Vs. gradito riscontro, porgiamo distinti saluti.

INTERNATIONAL WELD S.R.L.
Rappresentante Legale
Caterina Benozzato
Caterina Benozzato

**CICPND**
CENTRO ITALIANO
DI COORDINAMENTO
PER LE PROVE NON DISTRUTTIVE

Via C. Pisacane, 46
20025 Legnano (MI)
PEC: info@pec.cicpnd.it
C.F. e P.I. 09510020150

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO
PRS N° 012C
Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
Signatory of EA, IAF and ILAC Mutual Recognition Agreement

# *CERTIFICATO DI LIVELLO 2*
## *LEVEL 2 CERTIFICATE*

**N° 32040/PND/C**

Si certifica la qualificazione per esami in Prove Non Distruttive al **LIVELLO 2**
*This is to certify qualification by examinations in Non-Destructive Testing at the **LEVEL 2***

***di / of***

**Nadalin Angelo Simone**

nato a / *born in* **Carmagnola (TO)**

il / *on* **22 febbraio 1974**

per il metodo / *for the method:*

**Ultrasuoni (UT)**

per i settori / *for the sectors:*

**Collaudo pre e in servizio che comprende la fabbricazione**

**(c; f; w; t; wp; p)**

Il presente certificato viene rilasciato in conformità alla Norma UNI EN ISO 9712:2012.
*This certificate is issued according to UNI EN ISO 9712:2012.*

Firma persona certificata
*Signature of certificate holder*



Direttore Generale
*General Manager*

Reggiani Michael
*M. Reggiani*

Data Delibera: 26/10/2022
*Approval Date*

Data Scadenza: 11/10/2027 R
*Expiry Date*

AIPnD

CICPND
CENTRO ITALIANO
DI COORDINAMENTO
PER LE PROVE NON DISTRUTTIVE

Via C. Pisacane, 46
20025 Legnano (MI)
PEC: info@pec.cicpnd.it
C.F. e P.I. 09510020150

ACCREDIA
PRS N° 012C

# *CERTIFICATO DI LIVELLO 2*
## *LEVEL 2 CERTIFICATE*

**N° 32347/PND/C**

Si certifica la qualificazione per esami in Prove Non Distruttive al **LIVELLO 2**
*This is to certify qualification by examinations in Non-Destructive Testing at the **LEVEL 2***

***di / of***

**Nadalin Angelo Simone**

nato a / *born in* **Carmagnola (TO)**

il / *on* **22 febbraio 1974**

per il metodo / *for the method:*

**Magnetoscopia (MT)**

per i settori / *for the sectors:*

**Collaudo pre e in servizio che comprende la fabbricazione**

**(c; f; w; t; wp; p)**

Il presente certificato viene rilasciato in conformità alla Norma UNI EN ISO 9712:2012.
*This certificate is issued according to UNI EN ISO 9712:2012.*

Firma persona certificata
*Signature of certificate holder*

Direttore Generale
*General Manager*

M. Reggiani

Data Delibera: 28/02/2023
*Approval Date*

Data Scadenza: 26/01/2028 R
*Expiry Date*

AIPnD

CICPND
CENTRO ITALIANO
DI COORDINAMENTO
PER LE PROVE NON DISTRUTTIVE

Via C. Pisacane, 46
20025 Legnano (MI)
PEC: info@pec.cicpnd.it
C.F. e P.I. 09510020150

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO
PRS N° 012C
Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
Signatory of EA, IAF and ILAC Mutual Recognition Agreement

# *CERTIFICATO DI LIVELLO 2*
## *LEVEL 2 CERTIFICATE*

**N° 37589/PND/C**

Si certifica la qualificazione per esami in Prove Non Distruttive al **LIVELLO 2**
*This is to certify qualification by examinations in Non-Destructive Testing at the **LEVEL 2***

***di / of***

**Nadalin Angelo Simone**

nato a / *born in* **Carmagnola (TO)**

il / *on* **22 febbraio 1974**

per il metodo / *for the method:*

**Correnti Indotte (ET)**

per i settori / *for the sectors:*

**Fabbricazione**

**(c; f; w; t; wp; p)**

Il presente certificato viene rilasciato in conformità alla Norma UNI EN ISO 9712:2012.
*This certificate is issued according to UNI EN ISO 9712:2012.*

Firma persona certificata
*Signature of certificate holder*

Direttore Generale
*General Manager*

M. Reggiani

Data Delibera: 11/07/2023
*Approval Date*

Data Scadenza: 11/07/2028 C
*Expiry Date*

AIPnD

**QUALIFICAZIONE PER ESAMI E PER ESAMI E TITOLI DEL PERSONALE CHE ESEGUE CONTROLLI E COLLAUDI AINTIMISCUGLIO/SPETTROTEST**
(in accordo con la norma PR-QPE.SPT)

# CERTIFICATO DI QUALIFICAZIONE

| COGNOME E NOME: | SETTORE PRODUTTIVO: |
|---|---|
| NADALIN Angelo Simone | **CND (Unità Operativa)** |

## ADDESTRAMENTO TEORICO-PRATICO

| Addestramento teorico | | Addetramento pratico (affiancamento) | |
|---|---|---|---|
| Richiesto (ore) | Effettuato (ore) | Richiesto (ore) | Effettuato (ore) |
| 4 | 7 | 20 | 20 |

N.B: • L'addestramento teorico è riportato sul registro didattico e delle presenze del 07e 09/03/2022 e del 01/02/2022

• L'affiancamento pratico è registrato sul mod. ADD-D Rev.7.

## ESITO ESAME DI QUALIFICAZIONE

| TIPO DI PROVA | VALUTAZIONE | |
|---|---|---|
| | RICHIESTA | OTTENUTA |
| **Prova fisica** | Idoneità | 02/03/2022 |
| **Prova teorica** | 17 (*) | 19 |
| **Prova pratica** | Individuazione di n° 5 marche | Individ. correttamente: 329 S 1- 329S – F316L – 316T 1 – F304L1. |

(*) Numero minimo di risposte esatte alle 20 domande del questionario.

Firma esaminatori

## QUALIFICAZIONE

Considerati l'addestramento teorico-pratico e l'esito positivo dell'esame di qualificazione si certifica che il suddetto operatore è qualificato, in accordo con la norma PR-QPE.SPT, per l'esecuzione dei controlli e collaudi antimiscuglio/spettrotest.

Data della qualificazione 06/07/2022

Data scadenza qualificazione 05/07/2027

Firma QUA QPP RESP

Firma GDQ RESP

Firma QUA DIR

**(mod. SPT_B rev. 2)**

| Cogne Acciai Speciali | **Certificato per Esame della Vista del personale addetto ai CND in campo aeronautico**<br>*Certificate for Eye Examination of personnel involved in Aerospace NDT* | In accordo con PR-QPE.NDA<br>In agreement with PR-QPE.NDA |
|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Nome del Candidato<br>*Candidate Name* | NADALIN ANGELO SIMONE | | | | |
| Livello di Certificazione<br>*Certification Level* | ☐ Trainee ☐ 1 ☐ 2 ☐ 3 | Metodi CND<br>*NDT methods* | ☐ PT ☐ MT ☒ UT ☐ RT | ☒ | Iniziale- *Initial*<br>Periodica -*Periodic* |

| **Requisiti Standard secondo Pratica Scritta**<br>*Standard requirements according to Written Practice* | | **Risultato**<br>*Result* | | |
|---|---|---|---|---|
| Visione da vicino<br>*Near vision* | Occhio sinistro<br>*Left eye* | ☐ Idoneo a Jaeger 1 a 30,5 cm senza mezzi correttivi<br>*Able on Jaeger 1 at 30,5cm without vision correction means* | ☒ Idoneo a Jaeger 1 a 30,5 cm con mezzi correttivi<br>*Able on Jaeger 1 at 30,5cm with vision correction means* | ☐ Non Idoneo<br>*Not Able* |
| | Occhio destro<br>*Right eye* | ☐ Idoneo a Jaeger 1 a 30,5 cm senza mezzi correttivi<br>Able on Jaeger 1 at 30,5cm without vision correction means | ☒ Idoneo a Jaeger 1 a 30,5 cm con mezzi correttivi<br>Able on Jaeger 1 at 30,5cm with vision correction means | ☐ Non Idoneo<br>Not Able |
| Percezione Cromatica<br>*Colors perception* | | ☒ Test CAS superato<br>*CAS test passed* | ☐ Incertezze al Test CAS<br>*Hesitation on CAS test* | |
| Note<br>*Notes* | | | | |
| Data<br>*Date* 16.10.2023 | | Inf. Wollinger<br>Nome e firma dell'esaminatore<br>Name and signature of examine | | Firma del candidato<br>Candidate *signature* |

## Valutazioni del Livello 3 Responsabile
*Evaluation of Responsible Level 3*

☐ Idoneo senza mezzi correttivi - *Able without correction media*
☒ Idoneo con mezzi correttivi - *Able with correction media*
☐ Idoneo con limitazioni (vedi sotto) - Able with limitation (see below)
☐ NON IDONEO - UNABLE

| Limitazioni<br>Restrictions | / |
|---|---|

| | | |
|---|---|---|
| 16.10.2023<br>Data<br>Date | COGNE ACCIAI SPECIALI s.p.a.<br>Via Paravera n° 16<br>11100 AOSTA<br>Nome e firma del Livello 3 Responsabile<br>*Name and signature of Responsible Level 3* | Firma del candidato<br>*Candidate signature* |

CENTRO ITALIANO
DI COORDINAMENTO
PER LE PROVE
NON DISTRUTTIVE

Via C. Pisacane, 46
20025 Legnano (MI)
PEC: info@pec.cicpnd.it
C.F. e P.I. 09510020150

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO
PRS N° 012C
Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
Signatory of EA, IAF and ILAC Mutual Recognition Agreement

# *CERTIFICATO DI LIVELLO 3*
## *LEVEL 3 CERTIFICATE*

**N° 34194/PND/C**

Si certifica la qualificazione per esami in Prove Non Distruttive al **LIVELLO 3**
*This is to certify qualification by examinations in Non-Destructive Testing at the **LEVEL 3***

***di / of***

**Baisotti Marco Pietro**

nato a / *born in* **Ivrea (TO)**

il / *on* **10 marzo 1974**

per il metodo / *for the method:*

**Ultrasuoni (UT)**

per i settori / *for the sectors:*

**Collaudi pre e in servizio che comprendono la fabbricazione**

**(c; f; w; t, wp)**

Il presente certificato viene rilasciato in conformità alla Norma UNI EN ISO 9712:2022.
*This certificate is issued according to UNI EN ISO 9712:2022.*

Direttore Generale
*General Manager*

Reggiani Michael
*M. Reggiani*

Data Delibera: 07/11/2024
*Approval Date*

Data Scadenza: 29/11/2029 R
*Expiry Date*

Approvazione per l'esecuzione di prove non distruttive secondo l'Allegato I paragrafo 3.1.3 della **Direttiva attrezzature in pressione 2014/68/UE/PED** (CEM/TR 15589 Route A). Il presente certificato emesso in data 19/11/2024 annulla e sostituisce il precedente.

AIPnD

**Date:** 10/9/2025

**To:** Ricacardo Ghidoni – Quality Assurance, Sirtef s.r.l.
**Subject:** S319CN 5t Carbon Shank Hook (JC) PIC 5WB, Heat #58037678 - Mechanical Test Certificate

This memo contains the Mechanical Test report for the material used to make the above item (page 2). At the moment we cannot automatically generate this document from our CertPro software that you would typically use to obtain certificates. We must seek some internal technical support for it to configure the documents in this specific case.

Respectfully,

**Scott Eyman**
Sr. Director, Quality and Manufacturing Technology
**Lifting & Rigging Hardware**

**Classification:** ASTM Class CG (521-11) or F (668-09)

**Exceptions:**

Element Materials Technology
3100 North Hemlock Circle
Broken Arrow, OK
74012-1115 USA

P 918 258 6066
F 918 258 1154
T 800 982 8378
info.brokenarrow@element.com
element.com

## Laboratory Report - EAR-Controlled Data

**Attn:** Aliecia Callison
**The Crosby Group LLC - Longview**
**2414 Crosby Way**
**LONGVIEW, TX 75602 US**

**Report No:** B20040463
**Date Reported:** 4/27/2020
**P.O. No:** Element - CL114934

**Material:**

**Description:** (2) Test Samples / Lebus# 500-S / Grade: Carbon / Die# 1069 / PIC: 5WB / HK SHK CBN CR HK 5.00TN / Heat# 58037678

**Room Temperature Tensile Testing ASTM A370-19e1 / ASTM E8/E8M-16a, Longitudinal at 4/5 Radius, As Received**

| Diameter, Initial, in | Tensile Strength, psi | Yield (0.2% Offset), psi | Elongation After Fracture (4D), % | Reduction of Area, % | Location of Fracture |
|---|---|---|---|---|---|
| 0.251 | 100100 | 67800 | 30 | 67 | Inside Middle Half of Gage |

**Hardness Test ASTM E18-18a/ASTM A370-19e1, As Received**

Testing Location, Hardness: Surface

| Sample ID | Results |
|---|---|
| 1 | 92 HRBW |

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Approved by:

Doug Kooken
Operations Manager

**S-319/S-319N**



- The most complete line of shank marked hooks. Available 3/4 to 300 metric tons.
- Hook Identification code marked into each hook.
- All carbon and alloy hooks are quenched and tempered.
- Quenched & Tempered.
- Available in carbon steel, alloy steel, and bronze.
- Proper design, careful forging, and precision controlled quench and tempering give maximum strength without excessive weight and bulk.
- Every Crosby Shank Hook has a pre-drilled cam which can be equipped with a latch. Simply purchase the Crosby latch assemblies. Even years after the purchase of the original hook, latch assemblies can be added.
- Type Approval Certification in accordance with ABS 2016 Steel Vessels and ABS Guide for Certification on Cranes available. Certificates available when requested at time of order and may include additional charges.

APPLICATION AND WARNING INFORMATION
SECTION 17

## S-319 / S-319N Shank Hook

| Working Load Limit (t) | | | Hook ID Code | Shank Hooks Stock No. | | | Shank Length ‡ | Weight Each (lb) | Rep. Latch Kits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon | Alloy | Bronze | | Carbon S-319C S-319CN | Alloy S-319A S-319AN | Bronze S-319BN | | | S-4320 Stock No. | PL Stock No. | SS-4055 Stock No. |
| 0.75 | 1 | .5 | †D | 1028505 | 1028701 | 1028900 | Std. | .50 | 1096325 | - | - |
| 1 | 1.5 | .6 | †F | 1028514 | 1028710 | 1028909 | Std. | .75 | 1096374 | - | - |
| 1.5 | 2 | 1 | †G | 1028523 | 1028723 | 1028918 | Std. | 1.00 | 1096421 | - | - |
| 2 | 3 | 1.4 | †H | 1028532 | 1028732 | 1028927 | Std. | 1.82 | 1096468 | - | - |
| 3 | 5 | 2 | †I | 1028541 | 1028741 | 1028936 | Std. | 3.69 | 1096515 | 1092000 | - |
| 5 | 7 | 3.5 | †J | 1028550 | 1028750 | 1028945 | Std. | 7.25 | 1096562 | 1092001 | - |
| 7.5 | 11 | 5 | †K | 1028563 | 1028765 | 1028954 | Std. | 13.4 | 1096609 | 1092002 | - |
| 10 | 15 | 6.5 | †L | 1028590 | 1028792 | 1028981 | Std. | 21.9 | 1096657 | 1092003 | - |
| 15 | 22 | 10 | †N | 1028599 | 1028801 | 1028990 | Std. | 38.4 | 1096704 | 1092004 | - |
| 20 | 30 | - | O | 1024386 | 1024803 | - | Std. | 72 | - | 1093716 | 1090161 |
| 20 | 30 | - | O | 1024402 | 1024821 | - | Long | 85 | - | 1093716 | 1090161 |
| 25 | 37 | - | P | 1024420 | 1024849 | - | Std. | 134 | - | 1093717 | 1090189 |
| 25 | 37 | - | P | 1024448 | 1024867 | - | Long | 172 | - | 1093717 | 1090189 |
| 30 | 45 | - | S | 1024466 | 1024885 | - | Std. | 182 | - | 1093718 | 1090189 |
| 30 | 45 | - | S | 1024484 | 1024901 | - | Long | 214 | - | 1093718 | 1090189 |
| 40 | 60 | - | T | 1024509 | 1024929 | - | Std. | 268 | - | 1093719 | 1090205 |
| 40 | 60 | - | T | 1024545 | 1024965 | - | Long | 312 | - | 1093719 | 1090205 |
| 50 | 75 | - | U | 1024563 | 1024983 | - | Std. | 390 | - | 1093720 | - |
| 50 | 75 | - | U | 1024581 | 1025009 | - | Long | 426 | - | 1093720 | - |
| - | 100 | - | W | - | 1025027 | - | Std. | 610 | - | 1093721 | - |
| - | 100 | - | W | - | 1025045 | - | Long | 675 | - | 1093721 | - |
| - | 150 | - | X | - | 1025063 | - | Std. | 735 | - | 1093721 | - |
| - | 200 | - | Y | - | 1025081 | - | Std. | 1020 | - | 1093723 | - |

Maximum allowable Proof Load is 2 Times Working Load Limit. All carbon hooks designed with a 5:1 design factor. All alloy hooks 1 through 22t designed with a 4.5:1 design factor. All alloy hooks 30t and larger designed with a 4:1 design factor. All bronze hooks designed with a 4:1 design factor. †New 319N style hook. ‡See column "Y" on following page for actual length.


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REMAZEL

# CERTIFICATION LIST

Certificate Nr.: 001/24

Date: 22/11/2024

| Final Customer: | Order Customer: | Object: | Description: | Quantity: | Inspection and Test Plan (ITP): | Our job: |
|---|---|---|---|---|---|---|
| Rosetti Marino | 24005969 | HOOK | CROSBY HOOK | 1 | | 24-27012 |

## MATERIAL

| Drawing | Pos. | Q.ty | Description | Material | Certificates 3.1 | Order | Heat/Plate ID | Additional Mechanical Test | UT Certificates | Nesting |
|---|---|---|---|---|---|---|---|---|---|---|
| 1028550 | | 1 | Carbon shank Hook | S319CN | 330644-001 | 24005969 | 5803767804 | / | 24/1886RP01 | / |

| SIRTEF<br>UNI EN ISO 9001:2015 with Rina Service<br>Certificates n° 666/97/S | TRADE OF STEEL WIRE ROPES, FIBRE BELTS AND ROPES, ALLOY STEEL ACCESSORIES, H.R. CHAINS. PRODUCTION OF STEEL WIRE SLINGS AND WEBBING SLINGS. LIFTING MATERIALS TESTING AND INSPECTION. TRAINING COURSES DEDICATED TO THE USE AND MAINTENANCE OF ROPES AND LIFTING ACCESSORIES<br>Web site: https://www.sirtef.it | Nr Document<br>**191/M/2025** |
|---|---|---|
| | **CERTIFICATO DI CONTROLLO VISIVO-DIMENSIONALE**<br>Visual-Dimensional Inspection Certificate | Foglio - Sheet |
| | Module Nr: QA/100 \| date: 27/06/2023 \| Rev 00 | **1 - 1** |

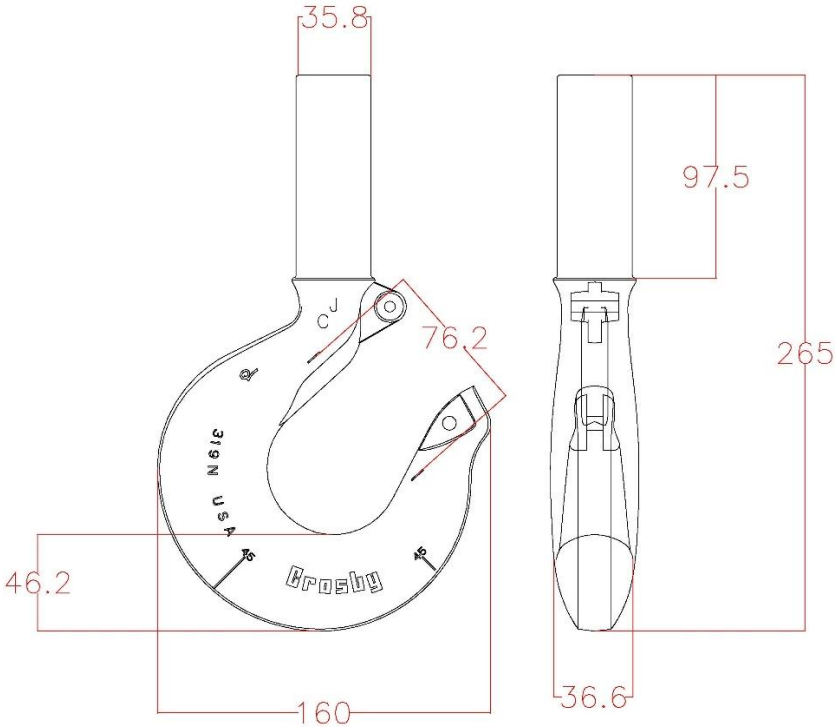
| | | | |
|---|---|---|---|
| Oggetto del controllo<br>Control object | **CROSBY S319CN 5t Carbon Shank Hook (JC) S.N. 1028550<br>PIC: 5WB** | N° Serie - Serial Number<br>BATCH: 5WB | N° Disegno - Nr DWG<br>- |
| Cliente<br>Costumer: | **REMAZEL ENGINEERING S.p.A.** | N° Costumer<br>Inspection/Test Plan | N° Commessa Cliente<br>Nr Job Costumer |
| Ordine Cliente<br>Customer Order | **4125** | - | **-** |
| Condizioni superficiali<br>Surface condition | **RAW** | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Distanza visione<br>Vision distance | **600 mm.** | Angolo di Visione<br>Viewing angle | **30°** | Illuminazione Min<br>Light | **350 - 500 Lux** | Metodo di Prova<br>Type test | **Diretto** |

| | | | |
|---|---|---|---|
| ESAME VISIVO<br>visual inspection | ☒ CONFORME (acceptable)<br>☐ NON CONFORME (not acceptable) | ESAME DIMENSIONALE<br>dimensional examination | ☒ CONFORME (acceptable)<br>☐ NON CONFORME (not acceptable) |

| STRUMENTI UTILIZZATI – Instrument used | | | |
|---|---|---|---|
| STRUMENTO<br>Intrument | CALIBRO DIGITALE CA 04<br>Digital caliper CA 04 | METRO A NASTRO<br>Measuring tape | |
| CERT. TARATURA<br>Calibration cert. | Calibration card dated 31/07/2025 | Initial calibration | |

**DISEGNO - DRAWING**




NOTE:

ESITO DELL'ESAME - Examination results

| ☒ ACCETTABILE - ACCEPTABLE | ☐ NON ACCETTABILE – NOT ACCETTABILE |
|---|---|

| DATA<br>Date | RESPONSABILE C.Q.<br>Quality Manager | OPERATORE SIRTEF<br>Sirtef Operator | ISPETTORI<br>Inspector |
|---|---|---|---|
| 27/11/2024 | | SIRTEF S.r.l.<br>Calamita G.Franco<br>II° Livello PND | |

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Quality Control Group S.r.l.
Via Roma, 79
24030 Medolago (BG)
+39 035 901473

# NDE QUALIFICATION CERTIFICATE

## Certificato di qualifica PnD

Web site: www.qualitycontrolgroup.com; e-mail: info@qualitycontrolgroup.com

We certify that
Si certifica che

**CORTINOVIS ANDREA**

SURNAME / NAME

Birth date / Data di nascita: 10/01/1998

Birth place / Luogo di nascita: Merate (LC)

In accordance to the requirements of our Written Practice nr. PR 03.02 rev. 7 which satisfies the ASNT Recommended Practice SNT-TC-1A 2020 edition and ASME BPV Code Ed.2023 is recertified the qualification to

Level / Livello: II

Method / Metodo: MT

Technique / Tecnica: Manual Pulse echo

Limitation / Limitazioni: None

Certification date / Data della certificazione: 25/03/2024

Expiring date / Data di scadenza: 24/03/2029

This certificate is based on

School graduation: High level school — obtained on year: 2017

Training satisfactorily performed on: 2022 to 2023 — for a total hours: 345

Initial experience duration of: 12 months

Examination performed on: 25/03/2024

with a composite grade of: 94.2%

Lastest Re-examination performed on: -

with a composite grade of: -

Evidence of continuing satisfactory technical performance from: 2022 to actual

Latest Technical Performance Evaluation satisfactorily performed on: 18/02/2024

Visual acuity verified on: 08/01/2024

The level III evaluator
Il livello III valutatore

CICPnD C.E. 017 Quality Control

BERTOLINI LUCA
EN ISO 9712 liv. 3
Metodi MT-PT-RT-UT-VT

QUALITY CONTROL GROUP S.r.l.

The General Manager
Il Direttore Generale

QUALITY CONTROL GROUP S.r.l.

Quality Control Group S.r.l.
Via Roma, 79
24030 Medolago (BG)
+39 035 901473

# NDE QUALIFICATION CERTIFICATE

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Web site: www.qualitycontrolgroup.com; e-mail: info@qualitycontrolgroup.com

We certify that
Si certifica che

**CORTINOVIS ANDREA**

SURNAME / NAME

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Birth place / Luogo di nascita: Merate (LC)

In accordance to the requirements of our Written Practice nr. PR 03.02 rev. 7 which satisfies the ASNT Recommended Practice SNT-TC-1A 2020 edition and ASME BPV Code Ed.2023 is recertified the qualification to

Level / Livello: II
Method / Metodo: UT
Technique / Tecnica: Manual Pulse echo

Limitation / Limitazioni: None

Certification date / Data della certificazione: 25/03/2024
Expiring date / Data di scadenza: 24/03/2029

This certificate is based on
School graduation: High level school — obtained on year: 2017
Training satisfactorily performed on: 2021 to 2023 — for a total hours: 1200
Initial experience duration of: 24 months

Examination performed on: 25/03/2024
with a composite grade of: 90.0%
Lastest Re-examination performed on: -
with a composite grade of: -
Evidence of continuing satisfactory technical performance from: 2021 to actual
Latest Technical Performance Evaluation satisfactorily performed on: 18/02/2024
Visual acuity verified on: 08/01/2024

The level III evaluator
Il livello III valutatore

CICPnD C.E. 017
Quality Control
BERTOLINI LUCA
EN ISO 9712 liv. 3
Metodi MT-PT-RT-UT-VT
QUALITY CONTROL GROUP S.r.l.

The General Manager
Il Direttore Generale

QUALITY CONTROL GROUP S.r.l.

CICPND
CENTRO ITALIANO
DI COORDINAMENTO
PER LE PROVE NON DISTRUTTIVE

Via C. Pisacane, 46
20025 Legnano (MI)
PEC: info@pec.cicpnd.it
C.F. e P.I. 09510020150

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO
PRS N° 012C
Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
Signatory of EA, IAF and ILAC Mutual Recognition Agreement

# *CERTIFICATO DI LIVELLO 2*
## *LEVEL 2 CERTIFICATE*

**N° 38447/PND/C**

Si certifica la qualificazione per esami in Prove Non Distruttive al **LIVELLO 2**
*This is to certify qualification by examinations in Non-Destructive Testing at the **LEVEL 2***

***di / of***

**Cortinovis Andrea**

nato a / *born in* **Merate (LC)**

il / *on* **10 gennaio 1998**

per il metodo / *for the method:*

**Ultrasuoni (UT)**

per i settori / *for the sectors:*

**Collaudi pre e in servizio che comprendono la fabbricazione**

**(c; f; w; t; wp)**

Il presente certificato viene rilasciato in conformità alla Norma UNI EN ISO 9712:2022.
*This certificate is issued according to UNI EN ISO 9712:2022.*

Direttore Generale
*General Manager*

Reggiani Michael
*M. Reggiani*

Data Delibera: 08/04/2024
*Approval Date*

Data Scadenza: 08/04/2029 C
*Expiry Date*

Approvazione per l'esecuzione di prove non distruttive secondo l'Allegato I paragrafo 3.1.3 della **Direttiva attrezzature in pressione 2014/68/UE/PED** (CEM/TR 15589 Route A).

AIPnD

**CICPND**
CENTRO ITALIANO
DI COORDINAMENTO
PER LE PROVE NON DISTRUTTIVE

Via C. Pisacane, 46
20025 Legnano (MI)
PEC: info@pec.cicpnd.it
C.F. e P.I. 09510020150

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO
PRS N° 012C
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## *LEVEL 2 CERTIFICATE*

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Si certifica la qualificazione per esami in Prove Non Distruttive al **LIVELLO 2**
*This is to certify qualification by examinations in Non-Destructive Testing at the **LEVEL 2***

***di / of***

**Cortinovis Andrea**

nato a / *born in* **Merate (LC)**

il / *on* **10 gennaio 1998**

per il metodo / *for the method:*

**Magnetoscopia (MT)**

per i settori / *for the sectors:*

**Collaudi pre e in servizio che comprendono la fabbricazione**

**(c; f; w; t; wp)**

Il presente certificato viene rilasciato in conformità alla Norma UNI EN ISO 9712:2022.
*This certificate is issued according to UNI EN ISO 9712:2022.*

Direttore Generale
*General Manager*

Reggiani Michael
*M. Reggiani*

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Approvazione per l'esecuzione di prove non distruttive secondo l'Allegato I paragrafo 3.1.3 della **Direttiva attrezzature in pressione 2014/68/UE/PED** (CEM/TR 15589 Route A).

AIPnD

Rossi

# GENERIC MATERIAL CERTIFICATES

**Gearbox reference**

Customer: **REMAZEL ENGINEERING SPA**
Order Confirm: 24037173 SO
Code: R000308177
Description: G MR ICI 80 UO3A 52 B3

| Part Desc. | Part Ref. | Material | Ref. Doc |
|---|---|---|---|
| Housing | 10.326B | GJL200 | Fonderia Ghirlandina / n. 2402379 |
| Cylindrical Wheel | 5.36D / 2 | 16MnCr5 | Centro Italiano Acciai / n. 4503 |
| Cylindrical Wheel | 5.127A /5,2 | 20MnCrS5 +A RUL TD | Interacciai / n. 2945249 |
| Shaft | 3.506D | E355 | Tenaris / n. 03-24-04888 |
| Sprocket | 2.267A / 5.2 | 16MnCr5 | Centro Italiano Acciai / n. 5714 |
| Bevel wheel | 16.90-12.180 /5 RT | SCM420H | SeAH Besteel / n. 201907--011019 |

Issued: TSS

CENTRO ITALIANO ACCIAI SRL
GRUPPO ACCIAIERIE VENETE SPA

# CERTIFICATO DI COLLAUDO – MILL'S TEST CERTIFICATE

**EN 10204 3.1**

**N° 5714**

**DATE:** 27/09/2022

Centro Italiano Acciai s.r.l C.S. € 270.000 i.v. C.F. 01321520288 P.IVA 02356350369
R.E.A. di MO n. 284827 Reg. Imprese di MO n. 158694 Meccanografico MO 027779
Sede Legale 41122 MODENA Via Pietro Cavalli, 35 - Italy Tel. 059 283235
Società assoggettata a direzione e coordinamento da parte di Acciaierie Venete Spa
Azienda con sistema di gestione per la qualità certificato da IGQ secondo ISO 9001

**CLIENTE** – CUSTOMER – CLIENT – KUNDE
**103545 - ROSSI SPA**
VIA EMILIA OVEST N. 915/A
41100 MODENA (MO)

**ORDINE CLIENTE** - PURCHASE ORDER – COMMANDE CLIENT - KUNDENAUFTRAG
715021 DEL 23/09/2022

**ORDINE** - ORDER – COMMANDE - AUFTRAG
C1068244 / 10

**ARTICOLO (ACCIAIO)**- ITEM (STEEL) - ITEM (ACIER) - ARTIKEL (STAHL)

**PROFILO** - PROFILE – PROFIL - ABMESSUNG: **TONDO mm. 35 (h9 - EN ISO 286-2)**

**STATO DI FORNITURA**- DELIVERY CONDITION – CONDITION DE LIVRAISON – LIEFERZUSTAND: **RICOTTO LAVORABILE**

**STATO DI ESECUZIONE** - STATE OF EXECUTION – ETAT DE L'ÉXECUTION - AUSFÜHRUNG: **PELATO RULLATO**

| LOTTO - REFERENCE – REFERENCE - REFERENZEN | COLATA – HEAT - COULEE - SCHMELZE | MARCA ACCIAIO – STEEL GRADE - MARQUE ACIER - STAHLGÜTE |
|---|---|---|
| **060660** | **286772** | **16MnCr5** |

**NORMA** - SPECIFICATION – NORME - NORM: **EN ISO 683-3:2018**

| PESO - WEIGHT – POIDS - GEWICHT (Kg) | COLLI - ITEMS – COLIS - KOLLI (Nr) | DDT - DELIVERY NOTE – BON DE LIVRAISON - LIEFERSCHEIN | BLUMO - BLOOM – BLOOM - KNÜPPEL | RIDUZIONE - REDUCTION – REDUCTION - UMFORMUNGSGRAD |
|---|---|---|---|---|
| **1181** | **1** | **C002303** **27/09/2022** | **200** | **29.2** |

ACCIAIO DA FORNO ELETTRICO - CONTINUOUS CASTING ELECTRIC STEEL - ACIER ELABORE AU FOUR ELECTRIQUE - ELEKTRO-LICHTBOGENOFEN STAHL

**COMPOSIZIONE CHIMICA (%)** - CHEMICAL COMPOSITION (%) - COMPOSITION CHIMIQUE (%) - CHEMISCHE ZUSAMMENSETZUNG (%)

| C | Si | Mn | P | S | Cu | Cr | Ni | Sn | Al | As | Mo |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.1720 | 0.2330 | 1.2150 | 0.0140 | 0.0200 | 0.2000 | 1.0660 | 0.1470 | 0.0080 | 0.0290 | 0.0050 | 0.0390 |

| V | Ti | Nb | Ca |
|---|---|---|---|
| 0.0070 | 0.0080 | 0.0020 | 0.0007 |

**ANALISI GAS** - GAS ANALYSIS - ANALYSE GAZ - GAS ANALYSE
$H_2$= 1.4 (ppm) | $O_2$= (ppm) | $N_2$= (ppm)

**D.I. (ASTM A255)**

THE PRODUCT COMPLIES WITH THE REQUIREMENTS OF THE EUROPEAN DIRECTIVE 2000/53/EC

**RADIOACTIVITY MEETS SPECIFICATION 96/29/EURATOM**

**CARATTERISTICHE MECCANICHE** - MECHANICAL PROPERTIES – CARACTERISTIQUES MECANIQUES-MECHANISCHE EIGENSCHAFTEN

**TRAZIONE**-TENSILE TESTING-TRACTION-ZUGVERSUCH – **EN ISO 6892-1**

**RESILIENZA** - IMPACT TEST - RESILIENCE - ZÄHIGKEIT – **EN ISO 148-1**

**DUREZZA** - HARDNESS - DURETE - HÄRTE – **EN ISO 6506-1**

| PROVINO - SAMPLE – EPROUVETTE - MUSTER | mm | STATO - CONDITION – ETAT - ZUSTAND | TRATTAMENTO TERMICO - HEAT TREATMENT – TRAITMENT TERMIQUE - WÄRMEBEHANDLUNG | | | Rm MPa | Re MPa | A % | Z % | TIPO - TYPE - TYPE - ART | KU °C | KU J | KU J | Mean J | HB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COLATA - HEAT – COULEE-SCHMELZE | 11 | TEMPRA E DISTENSIONE | 880°C | OLIO | 180°C | 1332 | 1066 | 11 | 40 | 20 | 34 | 34 | 34 | 34 | | | |
| VALORI ALLO STATO DI FORNITURA - VALUES IN DELIVERY CONDITION - WERTE IM LIEFERZUSTAND ▶ | | | | | | | | | | | | | | | 164 | | |

**TEMPRABILITA'** - HARDENABILITY – TREMPABILITE - HÄRTBARKEIT – **EN ISO 642**

| MM | 1.5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HRC | 44.7 | 43.6 | 42.1 | 39.4 | 35.8 | 33.1 | 31.2 | 30.3 | 28.4 | 27.3 | 25.9 | 25.3 | 24.7 | 24.4 | 23.6 |

**GRANO** - GRAIN – GRAIN - KORNGRÖSSE – **EN ISO 643**

**AUSTENITICO** **7** - **8**

**INCLUSIONI NON METALLICHE** - NON METALLIC INCLUSIONS - INCLUSIONS NON METALLIQUES - NICHTMETALLISCHE EINSCHLÜSSE – **UNI 3244/80 (M)**

| A (SS) | | B (OA) | | C (OS) | | D (OG) | |
|---|---|---|---|---|---|---|---|
| Thin | Heavy | Thin | Heavy | Thin | Heavy | Thin | Heavy |
| **2.0** | **1.0** | **1.5** | **1.0** | **0.0** | **0.0** | **1.0** | **1.0** |

**DIN 50602 (K)**

**K 3** *(OXIDE)* = **8**
**K** *(SULFIDE)* =
**K** *(TOTAL)* =

**MACRO** - MACROETCHING – MACRO - MAKRO ÄTZUNG

**MACROINCLUSIONI** - MACROINCLUSIONS – MACRO INCLUSIONS - MAKRO EINSCHLÜSSE

**DIFETTI INTERNI** – CORE DEFECTS – DEFAUTS CORE – KERNFEHLER: **EN 10308 CL.4**

**CONTROLLO ANTIMESCOLAMENTO** - ANTIMIXING CONTROL – CONTROLE ANTIMELANGE - VERWECHSLUNGSPRÜFUNG: **100%**

**ENTI COLLAUDATORI** - INSPECTION AUTHORITIES – SERVICE D'ESSAI - ABNAHMEBEHÖRDE

**NOTE** – NOTES – NOTES - ANMERKUNGEN

VS ORDINE 715021
COD.ART.3010144-X

**CONTROLLO QUALITA'** - QUALITY CONTROL - CONTROLE QUALITE - QUALITÄTSTELLE

SERVIZIO QUALITA' CENTRO ITALIANO ACCIAI SRL

**COPIA CONFORME ALL'ORIGINALE DEPOSITATO PRESSO CENTRO ITALIANO ACCIAI S.R.L.** *RIPORTA TUTTI I DATI ORIGINALI DEL CERTIFICATO DI COLLAUDO DEL PRODUTTORE DELL'ACCIAIO*

TEMPRASUD S.R.L.
TRATTAMENTI TERMICI

# Rapporto di Collaudo

Commessa **202300720** 0.1

Data Collaudo **22/02/2023**

Cliente **000625 ROSSI S.p.A. Divisione Epicicloidali** DDT Cliente **43001515** Del **17-gen-23**

Num Disegno **RC91021346** **1021346 PIGNONE CIL 2,267/** Materiale **16MnCr5**

Pezzi **1300** Peso **551,2** Numero Lotto

Colata Indice Rev. Carica Impianto

Numero Carica **230.000.784** Sistema **LLF1** Ciclo **606**

Trattamento **Cementazione tempra e rinvenimento 0,6 mm**

## Risultato del Collaudo

Collaudatore **GIULIANO GENOVA**

| Caratteristiche Richieste | Zona Rilievo | UM | Da | A | Strumento |
|---|---|---|---|---|---|
| **DUREZZA SUPERF.** | | **HRC** | **59,00** | **61,00** | |
| **PENETRAZ.EFFIC.** | | **mm** | **0,50** | **0,70** | |

| Caratteristiche Rilevate | Zona Rilievo | UM | Da | A | Strumento |
|---|---|---|---|---|---|
| **DUREZZA SUPERF.** | | **HRC** | **60,00** | **60,50** | **5** |
| **PENETRAZ.EFFIC.** | | **mm** | **0,66** | **0,66** | **2** |

PROVINO N° 762
ESEGUITO CICLO DI TRATTAMENTO DI CEMENTAZIONE TEMPRA E RINVENIMENTO
ESEGUITO COLLAUDO SU PARTICOLARE DISEGNO RC91021346
ESEGUITO COLLAUDO IN SCALA HRA CON CONVERSIONE IN SCALA HRC

| Strumento | Descrizione | Marca | Modello | Matricola |
|---|---|---|---|---|
| **2** | **Microdurometro affri J** | **AFFRI** | **Wiki 200 JS1** | **74353** |
| **5** | **Durometro TWIN 1** | **ERNST** | **TWINX** | **0012/2017** |

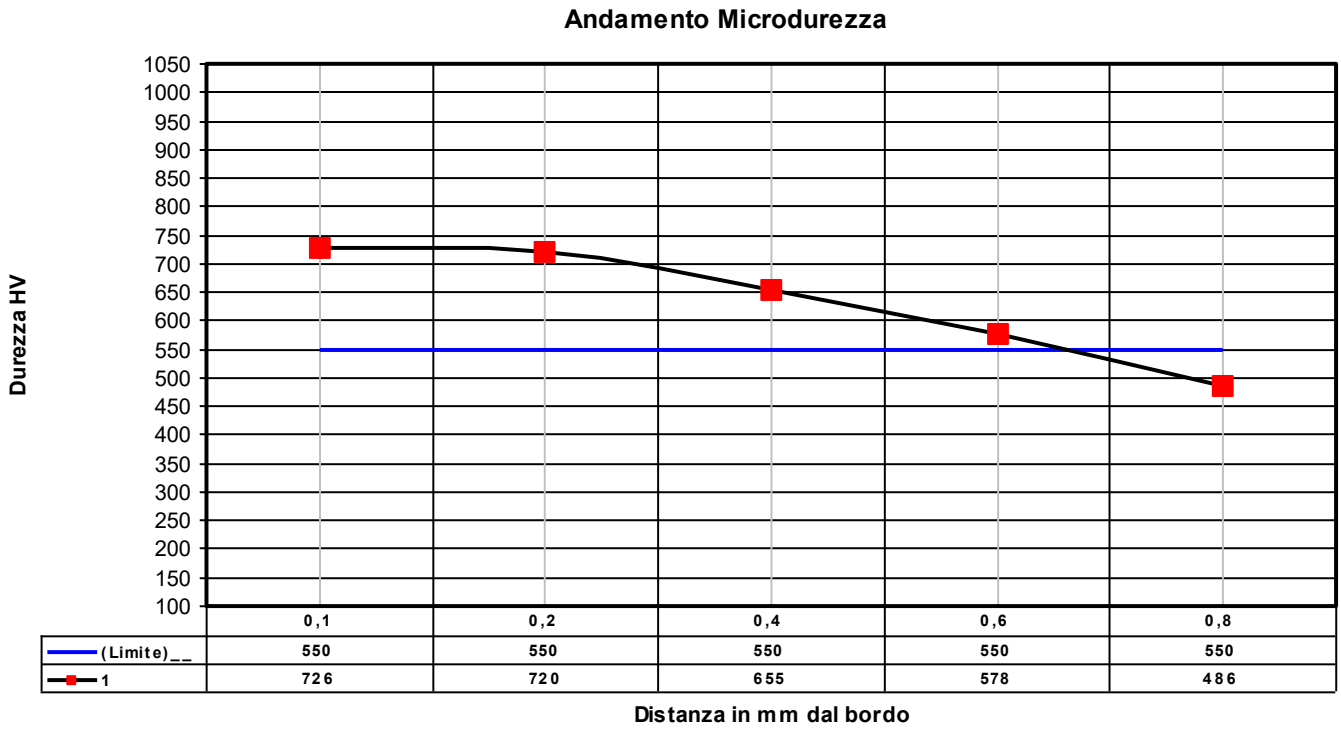
**Eseguito collaudo di tipo 3.1 in ottemperanza alla norma UNI EN ISO 10204**

Esito: **Conforme** Collaudatore: **GIULIANO GENOVA**

TEMPRASUD
TRATTAMENTI TERMICI

# Diagramma Andamento Microdurezza

Commessa **2023/00720.0.1**



Tenaris

# INSPECTION CERTIFICATE
CERTIFICATO DI COLLAUDO
(UNI EN 10204 3.1 / ISO 10474 3.1)

| Number / Numero: | Page / Pagina: |
|---|---|
| **03-24-04888** | **1 / 5** |
| Date / Data: **June 12, 2024** | |

**Dalmine S.p.A. – Arcore plant**
Via Achille Grandi, 100
20862 Arcore (MB) – Italy
+39 039 66 50 1 tel
+39 039 60 13 539 fax

| Customer / Cliente: **ROSSI S.P.A.** | Customer´s Order Item / Rifer. Ordine Cliente - I | Customer´s Reference / Posizione Cliente: | Manufacturer´s Works Order N° / Conferma-Posizione: |
|---|---|---|---|
| | **805872 OA** | **2/3091042** | **3241217/002** |

| Manufacture Process / Processo di fabbricazione: | Product Type / Tipo di prodotto: | Surface / Superficie: |
|---|---|---|
| **NORMALIZED NON RADDRIZZATI**<br>**NORMALIZZATI NON RADDRIZZATI** | **SEAMLESS PIPES HOT FINISHED FOR MECHANICAL APPLICATIONS (WITH EXTRA REQUIREM**<br>**TUBI S.S. FINITI A CALDO PER APPLICAZIONI MECCANICHE (CON RICHIESTE SUPPLEMENTA** | **BARE**<br>**GREZZI** |

| Standard or Specification / Norme o specifica: | Steel Grade / Grado dell'Acciaio: | Ends / Estremità: |
|---|---|---|
| **ACCORDING TO EN 10297/1 TQC 61377 REV.1.3**<br>**NORMA EN 10297/1 E TQC 61377 REV.1.3** | **STEEL E 355**<br>**ACCIAIO E 355** | **SQUARE CUT**<br>**LISCI ALLE ESTREMITA'** |

| Dimensions / Dimensioni: | Schedule / Schedula: | Length / Lunghezza: | Quantity / Quantità: **48Pcs/Pz** | Nominal Weight / Peso nominale: |
|---|---|---|---|---|
| **ø2.374" O.D. x .559" W.T.** | . | **13.287 ft ÷ 22.966 ft** | **844'03" ft 9193,2 lb** | **10.86 lb/ft** |
| **ø60.30mm O.D. x 14.20mm W.T.** | . | **4050 mm ÷ 7000 mm** | **257.34 mt 4170 kg** | **16.16 Kg/m** |

## DELIVERY NOTES / AVVISI DI SPEDIZIONE

| Delivery Notes<br>Avvisi di spedizione | Delivery Notes<br>Avvisi di spedizione |
|---|---|
| Job Number: 0031380810 / 000020<br>Shipping note: 0106345054 - 12/06/2024<br>Address: VIA EMILIA OVEST 915/A | Town: 41123 MODENA<br>Country: Italy |

## TENSILE TEST / PROVA DI TRAZIONE

| Heat N°<br>Colata N° | Sample N°<br>Prova N° | Lot N°<br>Lotto N° | Specimen condition<br>Condizioni della provetta | | | | Specimen dimensions<br>Dimensioni della provetta | | Test temp<br>Temp. di prova | Y.S.<br>**OffSet 0.2%**<br>Min: **370.00**<br>Max: **--** | U.T.S.<br>Req.<br>Min: **540.00**<br>Max: **700.00** | Elongation / Allungamento<br>Lo<br>**5D = 5.65√So** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ls | Sc | Type<br>Tipo | Ori | Size<br>Dimensioni | Area<br>Area | | | | | | Min. | Obt. |
| | | | | | | | **mm** | **mm2** | **°C** | **MPa** | **MPa** | **cal.** | **mm** | % | % |
| 941018 | C8771 | 1 | B | AM | Cs | L | 10.03 | 79.00 | +20 | 469.00 | 677.00 | 5D | 50.0 | 19.0% | 22.5% |

| | | | |
|---|---|---|---|
| AM: As manufactured / Come fabbricato | Lo: Initial length / Lunghezza iniziale | Obt: Obtained / Ottenuto | U.T.S: Ultimate Tensile Strength / Rottura |
| B: Body / Corpo | Ls: Location of sample / Ubicazione provetta | Ori: Orientation / Orientamento | Y.S: Yield Strength / Snervamento |
| Cs: Cylindrical specimen / Cilindrica | Max: Maximum / Massimo | Req: Required / Richiesto | |
| L: Longitudinal / Longitudinale | Min: Minimum / Minimo | Sc: Specimen condition / Condizioni Provetta | |

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# INSPECTION CERTIFICATE
## CERTIFICATO DI COLLAUDO
## (UNI EN 10204 3.1 / ISO 10474 3.1)

Number / Numero: **03-24-04888**

Page / Pagina: **2 / 5**

Date / Data: **June 12, 2024**

**Dalmine S.p.A. – Arcore plant**
Via Achille Grandi, 100
20862 Arcore (MB) – Italy
+39 039 66 50 1 tel
+39 039 60 13 539 fax

| | | | |
|---|---|---|---|
| Customer / Cliente: **ROSSI S.P.A.** | Customer´s Order Item / Rifer. Ordine Cliente - I: **805872 OA** | Customer´s Reference / Posizione Cliente: **2/3091042** | Manufacturer´s Works Order N° / Conferma-Posizione: **3241217/002** |
| Manufacture Process / Processo di fabbricazione: **NORMALIZED NON RADDRIZZATI** **NORMALIZZATI NON RADDRIZZATI** | Product Type / Tipo di prodotto: **SEAMLESS PIPES HOT FINISHED FOR MECHANICAL APPLICATIONS (WITH EXTRA REQUIREM** **TUBI S.S. FINITI A CALDO PER APPLICAZIONI MECCANICHE (CON RICHIESTE SUPPLEMENTA** | | Surface / Superficie: **BARE** **GREZZI** |
| Standard or Specification / Norme o specifica: **ACCORDING TO EN 10297/1 TQC 61377 REV.1.3** **NORMA EN 10297/1 E TQC 61377 REV.1.3** | | Steel Grade / Grado dell'Acciaio: **STEEL E 355** **ACCIAIO E 355** | Ends / Estremità: **SQUARE CUT** **LISCI ALLE ESTREMITA'** |
| Dimensions / Dimensioni: **ø2.374" O.D. x .559" W.T.** **ø60.30mm O.D. x 14.20mm W.T.** | Schedule / Schedula: . . | Length / Lunghezza: **13.287 ft ÷ 22.966 ft** **4050 mm ÷ 7000 mm** | Quantity / Quantità: **48Pcs/Pz** **844'03" ft 9193,2 lb** **257.34 mt 4170 kg** | Nominal Weight / Peso nominale: **10.86 lb/ft** **16.16 Kg/m** |

## CHEMICAL COMPOSITION / COMPOSIZIONE CHIMICA

| | | Composition % / Composizione % | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | X 100 | | | | | | | | | X 1000 | | | | |
| | | C | Mn | Si | Ni | Cr | Mo | V | Cu | F1 | P | S | Al | Ti | Nb |
| | H Max | **22** | **170** | **50** | **40** | **30** | **8** | **15** | **30** | **20** | **30** | **35** | **--** | **50** | **70** |
| | Min | **16** | **130** | **10** | **--** | **--** | **--** | **8** | **--** | **--** | **--** | **--** | **10** | **--** | **--** |
| Heat N° | P Max | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Colata N° | Min | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 941018 | H | 19 | 150 | 22 | 18 | 18 | 7 | 13 | 20 | 15.3 | 12 | 2 | 29 | 2 | 23 |

F1: (Nb+V )
H: Heat / Colata
Max: Maximum / Massimo
Min: Minimum / Minimo
P: Product / Prodotto

## IMPACT TEST / PROVA DI RESILIENZA

Type/Tipo: **KCV** | Orientation/Direzione: **L** | Unit / Unità: **JOULE**
Position/Posizione: | Temp: **- 20** Unit/Unità: **°C** | Ind.Min.Req: **27** Req.Min.Avg: **--**

| Heat N° / Colata N° | Sample N° / Prova N° | Zone / Zona | Lot N° / Lotto N° | Ls | Sc | Size / Dimensioni **mm** | Results / Risultato 1 | 2 | 3 | Avg. |
|---|---|---|---|---|---|---|---|---|---|---|
| 941018 | C8771 | outside | 1 | B | AM | 10 x 10.00 | 64.0 | 71.0 | 53.0 | 63.0 |

AM: As manufactured / Come fabbricato
Avg: Average / Media
B: Body / Corpo
Ind. Min. Req: Individual Minimum Required / Minimo singolo richiesto
L: Longitudinal / Longitudinale
Ls: Location of sample / Ubicazione provetta
Req. Min. Avg: Required minimum average / Minima media richiesta
Sc: Specimen condition / Condizioni Provetta
Temp: Temperature / Temperatura

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# INSPECTION CERTIFICATE
## CERTIFICATO DI COLLAUDO
## (UNI EN 10204 3.1 / ISO 10474 3.1)

Number / Numero: **03-24-04888**

Page / Pagina: **3 / 5**

Date / Data: **June 12, 2024**

**Dalmine S.p.A. – Arcore plant**
Via Achille Grandi, 100
20862 Arcore (MB) – Italy
+39 039 66 50 1 tel
+39 039 60 13 539 fax

| | | | |
|---|---|---|---|
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| Manufacture Process / Processo di fabbricazione: **NORMALIZED NON RADDRIZZATI** **NORMALIZZATI NON RADDRIZZATI** | Product Type / Tipo di prodotto: **SEAMLESS PIPES HOT FINISHED FOR MECHANICAL APPLICATIONS (WITH EXTRA REQUIREM** **TUBI S.S. FINITI A CALDO PER APPLICAZIONI MECCANICHE (CON RICHIESTE SUPPLEMENTA** | | Surface / Superficie: **BARE** **GREZZI** |
| Standard or Specification / Norme o specifica: **ACCORDING TO EN 10297/1 TQC 61377 REV.1.3** **NORMA EN 10297/1 E TQC 61377 REV.1.3** | | Steel Grade / Grado dell'Acciaio: **STEEL E 355** **ACCIAIO E 355** | Ends / Estremità: **SQUARE CUT** **LISCI ALLE ESTREMITA'** |
| Dimensions / Dimensioni: **ø2.374" O.D. x .559" W.T.** **ø60.30mm O.D. x 14.20mm W.T.** | Schedule / Schedula: . . | Length / Lunghezza: **13.287 ft ÷ 22.966 ft** **4050 mm ÷ 7000 mm** | Quantity / Quantità: **48Pcs/Pz** **844'03" ft 9193,2 lb** **257.34 mt 4170 kg** | Nominal Weight / Peso nominale: **10.86 lb/ft** **16.16 Kg/m** |

## SUPPLEMENTARY INFORMATION / INFORMAZIONI SUPPLEMENTARIE

STANDARD EDITIONS
EDIZIONI NORME

| | |
|---|---|
| Standard:EN 10297-1 Year:2003 | Norma:EN 10297-1 Anno:2003 |

Supplementary Information
Informazioni supplementari

| Heat | Pz | Mt | Kg | Colata | Pz | Mt | Kg |
|---|---|---|---|---|---|---|---|
| 941018-001 | 48 | 257,34 | 4170 | 941018-001 | 48 | 257,34 | 4170 |

Supplementary Information
Informazioni supplementari

| | |
|---|---|
| WE HEREBY DECLARE THAT ALL PIPES HAVE BEEN SPECTROSCOPICALLY CHECKED,<br>NO DISCREPANCY HAVE BEEN FOUND<br>ALL PIPES HAVE BEEN TESTED BY ELECTROMAGNETIC TEST - FLUX LEACKAGE -<br>INSTEAD OF HYDROSTATIC TEST WITH SATISFACTORY RESULT<br>ACCORDING TO SPEC. EN 10246-5.LEVEL F4<br>ALL PIPES HAVE BEEN NORMALIZED AT 900°C FOR 15 MINS. AND COOLED IN<br>STILL AIR<br>.<br>SEAMLESS HOT FINISHED PIPES<br>VISUAL AND DIMENSIONAL CONTROL HAS BEEN CARRIED OUT WITH SATISFACTORY RESULT<br>STEEL IS FULLY KILLED AND PRODUCED BY ELECTRIC FURNACE TO A FINE GRAIN PRACTICE<br>THE PRODUCT SUPPLIED IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE ORDER.<br>MANUFACTURED BY TENARIS DALMINE<br>NO WELD REPAIR, MERCURY AND RADIATION FREE<br>Tenaris IT identification number for MTC: 59u#R%&p | SI DICHIARA CHE TUTTI I TUBI SONO STATI SOTTOPOSTI AL CONTROLLO<br>DELL'ACCIAIO MEDIANTE SPETTROANALIZZATORE,DALL'ESAME NON SONO EMERSE<br>MESCOLANZE DI MATERIALE<br>TUTTI I TUBI SONO STATI SOTTOPOSTI A CONTROLLO ELETTROMAGNETICO<br>- FLUSSO DISPERSO - IN SOSTITUZIONE DELLA PROVA IDRAULICA<br>CON ESITO SODDISFACENTE IN ACCORDO ALLA SPEC. EN 10246-5.LEVEL F4<br>I TUBI SONO STATI NORMALIZZATI A 900°C PER 15 MIN. E RAFFREDDATI IN<br>ARIA CALMA<br>TUBI SENZA SALDATURA FINITI A CALDO<br>IL CONTROLLO VISIVO E DIMENSIONALE HA DATO ESITO SODDISFACENTE<br>L'ACCIAIO E' DI TIPO CALMATO, A GRANO FINE, PRODOTTO AL FORNO ELETTRICO<br>IL MATERIALE FORNITO E' IN ACCORDO AI REQUISITI DELL'ORDINE.<br>FABBRICATO DA TENARIS DALMINE<br>NON RIPARATO MEDIANTE SALDATURA, ESENTE DA MERCURIO E RADIAZIONI<br>Numero Identificativo Tenaris IT per MTC: 59u#R%&p |

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Number / Numero: **03-24-04888**
Page / Pagina: **4 / 5**
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## MARKING / MARCATURA

| Marking / Marcatura | |
|---|---|
| STENCILING<br>_T 60,30 X 14,20 TAM MT EN10297 E 355 HEAT:_COLATA NR _NR<br>.<br>LEGEND<br>_T = TENARIS Logo<br>_COLATA = Heat Number<br>_NR = Pipe/Tube identifier<br>. | VERNICIATURA<br>_T 60,30 X 14,20 TAM MT EN10297 E 355 HEAT:_COLATA NR _NR<br>.<br>LEGENDA<br>_T = Logo TENARIS<br>_COLATA = Numero di colata<br>_NR = Identificativo numerico del tubo<br>. |
| PUNCHING<br>_T MT E 355 S QD<br>.<br>LEGEND<br>_T = TENARIS Logo | PUNZONATURA<br>_T MT E 355 S QD<br>.<br>LEGENDA<br>_T = Logo TENARIS |

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Tenaris

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| Number / Numero: | Page / Pagina: |
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| **03-24-04888** | **5 / 5** |
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|---|---|---|---|
| | **805872 OA** | **2/3091042** | **3241217/002** |

| Manufacture Process / Processo di fabbricazione: | Product Type / Tipo di prodotto: | Surface / Superficie: |
|---|---|---|
| **NORMALIZED NON RADDRIZZATI**<br>**NORMALIZZATI NON RADDRIZZATI** | **SEAMLESS PIPES HOT FINISHED FOR MECHANICAL APPLICATIONS (WITH EXTRA REQUIREM**<br>**TUBI S.S. FINITI A CALDO PER APPLICAZIONI MECCANICHE (CON RICHIESTE SUPPLEMENTA** | **BARE**<br>**GREZZI** |

| Standard or Specification / Norme o specifica: | Steel Grade / Grado dell'Acciaio: | Ends / Estremità: |
|---|---|---|
| **ACCORDING TO EN 10297/1 TQC 61377 REV.1.3**<br>**NORMA EN 10297/1 E TQC 61377 REV.1.3** | **STEEL E 355**<br>**ACCIAIO E 355** | **SQUARE CUT**<br>**LISCI ALLE ESTREMITA'** |

| Dimensions / Dimensioni: | Schedule / Schedula: | Length / Lunghezza: | Quantity / Quantità: **48Pcs/Pz** | Nominal Weight / Peso nominale: |
|---|---|---|---|---|
| **ø2.374" O.D. x .559" W.T.** | . | **13.287 ft ÷ 22.966 ft** | **844'03" ft 9193,2 lb** | **10.86 lb/ft** |
| **ø60.30mm O.D. x 14.20mm W.T.** | . | **4050 mm ÷ 7000 mm** | **257.34 mt 4170 kg** | **16.16 Kg/m** |

The product certified herein has been manufactured, sampled, tested and inspected in accordance with the stated specifications and has been found to meet the requirements.
This certificate is not a declaration of origin nor may it be used as a declaration of origin.

Il prodotto qui certificato è stato fabbricato, provato, testato e controllato in conformità alle specifiche indicate ed è risultato conforme ai requisiti. Questo certificato non è una dichiarazione d'origine e non può essere utilizzato come tale

## CUSTOMER . THIRD PARTY

INSPECTION COMPANY
COMPAGNIA D'ISPEZIONE

## TENARIS QUALITY DEPARTMENT SIGNATURE

QUALITY CERTIFICATION DEPT.
UFFICIO CERTIFICAZIONE QUALITA'
STURNIOLO Domenico

CHIEF OF QUALITY CERTIFICATION DEPT.
RESPONSABILE DELL'UFFICIO CERTIFICAZIONE QUALITA'
MASTRANDREA Rocco

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CENTRO ITALIANO ACCIAI SRL
GRUPPO ACCIAIERIE VENETE SPA

# CERTIFICATO DI COLLAUDO – MILL'S TEST CERTIFICATE

## EN 10204 3.1

**N° 4503**

**DATE:** 25/07/2022

Centro Italiano Acciai s.r.l C.S. € 270.000 i.v. C.F. 01321520288 P.IVA 02356350369
R.E.A. di MO n. 284827 Reg. Imprese di MO n. 158694 Meccanografico MO 027779
Sede Legale 41122 MODENA Via Pietro Cavalli, 35 - Italy Tel. 059 283235
Società assoggettata a direzione e coordinamento da parte di Acciaierie Venete Spa
Azienda con sistema di gestione per la qualità certificato da IGQ secondo ISO 9001

**CLIENTE** – CUSTOMER – CLIENT – KUNDE

**103545 - ROSSI SPA**
VIA EMILIA OVEST N. 915/A
41100 MODENA (MO)

**ORDINE CLIENTE** - PURCHASE ORDER – COMMANDE CLIENT - KUNDENAUFTRAG: 703882 DEL 21/07/2022

**ORDINE** - ORDER – COMMANDE - AUFTRAG: C1067446 / 10

**ARTICOLO (ACCIAIO)**- ITEM (STEEL) - ITEM (ACIER) - ARTIKEL (STAHL)

**PROFILO** - PROFILE – PROFIL - ABMESSUNG: **TONDO mm. 73 (EN 10060 - PRECISION)**

**STATO DI FORNITURA**- DELIVERY CONDITION – CONDITION DE LIVRAISON – LIEFERZUSTAND: **RICOTTO LAVORABILE**

**STATO DI ESECUZIONE** - STATE OF EXECUTION – ETAT DE L'ÉXECUTION - AUSFÜHRUNG: **LAMINATO**

| LOTTO - REFERENCE – REFERENCE - REFERENZEN | COLATA – HEAT - COULEE - SCHMELZE | MARCA ACCIAIO – STEEL GRADE - MARQUE ACIER - STAHLGÜTE |
|---|---|---|
| **059755** | **285562** | **16MnCr5** |

**NORMA** - SPECIFICATION – NORME - NORM: **EN ISO 683-3:2018**

| PESO - WEIGHT – POIDS - GEWICHT (Kg) | COLLI - ITEMS – COLIS - KOLLI (Nr) | DDT - DELIVERY NOTE – BON DE LIVRAISON - LIEFERSCHEIN | BLUMO - BLOOM – BLOOM - KNÜPPEL | RIDUZIONE - REDUCTION – REDUCTION - UMFORMUNGSGRAD |
|---|---|---|---|---|
| **2604** | **2** | **C001849** 25/07/2022 | ● **200** | **7.5** |

ACCIAIO DA FORNO ELETTRICO - CONTINUOUS CASTING ELECTRIC STEEL - ACIER ELABORE AU FOUR ELECTRIQUE - ELEKTRO-LICHTBOGENOFEN STAHL

**COMPOSIZIONE CHIMICA (%)** - CHEMICAL COMPOSITION (%) - COMPOSITION CHIMIQUE (%) - CHEMISCHE ZUSAMMENSETZUNG (%)

| C | Si | Mn | P | S | Cu | Cr | Ni | Sn | Al | As | Mo |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.1610 | 0.2390 | 1.2420 | 0.0150 | 0.0230 | 0.2250 | 1.0510 | 0.1340 | 0.0120 | 0.0230 | 0.0050 | 0.0300 |

| V | Nb |
|---|---|
| 0.0060 | 0.0050 |

**ANALISI GAS** - GAS ANALYSIS - ANALYSE GAZ - GAS ANALYSE

$H_2^=$ **1.4** (ppm) | $O_2^=$ (ppm) | $N_2^=$ (ppm)

**D.I. (ASTM A255)** **2,14 inch** - **54,36 mm**

THE PRODUCT COMPLIES WITH THE REQUIREMENTS OF THE EUROPEAN DIRECTIVE 2000/53/EC

**RADIOACTIVITY MEETS SPECIFICATION 96/29/EURATOM**

**CARATTERISTICHE MECCANICHE** - MECHANICAL PROPERTIES – CARACTERISTIQUES MECANIQUES-MECHANISCHE EIGENSCHAFTEN

**TRAZIONE**-TENSILE TESTING-TRACTION-ZUGVERSUCH – **EN ISO 6892-1**

**RESILIENZA** - IMPACT TEST - RESILIENCE - ZÄHIGKEIT – **EN ISO 148-1**

**DUREZZA** - HARDNESS - DURETE - HÄRTE – **EN ISO 6506-1**

| PROVINO - SAMPLE – EPROUVETTE - MUSTER | mm | STATO - CONDITION – ETAT - ZUSTAND | TRATTAMENTO TERMICO - HEAT TREATMENT – TRAITMENT TERMIQUE - WÄRMEBEHANDLUNG | | | Rm MPa | Re MPa | A % | Z % | TIPO - TYPE - TYPE - ART | KU °C | KU J | KU J | Mean J | HB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COLATA - HEAT – COULEE-SCHMELZE | 11 | TEMPRA E DISTENSIONE | 880°C | OLIO | 180°C | 1320 | 1122 | 12 | 42 | 20 | 35 | 36 | 36 | 36 | | | |
| | | | | | | | | | | | | | | | | | |
| VALORI ALLO STATO DI FORNITURA - VALUES IN DELIVERY CONDITION - WERTE IM LIEFERZUSTAND ▶ | | | | | | | | | | | | | | | 160 | | |

**TEMPRABILITA'** - HARDENABILITY – TREMPABILITE - HÄRTBARKEIT – **EN ISO 642**

| MM | 1.5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HRC | 42.2 | 41.6 | 37.5 | 33.5 | 31.2 | 28.8 | 27.2 | 26.5 | 24.1 | 23.2 | 22.6 | 21.7 | 21.2 | 20.1 | 19.2 |

**GRANO** - GRAIN – GRAIN - KORNGRÖSSE: **EN ISO 643** **AUSTENITICO** **7 - 8**

**INCLUSIONI NON METALLICHE** - NON METALLIC INCLUSIONS - INCLUSIONS NON METALLIQUES - NICHTMETALLISCHE EINSCHLÜSSE

| A (SS) | | B (OA) | | C (OS) | | D (OG) | |
|---|---|---|---|---|---|---|---|
| Thin | Heavy | Thin | Heavy | Thin | Heavy | Thin | Heavy |
| | | | | | | | |

**DIN 50602 (K)**

K **4** *(OXIDE)* = **6**
K *(SULFIDE)* =
K *(TOTAL)* =

**MACRO** - MACROETCHING – MACRO - MAKRO ÄTZUNG

**MACROINCLUSIONI** - MACROINCLUSIONS – MACRO INCLUSIONS - MAKRO EINSCHLÜSSE

**DIFETTI INTERNI** – CORE DEFECTS – DEFAUTS CORE – KERNFEHLER: **EN 10308 CL.3**

**DIFETTI SUPERF.** - SURFACE DEFECTS – DEFAUTS DE SURFACE – OBERFLÄCHENFEHLER: **EN 10221 B**

**CONTROLLO ANTIMESCOLAMENTO** - ANTIMIXING CONTROL – CONTROLE ANTIMELANGE - VERWECHSLUNGSPRÜFUNG: **100%**

**ENTI COLLAUDATORI** - INSPECTION AUTHORITIES – SERVICE D'ESSAI - ABNAHMEBEHÖRDE

**NOTE** – NOTES – NOTES - ANMERKUNGEN

vs ordine 703882
cod art 3011023

**CONTROLLO QUALITA'** - QUALITY CONTROL - CONTROLE QUALITE - QUALITÄTSTELLE

SERVIZIO QUALITA' – CENTRO ITALIANO ACCIAI SRL

**COPIA CONFORME ALL'ORIGINALE DEPOSITATO PRESSO CENTRO ITALIANO ACCIAI S.R.L.** *RIPORTA TUTTI I DATI ORIGINALI DEL CERTIFICATO DI COLLAUDO DEL PRODUTTORE DELL'ACCIAIO*

TEMPRASUD
Advanced heat treatment solutions

# Rapporto di Collaudo / Test Report

| Nr.Certificato/Certificate Number | Data Collaudo/Test Date | Nr.Provino/Sample |
|---|---|---|
| 202306557 | 13/06/2023 | 2577 |

| CLIENTE/CUSTOMER | NUMERO LOTTO/BATCH NUMBER | CICLO/CYCLE |
|---|---|---|
| **000625 ROSSI S.p.A. Divisione Epicicloidali** | | |
| **DISEGNO/PART NUMBER** | **MATERIALE/MATERIAL** | **COLATA/CASTING** |
| **RC91054105 RUOTA CIL. 5.36D/2** | **16MnCr5** | |

| DDT CLIENTE/DELIVERY NOTE | DATA DDT/D.N. DATE | CARICA//CHARGE N. | PESO TOTALE/TOTAL WEIGHT | PEZZI TOTALI/TOTAL PIECES | IND. REVIS. | CONTROLLO/CHECK PLAN |
|---|---|---|---|---|---|---|
| **43016063** | **22/05/2023** | **230.002.899** | **275,04** | **955** | | |

## Risultato del Collaudo / Test's Result

Caratteristiche Richieste / Requested Features

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **DUREZZA SUPERF.** | ***SURFACE HARDENESS*** | | Da/From | **59,00** | A/To | **61,00** | **HRC** |
| **PENETRAZ.EFFIC.** | ***CHD*** | | Da/From | **0,25** | A/To | **0,40** | **mm** |

Caratteristiche Rilevate / Detected Features

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **DUREZZA SUPERF.** | ***SURFACE HARDENESS*** | | Da/From | **60,00** | A/To | **60,50** | **HRC** |
| **PENETRAZ.EFFIC.** | ***CHD*** | **1** | Da/From | **0,30** | A/To | **0,30** | **mm** |

## Trattamento Termico e Lavorazioni Eseguite/Performed Heat Treatment and Operations

| | |
|---|---|
| ACCETTAZIONE MATERIALE | ACCEPTANCE MATERIAL |
| PREPARAZIONE CARICA | ASSEMBLY |
| CEMENTAZIONE E TEMPRA | CARBURAZING AND QUENCHING |
| LAVAGGIO | WASHING |
| RINVENIMENTO | TEMPERING |
| COLLAUDO | TEST |
| SABBIATURA | SANDBLASTING |
| OLIATURA E IMBALLAGGIO | |
| PRONTA CONSEGNA | PROMPT DELIVERY |

## Note / Notes

ESEGUITO CICLO DI TRATTAMENTO DI CEMENTAZIONE TEMPRA E RINVENIMENTO
ESEGUITO COLLAUDO SU PARTICOLARE DISEGNO RC91054105
ESEGUITO COLLAUDO IN SCALA HR15N CON CONVERSIONE IN SCALA HRC
EFFETTUATO DUREZZA A CUORE SUL PEZZO: 39,3 HRC

**Eseguito collaudo di tipo 3.1 in ottemperanza alla norma UNI EN ISO 10204**

Esito/Result: Conforme/Conforms ✓ Deroga concessa dal cliente / Waived by the client ☐

Collaudatore/Tester: **GIULIANO GENOVA**

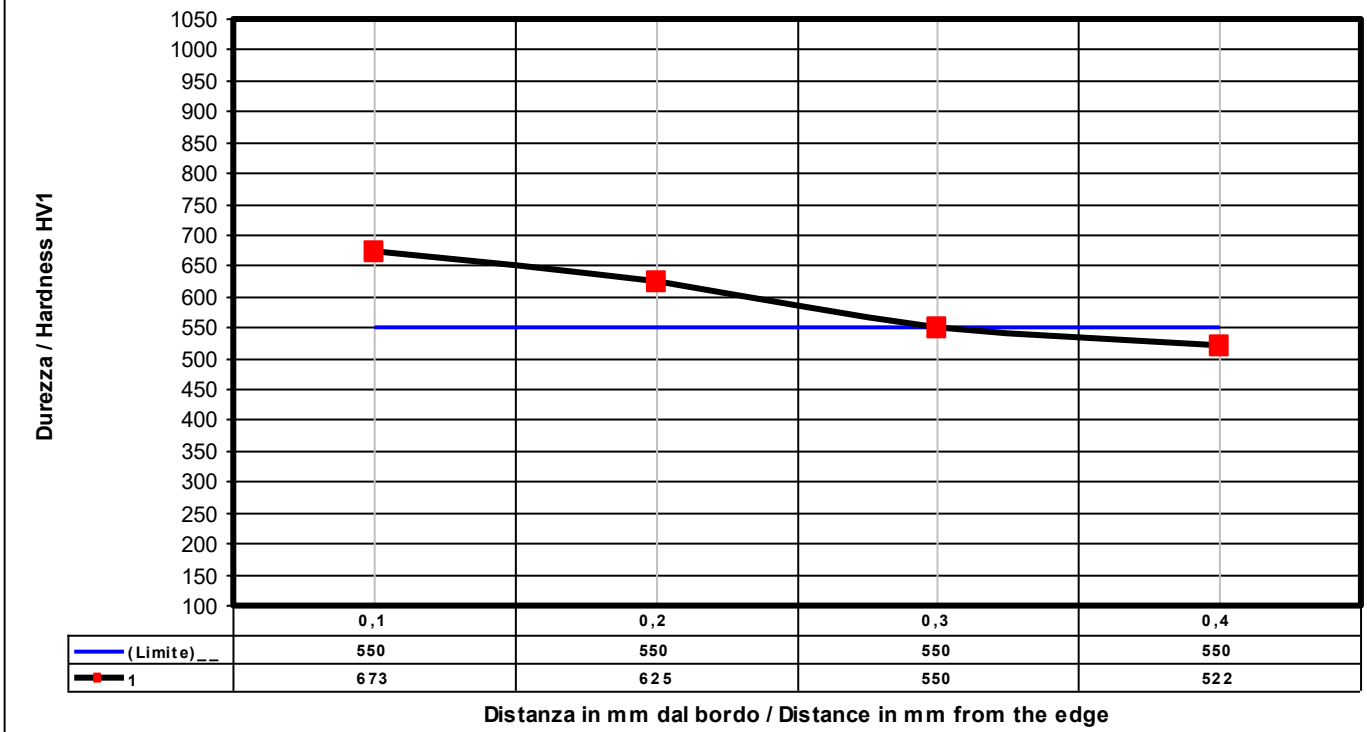
TEMPRASUD
Advanced heat treatment solutions

# Grafico Profondità
# Chart Depth

Commessa / work order **2023/06557**

Cliente/Customer ROSSI S.p.A. Divisione Epicicloidali

Disegno/Part Number **RC91054105 - 1054105 RUOTA CIL. 5.36D/2**




| | 0,1 | 0,2 | 0,3 | 0,4 |
|---|---|---|---|---|
| (Limite)__ | 550 | 550 | 550 | 550 |
| 1 | 673 | 625 | 550 | 522 |

INTERACCIAI
Acciai Speciali

**INTERACCIAI S.p.A.**
Sede Legale e Amministrativa
Via Pasteur, 2 - 42122 Reggio Emilia - ITALY
Tel.() 39 0522 556800 Fax () 39 0522 557519
http://www.interacciai.it
e-mail: info@interacciai.it
e-mail: amministrazione@interacciai.it
pec: amministrazione@pec.interacciai.it

CAP.SOC. € 2.500.000,00 i.v.
C.Fisc. – P.Iva – N. ISCR. R.I. 00283270353
R.E.A. di Reggio Emilia n.113556
VAT CODE IT 00283270353

Filiali con deposito

| ANCONA | BARI | BOLOGNA | BRESCIA | MILANO | MODENA | PIACENZA | REGGIO E. | ROMA | SIENA | TORINO | S.PONSO | TREVISO | VERONA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0731/60452 | 080/5324378 | 0542/670000 | 030/9759065 | 02/2544161 | 059/333033 | 0523/524321 | 0522/927013 | 0774/354474 | 0577/931909 | 011/8975963 | 0124/360748 | 0422/446700 | 045/8510680 |


# CERTIFICATO DI COLLAUDO

conforme all'originale conservato presso nostra sede
TEST CERTIFICATE
corresponding to the original kept in our head office
CERTIFICAT D'ESSAI
conforme à l'original conserve au siego
WERKPRUFZEUGNIS
entsprechend dem'In unserem siz aufbewahrlen original

UNI EN 10204/2005 3.1 DI RIFERIMENTO

Cliente:

ROSSI S.P.A.
VIA EMILIA OVEST 915/A
41123 MODENA MO

Il prodotto relativo a questo documento è conforme alle prescrizioni contrattuali / The product describes in this document is in according to the Customer's

| **ACCIAIO -**STEEL - ACIER - STAHL | 22514123140 | Quantità/Weight | CERTIFICATO N° | Rif Norma |
|---|---|---|---|---|
| 20MnCrS5 +A RUL TD | 140 | 623,00 | 2945249 | ISO 683-3 |

| **COLATA -** HEAT - COULEE - SCHMELZE | N. C. INTERNA | Ordine Cliente/Order | RIF. NS. DDT | DEL |
|---|---|---|---|---|
| 23 203543 | P213942 | 689335 OA DEL 18/05/2022 | BA01573 | 30/05/2022 |

**COMPOSIZIONE CHIMICA % -** CHEMICAL ANALYSIS % - COMPOSITION CHIMIQUE % - CHEMISCHE ZUSAMMENSETZUNG %

| C | Si | Mn | P | S | Cr | Ni | Mo | Cu | Sn | Al |
|---|---|---|---|---|---|---|---|---|---|---|
| **0,20** | **0,27** | **1,22** | **0,009** | **0,025** | **1,14** | **0,10** | **0,01** | **0,17** | **0,010** | **0,024** |

| Ti | V | Pb | B | Ca | N | O2 ppm | H2 ppm | Nb | C.E. |
|---|---|---|---|---|---|---|---|---|---|
| **0,005** | **0,003** | | **0,0008** | **0,0013** | **0,008** | **0,001** | | | **0,65** |

**CARATTERISTICHE MECCANICHE -** MECHANICAL PROPERTIES - CARATTERISTIQUES MECANIQUES - MECHANISCHE EIGENSCHAFTEN

| Di riferimento / Di prodotto | Trattamento termico del provino / Heat treatment / Traitement termique / Warmebehandlung | Grano / Grain size / Dim. grain / Korngrosse | Temp. prova di Resilienza / Temp. impact test / Temp. essai resilience / Temp. kerbschlagsprobe |
|---|---|---|---|
| | **Temprato e Disteso** | 6 | **25** |

| PRELIEVO TEST ESSAI PRUFUNG | Diametro | Sezione | Rp02 MPa | Rm MPa | A % | Z % | HBW | KV Joule | | | Kcu Joule |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **1168** | **1370** | **12** | **39** | **192** | **51** | **50** | **53** | |

**PROVA JOMINY -** JOMINY - TEST - ESSAI JOMINY - STIRNABSCHRECKVERSUCH

| mm A | 1.5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HRC | **46** | **46** | **44** | **41** | **38** | **36** | **33** | **31** | **30** | **29** | **27** | **26** | **25** | | |

| **Durezza superficiale HRc** Surface hardness Min. | Max. | **Profondità di tempra mm** Hardening depth Min. | Max. | **Durezza profondità Di tempra** Hardness HRc |
|---|---|---|---|---|
| | | | | |

| **Bandosità** Band structure | **Micropurezza** Micropurity K4=23 | **Tasso di Riduzione** Reduction ratio |
|---|---|---|
| | | |

IN CONFORMITA' PUR 1 7 rev.0

Note - notes:

INTERACCIAI S.p.A.

TEMPRASUD S.R.L.
TRATTAMENTI TERMICI

# Rapporto di Collaudo

Commessa **202303242** 0.1

Data Collaudo **18/03/2023**

Cliente **000625 ROSSI S.p.A. Divisione Epicicloidali** DDT Cliente **43007896** Del **09-mar-23**

Num Disegno **RC91051649** **1051649 RUOTA CIL. 5.127A/** Materiale **16NiCr4**

Pezzi **368** Peso **1008,32** Numero Lotto

Colata Indice Rev. Carica Impianto **230315012**

Numero Carica **230.001.270** Sistema **LLF6** Ciclo **606**

Trattamento **Cementazione tempra e rinvenimento 0,6 mm**

## Risultato del Collaudo

Collaudatore **JONATAN DE LEO**

| Caratteristiche Richieste | Zona Rilievo | UM | Da | A | Strumento |
|---|---|---|---|---|---|
| **DUREZZA SUPERF.** | | **HRC** | **59,00** | **61,00** | |
| **PENETRAZ.EFFIC.** | | **mm** | **0,50** | **0,70** | |

| Caratteristiche Rilevate | Zona Rilievo | UM | Da | A | Strumento |
|---|---|---|---|---|---|
| **DUREZZA SUPERF.** | | **HRC** | **59,90** | **60,20** | **4** |
| **PENETRAZ.EFFIC.** | | **mm** | **0,67** | **0,67** | **2** |

PROVINO N° 1181
ESEGUITO CICLO DI TRATTAMENTO DI CEMENTAZIONE TEMPRA E RINVENIMENTO
ESEGUITO COLLAUDO SU PARTICOLARE DISEGNO RC91051649

| Strumento | Descrizione | Marca | Modello | Matricola |
|---|---|---|---|---|
| **2** | **Microdurometro affri J** | **AFFRI** | **Wiki 200 JS1** | **74353** |
| **4** | **Durometro TWIN 2** | **ERNST** | **TWIN 2** | **47/1999** |

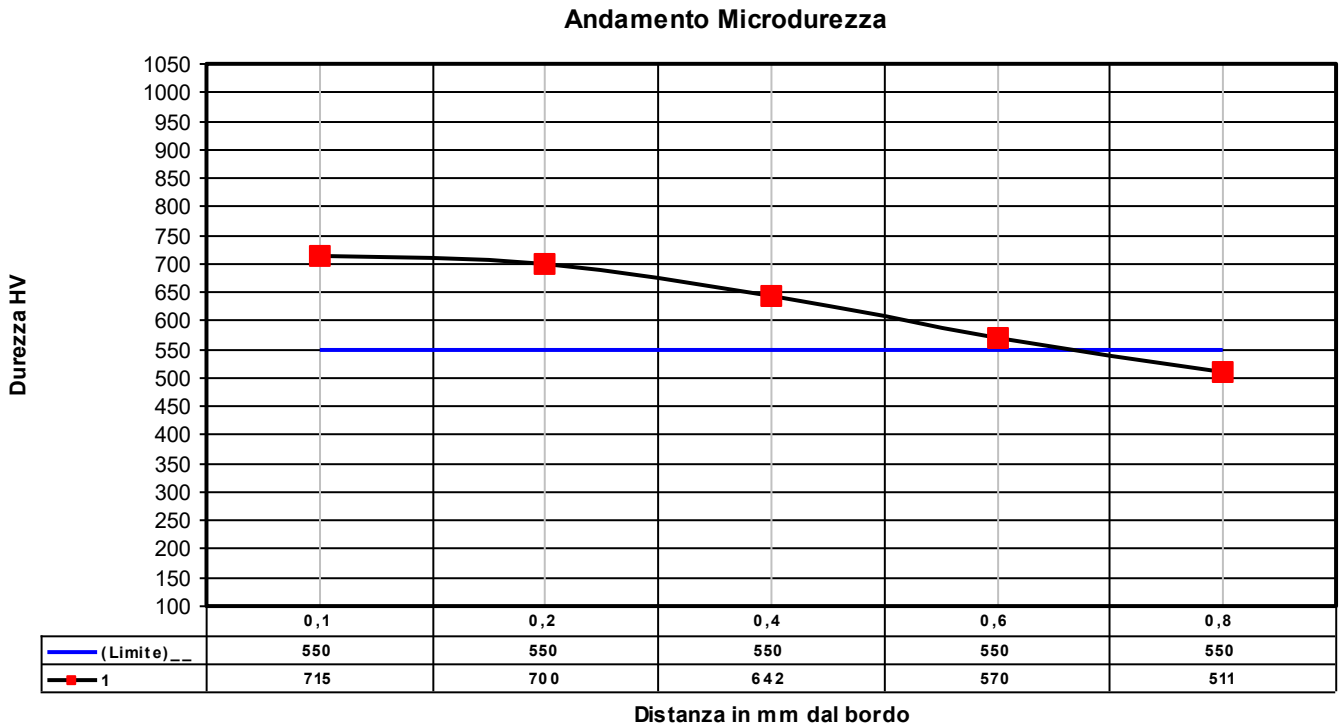
**Eseguito collaudo di tipo 3.1 in ottemperanza alla norma UNI EN ISO 10204**

Esito: **Conforme** Collaudatore: **JONATAN DE LEO**

TEMPRASUD
TRATTAMENTI TERMICI

# Diagramma Andamento Microdurezza

Commessa **2023/03242.0.1**



FONDERIA GHIRLANDINA S.P.A.
41122 MODENA - ITALY
Via della Tecnica, 72
Tel. (+39) 059/283427 - 281535
Fax (+39) 059/280808
E-mail:fonderiaghirlandina@fonderiaghirlandina.com
www.fonderiaghirlandina.com

# Certificato di Conformità

Certificate of Conformity

**EN 10204 3.1**

**N°CERTIFICATO/ *Certificate*** **2402379 del 16/09/2024**

**Cliente** / Customer
**ROSSI S.P.A.**

**Ordine N°** / Order N°
**833676 OA**

**Particolare** / Part
**10.326** **CARCASSA**

**Disegno** / Drawing
**10.326**

**Materiale** / Material
**GJL200 UNI-EN 1561**

**Specifica** / Specification

**Quantità** / Quantity
**623**

**Commessa** / Work Order
**C000051-2400859-0010**

**Origine**

**Composizione Chimica** / Chemical Composition (%)

| Data colata | C | Cr | Cu | Mn | P | S | Si | Sn | Ni | Al | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18G24 | 3,276 | 0,031 | 0,049 | 0,581 | 0,075 | 0,038 | 1,640 | 0,020 | 0,025 | 0,001 | | | | | | |

**Trazione (N/mm2)**

**Prove meccaniche** / *Mechanical test* **(HB)**

Durezze su pezzi controllati

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 203 | 203 | 207 | 207 | 207 | 203 | 203 | 203 |
| 207 | 207 | 207 | 207 | | | | |

Note

**Si certifica che il materiale in oggetto è conforme all'Ordine, Disegno e Norme Applicabili**
We cerify that the above mentioned materials are in accordance with the Order , Drawing and RefferingStandards

**Rif. DDT N°:** **2401123 del 16/09/2024**

**Controllo Qualità** / Quality Control
Piccinini Luca

SEAH Besteel
522, Oehang-ro, Gunsan-si,
Jeollabuk-do, Korea (573-711)

# MATERIAL CERTIFICATE

ACCORDING TO EN10204:2004, Type 3.1

TEL : +82-(0)63-460-8573(Repres.)
+82-(0)63-460-8285(QA)
+82-(0)63-460-8470(Technology Service)
FAX : +82-(0)63-460-8423



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Date | : 2019-07-31 | Specification | : KS D 3754 : 2013 | Size | (mm) : | 105 | |
| Cert. No. | : 201907-011019 | Steel Grade | : SCM420H | Length | (mm) : | 7,000 | |
| Customer | : | Shape of Product | : Round Bar | Weight | (kg) : | 7,710 | |
| Heat No. | : B52287 | Delivery Condition | : As Rolled | Quantity | (pcs) : | 16 | |
| Serial-No. | : | Melting Process | : EAF-LF-VD(RH)-CC | | | | |

Chemical Composition (wt. %)

| Inspection Items | | C | Si | Mn | P | S | Cu | Ni | Cr | Mo |
|---|---|---|---|---|---|---|---|---|---|---|
| | | × 100 | × 100 | × 100 | × 1000 | × 1000 | × 100 | × 100 | × 100 | × 100 |
| Spec. | Min. | 17 | 15 | 55 | | | | | 85 | 15 |
| | Max. | 23 | 35 | 90 | 30 | 30 | 30 | 25 | 125 | 35 |
| Result | | 22 | 24 | 81 | 17 | 10 | 10 | 7 | 110 | 15 |

| Inspection Items | | Tensile Test | | | | Charpy Impact Test | | | | | | Product Hardness | | | Ultrasonic Test | Surface Inspection |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Type | | | | | | | | | | |
| Spec. | Min. | | | | | | | | | | | | | | | |
| | Max. | | | | | | | | | | | | | | | |
| Result | | | | | | | | | | | | | | | GOOD | GOOD |

| Inspection Items | | Gas Analysis(ppm) | | | Austenite Grain Size | Macro Structure | | | | Macro Streak Flaw | | | Decarburized Layer |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | DM-T |
| Spec. | Min. | | | | | | | | | | | | |
| | Max. | | | | | | | | | | | | |
| Result | | | | | | | | | | | | | |

| Inspection Item | | Nonmetallic Inclusion | | | | | | | | | | | | | | Reduction Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spec. | Min. | | | | | | | | | | | | | | | |
| | Max. | | | | | | | | | | | | | | | |
| Result | | | | | | | | | | | | | | | | |

| Inspection Items | | Hardenability(End Quenching Method) HRC, mm, ASTM A255 | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| Spec. | Min. | 40 | 39 | 35 | 31 | 28 | 25 | 24 | 23 | 20 | 20 | | | | | |
| | Max. | 48 | 48 | 47 | 44 | 42 | 39 | 37 | 35 | 33 | 31 | 30 | 30 | 29 | 29 | 28 |
| Result | | 45 | 45 | 43 | 38 | 34 | 31 | 30 | 29 | 27 | 25 | 24 | 23 | 22 | 22 | 21 |

| Bundle | Quantity(pcs) | Weight(kg) |
|---|---|---|
| | | |

<<Remark>>

We hereby certify that the material described herein has been made in accordance with the rules of the contract.
Our quality system is certified in accordance with IATF 16949:2016 / ISO 9001:2015 by KSA

Certified by

Manager of Quality Assurance Dept.

TEL:(04)24060036
FAX:(04)24069985

# 無放射性污染暨品質證明

## （出廠證明書）
## TEST CERTIFICATE

豐興鋼鐵股份有限公司
FENG HSIN STEEL CO., LTD.

OFFICE： 臺中市后里區甲后路一段998號
No. 998, Sec. 1, Jiahou Rd., Houli Dist.,
Taichung City 421, Taiwan(R.O.C)
TEL : (04)25565101
FAX : (04)25566955

| | | | | | |
|---|---|---|---|---|---|
| 客戶名稱 CUSTOMER NAME | | | | 證明書編號 CERTIFICATE NO. | 2103B1358-001 |
| 規格名稱 SPEC. | JIS G4052 SCM420H FT | 產品名稱 PRODUCT | HOT ROLLED STRAIGHT ROUND BAR 熱軋直棒鋼 | 交運日期 SHIPPING DATE | 2021/03/18-2021/03/18 |
| | | | | 證明書列印日期 CERTIFICATE DATE | 2021/05/24 |

| 尺寸及規格MATERIAL DESCRIP. | | | | 爐號 | 拉力試驗TENSILE | | | 硬度 | 化學成分(%)CHEMICAL ANALYSIS | | | | | | | | | | | | | | | | 秤量單編號 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 直徑 DIA. (mm) | 長度 LEN. (m) | 數量 QTY (bdl.) | 重量 WEIGHT (kgs) | HEAT No. | 降伏YP N/mm² | 抗拉TS N/mm² | 伸長率 EL(%) | HARD-NESS | C | Si | Mn | P | S | Ni | Cr | Mo | CU | | Al | | | | B | | | | SHIPPING NO. |
| | | | | | | | | | X100 | | | X1000 | | X100 | | | | | X1000 | | | | X10000 | | X100 | | |
| | | | | | | | | HRB | 17<br>23 | 15<br>35 | 55<br>95 | 30<br>MAX | 30<br>MAX | 25<br>MAX | 85<br>125 | 15<br>30 | 30<br>MAX | | | | | | | | | | |
| 32 | 6 | 3 | 5,940 | 385820 | 479 | 688 | 16.2 | 94.70 | 20 | 25 | 81 | 12 | 4 | 5 | 104 | 15 | 11 | | 29 | | | | | | | | 2DA318017 |
| 34 | 6 | 3 | 5,857 | 385820 | 423 | 665 | 21.9 | 96.20 | 20 | 25 | 81 | 12 | 4 | 5 | 104 | 15 | 11 | | 29 | | | | | | | | 2DA318017 |

TOTAL: 6 BUNDLES 11,797 kgs.

REMARK：

QC-09-11

※茲證明本表所列產品，均依材料規格製造及試驗並符合規格之要求
WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MANUFACTURED AND TESTED WITH SATISFACTORY RESULTS IN ACCORDANCE WITH THE REQUIREMENT OF THE ABOVE MATERIAL SPECIFICATION.

冶金研發處處長
MANAGER
METALLURGICAL R&D DEP.

郭志毅

NO.980 #001
0424936988
28/04/2022 14:15

# 亞格齒輪企業股份有限公司

YAGER GEAR

**Yager Gear Enterprise Co.,Ltd.**

**熱處理報告**

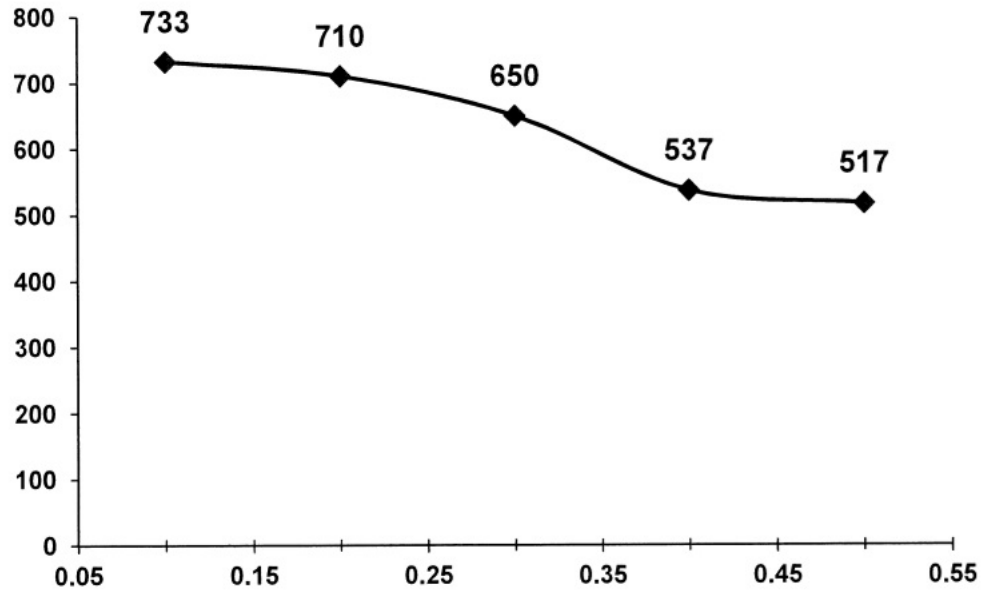
**Process Approval Report - Hardness**

| 客戶名稱: CLIENTS NAME: | 臻裕 | 產品編號: CLIENTS PARTS NAME: | 16.90 | 熱處理方法 HEAT TREATMENT METHOD | |
|---|---|---|---|---|---|
| 檢驗日期: INSPECT DATE | 2022/12/7 | 材質 MATERIAL | SCM420H | | 高週波 HIGH FREQUENCY |

| 項目 ITEMS | 要求規格 REQUEST SPECIFICATION | 檢驗結果 TEST RESULTS | | |
|---|---|---|---|---|
| | | | V | 氣體滲碳 GAS CARBURIZING |
| 表面硬度 SURFACE HARDNESS | HV 660 - HV 740 | HV 733 | | 滲碳氮化 CARBONTRIDING |
| 滲碳深度 CARBURIZED DEPTH | 0.25-0.4mm | 0.39 mm | | 調質 HEAT REFINING |
| 芯部硬度 CORE HARDNESS | HV 340 - HV 440 | HV 342 | | 正常化 NORMALIZING |
| 荷重 LONDING | 1000gf | | | 退火 ANNEALING |
| 滲碳深度基準 CARBURIZED DEPTH BENCHMARK | 550 | | | 氮化 NITRIDING |

硬度分佈曲線圖

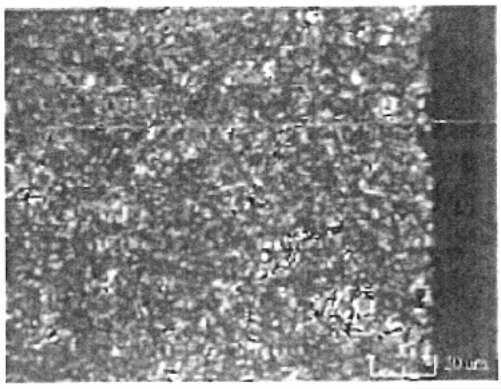
HARDENABILITY CURVE




| | mm | HV | HRC |
|---|---|---|---|
| 1 | 0.1 | 733 | 61.5 |
| 2 | 0.2 | 710 | 60.6 |
| 3 | 0.3 | 650 | 57.8 |
| 4 | 0.4 | 537 | 51.5 |
| 5 | 0.5 | 517 | 50.3 |
| 6 | 0.1 | 342 | 34.6 |

金相組織(倍率X500)

PHOTO OF STRUCTURE



審核 APPROVAL

蘇文標

檢驗者 INSPECTOR

蘇文標

# 亞格齒輪企業股份有限公司

YAGER GEAR

**Yager Gear Enterprise Co.,Ltd.**

**熱處理報告**

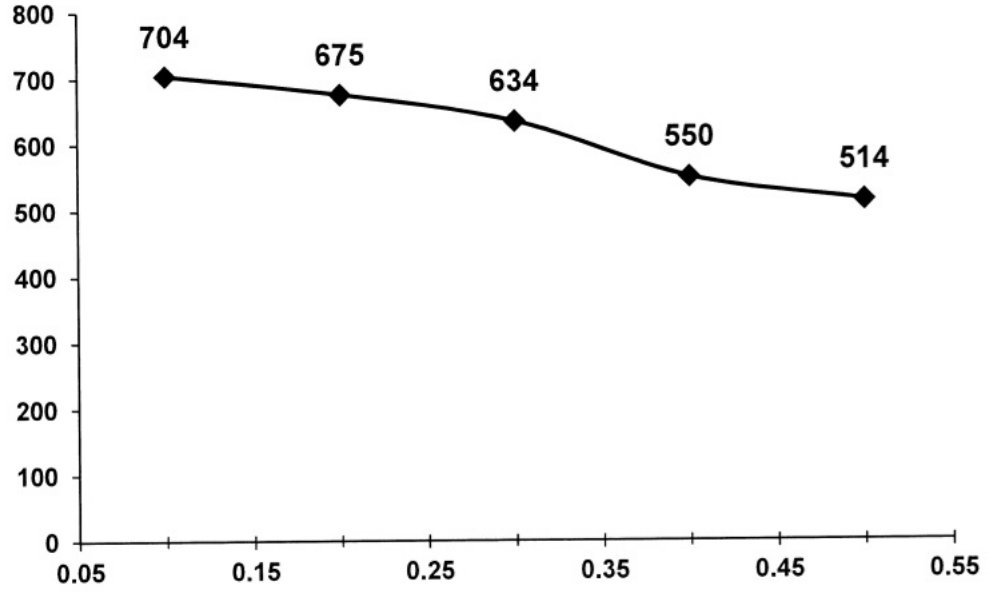
**Process Approval Report - Hardness**

| 客戶名稱: CLIENTS NAME: | 臻裕 | 產品編號: CLIENTS PARTS NAME: | 12.180 | 熱處理方法 HEAT TREATMENT METHOD | |
|---|---|---|---|---|---|
| 檢驗日期: INSPECT DATE | 2022/10/4 | 材質 MATERIAL | SCM420H | | 高週波 HIGH FREQUENCY |

| 項目 ITEMS | 要求規格 REQUEST SPECIFICATION | 檢驗結果 TEST RESULTS | | |
|---|---|---|---|---|
| 表面硬度 SURFACE HARDNESS | HV 660 - HV 740 | HV 704 | | 滲碳氮化 CARBONTRIDING |
| 滲碳深度 CARBURIZED DEPTH | 0.25-0.4mm | 0.40 mm | | 調質 HEAT REFINING |
| 芯部硬度 CORE HARDNESS | HV 340 - HV 440 | HV 358 | | 正常化 NORMALIZING |
| 荷重 LONDING | 1000gf | | | 退火 ANNEALING |
| 滲碳深度基準 CARBURIZED DEPTH BENCHMARK | 550 | | | 氮化 NITRIDING |

硬度分佈曲線圖

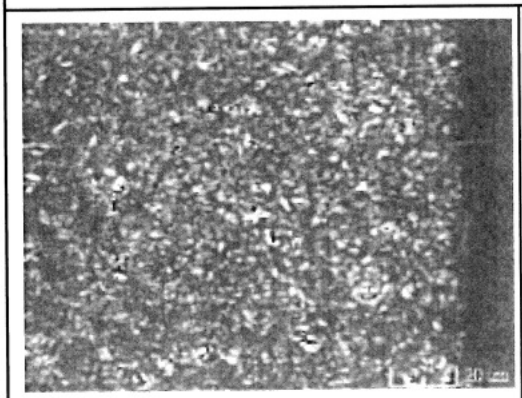
HARDENABILITY CURVE




| | mm | HV | HRC |
|---|---|---|---|
| 1 | 0.1 | 704 | 60.3 |
| 2 | 0.2 | 675 | 59.1 |
| 3 | 0.3 | 634 | 57.1 |
| 4 | 0.4 | 550 | 52.4 |
| 5 | 0.5 | 514 | 50.1 |
| 6 | 0.1 | 358 | 36.5 |

金相組織(倍率X500)

PHOTO OF STRUCTURE



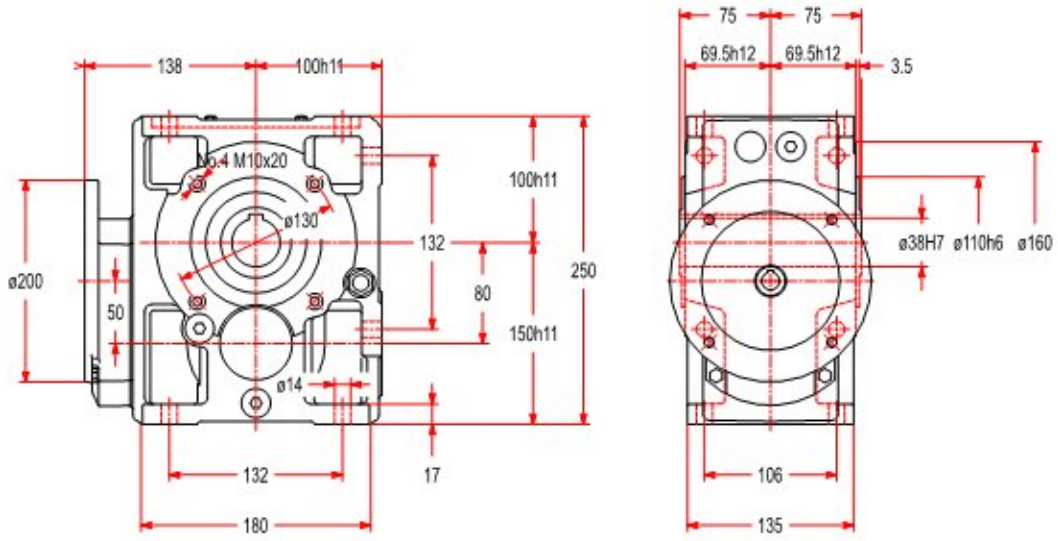
審核 APPROVAL

蘇文標

檢驗者 INSPECTOR

蘇文標

## Dimensioni principali [mm] (per accessori, vedere pag. seguenti)




Informazione

Vite UNI 5737: M 12 x 40

Viti UNI 5588: M 12

Affidabilità prodotto, considerazioni sull'applicazione
Il cliente è responsabile della corretta selezione e applicazione del prodotto in vista dei propri fabbisogni industriali e/o commerciali, salvo il caso in cui l'utilizzo non sia stato raccomandato da personale tecnico qualificato Rossi, dopo opportuna formazione sul tipo di applicazione del cliente. In questo caso tutti i dati necessari richiesti per la selezione devono essere comunicati esattamente e per iscritto dal cliente, indicati in sede di ordine e confermati da Rossi. Il cliente è sempre responsabile della sicurezza delle applicazioni di prodotto. Ogni possibile cura è stata adottata nella stesura del presente catalogo al fine di assicurare l'accuratezza delle informazioni contenute in questa pubblicazione, tuttavia Rossi non può assumere alcuna responsabilità per eventuali errori, omissioni o dati non aggiornati. A causa della costante evoluzione dello stato dell'arte, Rossi si riserva il diritto di apportare modifiche in qualsiasi momento alle pubblcazioni. La responsabilità della selezione del prodotto è del cliente, salvo diversi accordi legalmente formalizzati per iscritto e sottoscritti dalle parti.

Rossi

# GENERIC MATERIAL CERTIFICATES

**Gearbox reference**

Customer: **REMAZEL ENGINEERING SPA**
Order Confirm: 24037173 SO
Code: R000308176
Description: G MR ICI 140 UO3D 40,6 B3

| Part Desc. | Part Ref. | Material | Ref. Doc |
|---|---|---|---|
| Housing | 10.535 | EN-GJS-400-15 | VDP Fonderia / n. 40000339167 |
| Cylindrical Wheel | 5.42A/2,02 | 20MnCrS5 +A RUL TD | Interacciai / n. 3214906 |
| Wheel | 5.147B / 5 | 20MNCr5 +HH | Acciaierie Venete / n. 568141 |
| Shaft | 3.511B | E355 | Tenaris / n. 03-23-06425 |
| Sprocket | 2.843A / 4,45 | 18NiCrMo5 | Centro Italiano Acciai / n. 5322 |
| Bevel wheel | 16.297 / 4R | 16CRNI4 | Acciaierie Bertoli Safau / n. 259294/1 |
| Ground bevel pinion | 12.101B /4R | 18NiCrMoS5 +A TD | Interacciai / n. 3092274 |
| Ground bevel pinion | 12.187A/4R | 17NICRM06-4HH/D | Riva Acciaio / n. 30956 |

Issued: TSS

CENTRO ITALIANO ACCIAI SRL
GRUPPO ACCIAIERIE VENETE SPA

# CERTIFICATO DI COLLAUDO – MILL'S TEST CERTIFICATE

**EN 10204 3.1**

**N° 5322**

**DATE:** 11/09/2023

Centro Italiano Acciai s.r.l C.S. € 1.350.000 i.v. C.F. 01321520288 P.IVA 02356350369
R.E.A. di MO n. 284827 Reg. Imprese di MO n. 158694 Meccanografico MO 027779
Sede Legale 41122 MODENA Via Pietro Cavalli, 35 - Italy Tel. 059 283235
Società assoggettata a direzione e coordinamento da parte di Acciaierie Venete Spa
Azienda con sistema di gestione per la qualità certificato da IGQ secondo ISO 9001

**CLIENTE** – CUSTOMER – CLIENT – KUNDE
**103545 - ROSSI SPA**
VIA EMILIA OVEST N. 915/A
41100 MODENA (MO)

**ORDINE CLIENTE** - PURCHASE ORDER – COMMANDE CLIENT - KUNDENAUFTRAG
776797 DEL 02/08/2023

**ORDINE** - ORDER – COMMANDE - AUFTRAG
C1073466 / 10

**ARTICOLO (ACCIAIO)**- ITEM (STEEL) - ITEM (ACIER) - ARTIKEL (STAHL)

**PROFILO** - PROFILE – PROFIL - ABMESSUNG: **TONDO mm. 60 (h11 - EN ISO 286-2)**

**STATO DI FORNITURA**- DELIVERY CONDITION – CONDITION DE LIVRAISON – LIEFERZUSTAND: **RICOTTO LAVORABILE**

**STATO DI ESECUZIONE** - STATE OF EXECUTION – ETAT DE L'ÉXECUTION - AUSFÜHRUNG: **PELATO RULLATO**

| LOTTO - REFERENCE – REFERENCE - REFERENZEN | COLATA – HEAT - COULEE - SCHMELZE | MARCA ACCIAIO – STEEL GRADE - MARQUE ACIER - STAHLGÜTE |
|---|---|---|
| **062208** | **297533** | **18NiCrMo5** |

**NORMA** - SPECIFICATION – NORME - NORM

**PESO** - WEIGHT – POIDS - GEWICHT (Kg): **3132**
**COLLI** - ITEMS – COLIS - KOLLI (Nr): **3**
**DDT** - DELIVERY NOTE – BON DE LIVRAISON - LIEFERSCHEIN: **C002076** **11/09/2023**
**BLUMO** - BLOOM – BLOOM - KNÜPPEL: ● **200**
**RIDUZIONE** - REDUCTION – REDUCTION - UMFORMUNGSGRAD: **10.1**

ACCIAIO DA FORNO ELETTRICO - CONTINUOUS CASTING ELECTRIC STEEL - ACIER ELABORE AU FOUR ELECTRIQUE - ELEKTRO-LICHTBOGENOFEN STAHL

**COMPOSIZIONE CHIMICA (%)** - CHEMICAL COMPOSITION (%) - COMPOSITION CHIMIQUE (%) - CHEMISCHE ZUSAMMENSETZUNG (%)

| C | Si | Mn | P | S | Cu | Cr | Ni | Sn | Al | As | Mo |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.1840 | 0.2140 | 0.8280 | 0.0100 | 0.0280 | 0.1930 | 0.9420 | 1.2970 | 0.0100 | 0.0240 | 0.0060 | 0.1840 |

| V | Ti | Nb | Ca |
|---|---|---|---|
| 0.0060 | 0.0100 | 0.0040 | 0.0006 |

**ANALISI GAS** - GAS ANALYSIS - ANALYSE GAZ - GAS ANALYSE
$H_2$= 1.4 (ppm) | $O_2$= (ppm) | $N_2$= (ppm)

**D.I. (ASTM A255)**

THE PRODUCT COMPLIES WITH THE REQUIREMENTS OF THE EUROPEAN DIRECTIVE 2000/53/EC

**RADIOACTIVITY MEETS SPECIFICATION 96/29/EURATOM**

**CARATTERISTICHE MECCANICHE** - MECHANICAL PROPERTIES – CARACTERISTIQUES MECANIQUES-MECHANISCHE EIGENSCHAFTEN

**TRAZIONE**-TENSILE TESTING-TRACTION-ZUGVERSUCH – **EN ISO 6892-1**

**RESILIENZA** - IMPACT TEST - RESILIENCE - ZÄHIGKEIT – **EN ISO 148-1**

**DUREZZA** - HARDNESS - DURETE - HÄRTE – **EN ISO 6506-1**

| PROVINO - SAMPLE – EPROUVETTE - MUSTER | mm | STATO - CONDITION – ETAT - ZUSTAND | TRATTAMENTO TERMICO - HEAT TREATMENT – TRAITMENT TERMIQUE - WÄRMEBEHANDLUNG | | | Rm MPa | Re MPa | A % | Z % | TIPO - TYPE - TYPE - ART | KU °C | KU J | KU J | Mean J | HB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COLATA - HEAT – COULEE-SCHMELZE | 11 | TEMPRA E DISTENSIONE | 850°C | OLIO | 180°C | 1420 | 1179 | 12 | 42 | | 20 | 36 | 36 | 38 | 37 | | | |
| VALORI ALLO STATO DI FORNITURA - VALUES IN DELIVERY CONDITION - WERTE IM LIEFERZUSTAND ▶ | | | | | | | | | | | | | | | | | 176 | |

**TEMPRABILITA'** - HARDENABILITY – TREMPABILITE - HÄRTBARKEIT – **EN ISO 642**

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MM | 1.5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | |
| HRC | 45.3 | 44.8 | 44.4 | 42.9 | 40.3 | 37.8 | 36.1 | 33.9 | 31.6 | 30.2 | 29.1 | 28.4 | 27.5 | |

**GRANO** - GRAIN – GRAIN - KORNGRÖSSE – **EN ISO 643**: **AUSTENITICO** **6 - 8**

**INCLUSIONI NON METALLICHE** - NON METALLIC INCLUSIONS - INCLUSIONS NON METALLIQUES - NICHTMETALLISCHE EINSCHLÜSSE – **UNI 3244/80 (M)**

| A (SS) | | B (OA) | | C (OS) | | D (OG) | | DS |
|---|---|---|---|---|---|---|---|---|
| Thin | Heavy | Thin | Heavy | Thin | Heavy | Thin | Heavy | |
| 2.0 | 1.0 | 2.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.5 | 1.0 |

**DIN 50602 (K)**
K 3 *(OXIDE)* = 12
K *(SULFIDE)* =
K *(TOTAL)* =

**MACRO** - MACROETCHING – MACRO - MAKRO ÄTZUNG

**MACROINCLUSIONI** - MACROINCLUSIONS – MACRO INCLUSIONS - MAKRO EINSCHLÜSSE

**DIFETTI INTERNI** – CORE DEFECTS – DEFAUTS CORE – KERNFEHLER: **EN 10308 CL.4**

**CONTROLLO ANTIMESCOLAMENTO** - ANTIMIXING CONTROL – CONTROLE ANTIMELANGE - VERWECHSLUNGSPRÜFUNG: **100%**

**ENTI COLLAUDATORI** - INSPECTION AUTHORITIES – SERVICE D'ESSAI - ABNAHMEBEHÖRDE

**NOTE** – NOTES – NOTES - ANMERKUNGEN

**CONTROLLO QUALITA'** - QUALITY CONTROL - CONTROLE QUALITE - QUALITÄTSTELLE

SERVIZIO QUALITA' CENTRO ITALIANO ACCIAI SRL

**COPIA CONFORME ALL'ORIGINALE DEPOSITATO PRESSO CENTRO ITALIANO ACCIAI S.R.L.** *RIPORTA TUTTI I DATI ORIGINALI DEL CERTIFICATO DI COLLAUDO DEL PRODUTTORE DELL'ACCIAIO*

DATI DEL CARICATORE / LUOGO DI CARICO

T.T.S.
Trattamenti Termici Speciali
divisione della F G GRUPPO S.P.A.
Via Mascagni n.6 - 42048 Rubiera (RE)
Partita IVA e Codice Fiscale n.05764390018
TEL. 0522/626444 FAX 0522/628678 Email:tts@fg-gruppo.it
Capitale Sociale €1.032.000 i.v. Reg.Imprese di Torino 2647/89
Sede Legale: 10134 Torino (To) - Via Tunisi n.70

**DICHIARAZIONE DI CONFORMITA'**

*NUMERO* BC001178 *DATA* 14/06/2024

**Mod. FT 005**

**Rif. PG 08**

**CLIENTE / CUSTOMER**

ROSSI SPA

VIA EMILIA OVEST 915/A
41123 MODENA MO

**INDIRIZZO CONSEGNA / DELIVERY ADDRESS**

STABILIMENTO

VIA STRADELLO BAGNESI
41121 GANACETO MO

| pag. 1 | Cod.cliente | Partita Iva/Cod.Fiscale | Cod.fornitore |
|---|---|---|---|
| | 1 3576 | IT 01855520365 | |

| Vs.DDT/Your DN | Disegno/Part Number | | Materiale/Material | Specifica/Specific | Lavorazione/Heat Treatment | Durezza/Hardness | Profond/Case Dept | Pz/Qt | Kg |
|---|---|---|---|---|---|---|---|---|---|
| 44016739 05/06/24<br>LDP: 11-6802 | 2.773/4,5 | RC00034761 Rocchetto | 18NiCrMo5 -M.8R | ord.774369 | CMT+DIST +S | HRc = 59-61<br>HRc = 59-60 | 1,4-1,8<br>1,5mm | 10 | 306 |
| 44016739 05/06/24<br>LDP: 11-6805 | 2.1107/2,81-80 | RC00079429 Rocchetto | . -M.5R | ord.820322 | PROT2Z+CMT+CORIN+RAD.10 | HRc 59-61<br>HRc=59-60/cod=34-36 | 0,85-1,15<br>0,90mm da Be | 15 | 225 |
| 44016873 06/06/24<br>LDP: 110-1931 | 2.843/4,45 | RC00045315 Rocchetto | . -M.4R | ord.828644 | CMT+DIST +S | HRc= 59-61<br>HRc= 59-60 | 0,75-1,05<br>0,85mm da Be | 150 | 300 |
| 44016978 07/06/24<br>LDP: 19-2150 | 2.716/3,08-55 | RC00016329 Rocchetto | 18NiCrMo5 -M.4R | ord.822316 | PROT2Z+CMT+CORIN+RAD.10 | HRc= 59-61<br>HRc= 59-60 | 0,75-1,05<br>0,85mm da Be | 10 | 45 |
| 44016978 07/06/24<br>LDP: 13-2555 / 11-6802 | 2.773/4,07 | RC00034760 Rocchetto | 18NiCrMo5 -M.8R | ord.798403 | CMT+DIST +S | HRc= 59-61<br>HRc= 59-60 | 1,4-1,8<br>1,5mm | 30 | 970 |
| | I-C03 | CONTENITORE PICCOLO (Rossi) | | | | | | 2 | |
| | I-C01 | CONTENITORE GRANDE (Rossi) | | | | | | 3 | |

Note

**La seconda riga di ogni voce porta i valori di collaudo. La F G GRUPPO S.p.A., certifica sotto la propria responsabilita' che, a parte quanto indicato nelle NOTE, i controlli di processo ed i controlli finali sono stati eseguiti conformemente al proprio MGSQ. Le caratteristiche ottenute sono conformi alle descrizioni richieste ai vostri requisiti / specifica / disegni applicabili.**
**The F G GRUPPO S.p.A., hereby certify, a part the deviations quoted in the square below as 'NOTES', that the whole of the heats treatments described above are conform to the specifications, drawings and order relative thereto and the goods have been inspected and tested in accordance with the conditions andrequirements of the order.**

F G Gruppo S.p.A
P.IVA 05764390018
QUALITY MANAGER
MARCO RADDI RE

FIRMA/SIGNATURE .....

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# INSPECTION CERTIFICATE
CERTIFICATO DI COLLAUDO
(UNI EN 10204 3.1 / ISO 10474 3.1)

Number / Numero: **03-23-06425**
Page / Pagina: **1 / 5**
Date / Data: **May 25, 2023**

**Dalmine S.p.A. – Arcore plant**
Via Achille Grandi, 100
20862 Arcore (MB) – Italy
+39 039 66 50 1 tel
+39 039 60 13 539 fax

| | | | |
|---|---|---|---|
| Customer / Cliente: **ROSSI S.P.A.** | Customer´s Order Item / Rifer. Ordine Cliente - I: **744655 OA** | Customer´s Reference / Posizione Cliente: **2/3091036** | Manufacturer´s Works Order N° / Conferma-Posizione: **3241039/002** |
| Manufacture Process / Processo di fabbricazione: **NORMALIZED NON RADDRIZZATI** **NORMALIZZATI NON RADDRIZZATI** | Product Type / Tipo di prodotto: **SEAMLESS PIPES HOT FINISHED FOR MECHANICAL APPLICATIONS (WITH EXTRA REQUIREM** **TUBI S.S. FINITI A CALDO PER APPLICAZIONI MECCANICHE (CON RICHIESTE SUPPLEMENTA** | | Surface / Superficie: **BARE** **GREZZI** |
| Standard or Specification / Norme o specifica: **ACCORDING TO EN 10297/1 TQC 61377 REV.1.3** **NORMA EN 10297/1 E TQC 61377 REV.1.3** | | Steel Grade / Grado dell'Acciaio: **STEEL E 355** **ACCIAIO E 355** | Ends / Estremità: **SQUARE CUT** **LISCI ALLE ESTREMITA'** |
| Dimensions / Dimensioni: **ø4.000" O.D. x .787" W.T.** **ø101.60mm O.D. x 20.00mm W.T** | Schedule / Schedula: . . | Length / Lunghezza: **13.287 ft ÷ 22.966 ft** **4050 mm ÷ 7000 mm** | Quantity / Quantità: **17Pcs/Pz** **327'02" ft 8866,9 lb** **99.73 mt 4022 kg** | Nominal Weight / Peso nominale: **27.07 lb/ft** **40.29 Kg/m** |

## DELIVERY NOTES / AVVISI DI SPEDIZIONE

| Delivery Notes / Avvisi di spedizione | Delivery Notes / Avvisi di spedizione |
|---|---|
| Job Number: 0031353410 / 000020<br>Shipping note: 0104841964 - 24/05/2023<br>Address: VIA EMILIA OVEST 915/A | Town: 41123 MODENA<br>Country: Italy |

## TENSILE TEST / PROVA DI TRAZIONE

| Heat N° / Colata N° | Sample N° / Prova N° | Lot N° / Lotto N° | Specimen condition / Condizioni della provetta | | | | Specimen dimensions / Dimensioni della provetta | | Test temp / Temp. di prova | Y.S. OffSet 0.2% Min: 370.00 Max: -- | U.T.S. Req. Min: 540.00 Max: 700.00 | Elongation / Allungamento | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ls | Sc | Type / Tipo | Ori | Size / Dimensioni | Area / Area | | | | Lo 5D = 5.65√So | Min. | Min. | Obt. |
| | | | | | | | mm | mm2 | °C | MPa | MPa | cal. | mm | % | % |
| 932023 | B8846 | 6 | B | AM | Cs | L | 9.93 | 77.40 | +20 | 466.00 | 650.00 | 5D | 50.0 | 19.0% | 25.5% |

AM: As manufactured / Come fabbricato
B: Body / Corpo
Cs: Cylindrical specimen / Cilindrica
L: Longitudinal / Longitudinale
Lo: Initial length / Lunghezza iniziale
Ls: Location of sample / Ubicazione provetta
Max: Maximum / Massimo
Min: Minimum / Minimo
Obt: Obtained / Ottenuto
Ori: Orientation / Orientamento
Req: Required / Richiesto
Sc: Specimen condition / Condizioni Provetta
U.T.S: Ultimate Tensile Strength / Rottura
Y.S: Yield Strength / Snervamento

This certificate is issued by a computerized system and it is valid with electronic signature. On the original certificate the trade-mark green colored "Tenaris" is stamped. In case the owner of the original certificate would release a copy of it, he must attest its conformity to the original one taking upon himself the responsibility for any unlawful or not allowed use. Any alteration and/or falsification will be subjected to the law.

Questo certificato è emesso da un sistema computerizzato ed è valido con firma elettronica. Il certificato originale riporta il marchio "Tenaris" in colore verde. Il possessore dell'originale, qualora rilasci copia, deve attestarne a suo nome la conformità all'originale, assumendosi ogni responsabilità per usi illeciti o non Qualunque alterazione e/o falsificazione sarà perseguita a norma di legge.

# INSPECTION CERTIFICATE
## CERTIFICATO DI COLLAUDO
## (UNI EN 10204 3.1 / ISO 10474 3.1)

Number / Numero: **03-23-06425**

Page / Pagina: **2 / 5**

Date / Data: **May 25, 2023**

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| | | | |
|---|---|---|---|
| Customer / Cliente: **ROSSI S.P.A.** | Customer´s Order Item / Rifer. Ordine Cliente - I: **744655 OA** | Customer´s Reference / Posizione Cliente: **2/3091036** | Manufacturer´s Works Order N° / Conferma-Posizione: **3241039/002** |
| Manufacture Process / Processo di fabbricazione: **NORMALIZED NON RADDRIZZATI** **NORMALIZZATI NON RADDRIZZATI** | Product Type / Tipo di prodotto: **SEAMLESS PIPES HOT FINISHED FOR MECHANICAL APPLICATIONS (WITH EXTRA REQUIREM** **TUBI S.S. FINITI A CALDO PER APPLICAZIONI MECCANICHE (CON RICHIESTE SUPPLEMENTA** | | Surface / Superficie: **BARE** **GREZZI** |
| Standard or Specification / Norme o specifica: **ACCORDING TO EN 10297/1 TQC 61377 REV.1.3** **NORMA EN 10297/1 E TQC 61377 REV.1.3** | | Steel Grade / Grado dell'Acciaio: **STEEL E 355** **ACCIAIO E 355** | Ends / Estremità: **SQUARE CUT** **LISCI ALLE ESTREMITA'** |
| Dimensions / Dimensioni: **ø4.000" O.D. x .787" W.T.** **ø101.60mm O.D. x 20.00mm W.T** | Schedule / Schedula: . . | Length / Lunghezza: **13.287 ft ÷ 22.966 ft** **4050 mm ÷ 7000 mm** | Quantity / Quantità: **17Pcs/Pz** **327'02" ft 8866,9 lb** **99.73 mt 4022 kg** | Nominal Weight / Peso nominale: **27.07 lb/ft** **40.29 Kg/m** |

## CHEMICAL COMPOSITION / COMPOSIZIONE CHIMICA

| | | Composition % / Composizione % | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | X 100 | | | | | | | | | X 1000 | | | | |
| | | C | Mn | Si | Ni | Cr | Mo | V | Cu | F1 | P | S | Al | Ti | Nb |
| | H Max | **22** | **170** | **50** | **40** | **30** | **8** | **15** | **30** | **20** | **30** | **35** | **--** | **50** | **70** |
| | Min | **16** | **130** | **10** | **--** | **--** | **--** | **8** | **--** | **--** | **--** | **--** | **10** | **--** | **--** |
| Heat N° | P Max | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Colata N° | Min | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 932023 | H | 19 | 149 | 23 | 14 | 13 | 5 | 13 | 19 | 15.2 | 11 | 2 | 28 | 2 | 22 |

F1: (Nb+V )
H: Heat / Colata
Max: Maximum / Massimo
Min: Minimum / Minimo
P: Product / Prodotto

## IMPACT TEST / PROVA DI RESILIENZA

Type/Tipo: **KCV** | Orientation/Direzione: **L** | Unit / Unità: **JOULE**
Position/Posizione: | Temp: **- 20** Unit/Unità: **°C** | Ind.Min.Req: **27** Req.Min.Avg: **--**

| Heat N° / Colata N° | Sample N° / Prova N° | Zone / Zona | Lot N° / Lotto N° | Ls | Sc | Size / Dimensioni mm | Results / Risultato 1 | 2 | 3 | Avg. |
|---|---|---|---|---|---|---|---|---|---|---|
| 932023 | B8846 | outside | 6 | B | AM | 10 x 10.00 | 133.0 | 133.0 | 130.0 | 132.0 |

AM: As manufactured / Come fabbricato
Avg: Average / Media
B: Body / Corpo
Ind. Min. Req: Individual Minimum Required / Minimo singolo richiesto
L: Longitudinal / Longitudinale
Ls: Location of sample / Ubicazione provetta
Req. Min. Avg: Required minimum average / Minima media richiesta
Sc: Specimen condition / Condizioni Provetta
Temp: Temperature / Temperatura

This certificate is issued by a computerized system and it is valid with electronic signature. On the original certificate the trade-mark green colored "Tenaris" is stamped. In case the owner of the original certificate would release a copy of it, he must attest its conformity to the original one taking upon himself the responsibility for any unlawful or not allowed use. Any alteration and/or falsification will be subjected to the law.

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# INSPECTION CERTIFICATE
## CERTIFICATO DI COLLAUDO
## (UNI EN 10204 3.1 / ISO 10474 3.1)

Number / Numero: **03-23-06425**

Page / Pagina: **3 / 5**

Date / Data: **May 25, 2023**

**Dalmine S.p.A. – Arcore plant**
Via Achille Grandi, 100
20862 Arcore (MB) – Italy
+39 039 66 50 1 tel
+39 039 60 13 539 fax

| | | | |
|---|---|---|---|
| Customer / Cliente: **ROSSI S.P.A.** | Customer´s Order Item / Rifer. Ordine Cliente - I: **744655 OA** | Customer´s Reference / Posizione Cliente: **2/3091036** | Manufacturer´s Works Order N° / Conferma-Posizione: **3241039/002** |
| Manufacture Process / Processo di fabbricazione: **NORMALIZED NON RADDRIZZATI** **NORMALIZZATI NON RADDRIZZATI** | Product Type / Tipo di prodotto: **SEAMLESS PIPES HOT FINISHED FOR MECHANICAL APPLICATIONS (WITH EXTRA REQUIREM** **TUBI S.S. FINITI A CALDO PER APPLICAZIONI MECCANICHE (CON RICHIESTE SUPPLEMENTA** | | Surface / Superficie: **BARE** **GREZZI** |
| Standard or Specification / Norme o specifica: **ACCORDING TO EN 10297/1 TQC 61377 REV.1.3** **NORMA EN 10297/1 E TQC 61377 REV.1.3** | | Steel Grade / Grado dell'Acciaio: **STEEL E 355** **ACCIAIO E 355** | Ends / Estremità: **SQUARE CUT** **LISCI ALLE ESTREMITA'** |
| Dimensions / Dimensioni: **ø4.000" O.D. x .787" W.T.** **ø101.60mm O.D. x 20.00mm W.T** | Schedule / Schedula: . . | Length / Lunghezza: **13.287 ft ÷ 22.966 ft** **4050 mm ÷ 7000 mm** | Quantity / Quantità: **17Pcs/Pz** **327'02" ft 8866,9 lb** **99.73 mt 4022 kg** | Nominal Weight / Peso nominale: **27.07 lb/ft** **40.29 Kg/m** |

## SUPPLEMENTARY INFORMATION / INFORMAZIONI SUPPLEMENTARIE

STANDARD EDITIONS
EDIZIONI NORME

| Standard:EN 10297-1 Year:2003 | Norma:EN 10297-1 Anno:2003 |
|---|---|

Supplementary Information
Informazioni supplementari

| Heat | Pz | Mt | Kg | Colata | Pz | Mt | Kg |
|---|---|---|---|---|---|---|---|
| 932023-006 | 17 | 99,73 | 4022 | 932023-006 | 17 | 99,73 | 4022 |

Supplementary Information
Informazioni supplementari

| | |
|---|---|
| WE HEREBY DECLARE THAT ALL PIPES HAVE BEEN SPECTROSCOPICALLY CHECKED,<br>NO DISCREPANCY HAVE BEEN FOUND<br>ALL PIPES HAVE BEEN TESTED BY ELECTROMAGNETIC TEST - FLUX LEACKAGE -<br>ACCORDING TO SPEC.EN 10246-5.LEVEL F4, INSTEAD OF HYDROSTATIC TEST,<br>WITH SATISFACTORY RESULT.<br>ALL PIPES HAVE BEEN NORMALIZED AT 900°C FOR 20 MINS. AND COOLED IN<br>STILL AIR<br>.<br>SEAMLESS HOT FINISHED PIPES<br>VISUAL AND DIMENSIONAL CONTROL HAS BEEN CARRIED OUT WITH SATISFACTORY RESULT<br>STEEL IS FULLY KILLED AND PRODUCED BY ELECTRIC FURNACE TO A FINE GRAIN PRACTICE<br>THE PRODUCT SUPPLIED IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE ORDER.<br>MANUFACTURED BY TENARIS DALMINE<br>NO WELD REPAIR, MERCURY AND RADIATION FREE<br>Tenaris IT identification number for MTC: 59Ss*4fp | SI DICHIARA CHE TUTTI I TUBI SONO STATI SOTTOPOSTI AL CONTROLLO<br>DELL'ACCIAIO MEDIANTE SPETTROANALIZZATORE, DALL'ESAME NON SONO EMERSE<br>MESCOLANZE DI MATERIALE<br>TUTTI I TUBI SONO STATI SOTTOPOSTI A CONTROLLO ELETTROMAGNETICO<br>- FLUSSO DISPERSO - IN ACCORDO ALLA SPEC.EN 10246-5.LEVEL F4<br>IN SOSTITUZIONE DELLA PROVA IDRAULICA, CON ESITO SODDISFACENTE.<br>I TUBI SONO STATI NORMALIZZATI A 900°C PER 20 MIN. E RAFFREDDATI IN<br>ARIA CALMA<br>TUBI SENZA SALDATURA FINITI A CALDO<br>IL CONTROLLO VISIVO E DIMENSIONALE HA DATO ESITO SODDISFACENTE<br>L'ACCIAIO E' DI TIPO CALMATO, A GRANO FINE, PRODOTTO AL FORNO ELETTRICO<br>IL MATERIALE FORNITO E' IN ACCORDO AI REQUISITI DELL'ORDINE.<br>FABBRICATO DA TENARIS DALMINE<br>NON RIPARATO MEDIANTE SALDATURA, ESENTE DA MERCURIO E RADIAZIONI<br>Numero Identificativo Tenaris IT per MTC: 59Ss*4fp |

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# INSPECTION CERTIFICATE
## CERTIFICATO DI COLLAUDO
## (UNI EN 10204 3.1 / ISO 10474 3.1)

Number / Numero: **03-23-06425**

Page / Pagina: **4 / 5**

Date / Data: **May 25, 2023**

**Dalmine S.p.A. – Arcore plant**
Via Achille Grandi, 100
20862 Arcore (MB) – Italy
+39 039 66 50 1 tel
+39 039 60 13 539 fax

| Customer / Cliente: **ROSSI S.P.A.** | Customer´s Order Item / Rifer. Ordine Cliente - I | Customer´s Reference / Posizione Cliente: | Manufacturer´s Works Order N° / Conferma-Posizione: |
|---|---|---|---|
| | **744655 OA** | **2/3091036** | **3241039/002** |

| Manufacture Process / Processo di fabbricazione: | Product Type / Tipo di prodotto: | Surface / Superficie: |
|---|---|---|
| **NORMALIZED NON RADDRIZZATI**<br>**NORMALIZZATI NON RADDRIZZATI** | **SEAMLESS PIPES HOT FINISHED FOR MECHANICAL APPLICATIONS (WITH EXTRA REQUIREM**<br>**TUBI S.S. FINITI A CALDO PER APPLICAZIONI MECCANICHE (CON RICHIESTE SUPPLEMENTA** | **BARE**<br>**GREZZI** |

| Standard or Specification / Norme o specifica: | Steel Grade / Grado dell'Acciaio: | Ends / Estremità: |
|---|---|---|
| **ACCORDING TO EN 10297/1 TQC 61377 REV.1.3**<br>**NORMA EN 10297/1 E TQC 61377 REV.1.3** | **STEEL E 355**<br>**ACCIAIO E 355** | **SQUARE CUT**<br>**LISCI ALLE ESTREMITA'** |

| Dimensions / Dimensioni: | Schedule / Schedula: | Length / Lunghezza: | Quantity / Quantità: **17Pcs/Pz** | Nominal Weight / Peso nominale: |
|---|---|---|---|---|
| **ø4.000" O.D. x .787" W.T.** | . | **13.287 ft ÷ 22.966 ft** | **327'02" ft** **8866,9 lb** | **27.07 lb/ft** |
| **ø101.60mm O.D. x 20.00mm W.T** | . | **4050 mm ÷ 7000 mm** | **99.73 mt** **4022 kg** | **40.29 Kg/m** |

## MARKING / MARCATURA

| Marking<br>Marcatura | |
|---|---|
| STENCILING<br>_T 101,60 X 20,00 TAM MT EN10297 E 355 HEAT:_COLATA NR _NR<br>.<br>LEGEND<br>_T = TENARIS Logo<br>_COLATA = Heat Number<br>_NR = Pipe/Tube identifier<br>. | VERNICIATURA<br>_T 101,60 X 20,00 TAM MT EN10297 E 355 HEAT:_COLATA NR _NR<br>.<br>LEGENDA<br>_T = Logo TENARIS<br>_COLATA = Numero di colata<br>_NR = Identificativo numerico del tubo<br>. |
| PUNCHING<br>_T MT E 355 S QD<br>.<br>LEGEND<br>_T = TENARIS Logo | PUNZONATURA<br>_T MT E 355 S QD<br>.<br>LEGENDA<br>_T = Logo TENARIS |

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Number / Numero: **03-23-06425**

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| Manufacture Process / Processo di fabbricazione: **NORMALIZED NON RADDRIZZATI** **NORMALIZZATI NON RADDRIZZATI** | Product Type / Tipo di prodotto: **SEAMLESS PIPES HOT FINISHED FOR MECHANICAL APPLICATIONS (WITH EXTRA REQUIREM** **TUBI S.S. FINITI A CALDO PER APPLICAZIONI MECCANICHE (CON RICHIESTE SUPPLEMENTA** | | Surface / Superficie: **BARE** **GREZZI** |
| Standard or Specification / Norme o specifica: **ACCORDING TO EN 10297/1 TQC 61377 REV.1.3** **NORMA EN 10297/1 E TQC 61377 REV.1.3** | | Steel Grade / Grado dell'Acciaio: **STEEL E 355** **ACCIAIO E 355** | Ends / Estremità: **SQUARE CUT** **LISCI ALLE ESTREMITA'** |

| Dimensions / Dimensioni: | Schedule / Schedula: | Length / Lunghezza: | Quantity / Quantità: **17Pcs/Pz** | Nominal Weight / Peso nominale: |
|---|---|---|---|---|
| **ø4.000" O.D. x .787" W.T.** | . | **13.287 ft ÷ 22.966 ft** | **327'02" ft 8866,9 lb** | **27.07 lb/ft** |
| **ø101.60mm O.D. x 20.00mm W.T** | . | **4050 mm ÷ 7000 mm** | **99.73 mt 4022 kg** | **40.29 Kg/m** |

The product certified herein has been manufactured, sampled, tested and inspected in accordance with the stated specifications and has been found to meet the requirements.
This certificate is not a declaration of origin nor may it be used as a declaration of origin.

Il prodotto qui certificato è stato fabbricato, provato, testato e controllato in conformità alle specifiche indicate ed è risultato conforme ai requisiti. Questo certificato non è una dichiarazione d'origine e non può essere utilizzato come tale

## CUSTOMER . THIRD PARTY

INSPECTION COMPANY
COMPAGNIA D'ISPEZIONE

## TENARIS QUALITY DEPARTMENT SIGNATURE

QUALITY CERTIFICATION DEPT.
UFFICIO CERTIFICAZIONE QUALITA'
STURNIOLO Domenico

CHIEF OF QUALITY CERTIFICATION DEPT.
RESPONSABILE DELL'UFFICIO CERTIFICAZIONE QUALITA'
MASTRANDREA Rocco

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INTERACCIAI
Acciai Speciali

**INTERACCIAI S.p.A.**
Sede Legale e Amministrativa
Via Pasteur, 2 - 42122 Reggio Emilia - ITALY
Tel.() 39 0522 556800 Fax () 39 0522 557519
http://www.interacciai.it
e-mail: info@interacciai.it
e-mail: amministrazione@interacciai.it
pec: amministrazione@pec.interacciai.it

CAP.SOC. € 2.500.000,00 i.v.
C.Fisc. – P.Iva – N. ISCR. R.I. 00283270353
R.E.A. di Reggio Emilia n.113556
VAT CODE IT 00283270353

Filiali con deposito

| ANCONA | BARI | BOLOGNA | BRESCIA | MILANO | MODENA | PIACENZA | REGGIO E. | ROMA | SIENA | TORINO | S.PONSO | TREVISO | VERONA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0731/60452 | 080/5324378 | 0542/670000 | 030/9759065 | 02/2544161 | 059/333033 | 0523/524321 | 0522/927013 | 0774/354474 | 0577/931909 | 011/8975963 | 0124/360748 | 0422/446700 | 045/8510680 |


# CERTIFICATO DI COLLAUDO

conforme all'originale conservato presso nostra sede
TEST CERTIFICATE
corresponding to the original kept in our head office
CERTIFICAT D'ESSAI
conforme à l'original conserve au siego
WERKPRUFZEUGNIS
entsprechend dem'In unserem siz aufbewahrlen original

UNI EN 10204/2005 3.1 DI RIFERIMENTO

Cliente:

ROSSI S.P.A.
VIA EMILIA OVEST 915/A
41123 MODENA MO

Il prodotto relativo a questo documento è conforme alle prescrizioni contrattuali / The product describes in this document is in according to the Customer's

| **ACCIAIO -**STEEL - ACIER - STAHL | 22514123115 | Quantità/Weight | CERTIFICATO N° | Rif Norma |
|---|---|---|---|---|
| 20MnCrS5 +A RUL TD | 115 | 1298,00 | 3214906 | ISO 683-3 |

| **COLATA -** HEAT - COULEE - SCHMELZE | N. C. INTERNA | Ordine Cliente/Order | RIF. NS. DDT | DEL |
|---|---|---|---|---|
| 23/38166 | P236447 | 802621 del 16/01/2024 | BA00198 | 24/01/2024 |

**COMPOSIZIONE CHIMICA % -** CHEMICAL ANALYSIS % - COMPOSITION CHIMIQUE % - CHEMISCHE ZUSAMMENSETZUNG %

| C | Si | Mn | P | S | Cr | Ni | Mo | Cu | Sn | Al |
|---|---|---|---|---|---|---|---|---|---|---|
| **0,19** | **0,27** | **1,27** | **0,010** | **0,026** | **1,17** | **0,07** | **0,01** | **0,15** | **0,009** | **0,027** |

| Ti | V | Pb | B | Ca | N | O2 ppm | H2 ppm | Nb | C.E. |
|---|---|---|---|---|---|---|---|---|---|
| **0,007** | **0,002** | | **0,0003** | **0,001** | **0,0102** | **17,00** | **2,00** | **0,003** | **0,65** |

**CARATTERISTICHE MECCANICHE -** MECHANICAL PROPERTIES - CARATTERISTIQUES MECANIQUES - MECHANISCHE EIGENSCHAFTEN

| Di riferimento / Di prodotto | Trattamento termico del provino / Heat treatment / Traitement termique / Warmebehandlung | Grano / Grain size / Dim. grain / Korngrosse | Temp. prova di Resilienza / Temp. impact test / Temp. essai resilience / Temp. kerbschlagsprobe |
|---|---|---|---|
| | **Temprato e Disteso** | 6 | **20** |

| PRELIEVO TEST ESSAI PRUFUNG | Diametro | Sezione | Rp02 MPa | Rm MPa | A % | Z % | HBW | KV Joule | | | Kcu Joule |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **1329** | **1445** | **11.8** | **48.8** | **176** | | | | |

**PROVA JOMINY -** JOMINY - TEST - ESSAI JOMINY - STIRNABSCHRECKVERSUCH

| mm A | 1.5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HRC | **46** | **46** | **44** | **42** | **39** | **37** | **36** | **34** | **32** | **30** | **29** | **28** | **27** | | |

| **Durezza superficiale HRc** Surface hardness Min. Max. | **Profondità di tempra mm** Hardening depth Min. Max. | **Durezza profondità Di tempra** Hardness HRc |
|---|---|---|
| | | |

| **Bandosità** Band structure | **Micropurezza** Micropurity K4=14,0 | **Tasso di Riduzione** Reduction ratio |
|---|---|---|
| | | |

**Controllo radioattività** -Radioactivity test-Radioaktivitäskontrolle-contrôle de radioactivité: RADIOACTIVITY max 0,1 Bq/g

**Controllo antimescolamento 100%** -anti-mixing test 100%-Anti Mischungskontrolle-contrôle anti mélange: YES

IN CONFORMITA' PUR 1 7 rev.0
I VALORI DELLE PROVE MECCANICHE SI INTENDONO SU PROVINO DI COLATA TRATTATO TERMICAMENTE COME SUESPOSTO.
IL VALORE DELLA DUREZZA HBW SI INTENDE DI PRODOTTO.

Note - notes:

INTERACCIAI S.p.A.

TEMPRASUD
Advanced heat treatment solutions

# Rapporto di Collaudo / Test Report

| Nr.Certificato/Certificate Number | Data Collaudo/Test Date | Nr.Provino/Sample |
|---|---|---|
| 202402312 | 29/02/2024 | 1123 |

| CLIENTE/CUSTOMER | NUMERO LOTTO/BATCH NUMBER | CICLO/CYCLE |
|---|---|---|
| **000625 ROSSI S.p.A. Divisione Epicicloidali** | **02702780** | |
| DISEGNO/PART NUMBER | MATERIALE/MATERIAL | COLATA/CASTING |
| **RC91050305 1050305 RUOTA 5,42/2,02** | **16NiCr4** | |

| DDT CLIENTE/DELIVERY NOTE | DATA DDT/D.N. DATE | CARICA//CHARGE N. | PESO TOTALE/TOTAL WEIGHT | PEZZI TOTALI/TOTAL PIECES | IND. REVIS. | CONTROLLO/CHECK PLAN |
|---|---|---|---|---|---|---|
| **44005582** | **22/02/2024** | **240.001.338** | **622** | **500** | | |

## Risultato del Collaudo / Test's Result

Caratteristiche Richieste / Requested Features

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **DUREZZA SUPERF.** | ***SURFACE HARDENESS*** | | Da/From | **59,00** | A/To | **61,00** | **HRC** |
| **PENETRAZ.EFFIC.** | ***CHD*** | | Da/From | **0,30** | A/To | **0,50** | **mm** |

Caratteristiche Rilevate / Detected Features

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **DUREZZA SUPERF.** | ***SURFACE HARDENESS*** | | Da/From | **59,80** | A/To | **60,30** | **HRC** |
| **PENETRAZ.EFFIC.** | ***CHD*** | **1** | Da/From | **0,36** | A/To | **0,36** | **mm** |

## Trattamento Termico e Lavorazioni Eseguite/Performed Heat Treatment and Operations

| | |
|---|---|
| ACCETTAZIONE MATERIALE | ACCEPTANCE MATERIAL |
| PREPARAZIONE CARICA | ASSEMBLY |
| CEMENTAZIONE E TEMPRA | CARBURAZING AND QUENCHING |
| LAVAGGIO | WASHING |
| RINVENIMENTO | TEMPERING |
| COLLAUDO | TEST |
| SABBIATURA | SANDBLASTING |
| OLIATURA E IMBALLAGGIO | Oilng and Washing |
| PRONTA CONSEGNA | Ready to delivery |

## Note / Notes

PROVINO N° 1123
ESEGUITO CICLO DI TRATTAMENTO DI CEMENTAZIONE TEMPRA E RINVENIMENTO
ESEGUITO COLLAUDO SU PARTICOLARE DISEGNO RC91050305

**Eseguito collaudo di tipo 3.1 in ottemperanza alla norma UNI EN ISO 10204**

Esito/Result: Conforme/Conforms ✓ Deroga concessa dal cliente / Waived by the client ☐

Collaudatore/Tester: **JONATAN DE LEO**

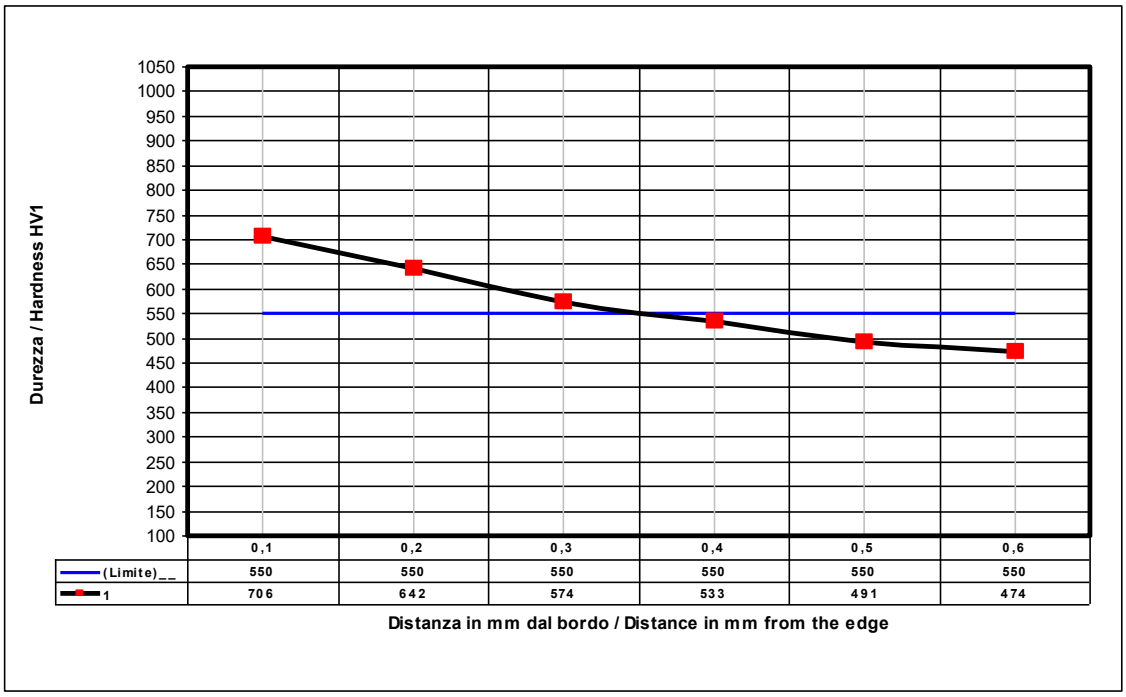
TEMPRASUD
Advanced heat treatment solutions

# Grafico Profondità
# Chart Depth

Commessa / work order **2024/02312**

Cliente/Customer ROSSI S.p.A. Divisione Epicicloidali

Disegno/Part Number **RC91050305 - 1050305 RUOTA 5,42/2,02**




| | 0,1 | 0,2 | 0,3 | 0,4 | 0,5 | 0,6 |
|---|---|---|---|---|---|---|
| (Limite)__ | 550 | 550 | 550 | 550 | 550 | 550 |
| 1 | 706 | 642 | 574 | 533 | 491 | 474 |

**ACCIAIERIE VENETE SPA**

# CERTIFICATO DI COLLAUDO – MILL'S TEST CERTIFICATE
# CERTIFICAT D'ESSAI – ABNAHMEPRÜFZEUGNIS
## EN 10204 3.1

**N° 568141**

**DATE:** 15/03/2022

Acciaierie Venete Spa C.S. € 63.000.000,00 i.v C.F. e P.IVA 00224180281
R.I di Trento 00224180281 V.A.T. N° IT 00224180281
Sede Legale: 38051 Borgo Valsugana (TN) Via Puisle, 4 - Italy
Direzione/Amministrazione: 35127 Padova Z.I. Sud - Riviera Francia, 9 - Italy Tel. 049 828.28.20 (r.a.)
Azienda con sistema di gestione per la qualità certificato da IGQ secondo ISO 9001 e IATF 16949

**CLIENTE / CUSTOMER / CLIENT / KUNDE**
100755 - DATA STEFANO SRL
FRAZIONE CROSI 59
10084 FORNO CANAVESE (TO)

**ORDINE CLIENTE** - PURCHASE ORDER / COMMANDE CLIENT - KUNDENAUFTRAG: 058/21

**ORDINE** - ORDER / COMMANDE - AUFTRAG: 129864 / 70

**ARTICOLO (ACCIAIO)** - ITEM (STEEL) - ITEM (ACIER) - ARTIKEL (STAHL)

**PROFILO** - PROFILE / PROFIL - ABMESSUNG: TONDO 120 mm

**STATO DI FORNITURA** - DELIVERY CONDITION / CONDITION DE LIVRAISON – LIEFERZUSTAND: RICOTTO

**STATO DI ESECUZIONE** - STATE OF EXECUTION / ETAT DE L'ÉXECUTION - AUSFÜHRUNG: LAMINATO RULLATO

**COLATA** - HEAT - COULEE - SCHMELZE: 286823

**MARCA ACCIAIO** - STEEL GRADE - MARQUE ACIER - STAHLGÜTE: 20MNCR5 +HH

**NORMA** - SPECIFICATION - NORME - NORM: BREVINI SP046-03 REV05+(T.A. VENETE-BREVINI REV.1)

**PESO** - WEIGHT / POIDS - GEWICHT (Kg): 12460

**COLLI** - ITEMS / COLIS - KOLLI (Nr): 14

**DDT** - DELIVERY NOTE / BON DE LIVRAISON - LIEFERSCHEIN: A1004261 24/03/2022

**BLUMO** - BLOOM / BLOOM - KNÜPPEL: 350 mm

**RIDUZIONE** - REDUCTION / REDUCTION - UMFORMUNGSGRAD: 8.5

**STAB. SPEDIZIONE:** PADOVA (Riviera Francia)

**COMPOSIZIONE CHIMICA (%)** - CHEMICAL COMPOSITION (%) - COMPOSITION CHIMIQUE (%) - CHEMISCHE ZUSAMMENSETZUNG (%)

| C | Si | Mn | P | S | Cu | Cr | Ni | Sn | Al | As | Mo |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.1940 | 0.2140 | 1.1910 | 0.0130 | 0.0250 | 0.2320 | 1.2220 | 0.1450 | 0.0110 | 0.0210 | 0.0070 | 0.0340 |

| V | Ti | Nb | Ca |
|---|---|---|---|
| 0.0070 | 0.0070 | 0.0010 | 0.0007 |

**ANALISI GAS** - GAS ANALYSIS - ANALYSE GAZ - GAS ANALYSE

| $H_2$= | $O_2$= | $N_2$= | |
|---|---|---|---|
| 1.5 (ppm) | 14 (ppm) | 90 (ppm) | 0.0090 (%) |

**D.I. (ASTM A255)** 2,77inch - 70,48mm

FUSIONE: FORNO ELETTRICO (EAF) - ELABORAZIONE FUORI FORNO: AFFINAZIONE (LF) - COLAGGIO: COLATA CONTINUA (CC)

**CARATTERISTICHE MECCANICHE** - MECHANICAL PROPERTIES / CARACTERISTIQUES MECANIQUES-MECHANISCHE EIGENSCHAFTEN

| PROVINO - SAMPLE / EPROUVETTE - MUSTER | mm | STATO - CONDITION / ETAT - ZUSTAND | TRATTAMENTO TERMICO - HEAT TREATMENT / TRAITMENT TERMIQUE - WÄRMEBEHANDLUNG | | | TRAZIONE - TENSILE TESTING-TRACTION-ZUGVERSUCH EN ISO 6892-1 Rm MPa | Re MPa | A % | Z % | RESILIENZA - IMPACT TEST - RESILIENCE - ZÄHIGKEIT EN ISO 148-1 TIPO - TYPE - TYPE - ART | KU | | | Mean | DUREZZA - HARDNESS - DURETE - HÄRTE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | °C | J | J | J | J | |
| COLATA - HEAT / COULEE-SCHMELZE | 11 | TEMPRA E DISTENSIONE | 880°C | OLIO | 180°C | 1312 | 1171 | 11 | 39 | 20 | 33 | 33 | 36 | 34 | |
| VALORI ALLO STATO DI FORNITURA - VALUES IN DELIVERY CONDITION - WERTE IM LIEFERZUSTAND ▶ | | | | | | | | | | | | | | | |

THE PRODUCT COMPLIES WITH THE REQUIREMENTS OF THE EUROPEAN DIRECTIVE 2000/53/EC

**RADIOACTIVITY MEETS SPECIFICATION 2013/59/EURATOM**

**TEMPRABILITA'** - HARDENABILITY / TREMPABILITE - HÄRTBARKEIT — EN ISO 642

| MM | 1.5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HRC | 46.2 | 45.5 | 44.4 | 42.1 | 38.7 | 36.2 | 34.7 | 33.2 | 31.5 | 29.7 | 29.1 | 28.4 | 27.7 | 27.0 | 26.6 |

**GRANO** - GRAIN / GRAIN - KORNGRÖSSE: EN ISO 643 — AUSTENITICO — 7 - 8

**INCLUSIONI NON METALLICHE** - NON METALLIC INCLUSIONS - INCLUSIONS NON METALLIQUES - NICHTMETALLISCHE EINSCHLÜSSE

| A (SS) | | B (OA) | | C (OS) | | D (OG) | |
|---|---|---|---|---|---|---|---|
| Thin | Heavy | Thin | Heavy | Thin | Heavy | Thin | Heavy |
| | | | | | | | |

**UNI 3244/80 (K)**

K 4 *(OXIDE)* = 7

K *(SULFIDE)* =

K *(TOTAL)* =

**MACRO** - MACROETCHING / MACRO - MAKRO ÄTZUNG

**MACROINCLUSIONI** - MACROINCLUSIONS / MACRO INCLUSIONS - MAKRO EINSCHLÜSSE

**DIFETTI INTERNI** – CORE DEFECTS / DEFAUTS CORE – KERNFEHLER: EN 10308 CL.3

**DIFETTI SUPERF.** - SURFACE DEFECTS / DEFAUTS DE SURFACE – OBERFLÄCHENFEHLER: EN 10221 B

**CONTROLLO ANTIMESCOLAMENTO** - ANTIMIXING CONTROL / CONTROLE ANTIMELANGE - VERWECHSLUNGSPRÜFUNG: 100%

**ENTI COLLAUDATORI** - INSPECTION AUTHORITIES / SERVICE D'ESSAI - ABNAHMEBEHÖRDE

**NOTE** – NOTES – NOTES - ANMERKUNGEN

CONTROLLO UT INTERNO 100% CONTROLLO SUPERFICIALE 100%
VACUUM DEGASSED

SILFAS HOT STEEL FORGINGS

Silfas S.r.l. QHSE Manager (M. PERONO)

**CONTROLLO QUALITA'** - QUALITY CONTROL - CONTROLE QUALITE - QUALITÄTSTELLE

Fornasiero I.

SERVIZIO QUALITA' ACCIAIERIE VENETE SPA

*CERTIFICATO CONFORME AL CAPITOLATO E SPECIFICHE DI RIFERIMENTO - CERTIFICATE IN COMPLIANCE WITH THE SPECIFICATION AND ITS REFERENCES-CERTIFICAT EN ACCOMPLIANCE AVEC LE CAHIER DES CHARGES ET SES REFERENCES-ZERTIFIKAT IN ÜBEREINSTIMMUNG MIT DER SPEZIFIKATION UND DESSEN BEZÜGE*

DATI DEL CARICATORE / LUOGO DI CARICO

T.T.S.
Trattamenti Termici Speciali
divisione della F G GRUPPO S.P.A.
Via Mascagni n.6 - 42048 Rubiera (RE)
Partita IVA e Codice Fiscale n.05764390018
TEL. 0522/626444 FAX 0522/628678 Email:tts@fg-gruppo.it
Capitale Sociale €1.032.000 i.v. Reg.Imprese di Torino 2647/89
Sede Legale: 10134 Torino (To) - Via Tunisi n.70

**DICHIARAZIONE DI CONFORMITA'**

*NUMERO* BC001344 *DATA* 25/05/2023

*CLIENTE / CUSTOMER*

ROSSI SPA

VIA EMILIA OVEST 915/A
41123 MODENA MO

STABILIMENTO

VIA STRADELLO BAGNESI
41121 GANACETO MO

| pag. 1 | Cod.cliente 1 3576 | Partita Iva/Cod.Fiscale IT 01855520365 | Cod.fornitore | Mod. FT 005 Rif. PG 08 |
|---|---|---|---|---|

| Vs.DDT/Your DN | Disegno/Part Number | Materiale/Material | Specifica/Specific | Lavorazione/Heat Treatment | Durezza/Hardness | Profond/Case Dept | Pz/Qt | Kg |
|---|---|---|---|---|---|---|---|---|
| 43013527 28/04/23<br>LDP: L1-6193/ L9-1673/ L9-1674 | 5.148B/5,07 RC00056077 Ruota | . -M.4R | ord.737914 | CMT+DIST +S | HRc 59-61<br>HRc= 59-60 | 0,75-1,05<br>0,9-1,0mm da Be | 72 | 1.642 |
| 4313868 03/05/23<br>LDP: L8-2776 | 5.49A/2,81 RC00057311 Ruota | . -M.5R | ord.753893 | CMT+DIST +S | HRc 59-61<br>HRc = 59-60 | 0,85-1,15<br>0,90mm da Be | 23 | 274 |
| 43013868 03/05/23<br>LDP: L8-2776 | 1052427 Ruota5.167A/3,6 | 20MnCr5 -M.5R | ord.750345 | CMT+DIST +S | HRc= 59-61<br>HRc= 59-60 | 0,85-1,15<br>0,90mm da Be | 11 | 250 |
| 43015574 17/05/23<br>LDP: L3-2344 L10-1532/1534 L9-1672 L4-3516/3523/22 | 5.147B/5 RC00055393 Ruota | . -M.4R | ord.747738 | CMT+DIST +S | HRc 59-61<br>HRc= 59-60 | 0,75-1,05<br>0,80-1,0mm da Be | 288 | 3.080 |
| | I-C01 CONTENITORE GRANDE (Rossi) | | | | | | 7 | |

Note

**La seconda riga di ogni voce porta i valori di collaudo. La F G GRUPPO S.p.A., certifica sotto la propria responsabilita' che, a parte quanto indicato nelle NOTE, i controlli di processo ed i controlli finali sono stati eseguiti conformemente al proprio MGSQ. Le caratteristiche ottenute sono conformi alle descrizioni richieste ai vostri requisiti / specifica / disegni applicabili.**
**The F G GRUPPO S.p.A., hereby certify, a part the deviations quoted in the square below as 'NOTES', that the whole of the heats treatments described above are conform to the specifications, drawings and order relative thereto and the goods have been inspected and tested in accordance with the conditions andrequirements of the order.**

F G Gruppo S.p.A
P.IVA 05764390018
QUALITY MANAGER
MARCO RADDI RE

FIRMA/SIGNATURE .....

www.bielle.it - Licenza d'uso rilasciata a FG Gruppo S.p.a.

COMPANY WITH
MANAGEMENT SYSTEM
CERTIFIED BY DNV
= ISO 9001 =
= ISO 14001 =

# CERTIFICATO DI CONTROLLO 3.1
INSPECTION CERTIFICATE 3.1

**Norma UNI EN 10204:2005**
According to EN 10204:2005

## N. 40000339167

| | | | | | |
|---|---|---|---|---|---|
| **Committente/destinatario**<br>Purchaser/consignee | 541 ROSSI S.P.A. | **N.ordine del committente**<br>Purchaser order number | 802655 OA/3 - 16.01.2024 | **Partita**<br>Batch | **L22196** |
| **N.articolo del committente**<br>Purchaser article number | 1105292 | **Commessa**<br>Job | | **Matricola**<br>Serial number | |
| **Prodotto**<br>Product | CARCASSA | **N.ordine del fabbricante**<br>Manufacturer's work order number | 11070095 /30 - 17.01.2024 | **Condizioni di fornitura**<br>Product delivery condition | |
| **Materiale**<br>Material designation | UNI EN 1563 EN-GJS-400-15 | **Bolla di consegna**<br>Delivery note | DDT BASSANESE N.62/D-220424<br>80116206 /30 | **Peso unitario**<br>Weight per unit | 54,200 KG |
| **Disegno**<br>Drawing | | **Numero di pezzi**<br>Number of pieces | 53 | **Spessore rilevante**<br>Relevant wall thickness | |

### Prova di trazione
Tensile test — EN ISO 6892-1

| | Prova N.<br>Test N. | Forma del provino<br>Shape of the test piece | Snervamento<br>Proof stress<br>Rp0,2 (MPa) | Rottura<br>Tensile strength<br>Rm (MPa) | Allungamento<br>Elongation<br>A5 (%) |
|---|---|---|---|---|---|
| **Valori richiesti**<br>Required values | | | **250 min.** | **400 min.** | **15,0 min.** |
| **Valori effettivi**<br>Actual values | **L20747** | **EN 1563 Type B (fig. 3)** | **308** | **448** | **20,7** |

### Prova di resilienza
Impact test — EN ISO 148-1

| Valore Medio<br>Mean value<br>(J) | Valori singoli<br>Individual values<br>(J) | | |
|---|---|---|---|
| | | | |
| | | | |
| **Temperatura del test**<br>Test temperature | | | |

### Prova di durezza
Hardness test — EN ISO 6506-1

| Val. Minino<br>Minimum value<br>(HBW) | Val. Medio<br>Mean value<br>(HBW) | Val. Massimo<br>Maximum value<br>(HBW) |
|---|---|---|
| | | |
| **167** | **173** | **177** |
| **Numero prove:**<br>Number of tests | | **5** |

### Composizione chimica %
Chemical composition %

| Prova N. | C | Si | S | P | Mn | Ni | Cr | Mo | V | Cu | Ti | Sn | Al | Pb | Sb | Mg | Zn | Ce |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L20747 | 3,57 | 2,62 | 0,010 | 0,029 | 0,24 | 0,01 | 0,04 | 0,00 | 0,02 | 0,12 | 0,018 | 0,0033 | 0,01 | 0,0012 | 0,0001 | 0,058 | 0,00 | 0,0046 |

### Prove non distruttive
Non-destructive test

### Note
Notes

**Data Emissione**
Date of Issue
21.03.2024

**Il Responsabile Controllo Qualità**
Qual.Contr.Responsible Official

**Marchioretto Giovanni**



**VDP Fonderia S.p.A.**
Via Lago di Alleghe, 39 - 36015 Schio (VI) Italy - Ph (+39) 0445 599 000 - vdp@vdp.it - www.vdp.it
Cap.Soc. € 5.200.000 EUR i.v. - R.E.A. VI - 327540 - C.F. e P.IVA IT03465880247

INTERACCIAI
Acciai Speciali

**INTERACCIAI S.p.A.**
Sede Legale e Amministrativa
Via Pasteur, 2 - 42122 Reggio Emilia - ITALY
Tel.() 39 0522 556800 Fax () 39 0522 557519
http://www.interacciai.it
e-mail: info@interacciai.it
e-mail: amministrazione@interacciai.it
pec: amministrazione@pec.interacciai.it

CAP.SOC. € 2.500.000,00 i.v.
C.Fisc. – P.Iva – N. ISCR. R.I. 00283270353
R.E.A. di Reggio Emilia n.113556
VAT CODE IT 00283270353

Filiali con deposito

| ANCONA | BARI | BOLOGNA | BRESCIA | MILANO | MODENA | PIACENZA | REGGIO E. | ROMA | SIENA | TORINO | S.PONSO | TREVISO | VERONA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0731/60452 | 080/5324378 | 0542/670000 | 030/9759065 | 02/2544161 | 059/333033 | 0523/524321 | 0522/927013 | 0774/354474 | 0577/931909 | 011/8975943 | 0124/360748 | 0422/446700 | 045/8510680 |

# CERTIFICATO DI COLLAUDO

conforme all'originale conservato presso nostra sede
TEST CERTIFICATE
corresponding to the original kept in our head office
CERTIFICAT D'ESSAI
conforme à l'original conserve au siego
WERKPRUFZEUGNIS
entsprechend dem'in unserem siz aufbewahrten original

UNI EN 10204/2005 3.1 DI RIFERIMENTO

Cliente:

INGRANAGGI MOREALI MARIO S.P.A.
VIA C. CAFIERO, 16
42124 REGGIO EMILIA RE

Il prodotto relativo a questo documento è conforme alle prescrizioni contrattuali / The product describes in this document is in according to the Customer's

| ACCIAIO -STEEL - ACIER - STAHL | 2181402352 | Quantità/Weight | CERTIFICATO N° | Rif Norma |
|---|---|---|---|---|
| 18NiCrMoS5 +A TD | 52 | 312,00 | 3092274 | UNI 7846 |

| COLATA - HEAT - COULEE - SCHMELZE | N. C. INTERNA | Ordine Cliente/Order | RIF. NS. DDT | DEL |
|---|---|---|---|---|
| 23/78357 | 2234206 | | RE01494 | 09/06/2023 |

**COMPOSIZIONE CHIMICA % -** CHEMICAL ANALYSIS % - COMPOSITION CHIMIQUE % - CHEMISCHE ZUSAMMENSETZUNG %

| C | Si | Mn | P | S | Cr | Ni | Mo | Cu | Sn | Al |
|---|---|---|---|---|---|---|---|---|---|---|
| 0,185 | 0,28 | 0,87 | 0,014 | 0,021 | 0,95 | 1,22 | 0,21 | 0,23 | 0,009 | 0,024 |

| Ti | V | Pb | B | Ca | N | O2 ppm | H2 ppm | Nb | C.E. |
|---|---|---|---|---|---|---|---|---|---|
| 0,008 | 0,004 | | | 0,0014 | 0,0093 | 17,00 | 2,10 | 0,003 | 0,66 |

**CARATTERISTICHE MECCANICHE -** MECHANICAL PROPERTIES - CARATTERISTIQUES MECANIQUES - MECHANISCHE EIGENSCHAFTEN

| Di riferimento / Di prodotto | Trattamento termico del provino / Heat treatment / Traitement termique / Warmebehandlung | Grano / Grain size / Dim. grain / Korngrosse | Temp. prova di Resilienza / Temp. impact test / Temp. essai resilience / Temp. kerbschlagsprobe |
|---|---|---|---|
| | Temprato e Disteso | 6 | 20 |

| PRELIEVO TEST ESSAI PRUFUNG | Diametro | Sezione | Rp02 MPa | Rm MPa | A % | Z % | HBW | KV Joule | | | Kcu Joule |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1326 | 1439 | 11.4 | 49.3 | 183 | | | | 38.2 |

**PROVA JOMINY -** JOMINY - TEST - ESSAI JOMINY - STIRNABSCHRECKVERSUCH

| mm A | 1.5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HRC | 44 | 44 | 44 | 44 | 42 | 39 | 38 | 36 | 33 | 31 | 30 | 30 | 29 | 29 | 29 |

| **Durezza superficiale HRc** Surface hardness Min. | Max. | **Profondità di tempra mm** Hardening depth Min. | Max. | **Durezza profondità Di tempra** Hardness HRc |
|---|---|---|---|---|
| | | | | |

| **Bandosità** Band structure | **Micropurezza** Micropurity | **Tasso di Riduzione** Reduction ratio |
|---|---|---|
| 2 UNI 8449 | K4=6 | 12.06 |

**Controllo antimescolamento 100%** -anti-mixing test 100%-Anti Mischungskontrolle-contrôle anti mélange: YES

CONFORME CIS
MATERIALE DEGASATO SOTTOVUOTO

INGRANAGGI
MOREALI MARIO S. p. A.
Ufficio Acquisti
APPROVATO
DATA 12/06/2023 FIRMA

Note - notes:

INTERACCIAI S.p.A.
Via Pasteur n. 2
42122 - REGGIO EMILIA
Partita IVA 00283270353

INTERACCIAI S.p.A.

TEMPRASUD
Advanced heat treatment solutions

# Rapporto di Collaudo

Commessa **202313300** 0

Data Collaudo **28/10/2023**

Cliente **001216 INGRANAGGI MOREALI MARIO SPA** DDT Cliente **1329** Del **19-ott-23**

Num Disegno **12,101/R** **PIGNONE CONICO SX** Materiale **18NCD5**

Pezzi **97** Peso **78,764** Numero Lotto **2023/001111**

Colata **78357** Indice Rev. **5A** Carica Impianto **231025001**

Numero Carica **230.005.583** Sistema **LLF5** Ciclo **608**

Trattamento **Cementazione tempra e rinvenimento 0,8 mm**

## Risultato del Collaudo

Collaudatore **GIULIANO GENOVA**

| Caratteristiche Richieste | Zona Rilievo | UM | Da | A | Strumento |
|---|---|---|---|---|---|
| **DUREZZA SUPERF.** | | **HRC** | **59,00** | **61,00** | |
| **PENETRAZ.EFFIC.** | | **mm** | **0,65** | **0,95** | |

| Caratteristiche Rilevate | Zona Rilievo | UM | Da | A | Strumento |
|---|---|---|---|---|---|
| **DUREZZA SUPERF.** | | **HRC** | **60,00** | **60,50** | **4** |
| **PENETRAZ.EFFIC.** | | **mm** | **0,83** | **0,83** | **2** |

ESEGUITO CICLO DI TRATTAMENTO DI CEMENTAZIONE TEMPRA E RINVENIMENTO
ESEGUITO COLLAUDO SU PROVINO TEMPRASUD

| Strumento | Descrizione | Marca | Modello | Matricola |
|---|---|---|---|---|
| **2** | **Microdurometro affri J** | **AFFRI** | **Wiki 200 JS1** | **74353** |
| **4** | **Durometro TWIN 2** | **ERNST** | **TWIN 2** | **47/1999** |

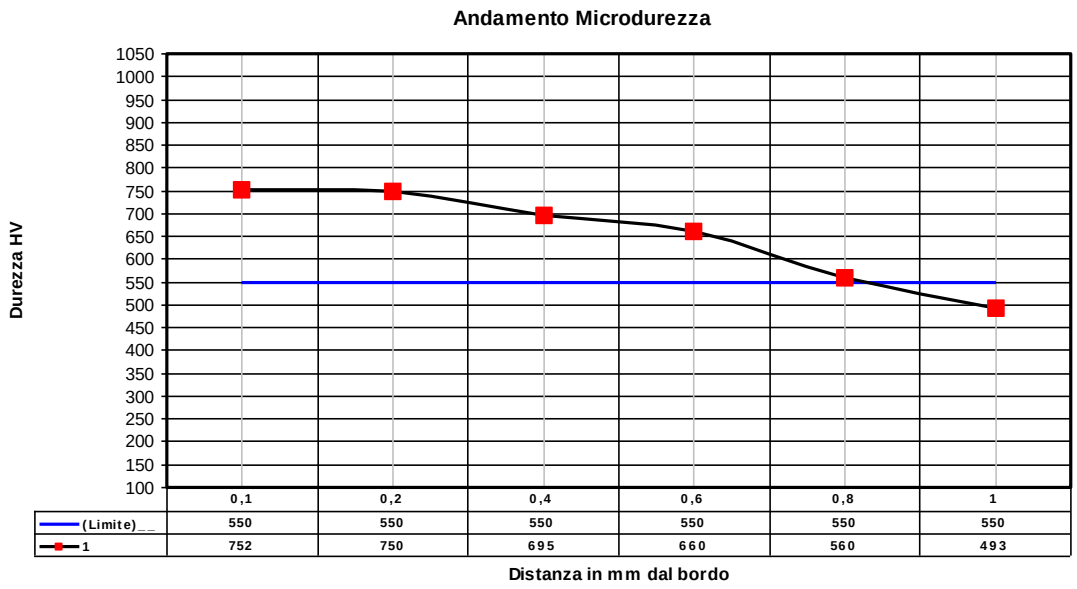
**Eseguito collaudo di tipo 2.2 in ottemperanza alla norma UNI EN ISO 10204**

Esito: **Conforme** Collaudatore: **GIULIANO GENOVA**

TEMPRASUD
Advanced heat treatment solutions

# Diagramma Andamento Microdurezza

Commessa **2023/13300.0**




| | 0,1 | 0,2 | 0,4 | 0,6 | 0,8 | 1 |
|---|---|---|---|---|---|---|
| (Limite)__ | 550 | 550 | 550 | 550 | 550 | 550 |
| 1 | 752 | 750 | 695 | 660 | 560 | 493 |

RIVA ACCIAIO S.P.A.
STABILIMENTO DI LESEGNO
Via Statale, 28 nord
12076 Lesegno(CN) ITALIA
Tel. 0174-718111 Fax. 0174-77251

Sede legale e amministrativa: Viale Certosa, 249 - 20151 Milano
telefono 02 30700 - telefax 02 38000346
codice fiscale, partita iva e numero iscrizione Registro Imprese Milano 08521290158

# CERTIFICATO DI COLLAUDO

**A03** Numero Certificato: 30956 — Data Certificato: 14/11/2022

CERTIFICHIAMO CHE IL PRODOTTO RELATIVO A QUESTO DOCUMENTO E' CONFORME ALLE PRESCRIZIONI CITATE IN ORDINE

**B14** Norma riferimento: UNI EN 10204/2005 — **B15** Tipo: 3.1

**B02** Acciaio: 17NICRM06-4HH/D EN 10084

**B07** Anno/Numero colata: 22/77453

**B01** Profilo: LAMINATO TONDO EN 10060

**B09** Misura 1 x Misura 2: 35,00

**B04** Stato fornitura: LAMINATO TONDO

**B09** Lunghezza: 5,500 - 6,500

**A07** Ordine Cliente: 22/005770

**A08** Conferma: 07 Y1J97 003

**C14** Tasso di riduzione: 26,62

**B06**

**A06** Dati Cliente:
PAPANI ACCIAI S.R.L.
VIA CARONNO VARESINO, 64 CP 40
21048 SOLBIATE ARNO

**C70** Processo:
FUSIONE AL FORNO ELETTRICO
COLAGGIO PROTETTO IN C.C. 160

## COMPOSIZIONE CHIMICA - ANALISI DI COLATA

| C71 C | C72 Mn | C73 Si | C74 P | C75 S | C76 Cr | C77 Ni | C78 Mo | C79 Cu | C80 Sn | C85 Al | C91 Ti |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,195 | 0,840 | 0,260 | 0,014 | 0,024 | 0,930 | 1,210 | 0,190 | 0,190 | 0,008 | 0,022 | 0,008 |

| C87 V | C88 Nb | C89 B | C92 Ca | | | | C93 N | C94 $O_{2(ppm)}$ | C95 $H_{2(ppm)}$ | | C96 CEV |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,005 | 0,003 | 0,0000 | | | | | | | | | |

## CARATTERISTICHE MECCANICHE

C01 Prelievo: C - Colata, L - Laminato, T - Trafilato: C

C03 Trattamento Termico: PROVETTA — TEMPR.E DIST

**PROVE DI TRAZIONE**

| C08 Dim. Campione | C10 Dim. Provetta | C12 $R_m$ (MPa) | C11 $R_e$ (MPa) | C13 $A5_{\%}$ | C15 $Z_{\%}$ |
|---|---|---|---|---|---|
| 11 | 10 | 1464 | 1355 | 12,0 | 47,3 |

**PROVE DI RESILIENZA**

| C41 Dim. Provetta | C40 Tipo | C42 $K_{1(J)}$ | C42 $K_{2(J)}$ | C42 $K_{3(J)}$ | C43 $K_{v(J)}$ | C44 Temp. |
|---|---|---|---|---|---|---|
| 10x10 | KCU | | | | 37,3 | 20°C |

C22 HB:

## PROVA JOMINY

C03 Normalizzazione: Tempra

| C61 mm | 1,5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | | | | | C45 DI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C60 HRC | 44 | 44 | 44 | 43 | 41 | 38 | 37 | 35 | 33 | 31 | 30 | 29 | 29 | 29 | 29 | | | | | |

**C65** Grano Austenitico: MAC QUAID - EHN 6

**C62** Micropurezza: ASTM E45 - JERKONTORET METODO A
S: A1,5 B0,5 C0,5 D1,0

**C05** Bandatura

**C31** Valori di durezza: +AR | +A HB 183 | +FP

## INFORMAZIONI SUPPLEMENTARI

**B03**
RICOT.CESOIABILE A FREDDO (+S)
RULLATO 2 MM/M MAX
BARRE LUNG. COMMERCIALE

CONTROLLO ANTIMESCOLAMENTO ESEGUITO

**D51** Note:
CONFORME 18NICRMOS5 UNI7846
E 17NICRMOS6-4 EN10084

CONFORME 18NICRMO5 UNI7846
E 17NICRMO6-4 EN10084

DOCUMENTO ELETTRONICO VALIDO SENZA FIRMA

**A10** Dati DDT: N° 11054 KG. 10773

**Z04**
INGRANAGGI
MOREALI MARIO S. p. A.
Ufficio Acquisti
APPROVATO
DATA 29/08/2023 FIRMA

**Z01** Responsabile C.Q.: G. Piumatti

**Z02**

SIDERIT
TRATTAMENTI TERMICI
STABILIMENTO ZOLA PREDOSA

**SEDE LEGALE:**
**SIDERIT S.r.l. con Socio Unico**
**Società soggetta a direzione**
**e coordinamento di Proterm S.r.l.**
Via Casteldebole 2/A
40069 Zola Predosa (BO) – IT
Tel. 051752321
Cap. Soc. EUR 2.184.000,00 i.v.
P.IVA C.F e R.I. 01603891209 - R.E.A. 350684/BO

**STABILIMENTO PRODUTTIVO:**
**SIDERIT ZOLA PREDOSA**
Via Casteldebole 2/A
40069 Zola Predosa (BO) – IT
Tel. 051752321

**AZIENDA CON SISTEMA DI GESTIONE CERTIFICATO DA KIWA-CERMET SECONDO UNI EN ISO 9001:2015 CERTIFICATO NUMERO 008**

**COMPANY WITH MANAGEMENT SYSTEM CERTIFIED BY KIWA-CERMET IN COMPLIANCE WITH THE STANDARD UNI EN ISO 9001:2015 (CERT. N. 008)**

*Prove di durezza eseguite secondo normative UNI EN ISO 6506, 6507 e 6508.*
*Spessore degli strati induriti UNI 11153 laddove non diversamente indicato nei CSR cliente.*

*Eventuali contestazioni dovranno essere comunicate prima dell'esecuzione di ulteriori lavorazioni e dell'utilizzo dei particolari.*

| **CERTIFICATO DI COLLAUDO**<br>TEST CERTIFICATE | **2322085** | **DATA**<br>DATE | **03/09/2023** |
|---|---|---|---|

*UNI EN 10204:2005 - 3.1* *Pos05a06r1*

**Spett.le:** **C.F.T. RICALCATURA SRL**
**CASE BENSIO, 15**
**10070 CORIO TO**

| | | | |
|---|---|---|---|
| **DISEGNO**<br>Part Number | **S12186** | **COMMESSA**<br>Committed | |
| **DESCRIZIONE**<br>Description | **PIGNONE S12.186** | **ORDINE**<br>Order | |
| **DDT**<br>Delivery note | **1867** | **Q.TA'**<br>Pieces | **1009 (TOT)** |
| **DATA DDT**<br>Delivery note date | **30/08/2023** | **PESO [Kg]**<br>Weight [Kg] | **1.715,00** |
| **MATERIALE**<br>Material | **18NICRMO5** | **CONTENITORI**<br>Cases | **42S 8S8** |
| **COLATA**<br>Heat Code | **22-77453** | **PARTITA**<br>Batch | **2319100** |

| **TRATTAMENTO TERMICO**<br>Heat Treatment | **MODALITA' DI LAVORO**<br>Work Details |
|---|---|
| **RICOTTURA ISOTERMICA 18NCD5**<br>**PALLINATURA GREZZI**<br>**COLLAUDO GREZZI** | |

**ANALISI DI COLLAUDO**
Laboratory analysis

| **Specifiche**<br>Specification | **Richieste**<br>Required | **Risultati**<br>Results | **u.m.** |
|---|---|---|---|
| **Durezza superficiale HB**<br>Surface Hardness HB | **149 - 201** | **170-174** | **HB** |

| **Specifiche cliente**<br>Customer standard | **Esame microstrutturale**<br>Microstructural Analisys |
|---|---|
| **OAMP/2023/1236**<br>**OPF 2023/001533/0020** | |

| | | | |
|---|---|---|---|
| **Strumento**<br>Tool device code | **Reicherter Briviskop 3000H** | **Classe funzionale**<br>Class | |
| **Note**<br>Notes | | **Settore applicazione**<br>Area | |
| **Collaudatore**<br>Inspector | **PATTARA** | **ESITO**<br>COMPLIANCE RESULT | CONFORME |
| **Responsabile collaudo**<br>Lab Supervisor | **Claudio Mellini** | | |

**CONFORME**

04.09.2023

TEMPRASUD
Advanced heat treatment solutions

# Rapporto di Collaudo

Commessa **202313409** 0

Data Collaudo **04/11/2023**

Cliente **001216 INGRANAGGI MOREALI MARIO SPA** DDT Cliente **1337** Del **23-ott-23**

Num Disegno **12,187/R** **PIGNONE CONICO SX** Materiale **17NiCrMo6-4**

Pezzi **354** Peso **259,128** Numero Lotto **2023/001535**

Colata **77453** Indice Rev. **6** Carica Impianto **231103002**

Numero Carica **230.005.785** Sistema **LLF7** Ciclo **609**

Trattamento **Cementazione tempra e rinvenimento 0,8 mm**

## Risultato del Collaudo

Collaudatore **DANIELE GAVOTO**

| Caratteristiche Richieste | Zona Rilievo | UM | Da | A | Strumento |
|---|---|---|---|---|---|
| **DUREZZA SUPERF.** | | **HRC** | **59,00** | **61,00** | |
| **PENETRAZ.EFFIC.** | | **mm** | **0,65** | **0,95** | |

| Caratteristiche Rilevate | Zona Rilievo | UM | Da | A | Strumento |
|---|---|---|---|---|---|
| **DUREZZA SUPERF.** | | **HRC** | **60,00** | **60,50** | |
| **PENETRAZ.EFFIC.** | | **mm** | **0,91** | **0,91** | |

ESEGUITO COLLAUDO SU PROVINO TEMPRASUD
PROVINO N° 4931

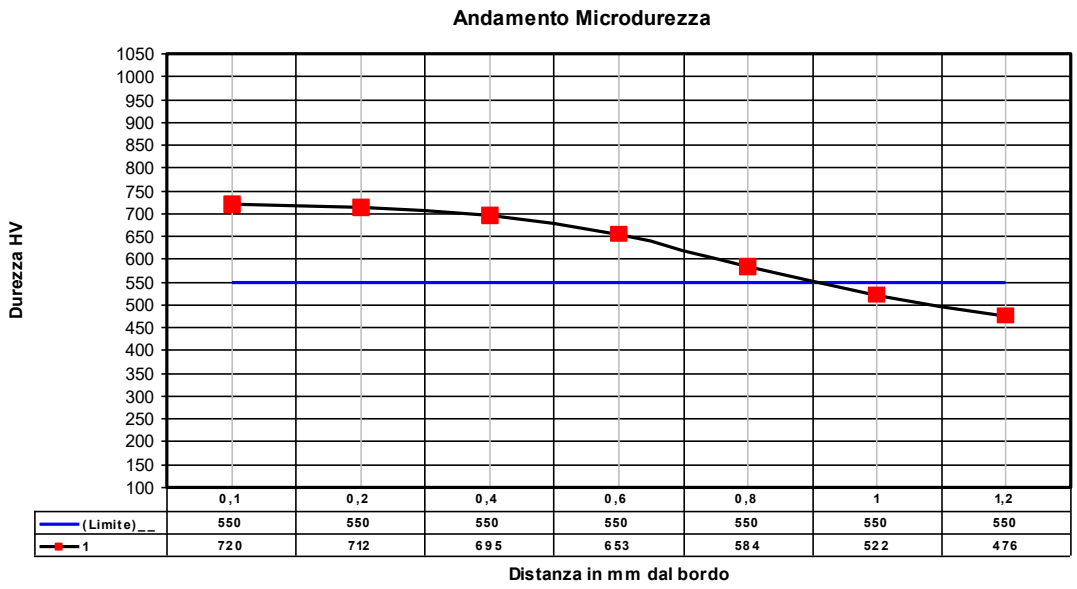
**Eseguito collaudo di tipo 2.2 in ottemperanza alla norma UNI EN ISO 10204**

Esito: **Conforme** Collaudatore: **DANIELE GAVOTO**

TEMPRASUD
Advanced heat treatment solutions

# Diagramma Andamento Microdurezza

Commessa **2023/13409.0**




| | 0,1 | 0,2 | 0,4 | 0,6 | 0,8 | 1 | 1,2 |
|---|---|---|---|---|---|---|---|
| (Limite)__ | 550 | 550 | 550 | 550 | 550 | 550 | 550 |
| 1 | 720 | 712 | 695 | 653 | 584 | 522 | 476 |

ACCIAIERIE BERTOLI SAFAU
ABSOLUTE STEEL QUALITY

ACCIAIERIE BERTOLI SAFAU SpA
Via Buttrio n.28 - Frazione Cargnacco - 33050 Pozzuolo del Friuli (UD)
Tel. +39 0432 613212 - Fax +39 0432 613209 - www.absacciai.it

# CERTIFICATO DI COLLAUDO

Inspection Certificate 3.1/Certificat de reception 3.1/
Abnahmeprufzeugnis 3.1

N. 259294 / 1
Data 07.05.2020
COLATA N. Heat-Coulee-Schmelze 262628


CLIENTE Customer-Client-Besteller: RODA FORGE S.P.A.
ORDINE Order-Commande-Bestellung: 200067
PROFILO Shape-Section-Profili: LAMINATO BARRE TONDO GREZZO 55 MM -
STATO DI FORNITURA SupplyCondition-Etat de livraison: CESOIABILE
ACCIAIO Steel-Acier-Stahl: 16CRNI4
COMESSA/POS Sales Order/Pos: 1066620/280
CAPITOLATO ABS: Technical Specification: ABS
MATERIALE CLIENTE Customer Material Code: 16CRNI4+G0T055-028
CAPITOLATO DI ANALISI: Material Specification: DANA Q.F.1001 REV.1 1.4.2015
CAPITOLATO DI FORNITURA: Technical Delivery Raquirements:

## COMPOSIZIONE CHIMICA DI COLATA %

CAST ANALYSIS % - COMPOSITION CHIMIQUE DE COULEE % - SCHMELZE CHEMISCHE ANALYSE %

| | C | Mn | Si | P | S | Cr | Ni | Mo | Al (T) | Cu | Sn | Ti |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Min | 0,130 | 0,70 | 0,15 | | 0,015 | 0,80 | 0,80 | | 0,020 | | | |
| Max | 0,180 | 1,00 | 0,40 | 0,020 | 0,030 | 1,10 | 1,10 | 0,10 | 0,050 | 0,30 | 0,100 | 0,0500 |
| Colata/Heat | 0,170 ✓ | 0,94 ✓ | 0,25 ✓ | 0,010 ✓ | 0,022 ✓ | 0,96 ✓ | 0,90 ✓ | 0,05 | 0,020 ✓ | 0,28 | 0,012 | 0,0020 ✓ |
| | B (T) | V | Nb | As | Ca | Sb | Co | O/ppm | H/ppm | N/ppm | Al/N2 | |
| Min | | | | | | | | | | 60 | 2,10 | |
| Max | 0,0005 | 0,100 | 0,060 | 0,100 | 0,0010 | 0,100 | 0,300 | 20,00 | 2,50 | 120 | | |
| Colata/Heat | 0,0001 | 0,008 | 0,003 | 0,006 | 0,0003 ✓ | 0,001 | 0,013 | 9,00 | 0,70 | 95 | 2,11 | |

CAP. SECONDO CLASSE QL2

## CARATT. MECCANICHE

MECHANICAL PROPERTIES - CARACTERISTIQUES MECANIQUE - MECHANISCHE EIGSNSCHAFTER

TRAZIONE/RESILIENZA DI RIFERIMENTO

TRATTAMENTO TERMICO HEAT TREATMENT

TEMPRA RINVENIMENTO

### TRAZIONE

TENSILE TEST

| | R LONG. | RE LONG. | A%5D LONG. |
|---|---|---|---|
| Min | 1.080Mpa | 835Mpa | 9% |
| Max | 1.470Mpa | | |
| Colata/Heat | 1.272Mpa | 872Mpa | 12,2% |
| | ✓ | ✓ | ✓ |

### RESILIENZE

IMPACT TEST

| | KCU 20°C Long |
|---|---|
| Min | 30J |
| Max | |
| Colata/Heat | 32J |
| | ✓ |

### DUREZZE

HARDNESS

| | IN PELLE |
|---|---|
| Min | |
| Max | 260HB |
| Colata/Heat | 181HB |

### PROVA JOMINY

JOMINY TEST - ESSAI JOMINY - STIRNABSCHRECKVERSUCH

| | J1.5 MM - HRC | J3.0 MM - HRC | J5.0 MM - HRC | J7.0 MM - HRC | J9.0 MM - HRC | J10.0 MM - HRC | J11.0 MM - HRC | J13.0 MM - HRC | J15.0 MM - HRC | J20.0 MM - HRC | J25.0 MM - HRC | J30.0 MM - HRC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Min | 39 | | 34,5 | | | 29 | | | 25 | 22,5 | 21 | 20 |
| Max | 44 | | 40,5 | | | 35,5 | | | 31,5 | 29 | 27,5 | 26,5 |
| Colata/Heat | 43,1 ✓ | 42,2 ✓ | 40,3 ✓ | 37,1 ✓ | 34,3 ✓ | 33 | 31,7 ✓ | 29,8 ✓ | 28,5 | 27,3 | 26,4 | 25,2 |
| | J35.0 MM - HRC | J40.0 MM - HRC | J45.0 MM - HRC | J50.0 MM - HRC | | | | | | | | |
| Min | | | | | | | | | | | | |
| Max | | | | | | | | | | | | |
| Colata/Heat | 24,2 | 23,8 | 23,3 | 22,8 | | | | | | | | |

PROVA JOMINI MM - HRC EN ISO 642

TEMPERATURA DI AUSTENITIZZAZIONE 880 °C

ACCIAIERIE BERTOLI SAFAU
ABSOLUTE STEEL QUALITY
ACCIAIERIE BERTOLI SAFAU SpA
Via Buttrio n.28 - Frazione Cargnacco - 33050 Pozzuolo del Friuli (UD)
Tel. +39 0432 613211 - Fax +39 0432 613209 - www.abssocial.it

# CERTIFICATO DI COLLAUDO

Inspection Certificate 3.1/Certificat de reception 3.1/
Abnahmeprufzeugnis 3.1

| | |
|---|---|
| N. | 259294 / 1 |
| Data | 07.05.2020 |
| COLATA N. Heat-Coulee-Schmelze | 262628 |
| Pag. | 2 / 2 |

## INCLUSIONI NON METALLICHE

NON METALLIC INCLUSION - INCLUSIONS NON METALLIQUES - PRUFUNG NICHTEMETALLISCHE EINSCHLUSSE

| | Tipo A Type A | Tipo B Type B | Tipo C Type C | Tipo D Type D |
|---|---|---|---|---|
| Fine Thin | 2 | 0 | 0 | 1 |
| Grosso Heavy | 1 | 0,5 | 0 | 1 |

MICROINCLUSIONI: METODO JK, CAMPO PEGGIORE
MICROINCLUSIONI: NORMA UNI 3244-66

## GRANO

GRAIN - GRAIN - KORNGROSSE

GRANO AUSTENITICO: NORMA UNI EN ISO 643 / ASTM E112
GRANO AUSTENITICO: METODO MC QUAID
TEMPERATURA GRANO AUSTENITICO 920 °C
DIMENSIONE GRANO AUSTENITICO 7 ✓

## ALTRE PROVE

OTHER TESTS - AUTRES ESSAIS - SONSTIGE PRUFUNGEN

GRADO BANDATURA 2
MACROGRAFIA C 1
MACROGRAFIA R 1
MACROGRAFIA S 1
BANDATURA NORMA UNI 8449
MACROGRAFIE NORMA ASTM E381

## NOTE

DIFETTI SUPERFICIALI: CONTROLLO ESEGUITO AL 100%
DIFETTI INTERNI METODO CONTROLLO US ESEGUITO AL 100%
ANTIMIX 100 %
R/R = 24
CERTIFICATO REDATTO IN ACCORDO A: EN 10204/3.1
PROD. DI PARTENZA COLATA CONTINUA
PAESE D'ORIGINE ITALIA
ACCIAIO DEGASATO SOTTOVUOTO .
ACCIAIO ELABORATO AL FORNO ELETTRICO .
ACCIAIO GRANO FINE .
ACCIAIO COMPLETAMENTE CALMATO .
- Materiale esente da piombo, mercurio, cadmio e cromo esavalente (dir. 2000/53/CE - dir. 2011/65/UE e s.m.i.)
- Materiale con radioattivita' non superiore a 0,1Bq/g (d.lgs. 230/1995 e s.m.i.)

## CONTROLLO QUALITA'

QUALITY CONTROL - CONTROLE DE QUALITE - QUALITATSSTEILE

Azienda con sistema di gestione certificato da IGQ secondo
ISO 9001 e IATF 16949

Verif.:Sabrina Anzile

Sabrina Anzile

INGRANAGGI
**MOREALI MARIO S. p. A.**
Ufficio Acquisti

APPROVATO

| DATA | FIRMA |
|---|---|
| 11/01/2024 | Moreali |

PROTERM
TRATTAMENTI TERMICI
REGGIO EMILIA
PROTERM S.r.l
**SEDE LEGALE:** Via Piretti 4 40012 Calderara di Reno (BO) – IT | Tel. 0514148611
Cap. Soc. EUR 1.064.368,00 i.v. | P.IVA 00505861203 | C.F e R.I. 00368640371
R.E.A 212723/BO | Codice SDI A4707H7

**STABILIMENTO PRODUTTIVO:**
**REGGIO EMILIA (RE)**
42124 Via Casorati 13
Tel. 0522926336

AZIENDA CON SISTEMA DI GESTIONE CERTIFICATO DA IGQ SECONDO UNI EN ISO 9001 CERTIFICATO NUMERO IT-20894 IGQ 2D53

COMPANY WITH MANAGEMENT SYSTEM CERTIFIED BY IGQ IN COMPLIANCE WITH THE STANDARD UNI EN ISO 9001 CERT. N° IT-20894 IGQ 2D53

| **CERTIFICATO DI COLLAUDO** TEST CERTIFICATE | **2404740** | **DATA** DATE | **28/05/2024** |
|---|---|---|---|

*UNI 10204 Pt.3.1/05* *PRQ 824*

**Spett.le:** **INGRANAGGI MOREALI MARIO SPA**
**VIA C.CAFIERO 16**
**42124 REGGIO EMILIA RE**

| | | | |
|---|---|---|---|
| **DISEGNO** Part Number | **RC00047370** | **COMMESSA** Committed | **C 0114** |
| **DESCRIZIONE** Description | **CORONA CONICA DX REV.0** | **ORDINE** Order | **249** |
| **DDT** Delivery note | **420** | **Q.TA'** Pieces | **270 (PARZ)** |
| **DATA DDT** Delivery note date | **10/05/2024** | **PESO [Kg]** Weight [Kg] | **867,51** |
| **MATERIALE** Material | **16CrNi4** | **CONTENITORI** Cases | **5C8 684** |
| **COLATA** Heat Code | **262628** | **PARTITA** Batch | **2403774/2** |

| **TRATTAMENTO TERMICO** Heat Treatment | **MODALITA' DI LAVORO** Work Details |
|---|---|
| **PREPARAZIONE-MONTAGGIO CARICA**<br>**CEMENTAZIONE-TEMPRA-RINVENIMENTO**<br>**PALLINATURA CEMENTAZIONE**<br>**COLLAUDO**<br>**PROVE DI DUREZZA (CUCITURA) CMT** | **Griglia 303, Fornata 1120** |

**ANALISI DI COLLAUDO**
Laboratory analysis

| **Specifiche** Specification | **Richieste** Required | **Risultati** Results | **u.m.** |
|---|---|---|---|
| **Durezza Superficiale HRC** Surface Hardness HRC | **59 - 61** | **60-61** | **HRc** |
| **Profondità da cucitura** | **0.65 - 0.95** | **0.96** | **mm** |
| **Profondita Briro-E** Case Depth Briro-E PROVETTA | **0.65 - 0.95** | **0.88** | **mm** |

| **Specifiche cliente** Customer standard | **Esame microstrutturale** Microstructural Analisys |
|---|---|
| **spCLI C006** | |

| | | | |
|---|---|---|---|
| **Strumento** Tool device code | **D04ERN ERNST**<br>**D05BRI BRIRO** | **Classe funzionale** Class | |
| **Note** Notes | | **Settore applicazione** Area | |
| **Collaudatore** Inspector | **YL** | **ESITO** COMPLIANCE RESULT | CONFORME |
| **Responsabile collaudo** Lab Supervisor | **Francesco Del Giudice** | | |

INFORMAZIONI RISERVATE. È VIETATA LA DIVULGAZIONE E L'UTILIZZO SE NON ESPRESSAMENTE AUTORIZZATI DALLA DIREZIONE AZIENDALE.

PROTERM
TRATTAMENTI TERMICI
REGGIO EMILIA
PROTERM S.r.l
**SEDE LEGALE:** Via Piretti 4 40012 Calderara di Reno (BO) – IT | Tel. 0514148611
Cap. Soc. EUR 1.064.368,00 i.v. | P.IVA 00505861203 | C.F e R.I. 00368640371
R.E.A 212723/BO | Codice SDI A4707H7

**STABILIMENTO PRODUTTIVO:**
**REGGIO EMILIA (RE)**
42124 Via Casorati 13
Tel. 0522926336

AZIENDA CON SISTEMA DI GESTIONE CERTIFICATO DA IGQ SECONDO UNI EN ISO 9001 CERTIFICATO NUMERO IT-20894 IGQ 2D53

COMPANY WITH MANAGEMENT SYSTEM CERTIFIED BY IGQ IN COMPLIANCE WITH THE STANDARD UNI EN ISO 9001 CERT. N° IT-20894 IGQ 2D53

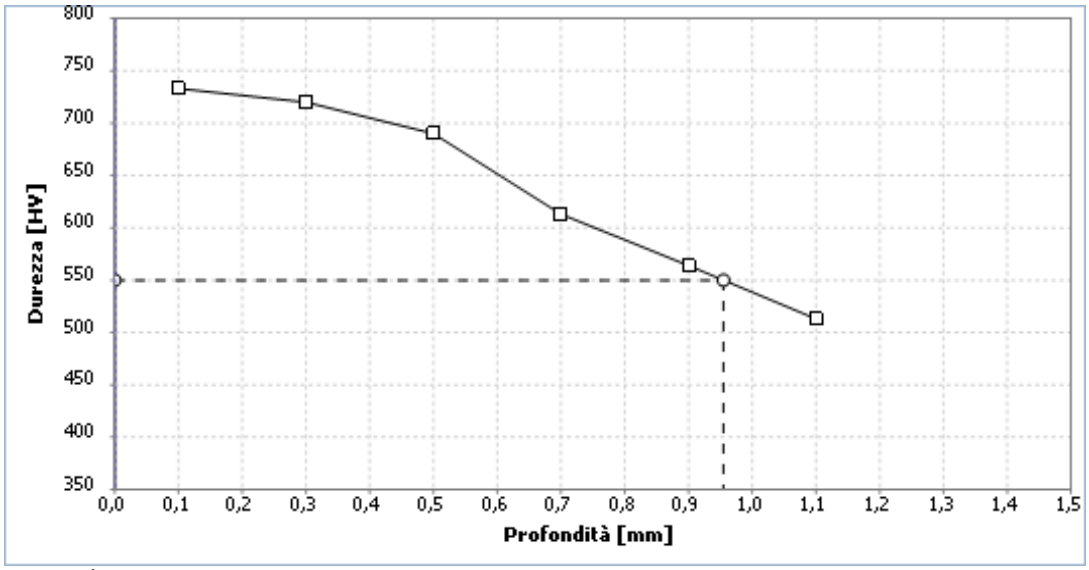
| **CERTIFICATO DI COLLAUDO**<br>TEST CERTIFICATE | **2404740** | **DATA**<br>DATE | **28/05/2024** |
|---|---|---|---|

*UNI 10204 Pt.3.1/05* *PRQ 824* *Pagina 1/1*

## PROFONDITA' DI INDURIMENTO

GRADIENTE DI DUREZZA

| **Profondità [mm]**<br>Depth [mm] | **Durezza [HV]**<br>Hardness [HV] |
|---|---|
| 0,10 | 733,00 |
| 0,30 | 720,00 |
| 0,50 | 690,00 |
| 0,70 | 613,00 |
| 0,90 | 564,00 |
| 1,10 | 513,00 |



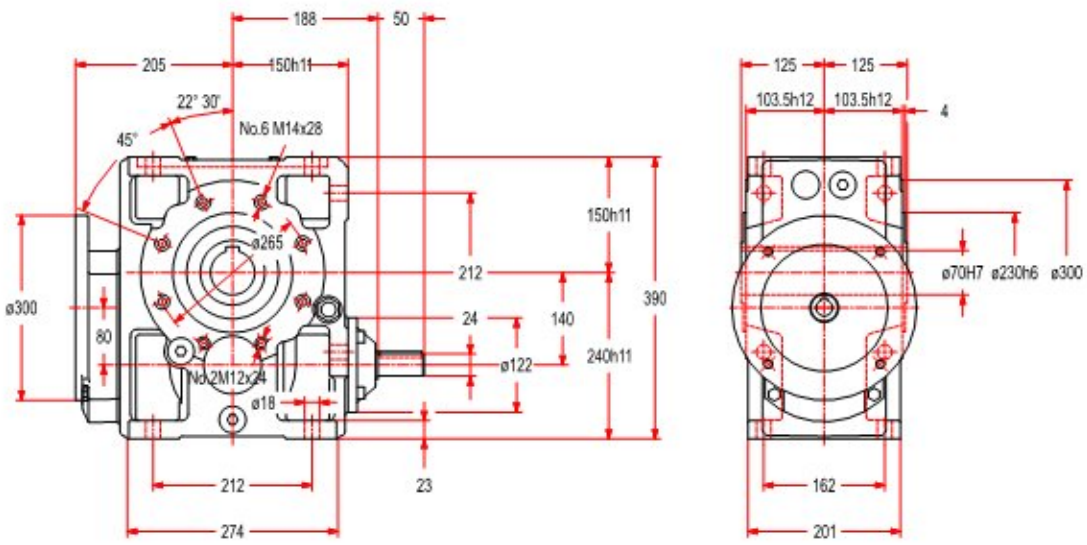

Profondità di 0,95mm ottenuta con durezza di 550HV

| **Note**<br>NOTES | | **CERTIFICATO DI CUCITURA** | **2404740** |
|---|---|---|---|
| **Collaudatore**<br>Inspector | **Francesco Del Giudice** | **ESITO**<br>COMPLIANCE RESULT | CONFORME |
| **Responsabile**<br>Lab supervisor | **Francesco Del Giudice** | | |

*Documento riservato di rilevante valore economico, di proprietà di Proterm S.r.l.*

*E' vietata la riproduzione e/o divulgazione, anche parziale, a terzi, senza l'autorizzazione scritta specifica della direzione di Proterm S.r.l.*

## Dimensioni principali [mm] (per accessori, vedere pag. seguenti)




Informazione

Vite UNI 5737: M 16 x 55

Viti UNI 5588: M 16

Affidabilità prodotto, considerazioni sull'applicazione
Il cliente è responsabile della corretta selezione e applicazione del prodotto in vista dei propri fabbisogni industriali e/o commerciali, salvo il caso in cui l'utilizzo non sia stato raccomandato da personale tecnico qualificato Rossi, dopo opportuna formazione sul tipo di applicazione del cliente. In questo caso tutti i dati necessari richiesti per la selezione devono essere comunicati esattamente e per iscritto dal cliente, indicati in sede di ordine e confermati da Rossi. Il cliente è sempre responsabile della sicurezza delle applicazioni di prodotto. Ogni possibile cura è stata adottata nella stesura del presente catalogo al fine di assicurare l'accuratezza delle informazioni contenute in questa pubblicazione, tuttavia Rossi non può assumere alcuna responsabilità per eventuali errori, omissioni o dati non aggiornati. A causa della costante evoluzione dello stato dell'arte, Rossi si riserva il diritto di apportare modifiche in qualsiasi momento alle pubblcazioni. La responsabilità della selezione del prodotto è del cliente, salvo diversi accordi legalmente formalizzati per iscritto e sottoscritti dalle parti.

# RAPPORTO DI PROVA - EN 10204 - 2.2
## *TEST REPORT - EN 10204 - 2.2*

| | | | |
|---|---|---|---|
| **CLIENTE:** *CUSTOMER :* | **REMAZEL ENGINEERING SPA** | **CONFERMA D'ORDINE - RIGA:** *ORDER CONFIRMATION - LINE:* | **50533327 ZOG** |
| **ORDINE CLIENTE:** *CUSTOMER ORDER:* | **24004219 DEL** | **DESTINAZIONE FINALE:** *SHIP TO:* | **REMAZEL ENGINEERING S.P.A.** |
| **CODICE ARTICOLO:** *ARTICLE CODE:* | **B2045232** | **QUANTITA':** *QUANTITY:* | **1** |
| **DESCRIZIONE ARTICOLO :** *DESCRIPTION CODE:* | **ET3065/MR/208.2/61104600690 V5** | **ORDINE DI PRODUZIONE:** *MANUFACTURING ORDER:* | **11427171** |

| | |
|---|---|
| **MATRICOLE :** *SERIAL NUMBERS:* | **07017447** |

La Dana Motion Systems Italia s.r.l dichiara sotto la propria responsabilità, sulla base dei risultati ottenuti dai test standard di verifica effettuati sui prodotti costruiti con gli stessi materiali e con lo stesso metodo di produzione, che i prodotti specificati sopra, sono conformi alle prescrizioni dell'ordine ed alle regole tecniche corrispondenti ai regolamenti ufficiali.

*Dana Motion Systems Italia s.r.l under its own responsibility, based on results of its standard tests aimed to verify products manufactured using the same materials and production method, declares that the products hereabove specified fully comply with order prescriptions and with all technical norms corresponding to official regulations.*

Sono stati eseguiti i seguenti test standard non specifici:
*The following non-specific inspection tests were performed:*

| **DESCRIZIONE DEI TEST** *TEST DESCRIPTION* | **RISULTATO** *RESULTS* |
|---|---|
| Prova di tenuta secondo SP001<br>*Seal Test according to SP001* | Approvato<br>*Approved* |
| Prova di rotazione a vuoto secondo SP001<br>*Rotation with no load according to SP001* | Approvato<br>*Approved* |
| Prova del senso di rotazione secondo SP001<br>*Free rotation test according to SP001* | Approvato<br>*Approved* |
| Verifica verniciatura/protettivo secondo SP017<br>*Paint/protective check according to SP017* | Approvato<br>*Approved* |

Quando applicabile:
*Where applicable:*

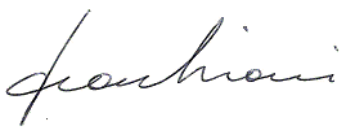
| | |
|---|---|
| Prova di apertura e tenuta freno secondo SP001<br>*Brake engagement and seal test according to SP001* | Approvato<br>*Approved* |
| Verifica livello olio<br>*Oil level check* | Approvato<br>*Approved* |

Reggio Emilia

30.07.2024

DIRETTORE DI PRODUZIONE
MANUFACTURING DIRECTOR
DIRECTEUR DE PRODUCTION
PRODUKTIONSLEITERS
DIRECTOR DE PRODUCCIÓN

**Fracchioni Claudio**



**Dana Motion Systems Italia S.r.l.**
Via Luciano Brevini, 1/A
42124 REGGIO EMILIA - ITALY
Tel. +39 0522 9281 Fax +39 0522 928200
www.brevini.com

# TRACEABILITY SHEET
# SCHEDA DI RINTRACCIABILITA'

**QCMAT31TT0**

| | |
|---|---|
| FORM | F0610 |
| FORMREVISION | 06 |
| FORM REVISED | 2023/10/26 |

| GEARBOX DESCRIPTION<br>DESCRIZIONE RIDUTTORE | SERIAL NUMBER<br>NUMERO DI SERIE | ORDER CONFIRMATION<br>CONFERMA D'ORDINE | ASSEMBLING ORDER<br>ORDINE DI MONTAGGIO | CUSTOMER<br>CLIENTE | N° ORDER<br>N° ORDINE | QUANTITY<br>QUANTITA' |
|---|---|---|---|---|---|---|
| **ET3065/MR/208.2/61104600690 V5** | **7017447** | **50533327** | **11427171** | **219934 - REMAZEL ENGINEERING S.P.A.** | **24004219 DEL** | **1** |

| REFERENCES<br>NORME DI RIFERIMENTO | DATA RILASCIO/<br>DATE OF ISSUE | |
|---|---|---|
| SP045-01 = Magnetic particle inspection (EN 10228 - 1)<br>SP045-02 = Penetrant Testing (EN 10228 - 2)<br>SP045-03 = Ultrasonic Testing (EN 10228 - 3)<br>SP045-04 = Overheating Check (ISO 14104)<br>SP045-05 = BARKHAUSEN | **16.09.2024** | **B2045232** |

| COMPONENT CODE<br>CODICE COMPONENTE | DESCRIPTION<br>*DESCRIZIONE* | WORKING ORDER<br>ORDINE DI LAVORO | RAW MATERIAL<br>MATERIALE GREZZO | INCOMING GOODS DATA<br>MERCE IN INGRESSO |
|---|---|---|---|---|
| 30506940100 | COUPLING B24/../D28i | 5002838119.2024.0001 | | 01_4500649437 - 2425E00097 31.05.24 - SPUN MICROPROCESSING - 500 |
| 31113730600 | SHAFT EM1065/B32/../B32 | 11442439 | 31113731599 | 02_4500630917 - FY2324-EX-661 30.03.2024 - SPUN MICROPROCESSING - 250+125PZ |
| 32000538300 | RING-GEAR EM1010/6F/../Z95M1,5 | 11381214 | 9029443 | 03_4500640225 - 800054294 15.04.24 - MASSUCCO INDUSTRIE SPA - 1800 PZ |
| 32001021100 | RING-GEAR EM1020/8F/../Z75M2,5 | 11400205 | 32001000088 | 04_4500640225 - 800054295 15.04. 24 - MASSUCCO INDUSTRIE SPA - 2112 PZ |
| 32001921100 | RING-GEAR EM1065/10F/../Z60M3,5 | 11381201 | 32001900088 | 05_4500640225 - 800054634 03.05.24 - MASSUCCO INDUSTRIE SPA - 903 PZ |
| 32500941100 | PLANET GEAR EM1010/../6,93/Z38M1,5 | 11365879 | 32500841199 | 06_4500566121 - 550172-01 17.07.2023 - RAMCO STEELS PVT. LTD. - 1928 PZ |
| 32501541100 | PLANET GEAR EM1020/../6/Z29M2,5 | 11400084 | 32501541199 | 07_4500629185 - 2401045 04.06.24 - F.A.C.E.M. SPA - 1433 - PZ |
| 32513641100 | PLANET GEAR EM1065/../5/Z21M3,5 | 11400363 | 32513641199 | 08_4500612666 - 2400623 03.04.24 - F.A.C.E.M. SPA - 2250 PZ |
| 32603241900 | SUN PINION EM1010/Z16M1,5/6,94/A24 | 11399726 | 32602831999 | 09_4500586850 - DANA2315-6 24.04.2024 - JINAN HONG ZHENG SCIENCE & TEC - 900 PZ |
| 32730430300 | SUN GEAR EM1020/Z15M2,5/6/B20 | 11394771 | 9042031 | 10_4500624042 - 264/V 20.03.24 - GI.GI.ESSE SRL - 543 PZ |
| 32733530300 | SUN PINION EM1065/Z15M3,5/5/B27 | 11386265 | 32733500088 | 11_4500626889 - 304/V 03.04.24 - GI.GI.ESSE SRL - 520 PZ |
| 3355332000K | PINION EM1065/Z11M10/../A32 | 11232108 | 9022943 | 12_4500548192 - 810 01.08.23 - GI.GI.ESSE SRL - 55 PZ |
| 34513131800 | PLANET CARRIER EM1010/A20/6,93/.. | 11396796 | 34512831895 | 13_4500611892 - DANA2401-3 30.05.2024 - JINAN HONG ZHENG SCIENCE & TEC - 3000 |
| 34546531800 | PLANET CARRIER EM1020/A27c/6/.. | 11396804 | 34546131895 | 14_4500591063 - DANA2316-1 19.03.2024 - JINAN HONG ZHENG SCIENCE & TEC - 2700 PZ |
| 345F471000K | PLANET CARRIER EM1065/A32C/5/.. | 11404168 | 345F4400095 | 15_4500639713 - F.LLI GALLI-666 16.04.2024 - ZANARDI FONDERIE SPA - 920 PZ |

# ARORA IRON & STEEL ROLLING MILLS (P) LTD.

DHANDARI KHURD, NEAR PHASE-VII, FOCAL POINT, LUDHIANA- 141 010.
Website : www.arorairon.com

IATF 16949:2016 | ISO 14001 : 2015 | ISO 45001 : 2018 | ISO 9001:2015

## TEST CERTIFICATE

### TEST CERTIFICATE ACCORDING TO EN10204 TYPE 3.1

| Customer Address: | | | | |
|---|---|---|---|---|
| M/S - SPUN MICRO PROCESSING PVT. LTD.<br>BEHRAMPUR ROAD,<br>VILLAGE BEGAMPUR KHATOLA,<br>GURGAON, HARYANA | Material | Billet Route | Test Certificate No. | 2023-24/030467 |
| | Process Route | EAF-LRF-VD-CCM-AMLC-EMS-RM | Date | 27-02-2024 |
| | Specification | Doc NO-SM16 QWI 173 | Invoice No. | 17316. |
| | | | Weight (MT.) | 4.395 |
| | Heat No. | A28548 | Input/Billet Size | 200X200 MM |
| | Grade | 20MnCr5 | Reduction Ratio | 18.14:1 (Spec.5:1 min) |
| | Supply Size | 53 MMØ | No's of Pcs | 45 |
| | Supply Condition | AS HOT ROLLED | No's of Bundle | 2 |
| | Colour Code | YELLOW+BLUE | Multiple | NA |

## TEST RESULT

### CHEMICAL ANALYSIS (ASTM E 415 / IS 8811)

| Element | | C% | Mn% | Si% | S% | P% | Cr% | Ni% | Mo% | V% | Al% | Cu% | Ti% | - | - | - | - | - | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spec. | Min | 0.170 | 1.100 | - | - | - | 1.000 | - | - | - | - | - | 0.010 | - | - | - | - | - | - |
| | Max | 0.220 | 1.400 | 0.400 | 0.035 | 0.025 | 1.300 | - | - | - | - | - | | - | - | - | - | - | - |
| Achieved | | 0.215 | 1.365 | 0.225 | 0.026 | 0.019 | 1.235 | 0.100 | 0.030 | 0.004 | 0.023 | 0.140 | 0.002 | - | - | - | - | - | - |

### JOMINY HARDENABILITY TEST (IS:3848, ASTM A255, SAE J406)

| Distance (MM) | | 1.5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spec. (HRC) | Min | 44 | 42 | 40 | 37 | 34 | 33 | 31 | 30 | 28 | 26 | 25 | 24 | 23 | | | | | |
| | Max | 49 | 49 | 48 | 46 | 43 | 42 | 41 | 39 | 37 | 35 | 34 | 33 | 32 | | | | | |
| Achieved (HRC) | | 47.5 | 47.0 | 46.5 | 44.5 | 43.0 | 41.0 | 38.0 | 36.5 | 33.5 | 31.5 | 30.0 | 29.0 | 28.0 | | | | | |

### Mechanical Properties

| Parameters | | IS:1608 / ASTM A370 Test Condition: As Rolled | | | | IS:1757 | ASTM A255 | | IS:1500 |
|---|---|---|---|---|---|---|---|---|---|
| | | Tensile Strength ($N/mm^2$) | Yield Strength ($N/mm^2$) | Elongation (%) | Reduction Area (%) | Impact Strength Charpy U-notch KCU at23°+5°(Joules) | D.I. Value (Inch) | D.I. Value (mm) | Surface Hardness As Rolled (BHN) |
| Spec. | Min | 1230 | 930 | 7 | - | 17.5 min | - | - | - |
| | Max | 1570 | - | - | - | - | - | - | - |
| Achieved | | 1328 | 1128 | 9.7 | | 26 J | - | - | 229/248 |

### Metallographic Properties

| Parameters | | Inclusion Rating (IS : 4163 / ASTM : E45A / JK Chart) WORST FIELD RATING | | | | | | | | | Grain Size IS 4748 / ASTM E112 (No.) | Depth of Decarburization IS 6396/ASTM E1077 | | Micro Structure | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type | A | | B | | C | | D | | DS | | Complete | Partial | Uniform | Banding | Structure |
| | Series | Thin | Thick | Thin | Thick | Thin | Thick | Thin | Thick | | | | | | | |
| Spec. | Min | - | - | - | - | - | - | - | - | - | ≥5 | - | | - | - | - |
| | Max | - | - | - | - | - | - | - | - | - | | | | | | Pearlite & Ferrite |
| Achieved | | 1.5 | 0.5 | 0.5 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | - | 6.0 to 6.5 | - | - | - | - | |

### Physical Properties, Non Destructive Test & Other Test

| Parameters | Internal Soundness ASTM E381 | Step Down Test IS 4075 | Surface Inspection IS 13352 | Magnetic Particle Inspection ASTM E1444 | Ultrasonic Test ASTM A388 | Upsetting Test IS 10167 |
|---|---|---|---|---|---|---|
| Spec. | - | - | - | - | - | - |
| Achieved | Better than C2,R1,S1 | Satisfactory | Satisfactory | 100% | 100% | - |

| Parameters | Dimensional Tolerance | Spark Test | X-RF | Gas Analysis Report Test method-Leco | | |
|---|---|---|---|---|---|---|
| | | | | $O_2$ (ppm) | $N_2$ (ppm) | $H_2$ (ppm) |
| Spec. | - | - | - | - | - | - |
| Achieved | As per IS 3739 Grade 1 | 100% | 100% | 9.0 | 73.0 | 0.67 |

Remarks :
**This material comply with RoHS (Pb, Cd, Hg, Cr6+) and REACH permissible limits. 3TG (Tantalum, Tin, Tungsten and Gold) not added intentionally in the product. Material is free from radioactive contamination.**

**MACHINE STRAIGHTENED MATERIAL**

| Prepared By: | Approved By: | Pre Dispatch Inspection: |
|---|---|---|
| VISHWAKARMA SHARMA | | |

In case of any Test Certificate issue, please inform Dinesh Singla at quality04@arorairon.com, Mobile No. +919914538700

SPUN MICRO–PROCESSING PVT LTD.
BEGAMPUR KHATOLA, GURGAON–122001(HR.)

# MATERIAL TEST CERTIFICATE

| | | | | | |
|---|---|---|---|---|---|
| PART NAME:- | COUPLING 0694 | MATERIAL:- | 20MnCr5(UNI EN 10084) | | |
| PART NO:- | 30506940100 | QTY :- | 500 NOS | HEAT NO:- | A28548 |
| DATE:- | 31-05-2024 | PURCHASE ORDER NO:- | 4500649437 | Invoice No. | 97 |
| CUSTOMER:- | BREVINI POWER TRANSMISSION | REFERENCE TO | UNI -EN-10204-3.1 | | |

## CHEMICAL COMPOSITION

| | C% | Mn% | Cr% | Mo% | Ni% | S% | Si% | P% | Al% | Cu% | Ca% |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MIN | 0.17 | 1.10 | 1.00 | | | | | | 0.02 | | |
| MAX | 0.22 | 1.40 | 1.30 | | | 0.035 | 0.40 | 0.025 | 0.05 | | |
| ACTUAL | 0.213 | 1.366 | 1.225 | | | 0.022 | 0.217 | 0.019 | 0.02 | | |
| | | | | | | | | | | | |

## HARDENABILITY

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DISTANCE | | 5 | | | 11 | | | 25 | | | |
| MIN | | 40 | | | 33 | | | 26 | | | |
| MAX | | 48 | | | 42 | | | 35 | | | |
| ACTUAL | | 45 | | | 38 | | | 30 | | | |

## MECHANICAL PROPERTIES(Test to be conducted in Barø11mm after H/T at190°C)

| BAR DIA | | | R(N/mm2) | RS (N/mm2) | A% | | KV(J) Min | GRAIN SIZE |
|---|---|---|---|---|---|---|---|---|
| ø53.0 | | MIN | 1000 | 670 | 8 | | 25 | 5 |
| | | MAX | | | | | | 8 |
| | | ACTUAL | 1291.19 | 1199.52 | 11.30 | | 37 | 8 |

## HEAT TREATMENT PROCESS

| INITIAL HEAT TREATMENT | FINAL HEAT TREATMENT |
|---|---|
| Report attached | Report attached |

**This is certify that all the result mentioned in certificate within specification as per standard mentioned.**

| PREPARED BY: | CHECKED BY: | APPROVED BY: |
|---|---|---|

SPUN MICRO-PROCESSING PVT LTD.
BEGAMPUR KHATOLA, GURGAON-122001(HR.)

# PROCESS CONTROL SHEET

**DATE:-** 11-04-2024

**COMPONENT NAME :-** COUPLING

**HEAT NO. :-** A28548

**COMPONENT NO. :-** 0694

**PURCHASE ORDER NO. :-** 4500649437

**INVOICE NO. :-** 97

**PROCESS :-** ISO-THERMAL ANNEALING

**MAT. GRADE :-** 20MnCr5

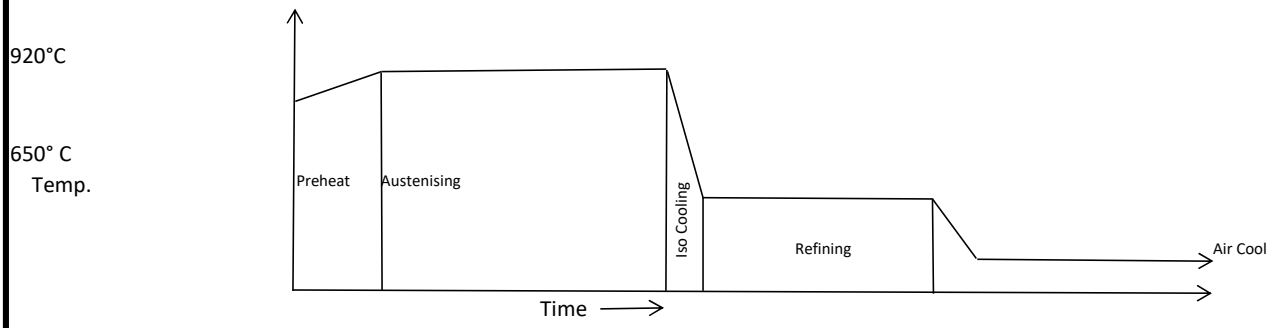
**METALLURGICAL SPECIFICATION :-**

**MICRO STRUCTURE :-** PERLITE & FERRITE.

**HEAT TREATMENT CYCLE :-**

| PROCESS | F/C USED | TEMP. (DEG.C) | SOAKING TIME (MINTS.) | QUENCH / COOLING MEDIA | INSPECTION | |
|---|---|---|---|---|---|---|
| | | | | | HARDNESS | MICRO STRUCTURE |
| AUSTENISING | CONT. F/C-5 | 920 | 120 | Cool in cooling chamber upto 650°C than transfer to F/c -4 | | |
| REFINING | CONT. F/C-4 | 650 | 195 | AIR | 166 ~ 178 BHN | Fine distributed of Perlite in Ferritic matrix |

**H.T CYCLE DIAGRAM:-**




**H.T CYCLE :-**

1 Austenising :-
- I. Temp. :- 920 Deg. C
- ii. Soaking :- 120 minutes.
- iii. Cool in Iso cooling chamber upto 650°C then transfer to other F/C-4

2 Refining :-
- I. Temp. :- 650°C
- ii. Soaking :- 195 Minutes
- iii. Cooling media :- Air

**OBSERVATION :-**

1 HARDNESS :- 166 - 178 BHN

2 MICRO STRUCTURE :- Fine distribution of Perlite in the matrix of Ferrite.

3 DISPOSITION :- OK

PREPARED BY

APPROVED BY

| SPUN Micro Processing Pvt.Ltd. | | CASE HARDENING REPORT |
|---|---|---|
| **ITEM DESCRIPTION** | COUPLING - 0694 | DATE:- 30-04-2024 |

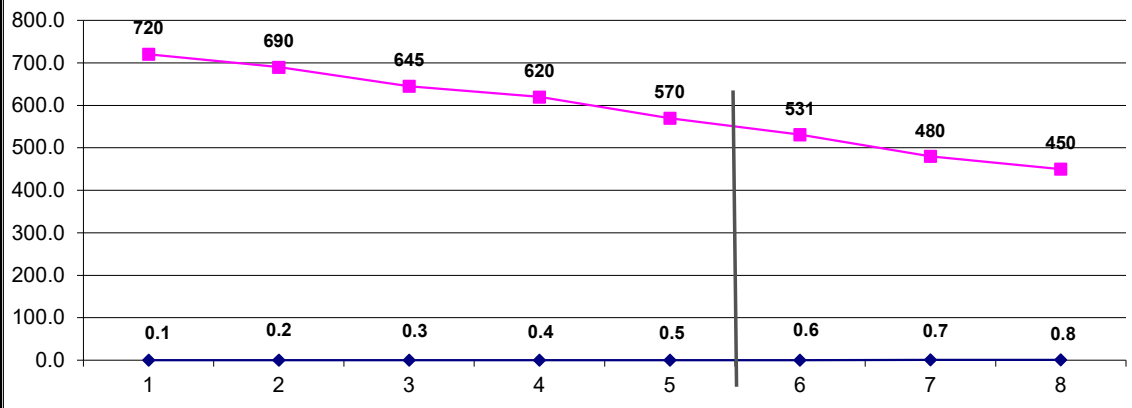
| ***SPECIFICATION*** | | ***OBSERVATION*** |
|---|---|---|
| ***SURFACE HARDNESS*** | **58-62 HRC** | 60,59,61,61,62 |
| ***CORE HARDNESS*** | **32-41 HRC** | 39 HRC |
| ***EFFECTIVE CASE DEPTH*** | **0.40~0.60mm (550HV)** | 0.55 mm |
| ***PURCHASE ORDER NO.*** | 4500649437 | |
| ***INVOICE NO.*** | 97 | |
| ***HEAT CODE*** | A28548 | |

**RESULTS**

Load 1000 gf

| Case Depth | HARDNESS(HV) |
|---|---|
| 0.1 | 720 |
| 0.2 | 690 |
| 0.3 | 645 |
| 0.4 | 620 |
| 0.5 | 570 |
| 0.6 | 531 |
| 0.7 | 480 |
| 0.8 | 450 |

**CASE DEPTH / HARDNESS**




PREPARED BY APPROVED BY

SPUN MICRO–PROCESSING PVT LTD.
BEGAMPUR KHATOLA, GURGAON–122001(HR.)

# MATERIAL TEST CERTIFICATE

| | | | | |
|---|---|---|---|---|
| PART NAME:- | Shaft 7306 | MATERIAL:- | 42CrMo4(UNI EN 10083) | |
| PART NO:- | 31113730600 | QTY:- | 375 NOS | HEAT NO:- A26372 |
| DATE:- | 30-03-2024 | **PURCHASE ORDER NO:-** | 4500630917 | INVOICE NO. 661 |
| CUSTOMER:- | BREVINI POWER TRANSMISSION | REFERENCE TO | UNI -EN-10204-3.1 | |

## CHEMICAL COMPOSITION

| | C% | Mn% | Cr% | Mo% | Ni% | S% | Si% | P% | Al% | Cu% |
|---|---|---|---|---|---|---|---|---|---|---|
| MIN | 0.38 | 0.60 | 0.90 | 0.15 | | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 |
| MAX | 0.45 | 0.90 | 1.20 | 0.30 | | 0.035 | 0.40 | 0.025 | 0.05 | 0.30 |
| ACTUAL | 0.423 | 0.754 | 1.086 | 0.250 | | 0.016 | 0.250 | 0.014 | 0.030 | 0.107 |
| | | | | | | | | | | |

## HARDENABILITY

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DISTANCE | | 5 | | | 11 | | | 25 | | | |
| MIN | | 55 | | | 48 | | | 39 | | | |
| MAX | | 61 | | | 59 | | | 53 | | | |
| ACTUAL | | 55 | | | 50 | | | 40 | | | |

## MECHANICAL PROPERTIES

| BAR DIA | SIZE | | R(N/mm2) | RS (N/mm2) | A% | Z% | KV(J) | GRAIN SIZE |
|---|---|---|---|---|---|---|---|---|
| Ø90.0 | | MIN | 1100 | 900 | 10 | | 35 | 5 |
| | | MAX | | | | | | 8 |
| | | ACTUAL | 1136.48 | 1040.83 | 15.36 | | 65 | 8.0 |

## HEAT TREATMENT PROCESS

| INITIAL HEAT TREATMENT | FINAL HEAT TREATMENT |
|---|---|
| Report attached | Not Applicable |

**This is to certify that all the result mentioned in this certificate is within specification.**

| PREPARED BY: | CHECKED BY: | APPROVED BY: |
|---|---|---|

| SPUN MICRO–PROCESSING PVT LTD. BEGAMPUR KHATOLA, GURGAON–122001(HR.) | **PROCESS CONTROL SHEET** | **DATE:- 15.03.2024** |
|---|---|---|

| | | | |
|---|---|---|---|
| **Component Name :-** | **SHAFT** | **HEAT NO. :- A26372** | |
| **Componet Number :-** | **31113730600** | **PURCHASE ORDER NO :- 4500630917** | **Invoice No. : - 661** |
| **Process :-** | Hard & Temper | Matrial Grade :-42CrMo4 | |

**Metallurgical Specification :-**

Specified Hardness :- **305-355 BHN**

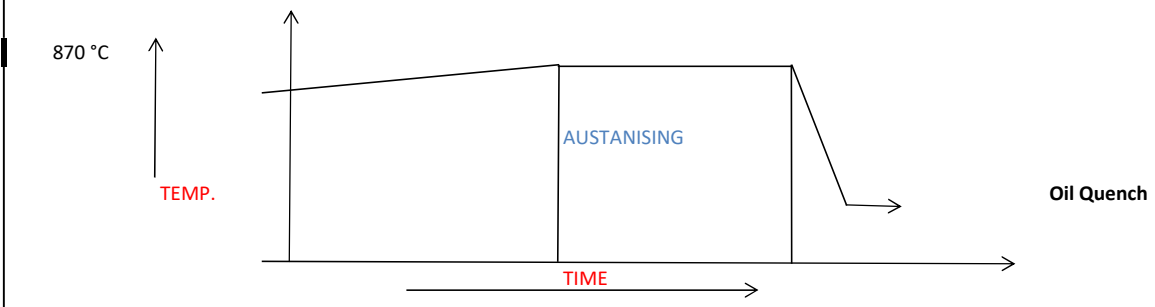
Micro Structure :- Uniform Sorbit

Heat Treatment Cycle :-

| PROCESS | F/C USED | TEMP. (DEG.C) | SOAKING TIME (MINTS.) | QUENCH / COOLING MEDIA | INSPECTION | |
|---|---|---|---|---|---|---|
| | | | | | HARDNESS | MICRO STRUCTURE |
| HARDENING | CONT. F/C | 870 | 120 | OIL | 401 ~ 429 BHN | -------- |
| TEMPERING | CONT. F/C | 600 | 180 | AIR | 321 ~ 342 BHN | UNIFORM SORBITE |

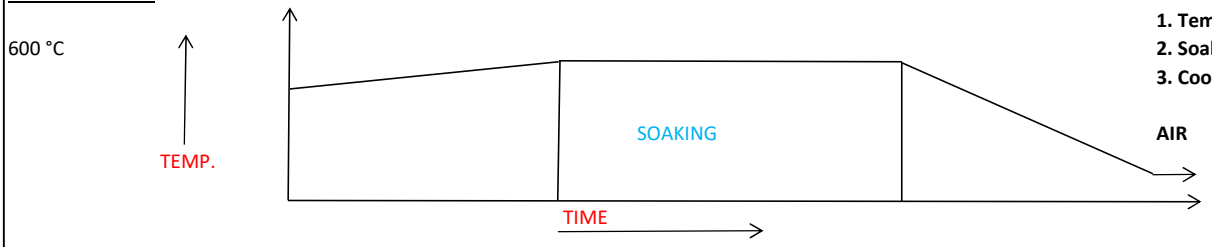
**H.T CYCLE DIAGRAM:-**

**1. HARDENING:-**




**1. Hardening Temp. :- 870 Deg. C**
**2. Soaking Time :- 120 Mints.**
**3. Quenching Media :- Oil**

**2. TEMPERING :-**




**1. Tempering Temp. :- 600 Deg. C**
**2. Soaking Time :- 180 Mints.**
**3. Cooling :- Air**

| | |
|---|---|
| 1. Hardness Observed :- | **321 - 342 BHN** |
| 2. Micro Structure :- | Uniform Sorbit |
| 3. Disposition :- | Satisfactory |

PREPARED BY

APPROVED BY

# ARORA IRON & STEEL ROLLING MILLS (P) LTD.

DHANDARI KHURD, NEAR PHASE-VII, FOCAL POINT, LUDHIANA- 141 010.
Website : www.arorairon.com

IATF 16949:2016 | ISO 14001 : 2015 | ISO 45001 : 2018
ISO 9001:2015

## TEST CERTIFICATE

### TEST CERTIFICATE ACCORDING TO EN10204 TYPE 3.1

| Customer Address: | | | | |
|---|---|---|---|---|
| M/S - SPUN MICRO PROCESSING PVT. LTD. | Material | Billet Route | Test Certificate No. | 2023-24/018523 |
| BEHRAMPUR ROAD, | Process Route | EAF-LRF-VD-CCM-AMLC-EMS-RM | Date | 11-10-2023 |
| VILLAGE BEGAMPUR KHATOLA, | Specification | AS PER SPECIFICATION SHEET | Invoice No. | 9811 |
| GURGAON | | | Weight (MT.) | 13.320 |
| HARYANA | Heat No. | A26372 | Input/Billet Size | 250X250 MM |
| | Grade | 42CrMo4 | Reduction Ratio | 9.83:1(Spec 5:1 Mini.) |
| | Supply Size | 90 MMØ | No's of Pcs | 60 |
| | Supply Condition | AS HOT ROLLED | No's of Bundle | 8 |
| | Colour Code | BLACK+ORANGE LINE | Multiple | NA |

## TEST RESULT

### CHEMICAL ANALYSIS (ASTM E 415 / IS 8811)

| Element | | C% | Mn% | Si% | S% | P% | Cr% | Ni% | Mo% | V% | Al% | Cu% | - | - | B% | Ca% | - | - | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spec. | Min | 0.380 | 0.600 | - | - | - | 0.900 | - | 0.150 | - | - | - | - | - | - | - | - | - | - |
| | Max | 0.450 | 0.900 | 0.400 | 0.035 | 0.035 | 1.200 | - | 0.300 | - | - | - | - | - | - | - | - | - | - |
| Achieved | | 0.440 | 0.750 | 0.255 | 0.013 | 0.013 | 1.060 | 0.145 | 0.260 | 0.005 | 0.025 | 0.110 | | | 0.0003 | 0.0007 | - | - | - |

### JOMINY HARDENABILITY TEST (IS:3848, ASTM A255, SAE J406)

| Distance (mm) | | 1.5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spec. (HRC) | Min | 53 | 53 | 52 | 51 | 49 | 43 | 40 | 37 | 34 | 32 | 31 | 30 | 30 | 29 | 29 | | | |
| | Max | 61 | 61 | 61 | 60 | 60 | 59 | 59 | 58 | 56 | 53 | 51 | 48 | 47 | 46 | 45 | | | |
| Achieved (HRC) | | 58.0 | 57.0 | 56.5 | 56.0 | 55.5 | 55.0 | 53.0 | 51.5 | 51.0 | 50.0 | 48.0 | 47.0 | 45.0 | 44.0 | 42.0 | | | |

### Mechanical Properties

| Parameters | | IS:1608 / ASTM A370 Test Condition:- Q & T | | | | IS:1757 | ASTM A255 | | IS:1500 |
|---|---|---|---|---|---|---|---|---|---|
| | | Tensile Strength (N/mm2) | Yield Strength (N/mm2) | Elongation (%) | Reduction Area (%) | Impact Strength Charpy U-notch (Joules) | D.I. Value (Inch) | D.I. Value (mm) | Surface Hardness As Rolled (BHN) |
| Spec. | Min | 880 | 635 | 11 | - | 25 KCU @23°±5° | - | - | - |
| | Max | 1030 | - | - | - | - | - | - | - |
| Achieved | | 946 | 783 | 13.1 | - | 34 J | - | - | 269/285 |

### Metallographic Properties

| Parameters | | Inclusion Rating (ISO : 4967 / EN: 10247 / JK Chart) WORST FIELD RATING | | | | | | | | | Grain Size IS 4748 / ASTM E112 (No.) | Depth of Decarburization IS 6396/ASTM E1077 | | Micro Structure | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type | A | | B | | C | | D | | DS | | | | | | |
| | Series | Thin | Thick | Thin | Thick | Thin | Thick | Thin | Thick | | | Complete | Partial | Uniform | Banding | Structure |
| Spec. | Min | - | - | - | - | - | - | - | - | - | ≥ 5 | - | | - | - | - |
| | Max | - | - | - | - | - | - | - | - | - | | | | | | |
| Achieved | | 1.5 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | - | 6.0 to 6.5 | - | - | - | - | Pearlite+Ferrite+Bainite |

### Physical Properties, Non Destructive Test & Other Test

| Parameters | Internal Soundness ASTM E381 | Step Down Test IS 4075 | Surface Inspection IS 13352 | Magnetic Particle Inspection ASTM E1444 | Ultrasonic Test ASTM A388 | Upsetting Test IS 10167 |
|---|---|---|---|---|---|---|
| Spec. | - | - | - | - | - | - |
| Achieved | Better than C2,R1,S1 | Satisfactory | Satisfactory | 100% Done Ok | 100% Done Ok | - |

| Parameters | Dimensional Tolerance | Spark Test | X-RF | Gas Analysis Report Test method-Leco | | |
|---|---|---|---|---|---|---|
| | | | | $O_2$ (ppm) | $N_2$ (ppm) | $H_2$ (ppm) |
| Spec. | - | - | - | | | |
| Achieved | As per IS 3739 Grade 1 | 100% Done Ok | 100% Done Ok | 10.00 | 76.0 | 0.53 |

Remarks :

**This material comply with RoHS (Pb, Cd, Hg, Cr6+) and REACH permissible limits. 3TG (Tantalum, Tin, Tungsten and Gold) not added intentionally in the product.**
**Material is free from radioactive contamination**

| Prepared By: | Approved By: | Pre-Dispatch Inspection: |
|---|---|---|
| PRIYARANJAN RAI | | |

In case of any **Test certificate** Issue, please inform Dinesh Singla at **quality04@arorairon.com**, Mobile No.**+919914538700**

**MASSUCCO INDUSTRIE SpA**
STAMPAGGIO A CALDO ACCIAI
LAMINAZIONE CIRCOLARE
10081 CASTELLAMONTE(TO) - LOC. PIOVA 98 - TORINO - ITALY
QUALITY ASSURANCE DEPT.
tel. +39 0124 518555 - fax +39 0124 514720 - mail: quality@massucco.it

DECLARATION:
Dichiarazione di conformità secondo EN10204-2004 - attestato 3.1.
Il lotto dettagliato è stato fabbricato/ispezionato/testato e, se non diversamente dichiarato conforme a tutti i disegni,specifiche e requisiti d'ordine applicabili.
Declaration of Conformity according to EN10204-2004 - certificate type 3.1
Supplies detailed have been manufactured/inspected/tested and, unless otherwise stated, conform in all respects to the relevant specifications, drawings and purchase order requirements.

| | |
|---|---|
| **Cliente - Customer**<br>**Stabilimento - Plant** | **DANA MOTION SYSTEMS ITALIA SRL**<br>**HUB VERONA C/TO INTRA LOGISTIC** |
| **Ordine di acquisto**<br>**Purchase Order-Bestellungnumber** | Nr. 4500640225 del 20.03.2024 |
| **n° di disegno**<br>**part Number** | 9029443- GEAR EM1010/6F/../..<br>9029443 rev D del 11/07/2019 --- 9029443 |
| **Numero colata materiale**<br>**Material Heat nr.** | 69209T080 |
| **N° Rintracciabilità - Commessa**<br>**Traceability ID Massucco** | 005400017855 |
| **Quantita' lotto**<br>**Batch Quantity** | 1.800,000 |
| **Documento di consegna**<br>**Delivery document** | 800054294 |

| | FATTO<br>DONE | REGISTRATO<br>RECORDED | INVIATO<br>SUBMITTED | NOTE<br>NOTES |
|---|---|---|---|---|
| | | | | |
| **Material certificate** | **YES** | **YES** | **YES** | |
| | | | | |
| **Forging Temperature check** | **YES** | **YES** | **NOT** | |
| | | | | |
| **Dimension Control** | **YES** | **YES** | **NOT** | |
| | | | | |
| **Heat treatment & check** | **YES** | **YES** | **YES** | |
| | | | | |
| | | | | |
| | | | | |

**Other notes:**

Date

**15.04.2024**

Signature Quality Assurance

**Firma digitale personale autorizzata da password**
**Personal digital signature authorized by password**

MASSUCCO INDUSTRIE ASSICURAZIONE QUALITA'

**COGNOR S.A. ODDZIAŁ HSJ W STALOWEJ WOLI**
Adres: str. E. Kwiatkowskiego 1
37-450 Stalowa Wola POLAND
NIP 118-12-34-296

ORIGINAL

**ROLLED PRODUCTS**

# INSPECTION CERTIFICATE No 90800/23/D

**PN-EN 10204:2006/3.1**

maurizio.perono@massucco.it

Customer: MASSUCCO INDUSTRIE S.P.A
10081 CASTELLAMONTE ul. LOCALITR PIOVA 98

Delivery address: Localita Goritti n. 15 10082 - CUORGNE IT - WŁOCHY

| Customer order No: | Order No: | Receipt Report No: |
|---|---|---|
| 4800002969 **4800002969** | **263.1110.280.23** | |

| Description: | Dimension: | Steel type: | Heat No: | Pieces: | Weight |
|---|---|---|---|---|---|
| Hot rolled steel bars<br>**Delivery condition: as rolled**<br><br>EN ISO 683-3:2018 / B21 [29.09.2012] / SP 046-03 Ver. 05 / [07.03.2014] / EN 10060:2003 / | ∅ 80<br>(+1.00;-1.00)<br><br>Length:<br>exact: 6 m<br>Toler.: -0/+200mm<br>Reduction ratio 17.2 | **20MnCr5 MOD +U** | **69209**<br>EAF + LF + VD + CC 270x320<br><br>Radio -isotopic activity is no than max 0,1 Bq/g | 140 | 34 250 |

**1. Chemical Analysis:**

| Heat No | C | Mn | Si | P | S | Cr | Ni | Cu | Mo | V | Al |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 69209 | 0.2100 | 1.2800 | 0.2400 | 0.0160 | 0.0280 | 1.2300 | 0.1600 | 0.2300 | 0.0600 | 0.0050 | 0.0260 |
| | Ti | N2 | Nb | Sn | Ca | H2 ppm | O2 ppm | | | | |
| | 0.0030 | 0.0074 | 0.0040 | 0.0110 | 0.0018 | 0.9800 | 8.0000 | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

**2. Mechanical properties on testing sample:**

| Test No | Heat treatment test | [MPa] | | Rm [MPa] | [%] | Z [%] | Impact | Heat treatment tests | Hardness |
|---|---|---|---|---|---|---|---|---|---|
| **6/3** | **quenched+tempe** | **ReH** | **1252** | **1421** | **A5 15.0** | **54.5** | **KV+25°C[J]37/38/31** | **Q-860°C oil**<br>**T-200°C air** | delivery cond. HB=187-187 |

Samples 6/3 made from the dimension dia 11 mm.

**3. Other tests**

Macroetch test:

Microinlusions: DIN 50602 K4(S+O) = 5,3 K4(S) = 5,3 K4(O) = 0

Grain size:
ISO 643 6-7 method MQE

Hardenability SP 046-03

| mm | 5 | 7 | 9 | 11 | 25 |
|---|---|---|---|---|---|
| HRC | 47.0 | 45.5 | 42.5 | 41.5 | 34.5 |

N - 920 ℃ air
Q - 900 ℃ water

DI = 3,576 inch.
100% ultrasonic test was carried out acc. to: EN10308Tab.1type 1aTab2, 3 class -satisfactory results.The surface material checked using the thermovision flaw detector.
Material does not show residual magnetism.Material is 'Fully Killed'.Spectrotest - 100%.
Surface defects acc. to: PN-EN 10221 class B.

| | | |
|---|---|---|
| Surface and dimensions tested at 100%.<br>MIXMATCH TEST 100% | Material was carried out acc. to Technical Specifications and order confirmation | Material marked: Heat No, grade, Quality Control KJ |

Material was released on the base of inspection and tests carried out. The product in accordance with European Directive No 2000/53/WE.

| Quality Control | The quality manager | Expert stamp | |
|---|---|---|---|
| Krystyna Dul | COGNOR SPÓŁKA AKCYJNA ODDZIAŁ HSJ W STALOWEJ WOLI DYREKTOR ds. jakości Przemysław Winiarski | Assicurazione Qualità Quality Department D. ANSINELLO MASSUCCO 644 25/05/2023 | Stalowa Wola 2023.05.25 |

**T.T.N. PIEMONTE S.r.l.**
Via Europa, 1
10081 CASTELLAMONTE (TO)
Tel: 0039-0124.423105 Fax: 0039-0124.510178
E-mail: info@ttnpiemonte.it

Informazione ed assistenza tecnica e commerciale:
Tel: 0039-0331463711
CAP. SOC. € 50.000
Registro Imprese Milano Nro. 05425320966
R.E.A. Milano Nro. 1820662
Cod. Fisc. e P. IVA 05425320966
Sede legale: NERVIANO (MI)

T.T.N. PIEMONTE
GRUPPO T.T.N.
www.ttnspa.it

BONIFICHE - NORMALIZZAZIONI
RICOTTURE - DISTENSIONI

NITRURAZIONI
CEMENTAZIONI

TEMPRA AD INDUZIONE

RIVESTIMENTI PVD, CVD

LABORATORIO
METALLOGRAFICO

**CERTIFICAZIONE IGQ N° 2L02**

Certificato conforme alla normativa
UNI EN 10204 - 3.1

* 1 5 6 6 2 0 *

Questo codice consente di risalire
ai diagrammi tempo temperatura
dei seguenti particolari.

# CERTIFICATO DI QUALITÀ E CONFORMITÀ

**Certificato N°: 463**

**Cliente: 008007 - MASSUCCO INDUSTRIE S.P.A.**
**LOC. PIOVA 98**
**10081 CASTELLAMONTE TO**

Descrizione particolari Vs.D.d.t. n. 51592 - 02/01/2024

N° 2114 Kg 7927 CORONA DENTATA TB383B SEC SP022-09 DOG 73261990 PART 57786 COMM 005400017855 - Disegno: 9029443-S - Colata: 69209 TJ 41.5/34.5 - Ns. Comm.:156620

Tipo di materiale: 20MC5

Trattamento richiesto: **Bonifica**

## Tempra

| N. Car. | Forno | 1° Preriscaldo | 2° Preriscaldo | Temp. Austenitiz. | Raffreddamento |
|---|---|---|---|---|---|
| 29 | SOTTRI N.5 | 680 | 0 | 900 | Acqua |

## Rinvenimento

| N. Car. | Forno | | Rinvenimento °C | Raffreddamento |
|---|---|---|---|---|
| 30 | SOTTRI N.5 | 0 | 565 | aria calma |

| | VALORI RICHIESTI | VALORI OTTENUTI |
|---|---|---|
| Durezza richiesta: | 780/950 mpa | min: 813 max: 880 mpa |
| Durezza Piena Tempra | | 0 mpa |
| Durezza a cuore | / | / |
| Sabbiatura | ☑ | ☑ |
| Raddrizzatura | ☐ | ☐ |
| Micrografie | ☐ | ☐ |

Castellamonte, 24/01/2024
T.T.N. PIEMONTE s.r.l.
Controllo Qualità

Assicurazione Qualità
Quality Department
F. BONATTO
MASSUCCO

**2024-02-01**

**LABORATORIO METALLOGRAFICO T.T.N. PIEMONTE**

**T.T.N. PIEMONTE S.r.l.**
Via Europa, 1
10081 CASTELLAMONTE (TO)
Tel: 0039-0124.423105 Fax: 0039-0124.510178
E-mail: info@ttnpiemonte.it

Informazione ed assistenza tecnica e commerciale:
Tel: 0039-0331463711
CAP. SOC. € 50.000
Registro Imprese Milano Nro. 05425320966
R.E.A. Milano Nro. 1820662
Cod. Fisc. e P. IVA 05425320966
Sede legale: NERVIANO (MI)

T.T.N. PIEMONTE
GRUPPO T.T.N.
www.ttnspa.it

**CERTIFICAZIONE IGQ N° 2L02**

BONIFICHE - NORMALIZZAZIONI
RICOTTURE - DISTENSIONI

NITRURAZIONI
CEMENTAZIONI

TEMPRA AD INDUZIONE

RIVESTIMENTI PVD, CVD

LABORATORIO
METALLOGRAFICO

Certificato conforme alla normativa
UNI EN 10204 - 3.1

* 1 5 6 6 2 0 *

Conservate con cura questo codice !! Vi consentirà in ogni momento di conoscere il ciclo tecnico subito dai Vostri pezzi.

# CERTIFICATO DI QUALITÀ E CONFORMITÀ

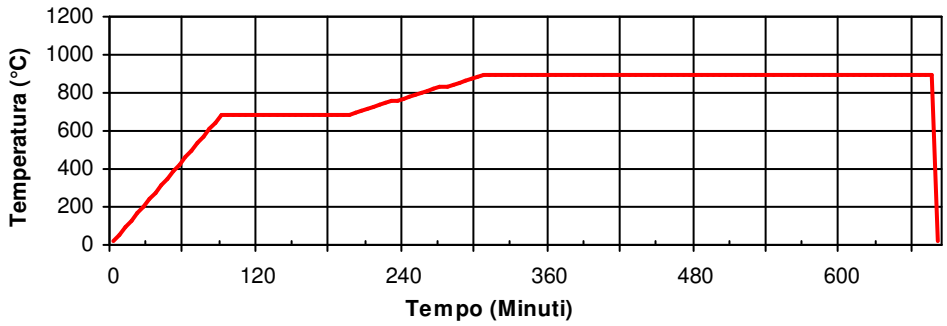
**Certificato N°: 463**

**Cliente: 008007 - MASSUCCO INDUSTRIE S.P.A.**
**LOC. PIOVA 98**
**10081 CASTELLAMONTE TO**

Descrizione particolari Vs.D.d.t. n. 51592 - 02/01/2024

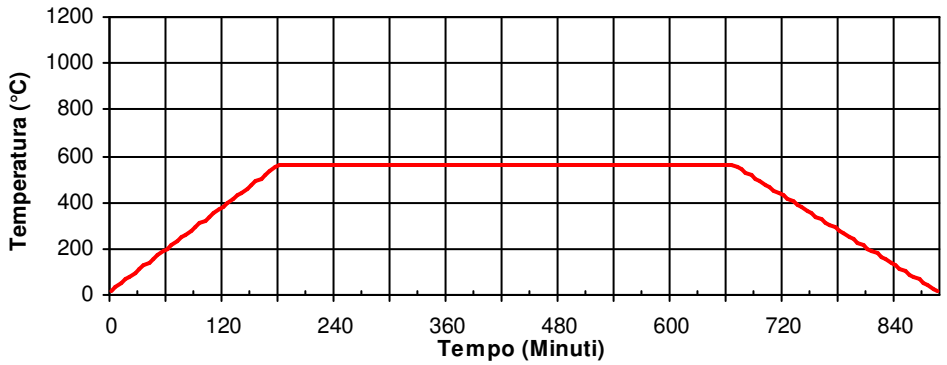
N° 2114 Kg 7927 CORONA DENTATA TB383B SEC SP022-09 DOG 73261990 PART 57786 COMM 005400017855 - Disegno: 9029443-S - Colata: 69209 TJ 41.5/34.5 - Ns. Comm.:156620

Tipo di materiale: 20MC5 Durezza richiesta: 780/950 mpa




**Tempra**

| Andamento | Ore | °C |
|---|---|---|
| Salita | 01:30 | 680 |
| Permanenza | 01:30 | 680 |
| Salita | 02:00 | 900 |
| Permanenza | 06:00 | 900 |




**1° Rinvenimento**

| Andamento | Ore | °C |
|---|---|---|
| Salita | 03:00 | 565 |
| Permanenza | 08:00 | 565 |

Assicurazione Qualità
Quality Department
F. BONATTO

**2024-02-01**

T.T.N. PIEMONTE s.r.l.
Controllo Qualità

**LABORATORIO METALLOGRAFICO T.T.N. PIEMONTE**

**T.T.N. PIEMONTE S.r.l.**
Via Europa, 1
10081 CASTELLAMONTE (TO)
Tel: 0039-0124.423105 Fax: 0039-0124.510178
E-mail: info@ttnpiemonte.it

Technical and commercial information and assistance:
Tel: 0039-0331463711
SPEC. CAPITAL € 50.000
Milan Company Register No. 05425320966
Milan R.E.A. No. 1820662
Tax Code and VAT No. 05425320966
Registered Office: NERVIANO (MI)

T.T.N. PIEMONTE
GRUPPO T.T.N.
www.ttnspa.it

HARDENING AND TEMPERING - NORMALISATION
ANNEALING - DESTRESSING
NITRIDING
CASE HARDENING
INDUCTION HARDENED
PVD, CVD COATING
METALLOGRAPHIC LABORATORY

**IGQ CERTIFICATION No. 2L02**

# QUALITY AND CONFORMITY CERTIFICATE

Certified compliant with the standards
UNI EN 10204 - 3.1

* 1 5 6 6 2 0 *

This code can be used to trace the temperature time diagrams of the following parts.

**Certificate No.:** **463**

**Client:** **008007 - MASSUCCO INDUSTRIE S.P.A.**
**LOC. PIOVA 98**
**10081 CASTELLAMONTE TO**

Part description Your delivery note no. 51592 - 02/01/2024

2114 kg 7927 RING GEAR TB383B TO SP022-09 CUST. 73261990 BATCH 57786 JOB 005400017855 - Drawing: 9029443-S -

Casting: 69209 TJ 41.5/34.5 Our Job: :156620

Material type: 20MC5

Required treatment: **Hardening and Tempering**

## Hardening

| Load No. | Furnace | 1st Preheating | 2nd Preheating | Austenitiz. Temp. | Cooling |
|---|---|---|---|---|---|
| 29 | SOTTRI N.5 | 680 | 0 | 900 | Water |

## Tempering

| Load No. | Furnace | | Tempering °C | Cooling |
|---|---|---|---|---|
| 30 | SOTTRI N.5 | 0 | 565 | still air |

| | VALUES REQUIRED | VALUES OBTAINED |
|---|---|---|
| Required hardness: | 780/950 mpa | min: 813 max: 880 mpa |
| Hardened Solid Hardness | | 0 mpa |
| Core Hardness | / | / |
| Sandblasting | ☑ | ☑ |
| Straightening | ☐ | ☐ |
| Micrography | ☐ | ☐ |

Castellamonte, 24/01/2024
T.T.N. PIEMONTE s.r.l.
Quality Control

Assicurazione Qualità
Quality Department
F. BONATTO
MASSUCCO Federica Bonatto

2024-02-01

**METALLOGRAPHIC LABORATORY T.T.N. PIEMONTE**

**T.T.N. PIEMONTE S.r.l.**
Via Europa, 1
10081 CASTELLAMONTE (TO)
Tel: 0039-0124.423105 Fax: 0039-0124.510178
E-mail: info@ttnpiemonte.it

Technical and commercial information and assistance:
Tel: 0039-0331463711
SPEC. CAPITAL € 50.000
Milan Company Register No. 05425320966
Milan R.E.A. No. 1820662
Tax Code and VAT No. 05425320966
Registered Office: NERVIANO (MI)

T.T.N. PIEMONTE
GRUPPO T.T.N.
www.ttnspa.it
**IGQ CERTIFICATION No. 2L02**

HARDENING AND TEMPERING - NORMALISATION
ANNEALING - DESTRESSING
NITRIDING
CASE HARDENING
INDUCTION HARDENED
PVD, CVD COATING
METALLOGRAPHIC LABORATORY

Certified compliant with the standards
UNI EN 10204 - 3.1

* 1 5 6 6 2 0 *

Keep this code carefully!! It will allow you to identify the technical cycle of your parts at any time.

# QUALITY AND CONFORMITY CERTIFICATE

**Certificate No.:** **463**

**Client:** **008007 - MASSUCCO INDUSTRIE S.P.A.**
**LOC. PIOVA 98**
**10081 CASTELLAMONTE TO**

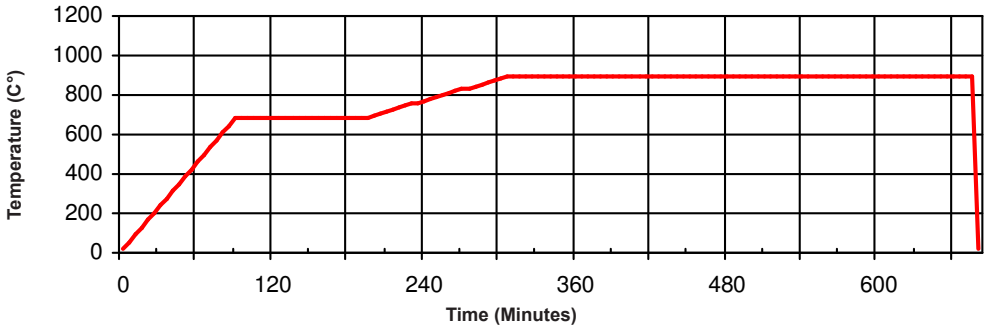
Part description Your delivery note no. 51592 - 02/01/2024

2114 kg 7927 RING GEAR TB383B TO SP022-09 CUST. 73261990 BATCH 57786 JOB 005400017855 - Drawing: 9029443-S -

Casting: 69209 TJ 41.5/34.5 - Our Job: 156620

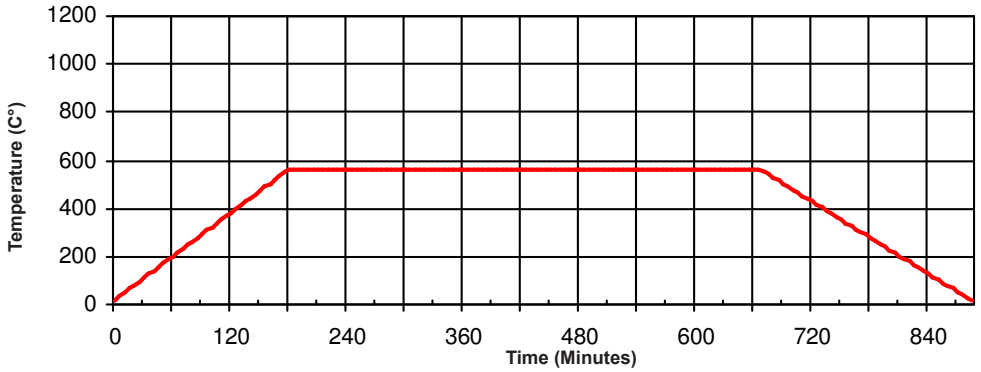
Material type: 20MC5

Required hardness: 780/950 mpa




**Hardening**

| Trend | Hours | °C |
|---|---|---|
| Ramp up | 01:30 | 680 |
| Hold | 01:30 | 680 |
| Ramp up | 02:00 | 900 |
| Hold | 06:00 | 900 |




**1st Tempering**

| Trend | Hours | °C |
|---|---|---|
| Ramp up | 03:00 | 565 |
| Hold | 08:00 | 565 |

Assicurazione Qualità
Quality Department
F. BONATTO
MASSUCCO INDUSTRIE

01/02/2024

T.T.N. PIEMONTE s.r.l.
Quality Control

| DANA | Check sheet<br>F0501 - R04.02 - 12.11.2012 | Inspection lot<br>030001085372 | Quantity<br>960 | Order Type/Number/Position<br>ZWO0 11381214 0080 | Work Center<br>0030 |
|---|---|---|---|---|---|

| PART NUMBER | REVISION | OPERATION | OPERATION DESCRIPTION |
|---|---|---|---|
| 32000538300 | E | 0080 | bioteco furnace for nitriding |

| ID | CHARACTERISTIC | METHOD | SAMPLING | UM | TARGET | MIN_MAX | #1 | #2 | #3 | #4 | #5 | #6 | #7 | #8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | MT3009<br>VICKERS HARDNESS HV5 | DUR001<br>DUROMETER | ZF0004<br>4 Pieces | HV | | 740,000<br>620,000 | 766 | 766 | 766 | 766 | | | | |
| 30 | MT3010<br>VICKERS HARDNESS HV10 | DUR001<br>DUROMETER | ZF0004<br>4 Pieces | HV | | 690,00<br>590,00 | 724 | 724 | 724 | 724 | | | | |
| 40 | MT3011<br>VICKERS HARDNESS HV30 | DUR001<br>DUROMETER | ZF0004<br>4 Pieces | HV | | 600,00<br>570,00 | 618 | 618 | 618 | 618 | | | | |
| 50 | MT0100<br>MATERIAL TYPE | VIS002<br>VISUAL INSPECTION | ZF0001<br>1 Piece | | | | B21-20MnCr5 | | | | | | | |
| 60 | MT4101<br>TEST SPECIMEN TYPE USED (SP022-02) | PRO001<br>TEST SPECIMEN ACCORDING TO SP022-2 | ZF0001<br>1 Piece | | | | | | | | | | | |
| 70 | MT5100<br>PROGRAM CODE USED | VIS002<br>VISUAL INSPECTION | ZF0001<br>1 Piece | | | | | | | | | | | |
| 80 | MT5101<br>LOAD NUMBER | VIS002<br>VISUAL INSPECTION | ZF0001<br>1 Piece | | | | | | | | | | | |
| 90 | DOD001<br>OUTSIDE DIAMETER Ø151,5 A | CAL001<br>CALIB.ACM.O R | ZF0008<br>8 Pieces | mm | | 151,500<br>151,460 | 151,46 | 151,46 | 151,46 | 151,46 | 151,47 | 151,47 | 151,46 | 151,46 |
| 100 | DOD001<br>OUTSIDE DIAMETER Ø151,5 B | CAL001<br>CALIB.ACM.O R | ZF0008<br>8 Pieces | mm | | 151,500<br>151,460 | 151,47 | 151,46 | 151,46 | 151,47 | 151,46 | 151,47 | 151,46 | 151,47 |
| 110 | VC3010<br>VISUAL TEST: AFTER HEAT TREATMENT | VIS001<br>VISUAL INSPECTION ACCORDING TO WI0519 | ZF0004<br>4 Pieces | | | | | | | | | | | |
| 120 | TX0038<br>NON-CONFORMITY OR RERA TEST | VIS002<br>VISUAL INSPECTION | ZF0004<br>4 Pieces | | | | | | | | | | | |

| Date | Time | Signature | Remarks |
|---|---|---|---|
| 28.05.2024 | 11:17:50 | DVALCAV001 | |

**MASSUCCO INDUSTRIE SpA**
STAMPAGGIO A CALDO ACCIAI
LAMINAZIONE CIRCOLARE
10081 CASTELLAMONTE(TO) - LOC. PIOVA 98 - TORINO - ITALY
QUALITY ASSURANCE DEPT.
tel. +39 0124 518555 - fax +39 0124 514720 - mail: quality@massucco.it

DECLARATION:
Dichiarazione di conformità secondo EN10204-2004 - attestato 3.1.
Il lotto dettagliato è stato fabbricato/ispezionato/testato e, se non diversamente dichiarato conforme a tutti i disegni,specifiche e requisiti d'ordine applicabili.
Declaration of Conformity according to EN10204-2004 - certificate type 3.1
Supplies detailed have been manufactured/inspected/tested and, unless otherwise stated, conform in all respects to the relevant specifications, drawings and purchase order requirements.

| | |
|---|---|
| **Cliente - Customer**<br>**Stabilimento - Plant** | **DANA MOTION SYSTEMS ITALIA SRL**<br>**HUB VERONA C/TO INTRA LOGISTIC** |
| **Ordine di acquisto**<br>**Purchase Order-Bestellungnumber** | Nr. 4500640225 del 20.03.2024 |
| **n° di disegno**<br>**part Number** | 32001000088<br>32001000088 rev. E --- 32001000088 |
| **Numero colata materiale**<br>**Material Heat nr.** | 69208T100 |
| **N° Rintracciabilità - Commessa**<br>**Traceability ID Massucco** | 005400017854 |
| **Quantita' lotto**<br>**Batch Quantity** | 2.112,000 |
| **Documento di consegna**<br>**Delivery document** | 800054295 |

| | FATTO<br>DONE | REGISTRATO<br>RECORDED | INVIATO<br>SUBMITTED | NOTE<br>NOTES |
|---|---|---|---|---|
| | | | | |
| **Material certificate** | **YES** | **YES** | **YES** | |
| | | | | |
| **Forging Temperature check** | **YES** | **YES** | **NOT** | |
| | | | | |
| **Dimension Control** | **YES** | **YES** | **NOT** | |
| | | | | |
| **Heat treatment & check** | **YES** | **YES** | **YES** | |
| | | | | |
| | | | | |
| | | | | |

**Other notes:**

Date

**15.04.2024**

Signature Quality Assurance

**Firma digitale personale autorizzata da password**
**Personal digital signature authorized by password**

MASSUCCO INDUSTRIE ASSICURAZIONE QUALITA'

**COGNOR S.A. ODDZIAŁ HSJ W STALOWEJ WOLI**
Adres: str. E. Kwiatkowskiego 1
37-450 Stalowa Wola POLAND
NIP 118-12-34-296

ORIGINAL

**ROLLED PRODUCTS**

# INSPECTION CERTIFICATE No 90781/23/D

**PN-EN 10204:2006/3.1**

maurizio.perono@massucco.it

Customer: MASSUCCO INDUSTRIE S.P.A
10081 CASTELLAMONTE ul. LOCALITR PIOVA 98

Delivery address: Localita Goritti n. 15 10082 - CUORGNE IT - WŁOCHY

| Customer order No: | Order No: | Receipt Report No: |
|---|---|---|
| 4200007497 **4200007497** | **263.1110.030.23** | |

| Description: | Dimension: | Steel type: | Heat No: | Pieces: | Weight |
|---|---|---|---|---|---|
| Hot rolled steel bars<br>**Delivery condition: as rolled**<br><br>EN ISO 683-3:2018 / B21 [29.09.2012] / SP 046-03 Ver. 05 / [07.03.2014] / EN 10060:2003 / | ∅ 100<br>(+1.30;-1.30)<br><br>Length:<br>exact: 6 m<br>Toler.: -0/+200mm<br>Reduction ratio 11.0 | **20MNCR5 MOD +U** | **69208**<br>EAF + LF + VD + CC 270x320<br><br>Radio -isotopic activity is no than max 0,1 Bq/g | 36 | 13 505 |

**1. Chemical Analysis:**

| Heat No | C | Mn | Si | P | S | Cr | Ni | Cu | Mo | V | Al |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 69208 | 0.2100 | 1.2700 | 0.2300 | 0.0160 | 0.0290 | 1.2700 | 0.1500 | 0.2800 | 0.0600 | 0.0060 | 0.0260 |
| | Ti | N2 | Nb | Sn | Ca | H2 ppm | O2 oom | | | | |
| | 0.0030 | 0.0077 | 0.0040 | 0.0120 | 0.0015 | 0.9400 | 10.0000 | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

**2. Mechanical properties on testing sample:**

| Test No | Heat treatment test | [MPa] | | Rm [MPa] | [%] | Z [%] | Impact | Heat treatment tests | Hardness |
|---|---|---|---|---|---|---|---|---|---|
| 4/3 | quenched+tempe | ReH | 1322 | 1511 | A5 11.8 | 51.0 | KV+25°C[J]35/28/31 | Q-870°C oil<br>T-190°C air | delivery cond. HB=241-241 |

Samples 4/3 made from the dimension dia 11 mm.

**3. Other tests**

Macroetch test:

Microinlusions: DIN 50602 K4(S+O) = 5,3 K4(S) = 5,3 K4(O) = 0

Grain size:
ISO 643 6-7 method MQE

Hardenability SP 046-03

| mm | 5 | 7 | 9 | 11 | 25 |
|---|---|---|---|---|---|
| HRC | 46.0 | 44.0 | 42.0 | 39.5 | 32.5 |

N - 920 ℃ air
Q - 900 ℃ water

DI = 3,658 inch.
100% ultrasonic test was carried out acc. to: EN10308Tab.1type 1aTab2, 3 class -satisfactory results.The surface material checked using the thermovision flaw detector.
Material does not show residual magnetism.Material is 'Fully Killed'.Spectrotest - 100%.
Surface defects acc. to: PN-EN 10221 class B.

| | | |
|---|---|---|
| Surface and dimensions tested at 100%.<br>MIXMATCH TEST 100% | Material was carried out acc. to Technical Specifications and order confirmation | Material marked: Heat No, grade, Quality Control KJ |

Material was released on the base of inspection and tests carried out. The product in accordance with European Directive No 2000/53/WE.

| Quality Control | The quality manager | Expert stamp | |
|---|---|---|---|
| Krystyna Dul | COGNOR SPÓŁKA AKCYJNA ODDZIAŁ HSJ W STALOWEJ WOLI DYREKTOR ds. jakości Przemysław Winiarski | Assicurazione Qualità Quality Department D. ANSINELLO 644 15/05/2023 | Stalowa Wola 2023.05.15 |

**T.T.N. PIEMONTE S.r.l.**
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# CERTIFICATO DI QUALITÀ E CONFORMITÀ

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Questo codice consente di risalire
ai diagrammi tempo temperatura
dei seguenti particolari.

**Certificato N°: 310**

**Cliente:** **008007 - MASSUCCO INDUSTRIE S.P.A.**
**LOC. PIOVA 98**
**10081 CASTELLAMONTE TO**

Descrizione particolari Vs.D.d.t. n. 51371 - 18/12/2023

N° 1043 Kg 8291 BLANCK RING GEAR EM1020 SP-022-09 DOG 73261990 PART 57667 COMM 005400017854 - Disegno: 32001022699-S - Colata: 69208 TJ 39.5/32 - Ns. Comm.:156465

Tipo di materiale: 20MN5

Trattamento richiesto: **Bonifica**

## Tempra

| N. Car. | Forno | 1° Preriscaldo | 2° Preriscaldo | Temp. Austenitiz. | Raffreddamento |
|---|---|---|---|---|---|
| 15 | SOTTRI N.5 | 680 | 0 | 900 | Acqua |

## Rinvenimento

| N. Car. | Forno | | Rinvenimento °C | Raffreddamento |
|---|---|---|---|---|
| 16 | SOTTRI N.5 | 0 | 565 | aria calma |

| | VALORI RICHIESTI | VALORI OTTENUTI |
|---|---|---|
| Durezza richiesta: | 780/950 mpa | min: 833 max: 906 mpa |
| Durezza Piena Tempra | | 0 mpa |
| Durezza a cuore | / | / |
| Sabbiatura | ☑ | ☑ |
| Raddrizzatura | ☐ | ☐ |
| Micrografie | ☐ | ☐ |

Castellamonte, 17/01/2024
T.T.N. PIEMONTE s.r.l.
Controllo Qualità

Assicurazione Qualità
Quality Department
F. BONATTO
MASSUCCO

26.01.2024

**LABORATORIO METALLOGRAFICO T.T.N. PIEMONTE**

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E-mail: info@ttnpiemonte.it

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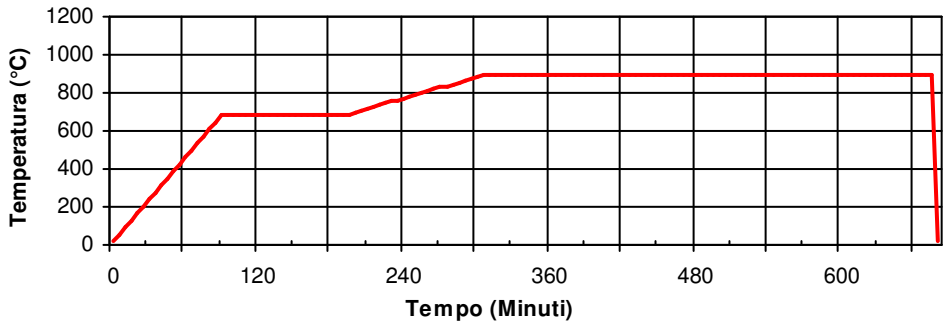
**Certificato N°: 310**

**Cliente: 008007 - MASSUCCO INDUSTRIE S.P.A.**
**LOC. PIOVA 98**
**10081 CASTELLAMONTE TO**

Descrizione particolari Vs.D.d.t. n. 51371 - 18/12/2023

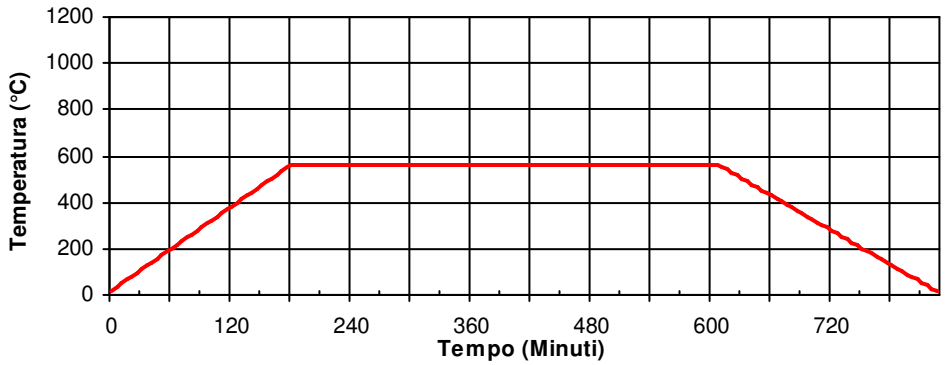
N° 1043 Kg 8291 BLANCK RING GEAR EM1020 SP-022-09 DOG 73261990 PART 57667 COMM 005400017854 - Disegno: 32001022699-S - Colata: 69208 TJ 39.5/32 - Ns. Comm.:156465

Tipo di materiale: 20MN5 Durezza richiesta: 780/950 mpa




**Tempra**

| Andamento | Ore | °C |
|---|---|---|
| Salita | 01:30 | 680 |
| Permanenza | 01:30 | 680 |
| Salita | 02:00 | 900 |
| Permanenza | 06:00 | 900 |




**1° Rinvenimento**

| Andamento | Ore | °C |
|---|---|---|
| Salita | 03:00 | 565 |
| Permanenza | 07:00 | 565 |

Assicurazione Qualità
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Questo codice consente di risalire
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# CERTIFICATO DI QUALITÀ E CONFORMITÀ

**Certificato N°: 60**

**Cliente:** **008007 - MASSUCCO INDUSTRIE S.P.A.**
**LOC. PIOVA 98**
**10081 CASTELLAMONTE TO**

Descrizione particolari Vs.D.d.t. n. 51354 - 15/12/2023

N° 1184 Kg 9412 BLANK RING GEAR EM1020 TB383BD SP022-09 DOC 73261990 PART 57667 COMM 005400017854 - Disegno: 32001022699-S - Colata: 69208 TJ 39.5/32.5 - Ns. Comm.:156347

Tipo di materiale: 20MC5 Trattamento richiesto: **Bonifica**

## Tempra

| N. Car. | Forno | 1° Preriscaldo | 2° Preriscaldo | Temp. Austenitiz. | Raffreddamento |
|---|---|---|---|---|---|
| 2 | SOTTRI N.5 | 680 | 0 | 900 | Acqua |

## Rinvenimento

| N. Car. | Forno | | Rinvenimento °C | Raffreddamento |
|---|---|---|---|---|
| 3 | SOTTRI N.5 | 0 | 565 | aria calma |

| | VALORI RICHIESTI | VALORI OTTENUTI |
|---|---|---|
| Durezza richiesta: | 780/950 mpa | min: 813 max: 906 mpa |
| Durezza Piena Tempra | | 0 mpa |
| Durezza a cuore | / | / |
| Sabbiatura | ☑ | ☐ |
| Raddrizzatura | ☐ | ☐ |
| Micrografie | ☐ | ☐ |

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11-01-2024

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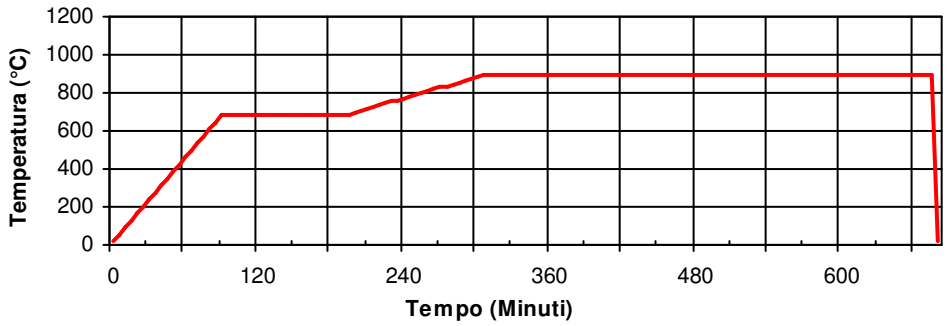
**Certificato N°: 60**

**Cliente:** **008007 - MASSUCCO INDUSTRIE S.P.A.**
**LOC. PIOVA 98**
**10081 CASTELLAMONTE TO**

Descrizione particolari Vs.D.d.t. n. 51354 - 15/12/2023

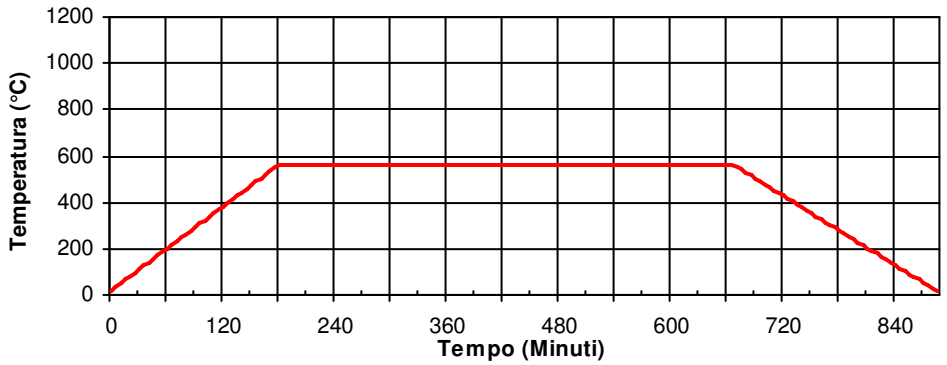
N° 1184 Kg 9412 BLANK RING GEAR EM1020 TB383BD SP022-09 DOC 73261990 PART 57667 COMM 005400017854 - Disegno: 32001022699-S - Colata: 69208 TJ 39.5/32.5 - Ns. Comm.:156347

Tipo di materiale: 20MC5 Durezza richiesta: 780/950 mpa




**Tempra**

| Andamento | Ore | °C |
|---|---|---|
| Salita | 01:30 | 680 |
| Permanenza | 01:30 | 680 |
| Salita | 02:00 | 900 |
| Permanenza | 06:00 | 900 |




**1° Rinvenimento**

| Andamento | Ore | °C |
|---|---|---|
| Salita | 03:00 | 565 |
| Permanenza | 08:00 | 565 |

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Milan Company Register No. 05425320966
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# CE QUALITY AND CONFORMITY CERTIFICATE

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**Certificate No.:** **310**

**Client:** **008007 - MASSUCCO INDUSTRIE S.P.A.**
**LOC. PIOVA 98**
**10081 CASTELLAMONTE TO**

Part description Your delivery note no. 51371 - 18/12/2023

1043 kg 8291 BLANK RING GEAR EM1020 SP-022-09 CUST. 73261990 BATCH 57667 JOB 005400017854 - Drawing: 32001022699-S -
Casting: 69208 TJ 39.5/32 - Our Job: 156465

Material type: 20MN5

Required treatment: **Hardening and Tempering**

## Hardening

| Load No. | Furnace | 1st Preheating | 2nd Preheating | Austenitiz. Temp. | Cooling |
|---|---|---|---|---|---|
| 15 | SOTTRI N.5 | 680 | 0 | 900 | Water |

## Tempering

| Load No. | Furnace | | Tempering °C | Cooling |
|---|---|---|---|---|
| 16 | SOTTRI N.5 | 0 | 565 | still air |

| | VALUES REQUIRED | VALUES OBTAINED |
|---|---|---|
| Required hardness: | 780/950 mpa | min: 833 max: 906 mpa |
| Hardened Solid Hardness | | 0 mpa |
| Core Hardness | / | / |
| Sandblasting | ☑ | ☑ |
| Straightening | ☐ | ☐ |
| Micrography | ☐ | ☐ |

Castellamonte, 17/01/2024
T.T.N. PIEMONTE s.r.l.
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26.01.2024

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# QUALITY AND CONFORMITY CERTIFICATE

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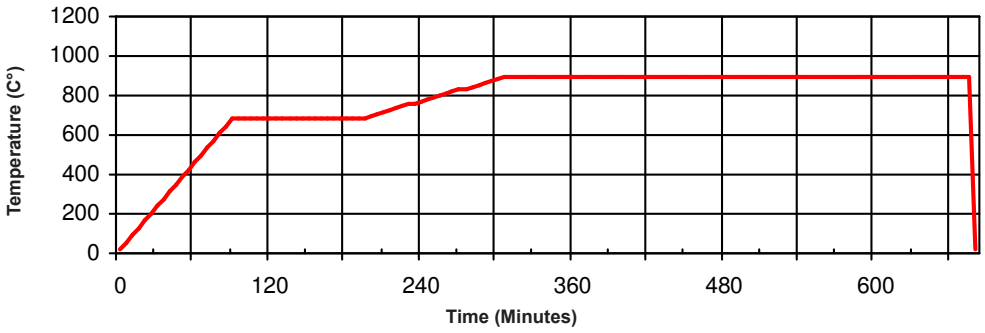
**Client:** **008007 - MASSUCCO INDUSTRIE S.P.A.**
**LOC. PIOVA 98**
**10081 CASTELLAMONTE TO**

Part description Your delivery note no. 51371 - 18/12/2023

1043 kg 8291 BLANK RING GEAR EM1020 SP-022-09 CUST. 73261990 BATCH 57667 JOB 005400017854 - Drawing: 32001022699-S -

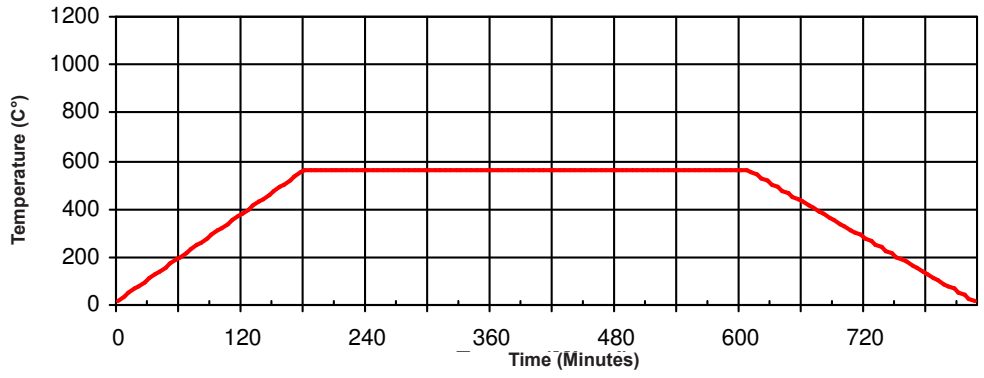
Casting: 69208 TJ 39.5/32 - Our Job: 156465

Material type: 20MN5 Required hardness: 780/950 mpa




**Hardening**

| Trend | Hours | °C |
|---|---|---|
| Ramp up | 01:30 | 680 |
| Hold | 01:30 | 680 |
| Ramp up | 02:00 | 900 |
| Hold | 06:00 | 900 |




**1st Tempering**

| Trend | Hours | °C |
|---|---|---|
| Ramp up | 03:00 | 565 |
| Hold | 07:00 | 565 |

Assicurazione Qualità
Quality Department
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MASSUCCO Fabrizio Bonatto

26/01/2024

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**IGQ CERTIFICATION No. 2L02**

# QUALITY AND CONFORMITY CERTIFICATE

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*156347*

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**Certificate No.:** **60**

**Client:** **008007 - MASSUCCO INDUSTRIE S.P.A.**
**LOC. PIOVA 98**
**10081 CASTELLAMONTE TO**

Part description Your delivery note no. 51354 - 15/12/2023

1184 Kg 9412 BLANK RING GEAR EM1020 TB383BD SP022-09 DOC 73261990 PART 57667 COMM 005400017854 - Drawing: 32001022699-S - Casting: 69208 TJ 39.5/32.5 - Our Job: 156347

Material type: 20MC5

**Required treatment: Hardening and Tempering**

## Hardening

| Load No. | Furnace | 1st Preheating | 2nd Preheating | Austenitiz. Temp. | Cooling |
|---|---|---|---|---|---|
| 2 | SOTTRI N.5 | 680 | 0 | 900 | Water |

## Tempering

| Load No. | Furnace | | Tempering °C | Cooling |
|---|---|---|---|---|
| 3 | SOTTRI N.5 | 0 | 565 | still air |

| | VALUES REQUIRED | VALUES OBTAINED |
|---|---|---|
| Required hardness: | 780/950 mpa | min: 813 max: 906 mpa |
| Hardened Solid Hardness | | 0 mpa |
| Core Hardness | / | / |
| Sandblasting | ☑ | ☐ |
| Straightening | ☐ | ☐ |
| Micrography | ☐ | ☐ |

Castellamonte, 10/01/2024
T.T.N. PIEMONTE s.r.l.
Quality Control

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Quality Department
F. BONATTO
MASSUCCO Federica Bonatto

11-01-2024

**METALLOGRAPHIC LABORATORY T.T.N. PIEMONTE**

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HARDENING AND TEMPERING - NORMALISATION
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# QUALITY AND CONFORMITY CERTIFICATE

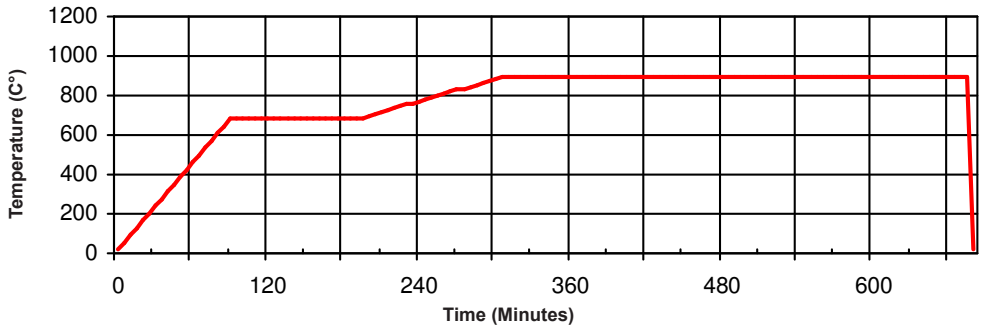
**Certificate No.:** **60**

**Client:** **008007 - MASSUCCO INDUSTRIE S.P.A.**
**LOC. PIOVA 98**
**10081 CASTELLAMONTE TO**

Part description Your delivery note no. 51354 - 15/12/2023

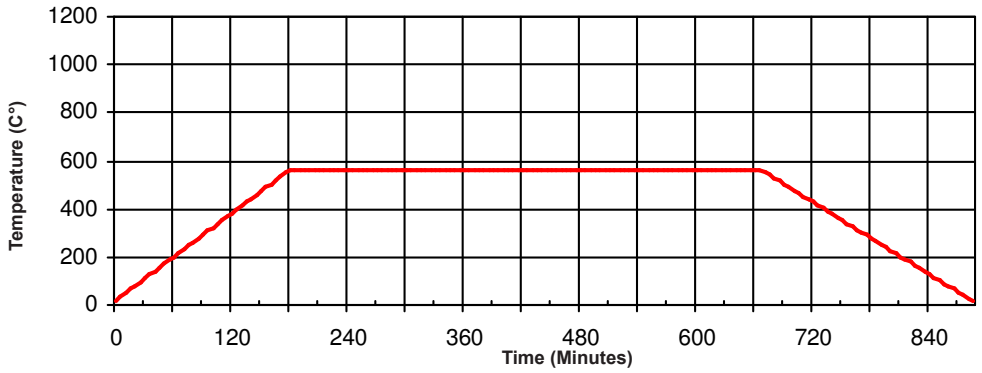
1184 Kg 9412 BLANK RING GEAR EM1020 TB383BD SP022-09 DOC 73261990 PART 57667 COMM 005400017854 - Drawing:
32001022699-S Casting: 69208 TJ 39.5/32.5 - Our Job: 156347

Material type: 20MC5 Required hardness: 780/950 mpa




**Hardening**

| Trend | Hours | °C |
|---|---|---|
| Ramp up | 01:30 | 680 |
| Hold | 01:30 | 680 |
| Ramp up | 02:00 | 900 |
| Hold | 06:00 | 900 |




**1st Tempering**

| Trend | Hours | °C |
|---|---|---|
| Ramp up | 03:00 | 565 |
| Hold | 08:00 | 565 |

Assicurazione Qualità
Quality Department
F. BONATTO
MASSUCCO INDUSTRIE

11-01-2024

T.T.N. PIEMONTE s.r.l.
Quality Control

**METALLOGRAPHIC LABORATORY T.T.N. PIEMONTE**

| DANA | Check sheet<br>F0501 - R04.02 - 12.11.2012 | Inspection lot<br>030001096759 | Quantity<br>864 | Order Type/Number/Position<br>ZWO0 11400205 0070 | Work Center<br>0030 |
|---|---|---|---|---|---|

| PART NUMBER | REVISION | OPERATION | OPERATION DESCRIPTION |
|---|---|---|---|
| 32001021100 | N | 0070 | bioteco furnace for nitriding |

| ID | CHARACTERISTIC | METHOD | SAMPLING | UM | TARGET | MIN_MAX | #1 | #2 | #3 | #4 | #5 | #6 | #7 | #8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | MT3009<br>VICKERS HARDNESS HV5 | DUR001<br>DUROMETER | ZF0004<br>4 Pieces | HV | | 740,00<br>620,00 | 766 | | | | | | | |
| 30 | MT3010<br>VICKERS HARDNESS HV10 | DUR001<br>DUROMETER | ZF0004<br>4 Pieces | HV | | 690,00<br>590,00 | 724 | | | | | | | |
| 40 | MT3011<br>VICKERS HARDNESS HV30 | DUR001<br>DUROMETER | ZF0004<br>4 Pieces | HV | | 600,00<br>570,00 | 660 | | | | | | | |
| 50 | MT0100<br>MATERIAL TYPE | VIS002<br>VISUAL INSPECTION | ZF0001<br>1 Piece | | | | B21-20MnCr5 | | | | | | | |
| 60 | MT4101<br>TEST SPECIMEN TYPE USED (SP022-02) | PRO001<br>TEST SPECIMEN ACCORDING TO SP022-2 | ZF0001<br>1 Piece | | | | | | | | | | | |
| 70 | MT5100<br>PROGRAM CODE USED | VIS002<br>VISUAL INSPECTION | ZF0001<br>1 Piece | | | | | | | | | | | |
| 80 | MT5101<br>LOAD NUMBER | VIS002<br>VISUAL INSPECTION | ZF0001<br>1 Piece | | | | | | | | | | | |
| 90 | DOD001<br>OUTSIDE DIAMETER Ø203 h7 "A" | CAL001<br>CALIB.ACM.O R | ZF0008<br>8 Pieces | mm | 203,000 | 203,000<br>202,954 | 202,98 | | | | | | | |
| 100 | DOD001<br>OUTSIDE DIAMETER Ø203 h7 OPPOSITE "A" | CAL001<br>CALIB.ACM.O R | ZF0008<br>8 Pieces | mm | 203,000 | 203,000<br>202,954 | 202,97 | | | | | | | |
| 110 | VC3010<br>VISUAL TEST: AFTER HEAT TREATMENT | VIS001<br>VISUAL INSPECTION ACCORDING TO WI0519 | ZF0004<br>4 Pieces | | | | | | | | | | | |
| 120 | TX0038<br>NON-CONFORMITY OR RERA TEST | VIS002<br>VISUAL INSPECTION | ZF0004<br>4 Pieces | | | | | | | | | | | |

| Date Time | Signature | Remarks |
|---|---|---|
| 20.06.2024 09:50:50 | RUGGIERO.S | |

**MASSUCCO INDUSTRIE SpA**
STAMPAGGIO A CALDO ACCIAI
LAMINAZIONE CIRCOLARE
10081 CASTELLAMONTE(TO) - LOC. PIOVA 98 - TORINO - ITALY
QUALITY ASSURANCE DEPT.
tel. +39 0124 518555 - fax +39 0124 514720 - mail: quality@massucco.it

DECLARATION:
Dichiarazione di conformità secondo EN10204-2004 - attestato 3.1.
Il lotto dettagliato è stato fabbricato/ispezionato/testato e, se non diversamente dichiarato conforme a tutti i disegni,specifiche e requisiti d'ordine applicabili.
Declaration of Conformity according to EN10204-2004 - certificate type 3.1
Supplies detailed have been manufactured/inspected/tested and, unless otherwise stated, conform in all respects to the relevant specifications, drawings and purchase order requirements.

| | |
|---|---|
| **Cliente - Customer**<br>**Stabilimento - Plant** | **DANA MOTION SYSTEMS ITALIA SRL**<br>**HUB VERONA C/TO INTRA LOGISTIC** |
| **Ordine di acquisto**<br>**Purchase Order-Bestellungnumber** | Nr. 4500640225 del 20.03.2024 |
| **n° di disegno**<br>**part Number** | 32001900088<br>32001900088 mod. D del 22/02/17 --- 32001900088 |
| **Numero colata materiale**<br>**Material Heat nr.** | 55387T120 |
| **N° Rintracciabilità - Commessa**<br>**Traceability ID Massucco** | 005400018047 |
| **Quantita' lotto**<br>**Batch Quantity** | 903,000 |
| **Documento di consegna**<br>**Delivery document** | 800054634 |

| | **FATTO**<br>**DONE** | **REGISTRATO**<br>**RECORDED** | **INVIATO**<br>**SUBMITTED** | **NOTE**<br>**NOTES** |
|---|---|---|---|---|
| | | | | |
| **Material certificate** | **YES** | **YES** | **YES** | |
| | | | | |
| **Forging Temperature check** | **YES** | **YES** | **NOT** | |
| | | | | |
| **Dimension Control** | **YES** | **YES** | **NOT** | |
| | | | | |
| **Heat treatment & check** | **YES** | **YES** | **YES** | |
| | | | | |
| | | | | |
| | | | | |

**Other notes:**

Date

**03.05.2024**

Signature Quality Assurance

**Firma digitale personale autorizzata da password**
**Personal digital signature authorized by password**

MASSUCCO INDUSTRIE ASSICURAZIONE QUALITA'

**COGNOR S.A. ODDZIAŁ HSJ W STALOWEJ WOLI**
Adres: str. E. Kwiatkowskiego 1
37-450 Stalowa Wola POLAND
NIP 118-12-34-296

ORIGINAL

**ROLLED PRODUCTS**

# INSPECTION CERTIFICATE No 41675/21/D

**EN 10204:2004/3.1**

maurizio.perono@massucco.it

Customer: MASSUCCO INDUSTRIE S.P.A
10081 CASTELLAMONTE ul. LOCALITR PIOVA 98

Delivery address: Localita Goritti n. 15 10082 - CUORGNE IT - WŁOCHY

| Customer order No: | | Order No: | Receipt Report No: |
|---|---|---|---|
| 4200003835 | **4200003835** | **262.1110.672.21** | |

| Description: | Dimension: | Steel type: | Heat No: | Pieces: | Weight |
|---|---|---|---|---|---|
| Hot rolled steel bars<br>Delivery condition: as rolled<br><br>EN 10084:2008 / B21 [29.09.2012] / SP 046-03 Ver. 05 / [07.03.2014] / EN 10060:2003 / | ∅ 120<br><br>Length:<br>limited: 5-6,5 m<br>Toler.:<br>Reduction ratio 7.6 | **20MNCR5 MOD** | **55387**<br>EAF + LF + VD + CC 270x320<br><br>Radio -isotopic activity is no than max 0,1 Bq/g | 40 | 21 935 |

## 1. Chemical Analysis:

| Heat No | C | Mn | Si | P | S | Cr | Ni | Cu | Mo | V | Al |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 55387 | 0.2100 | 1.2600 | 0.2300 | 0.0160 | 0.0250 | 1.2400 | 0.1400 | 0.2200 | 0.0400 | 0.0050 | 0.0250 |
| | Ti | N2 | Nb | Sn | Ca | B | H2 ppm | O2 ppm | | | |
| | 0.0030 | 0.0095 | 0.0040 | 0.0110 | 0.0016 | 0.0003 | 2.4000 | 15.0000 | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

## 2. Mechanical properties and hardness

| Test No | Heat treatment | [MPa] | | Rm[MPa] | [%] | Z[%] | Impact | Heat treatment tests | Hardness |
|---|---|---|---|---|---|---|---|---|---|
| 8/3 | quenched+tempe | Rp02 | 1238 | 1498 | A5 14.4 | 49.6 | KV2+25°C[J]35/35/34 | Q-870°C oil<br>T-200°C air | |

Samples forged to dia 11 from dia 120

## 3. Other tests

Macroetch test:

Microinlusions: ASTM E45 metoda A ASTM E-45 A method =A(2,5/1) B(0/0) C(0/0) D(1,5/0,5)
DIN 50602 K4(S+O) S(12,08)+O(0)=12,08

Grain size:
ISO 643 7 method MQE

Hardenability SP 046-03

| mm | 5 | 7 | 9 | 11 | 25 |
|---|---|---|---|---|---|
| HRC | 48.0 | 46.0 | 43.0 | 41.5 | 35.0 |

Steel killed DI=3,25.
100% ultrasonic test was carried out acc. to: EN10308Tab.1type 1aTab2, 3 class -satisfactory results.The surface material checked using the thermovision flaw detector.
Material does not show residual magnetism.Spectrotest - 100%.
Surface defects acc. to: PN-EN 10221 class B.

Assicurazione Qualità
Quality Department
M. PERONO

**Compliant with 19MnCr5 acc. to ISO683/17**

| | | |
|---|---|---|
| Surface and dimensions tested at 100%.<br>MIXMATCH TEST 100% | Material was carried out acc. to Technical Specifications and order confirmation | Material marked: Heat No, grade, |

Material was released on the base of inspection and tests carried out. The product in accordance with European Directive No 2000/53/WE.

| Quality Control | The quality manager | Expert stamp | |
|---|---|---|---|
| Tomasz Żak | COGNOR SPÓŁKA AKCYJNA ODDZIAŁ HSJ W STALOWEJ WOLI DYREKTOR ds. Jakości Krzysztof Kułaga | | Stalowa Wola<br>2021.04.23 |

**T.T.N. PIEMONTE S.r.l.**
Via Europa, 1
10081 CASTELLAMONTE (TO)
Tel: 0039-0124.423105 Fax: 0039-0124.510178
E-mail: info@ttnpiemonte.it

Informazione ed assistenza tecnica e commerciale:
Tel: 0039-0331463711
CAP. SOC. € 50.000
Registro Imprese Milano Nro. 05425320966
R.E.A. Milano Nro. 1820662
Cod. Fisc. e P. IVA 05425320966
Sede legale: NERVIANO (MI)

T.T.N. PIEMONTE
GRUPPO T.T.N.
www.ttnspa.it

BONIFICHE - NORMALIZZAZIONI
RICOTTURE - DISTENSIONI

NITRURAZIONI
CEMENTAZIONI

TEMPRA AD INDUZIONE

RIVESTIMENTI PVD, CVD

LABORATORIO
METALLOGRAFICO

**CERTIFICAZIONE IGQ N° 2L02**

Certificato conforme alla normativa
UNI EN 10204 - 3.1

* 1 5 7 5 8 8 *

Questo codice consente di risalire
ai diagrammi tempo temperatura
dei seguenti particolari.

# CERTIFICATO DI QUALITÀ E CONFORMITÀ

**Certificato N°: 1286**

**Cliente:** **008007 - MASSUCCO INDUSTRIE S.P.A.**
**LOC. PIOVA 98**
**10081 CASTELLAMONTE TO**

Descrizione particolari Vs.D.d.t. n. 462 - 12/02/2024

N° 942 Kg 9043 BREVINI BLANK RING-GEAR EM1065 - Disegno: 32001900088-F1 - Colata: 55387 TJ 41.5/35 - Ns. Comm.:157588

Tipo di materiale: 20MNCR5 Trattamento richiesto: **Bonifica + Distensione**

## Tempra

| N. Car. | Forno | 1° Preriscaldo | 2° Preriscaldo | Temp. Austenitiz. | Raffreddamento |
|---|---|---|---|---|---|
| 77 | SOTTRI N.5 | 680 | 0 | 900 | Acqua |

## Distensione

| N. Car. | Forno | 1° Preriscaldo | 2° Preriscaldo | Distensione °C | Raffreddamento |
|---|---|---|---|---|---|
| 85 | SOTTRI N.5 | 0 | 0 | 540 | aria calma |

## Rinvenimento

| N. Car. | Forno | | Rinvenimento °C | Raffreddamento |
|---|---|---|---|---|
| 78 | SOTTRI N.5 | 0 | 565 | aria calma |

| | VALORI RICHIESTI | VALORI OTTENUTI |
|---|---|---|
| Durezza richiesta: | 780/950 mpa | min: 791 max: 906 mpa |
| Durezza Piena Tempra | | 0 mpa |
| Durezza a cuore | 780/950 | 792/906 |
| Sabbiatura | ☑ | ☑ |
| Raddrizzatura | ☐ | ☐ |
| Micrografie | ☐ | ☐ |

Assicurazione Qualità
Quality Department
F. BONATTO
MASSUCCO

**23.02.2024**

Castellamonte, 22/02/2024
T.T.N. PIEMONTE s.r.l.
Controllo Qualità

**LABORATORIO METALLOGRAFICO T.T.N. PIEMONTE**

**T.T.N. PIEMONTE S.r.l.**
Via Europa, 1
10081 CASTELLAMONTE (TO)
Tel: 0039-0124.423105 Fax: 0039-0124.510178
E-mail: info@ttnpiemonte.it

Informazione ed assistenza tecnica e commerciale:
Tel: 0039-0331463711
CAP. SOC. € 50.000
Registro Imprese Milano Nro. 05425320966
R.E.A. Milano Nro. 1820662
Cod. Fisc. e P. IVA 05425320966
Sede legale: NERVIANO (MI)

T.T.N. PIEMONTE
GRUPPO T.T.N.
www.ttnspa.it

**CERTIFICAZIONE IGQ N° 2L02**

BONIFICHE - NORMALIZZAZIONI
RICOTTURE - DISTENSIONI

NITRURAZIONI
CEMENTAZIONI

TEMPRA AD INDUZIONE

RIVESTIMENTI PVD, CVD

LABORATORIO
METALLOGRAFICO

Certificato conforme alla normativa
UNI EN 10204 - 3.1

* 1 5 7 5 8 8 *

Conservate con cura questo codice !! Vi consentirà in ogni momento di conoscere il ciclo tecnico subito dai Vostri pezzi.

# CERTIFICATO DI QUALITÀ E CONFORMITÀ

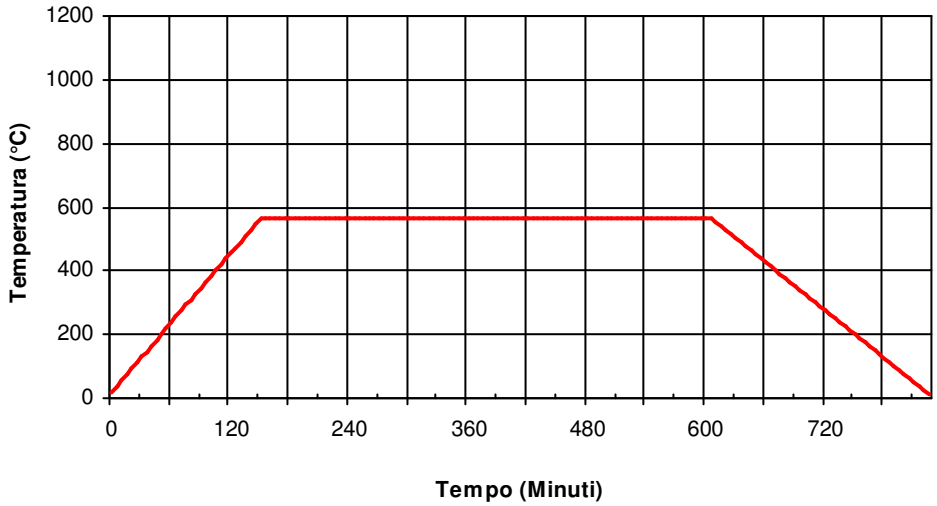
**Certificato N°: 1286**

**Cliente: 008007 - MASSUCCO INDUSTRIE S.P.A.**
**LOC. PIOVA 98**
**10081 CASTELLAMONTE TO**

Descrizione particolari Vs.D.d.t. n. 462 - 12/02/2024

N° 942 Kg 9043 BREVINI BLANK RING-GEAR EM1065 - Disegno: 32001900088-F1 - Colata: 55387 TJ 41.5/35 - Ns. Comm.:157588

Tipo di materiale: 20MNCR5 Durezza richiesta: 780/950 mpa




**1° Rinvenimento**

| Andamento | Ore | °C |
|---|---|---|
| Salita | 02:30 | 565 |
| Permanenza | 07:30 | 565 |

Assicurazione Qualità
Quality Department
F. BONATTO
MASSUCCO Federica Bonatto

23.02.2024

T.T.N. PIEMONTE s.r.l.
Controllo Qualità

**LABORATORIO METALLOGRAFICO T.T.N. PIEMONTE**

**T.T.N. PIEMONTE S.r.l.**
Via Europa, 1
10081 CASTELLAMONTE (TO)
Tel: 0039-0124.423105 Fax: 0039-0124.510178
E-mail: info@ttnpiemonte.it

Technical and commercial information and assistance:
Tel: : 0039-0331463711
SPEC. CAPITAL € 50.000
Milan Company Register No. 05425320966
Milan R.E.A. No. Nro. 1820662
Tax Code and VAT No. 05425320966
Registered Office: NERVIANO (MI)

T.T.N. PIEMONTE
GRUPPO T.T.N.
www.ttnspa.it
**IGQ CERTIFICATION No. 2L02**

HARDENING AND TEMPERING - NORMALISATION
ANNEALING - DESTRESSING
NITRIDING
CASE HARDENING
INDUCTION HARDENED
PVD, CVD COATING
METALLOGRAPHIC LABORATORY

Certified compliant with the standards
UNI EN 10204 - 3.1

* 1 5 7 5 8 8 *
This code can be used to trace the temperature time diagrams of the following parts.

# QUALITY AND CONFORMITY CERTIFICATE

**Certificate No.:** **1286**

**Client:** **008007 - MASSUCCO INDUSTRIE S.P.A.**
**LOC. PIOVA 98**
**10081 CASTELLAMONTE TO**

Part description Your delivery note no. 51371 - 18/12/2023

1043 kg 8291 BLANK RING GEAR EM1020 SP-022-09 CUST. 73261990 BATCH 57667 JOB 005400017854 - Drawing: 32001022699-S -

Material type: 20MNCR5

Required treatment: **Hardening and Tempering**

## Hardening

| Load No. | Furnace | 1st Preheating | 2nd Preheating | Austenitiz. Temp. | Cooling |
|---|---|---|---|---|---|
| 77 | SOTTRI N.5 | 680 | 0 | 900 | Water |

## Tempering

| Load No. | Furnace | 1st Preheating | 2nd Preheating | Tempering °C | Cooling |
|---|---|---|---|---|---|
| 85 | SOTTRI N.5 | 0 | 0 | 540 | still air |

## Tempering

| Load No. | Furnace | | Tempering °C | Cooling |
|---|---|---|---|---|
| 78 | SOTTRI N.5 | 0 | 565 | still air |

| | VALUES REQUIRED | VALUES OBTAINED |
|---|---|---|
| Required hardness: | 780/950 mpa | min: 791 max: 906 mpa |
| Hardened Solid Hardness | | 0 mpa |
| Core Hardness | 780/950 | 792/906 |
| Sandblasting | ☑ | ☑ |
| Straightening | ☐ | ☐ |
| Micrography | ☐ | ☐ |

Assicurazione Qualità
Quality Department
F. BONATTO
MASSUCCO Industrie

23.02.2024

Castellamonte, 22/02/2024
T.T.N. PIEMONTE s.r.l.
Quality Control

**METALLOGRAPHIC LABORATORY T.T.N. PIEMONTE**

**T.T.N. PIEMONTE S.r.l.**
Via Europa, 1
10081 CASTELLAMONTE (TO)
Tel: 0039-0124.423105 Fax: 0039-0124.510178
E-mail: info@ttnpiemonte.it

Technical and commercial information and assistance:
Tel: 0039-0331463711
SPEC. CAPITAL € 50.000
Milan Company Register No. 05425320966
Milan R.E.A. No. 1820662
Tax Code and VAT No. 5425320966
Registered Office: NERVIANO (MI)

T.T.N. PIEMONTE
GRUPPO T.T.N.
www.ttnspa.it

IGQ CERTIFICATION No. 2L02

HARDENING AND TEMPERING - NORMALISATION
ANNEALING - DESTRESSING
NITRIDING
CASE HARDENING
INDUCTION HARDENED
PVD, CVD COATING
METALLOGRAPHIC LABORATORY

Certified compliant with the standards
UNI EN 10204 - 3.1

* 1 5 7 5 8 8 *

Keep this code carefully!! It will allow you to identify the technical cycle of your parts at any time.

# QUALITY AND CONFORMITY CERTIFICATE

**Certificate No.:** **1286**

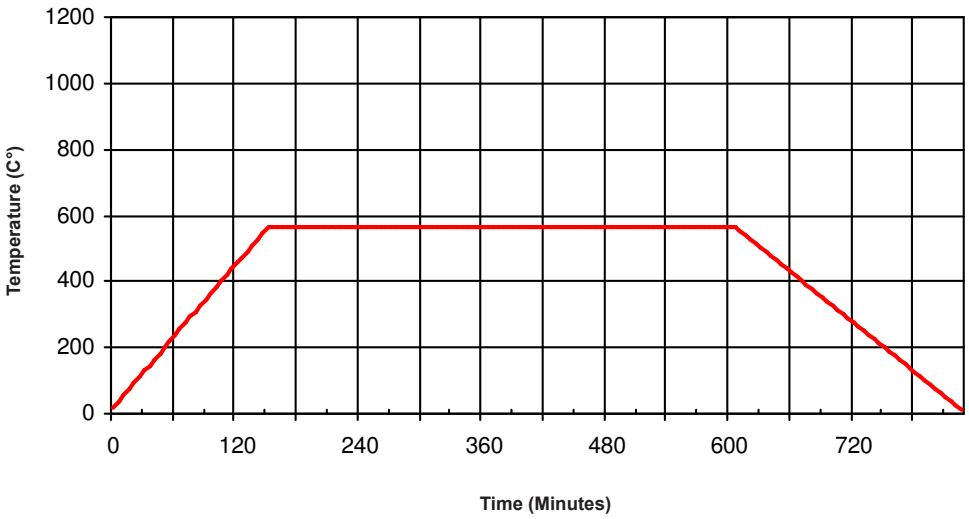
**Client:** **008007 - MASSUCCO INDUSTRIE S.P.A.**
**LOC. PIOVA 98**
**10081 CASTELLAMONTE TO**

Part description Your delivery note no. 462 - 12/02/2024

942 Kg 9043 BREVINI BLANK RING-GEAR EM1065 - Drawing - 32001900088-F1 - Casting: 55387 TJ 41.5/35 - Our Job: 157588

Material type: 20MNCR5

Required hardness: 780/950 mpa




**1st Tempering**

| Trend | Hours | °C |
|---|---|---|
| Ramp up | 02:30 | 565 |
| Hold | 07:30 | 565 |

Assicurazione Qualità
Quality Department
F. BONATTO
MASSUCCO INDUSTRIE

23.02.2024

T.T.N. PIEMONTE s.r.l.
Quality Control

**METALLOGRAPHIC LABORATORY T.T.N. PIEMONTE**

| DANA | Check sheet<br>F0501 - R04.02 - 12.11.2012 | Inspection lot<br>030001085941 | Quantity<br>576 | Order Type/Number/Position<br>ZWO0 11381201 0070 | Work Center<br>0030 |
|---|---|---|---|---|---|

| PART NUMBER | REVISION | OPERATION | OPERATION DESCRIPTION |
|---|---|---|---|
| 32001921100 | S | 0070 | bioteco furnace for nitriding |

| ID | CHARACTERISTIC | METHOD | SAMPLING | UM | TARGET | MIN_MAX | #1 | #2 | #3 | #4 | #5 | #6 | #7 | #8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | MT3009<br>VICKERS HARDNESS HV5 | DUR001<br>DUROMETER | ZF0004<br>4 Pieces | HV | | 740,000<br>620,000 | 740 | 735 | | | | | | |
| 30 | MT3010<br>VICKERS HARDNESS HV10 | DUR001<br>DUROMETER | ZF0004<br>4 Pieces | HV | | 690,00<br>590,00 | | | | | | | | |
| 40 | MT3011<br>VICKERS HARDNESS HV30 | DUR001<br>DUROMETER | ZF0004<br>4 Pieces | HV | | 600,00<br>570,00 | | | | | | | | |
| 50 | MT0100<br>MATERIAL TYPE | VIS002<br>VISUAL INSPECTION | ZF0001<br>1 Piece | | | | B21-20MnCr5 | | | | | | | |
| 60 | MT4101<br>TEST SPECIMEN TYPE USED (SP022-02) | PRO001<br>TEST SPECIMEN ACCORDING TO SP022-2 | ZF0001<br>1 Piece | | | | | | | | | | | |
| 70 | MT5100<br>PROGRAM CODE USED | VIS002<br>VISUAL INSPECTION | ZF0001<br>1 Piece | | | | | | | | | | | |
| 80 | MT5101<br>LOAD NUMBER | VIS002<br>VISUAL INSPECTION | ZF0001<br>1 Piece | | | | | | | | | | | |
| 90 | DOD001<br>OUTSIDE DIAMETER Ø230h7 A | CAL001<br>CALIB.ACM.O R | ZF0008<br>8 Pieces | mm | | 230,000<br>229,954 | 229,98 | 229,98 | 229,98 | 229,98 | 229,99 | 230 | 229,99 | 229,99 |
| 100 | DOD001<br>OUTSIDE DIAMETER Ø203 h7 OPPOSITE "A" | CAL001<br>CALIB.ACM.O R | ZF0008<br>8 Pieces | mm | | 230,000<br>229,954 | 229,98 | 229,98 | 229,98 | 229,98 | 229,97 | 229,99 | 230 | 229,99 |
| 110 | VC3010<br>VISUAL TEST: AFTER HEAT TREATMENT | VIS001<br>VISUAL INSPECTION ACCORDING TO WI0519 | ZF0008<br>8 Pieces | | | | | | | | | | | |
| 120 | TX0038<br>NON-CONFORMITY OR RERA TEST | VIS002<br>VISUAL INSPECTION | ZF0008<br>8 Pieces | | | | | | | | | | | |

| Date | Time | Signature | Remarks |
|---|---|---|---|
| 11.06.2024 | 14:54:02 | RUGGIERO.S | |

**MATERIAL SPECIFICATION (RSPL- 2561)**

# RAMCO STEELS PRIVATE LIMITED

PLOT NO. 782-783, SECTOR 69, FARIDABAD - 121004, INDIA.
Tel. No. +91-129-4290500
Email: info@ramcosteels.com
Web: www.ramcosteels.com

T.C. NO.: 03/21543/1
DATE: Jul 17, 2023

## Inspection Certificate in accordance with DIN EN 10204 - 3.1
## Metallurgical Test Report

Ramco Heat Code Reference # 14962

| | | | |
|---|---|---|---|
| ITEM DESCRIPTION | BLANK PLANET GEAR EM1010/../6-6,9/..(Reggio Emilia) | CUSTOMER | Dana Italia SRL |
| CUSTOMER DRG. NO. | 32500841199 Rev.1 | P.O. NO. & DATE | 4500566121/20, May 26, 2023 |
| MATERIAL SPECS. | 20MnCr5 +HH as Per EN-10084 NUMBER 1.7147 Ref. Customer std.(SP 046-03) | INVOICE NO. & DATE | 550172, Jul 17, 2023 |
| CAST/HEAT NO. | J11836 | QUANTITY | 1928 Pieces |
| SUPPLIER | M/s. Arjas Modern Steel Pvt. Ltd. | ROUTE CARD NO. | 03/21543 |

**RAW MATERIAL --> HOT FORGING --> QUENCHING & TEMPERING --> FINAL MACHINED PART**

**RAW MATERIAL CHARACTERISTICS**

### 1. CHEMICAL ANALYSIS

| ELEMENT IN % | | C% | Mn% | Si% | S% | P% | Cr% | Ni% | Mo% | Al% | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| As per Specs. | Minimum | 0.180 | 1.150 | 0.200 | -- | -- | 1.150 | -- | -- | 0.020 | | | | |
| | Maximum | 0.220 | 1.280 | 0.400 | 0.035 | 0.025 | 1.250 | -- | -- | 0.040 | | | | |
| AS REPORTED BY STEEL MILL | | 0.200 | 1.260 | 0.270 | 0.024 | 0.015 | 1.210 | 0.080 | 0.014 | 0.026 | | | | |
| OBSERVED VALUE AT RAMCO / OUTSIDE LAB | | 0.195 | 1.250 | 0.278 | 0.025 | 0.012 | 1.200 | 0.077 | 0.013 | 0.029 | | | | |

### 2. METALLOGRAPHIC CHARACTERISTICS

| | | | | | |
|---|---|---|---|---|---|
| GRAIN SIZE (As per ASTM E112 / IS:4748) | SPECIFIED ASTM NUMBER | 6.0 - 8.0 | MACRO-ETCH (As per ASTM E 381) | SPECIFIED | C2 R2 S2 OR BETTER |
| | REPORTED BY STEEL MILL | 6.0/7.0 | | REPORTED BY STEEL MILL | C2 R2 S2 |
| | OBSERVED BY RAMCO | 6.5 | | OBSERVED BY RAMCO | C2 R2 S2 |
| GRAIN FLOW OF RAW MATERIAL | SYMMETRICAL ALONG THE ROLLING DIRECTION | | AS ROLLED HARDNESS (BHN) | REPORTED BY STEEL MILL | 217~229 BHN |
| | | | | OBSERVED BY RAMCO | 170 BHN |

| INCLUSION RATING (AS PER ASTM E45A/IS 4163) | | | | | | | DEPTH OF DECARB | | |
|---|---|---|---|---|---|---|---|---|---|
| TYPE | SPECIFIED | | REPORTED BY STEEL MILL | | OBSERVED BY RAMCO | | | REPORTED BY STEEL MILL | 0.14/0.15 MM |
| | THIN | THICK | THIN | THICK | THIN | THICK | | OBSERVED BY RAMCO | -- |
| A | 2.0 | 1.0 | 1.5 | -- | 1.5 | 0.5 | REDUCTION RATIO OF STEEL BAR (REPORTED BY STEEL MILL) | | 25.0:1 |
| B | 2.0 | 1.0 | 0.5 | -- | 1.0 | -- | AS REPORTED BY STEEL MILL | | |
| C | 1.0 | 0.5 | -- | -- | -- | -- | ULTRASONIC TEST | MPI TEST | NI TEST | SPARK TEST |
| D | 2.0 | 1.0 | 1.5 | -- | 1.0 | -- | 100% | 100% | -- | 100% |

### 3. JOMINY HARDNEABILITY (HRC)

| Distance (mm) | 1.5 | 3.0 | 5.0 | 7.0 | 9.0 | 11.0 | 13.0 | 15.0 | 20.0 | 25.0 | 30.0 | 35.0 | 40.0 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Specified MIN (HRC) | 44.0 | 44.0 | 42.0 | 40.0 | 37.0 | 35.0 | 33.0 | 32.0 | 30.0 | 28.0 | 27.0 | 26.0 | 25.0 | | |
| Specified Max (HRC) | 47.0 | 47.0 | 46.0 | 44.0 | 41.0 | 40.0 | 39.0 | 37.0 | 35.0 | 33.0 | 32.0 | 31.0 | 30.0 | | |
| As Reported by Steel Mill | 46.0 | 45.0 | 44.0 | 42.5 | 40.0 | 37.0 | 35.0 | 33.0 | 30.0 | 29.0 | 28.0 | 27.0 | 26.0 | | |
| Observed Value at Ramco (HRC) | 46.0 | 44.0 | 43.0 | 42.0 | 40.0 | 36.0 | 34.0 | 32.0 | 30.0 | 28.5 | 28.0 | 26.0 | 25.0 | | |

### 4. MECHANICAL PROPERTIES (CHECKED ON ROUND BAR AFTER QUENCHING & TEMPERING OF RAW MATERIAL)

| PARAMETER | SPECIFIED AS PER Customer std. (SP 046-03) | | AS REPORTED BY STEEL MILL | OBSERVED VALUE BY RAMCO |
|---|---|---|---|---|
| | MINIMUM | MAXIMUM | | |
| Tensile Strength (Mpa) | 1200 | 1420 | -- | 1284.30 |
| Yield Strength (Mpa) | 885 | -- | -- | 1064.10 |
| Elongation (%) | 8 | -- | -- | 10.22 |
| Reduction Area (%) | -- | -- | -- | 41.52 |
| Impact in Joules (at room temp.) | 25 | -- | -- | 46.00 |

**Final Remarks: Material accepted.**

We hereby certify, that the material described above complies with the terms of the order contract.
Wir bestätigen, daß die Lieferung den Vereinbarungen bei der Bestellannahme entspricht.

With friendly regards,
mit freundlichen Grüßen,

**SURESH PANDEY**
**PREPARED BY**

**VIVEK SHARMA**
**APPPROVED BY**

DANA

# Check Sheet

F0501 - R04.02 - 12.11.2012

| Inspection lot | Quantity | Order Type/Number/Position | Work Center |
|---|---|---|---|
| 030001079546 | 2.360 | ZWO0 11365879 0140 | 0062 |

| PART NUMBER | REVISION | OPERATION | OPERATION DESCRIPTION |
|---|---|---|---|
| 32500941100 | C | 0140 | ipsen case-hardening furnace |

| ID | CHARACTERISTIC | METHOD | SAMPLING | UM | TARGET | MIN_MAX | #1 | #2 | #3 | #4 | #5 | #6 | #7 | #8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | MT3006<br>ROCKWELL HARD-NESS C | DUR001<br>DUROMETER | ZF0004<br>4 PIECES | | | 62,000<br>58,000 | 59 | 59 | 58 | 58 | | | | |
| 20 | MT3012<br>CASE-HARDENING DEPTH (HV550) | PRO001<br>TEST SPECIMEN ACCORDING TO SP022-2 | ZF0004<br>4 PIECES | | | 0,700<br>0,500 | ,69 | ,7 | ,71 | | | | | |
| 30 | MT3023<br>P3 CORE STRENGTH | LAB001<br>LABORATORY | ZF0004<br>4 PIECES | | | 1.400,00<br>1.100,00 | 1350 | | | | | | | |
| 40 | MT0100<br>MATERIAL TYPE | VIS002<br>VISUAL IN-SPECTION | ZF0001<br>1 PIECE | | | | B21-20MnCr5 | | | | | | | |
| 50 | MT4101<br>TEST SPECIMEN TYPE USED (SP022-02) | PRO001<br>TEST SPECIMEN ACCORDING TO SP022-2 | ZF0004<br>4 PIECES | | | | 01-TEST ON PART | | | | | | | |
| 60 | MT5100<br>PROGRAM CODE USED | VIS002<br>VISUAL IN-SPECTION | ZF0004<br>4 PIECES | | | | | | | | | | | |
| 70 | MT5101<br>LOAD NUMBER | VIS002<br>VISUAL IN-SPECTION | ZF0004<br>4 PIECES | | | | 24-05/0108 RTQ 4 | | | | | | | |
| 100 | VC3010<br>VISUAL TEST: AFTER HEAT TREATMENT | VIS001<br>VISUAL INSPEC-TION ACCORDING TO WI0519 | ZF0004<br>4 PIECES | | | | | | | | | | | |
| 110 | TX0038<br>NON-CONFORMITY OR RERA TEST | VIS002<br>VISUAL IN-SPECTION | ZF0004<br>4 PIECES | | | | | | | | | | | |

| Date | Time | Signature | Remarks |
|---|---|---|---|
| 04.06.2024 | 14:42:07 | DVALCAV001 | Tested according SP022-02 , carburizing temperature below 940°C |

**F.A.C.E.M. S.p.A.**
Fabbricazione Articoli Casalinghi E Metallurgici

TRE SPADE ®
www.trespade.it

**Partita Iva IT 00517250015**
Cod. Fisc. e n° Reg.Imp.Torino 00517250015
REA di Torino n° 151967 - Cap.Soc. 3.000.000 € i.v.
**Sede Legale:**
Via Bricherasio, 7 - 10128 Torino (TO) - Italia
Tel. +39 0124 707711
**Sede Amministrativa:**
Borgata Braidacroce, 108 - 10087 Valperga (TO) - Italia
Tel. +39 0124 707711
www.facem.com E-mail: facem@facem.com

# CERTIFICATO DI ANALISI
# ANALYSIS CERTIFICATE

DANA MOTION SYSTEMS ITALIA Srl -POWER TRANSMISSION
POWER TRANSMISSION
Via Luciano Brevini, 1/a
42124 REGGIO EMILIA
RE
Italia

Rif. DDT Nr. SDDT-2401045 del 04/06/2024 riga 5 Cod. articolo 32501541199 (SA0009) Spediti Nr. 156
Rif. Vs. Ordine Nr. 4500629185 del 08/02/2024 Marchiatura Nr. 3250154-14

## COLATA N. 379512

Colata originale n. 23/79512

Certificato di analisi originario n. 14370 Rilasciato il 29/05/2023 da: RIVA ACCIAIO Spa

**MATERIALE** 20MNCR5 CAP. BREVINI SP 046-03

**COMPOSIZIONE CHIMICA**

| C [%] | Mn [%] | Si [%] | P [%] | S [%] | Cr [%] | Ni [%] | Mo [%] | Al [%] | Cu [%] | Sn [%] | Ti [%] | Ca [%] | V [%] | N [PPM] | Nb [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,1800 | 1,2800 | 0,3000 | 0,0120 | 0,0220 | 1,1700 | 0,0900 | 0,0200 | 0,0240 | 0,2000 | 0,0080 | 0,0100 | 0,0015 | 0,0050 | 100,0000 | 0,0020 |

| O2 [PPM] | H2 [PPM] |
|---|---|
| 20,0000 | 2,5000 |

**DIAMETRO IDEALE** 0 "

**GROSSEZZA GRANO AUSTENITICO**
Grano austenitico definito 6
Grano austenitico inferiore
Grano austenitico superiore

**PROVA JOMINY**

| mm | 1,5 | 3,0 | 5,0 | 7,0 | 9,0 | 11,0 | 13,0 | 15,0 | 20,0 | 25,0 | 30,0 | 35,0 | 40,0 | 45,0 | 50,0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HRC | 44 | 43 | 43 | 42 | 38 | 36 | 34 | 33 | 31 | 29 | 28 | 27 | 26 | 25 | 23 |

**CARATTERISTICHE MECCANICHE**

**RESISTENZA A TRAZIONE**
Tipo prova TRAZIONE LONGITUDINALE - UNI EN ISO 6892-1
T.T. Provetta TEMPRA E DISTENSIONE

| A [%] | HB [HB] | R [N/MM2] | RS [N/MM2] | % |
|---|---|---|---|---|
| 13,00 | 250,00 | 1.316,00 | 1.213,00 | 53,50 |

**RESILIENZA**
Tipo prova PROVA DI RESILIENZA - UNI EN ISO 148/1
T.T. Provetta TEMPRA E DISTENSIONE
Temperatura [°C] 20
Valore medio [Joule] 33,3

**MICROPUREZZA**
Metodo: DIN 50602/85 METODO K4
Tipo K4
12,0

**NOTE**
Rapporto di riduzione tondo mm 38 = 22,58:1
Bandatura grado 3 secondo UNI 8449
ACCIAIO DEGASATO SOTTOVUOTO

I dati riportati in questo certificato sono conformi alla norma UNI EN 10204/3.1 ed all'originale da noi archiviato

Per F.A.C.E.M. SpA
Vacca Simone

230303

RIVA ACCIAIO S.P.A.
STABILIMENTO DI LESEGNO
Via Statale, 28 nord
12076 Lesegno(CN) ITALIA
Tel. 0174-718111 Fax. 0174-77251

Sede legale e amministrativa: Viale Certosa, 249 - 20151 Milano
telefono 02 30700 - telefax 02 38000346
codice fiscale, partita iva e numero iscrizione Registro Imprese Milano 08521290158

# CERTIFICATO DI COLLAUDO

*A03* Numero Certificato: 14370
Data Certificato: 29/05/2023

CERTIFICHIAMO CHE IL PRODOTTO RELATIVO A QUESTO DOCUMENTO E' CONFORME ALLE PRESCRIZIONI CITATE IN ORDINE

*B14* Norma riferimento: UNI EN 10204/2005
*B15* Tipo: 3.1

*B02* Acciaio: 20MNCRS5+HH INT 017
*B07* Anno/Numero colata: 23/79512
*B01* Profilo: LAMINATO TONDO EN 10060
*B09* Misura 1 x Misura 2: 38,00
*B04* Stato fornitura: LAMINATO TONDO
*B09* Lunghezza: 5,500 - 6,500
*A07* Ordine Cliente: SP04180
*A08* Conferma: 07 Y4P47 003
*C14* Tasso di riduzione: 22,58
*B06*

*A06* Dati Cliente:
INTERACCIAI S.P.A.
VIA PASTEUR 2
42122 REGGIO EMILIA

*C70* Processo:
FUSIONE AL FORNO ELETTRICO
COLAGGIO PROTETTO IN C.C. 160
ACCIAIO DEGASATO SOTTOVUOTO

## COMPOSIZIONE CHIMICA - ANALISI DI COLATA

| C71 C | C72 Mn | C73 Si | C74 P | C75 S | C76 Cr | C77 Ni | C78 Mo | C79 Cu | C80 Sn | C85 Al | C91 Ti |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,180 | 1,280 | 0,300 | 0,012 | 0,022 | 1,170 | 0,090 | 0,020 | 0,200 | 0,008 | 0,024 | 0,010 |

| C87 V | C88 Nb | C89 B | C92 Ca | | | | C93 N | C94 $O_{2\,[ppm]}$ | C95 $H_{2\,[ppm]}$ | | C96 CEV |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,005 | 0,002 | 0,0000 | 0,0015 | | | | 0,0100 | 20 | 2,5 | | |

## CARATTERISTICHE MECCANICHE

*C01* Prelievo: C - Colata, L - Laminato, T - Trafilato: C
*C03* Trattamento Termico: PROVETTA TEMPR.E DIST

PROVE DI TRAZIONE

| C08 Dim. Campione | C10 Dim. Provetta | C12 $R_{m\,[MPa]}$ | C11 $R_{e\,[MPa]}$ | C13 $A5_{\%}$ | C15 $Z_{\%}$ |
|---|---|---|---|---|---|
| 11 | 10 | 1316 | 1213 | 13,0 | 53,5 |

PROVE DI RESILIENZA

| C41 Dim. Provetta | C40 Tipo | C42 $K_{1\,[J]}$ | C42 $K_{2\,[J]}$ | C42 $K_{3\,[J]}$ | C43 $K_{v\,[J]}$ | C44 Temp. |
|---|---|---|---|---|---|---|
| 10x10 | KCU | | | | 33,3 | 20°C |

*C22* HB:

## PROVA JOMINY

*C03* Normalizzazione: Tempra

| C61 mm | 1,5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | | | | | C45 DI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C60 HRC | 44 | 43 | 43 | 42 | 38 | 36 | 34 | 33 | 31 | 29 | 28 | 27 | 26 | 25 | 23 | | | | | |

*C65* Grano Austenitico: MAC QUAID - EHN 6
*C62* Micropurezza: DIN50602/UNI3244 K4=12,0
*C05* Bandatura: 3 BANDATURA SECONDO UNI 8449
*C31* Valori di durezza: +AR HB 250 | +A | +FP

## INFORMAZIONI SUPPLEMENTARI

*B03*
BARRE LUNG. COMMERCIALE

CONTROLLO ANTIMESCOLAMENTO ESEGUITO

*D51* Note:
CONFORME 2000/53/CE, 2011/65/UE E SMI
RADIOATTIVITÀ < 0,1 BQ/G
(D.LGS. N°101 31/07/2020 E SMI)

DOCUMENTO ELETTRONICO VALIDO SENZA FIRMA

*A10* Dati DDT: N° 4998 KG. 8738

*Z04*
ID Doc. 640682 - CERTIFICATO COLATA
Cod.Colata: 379512
Nr.23/79512 Pr. 230303
Acciaio Base: S20MNCR5BPT
Forn/Cli: RIVA ACCIAIO Spa

*Z01* Responsabile C.Q.: G. Piumatti

*Z02*

**F.A.C.E.M. S.p.A.**
Fabbricazione Articoli Casalinghi E Metallurgici

TRE SPADE ®
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**Partita Iva IT 00517250015**
Cod. Fisc. e n° Reg.Imp.Torino 00517250015
REA di Torino n° 151967 - Cap.Soc. 3.000.000 € i.v.
**Sede Legale:**
Via Bricherasio, 7 - 10128 Torino (TO) - Italia
Tel. +39 0124 707711
**Sede Amministrativa:**
Borgata Braidacroce, 108 - 10087 Valperga (TO) - Italia
Tel. +39 0124 707711
www.facem.com E-mail: facem@facem.com

# CERTIFICATO DI ANALISI
# ANALYSIS CERTIFICATE

DANA MOTION SYSTEMS ITALIA Srl -POWER TRANSMISSION
POWER TRANSMISSION
Via Luciano Brevini, 1/a
42124 REGGIO EMILIA
RE
Italia

Rif. DDT Nr. SDDT-2401045 del 04/06/2024 riga 5 Cod. articolo 32501541199 (SA0009) Spediti Nr. 1277
Rif. Vs. Ordine Nr. 4500629185 del 08/02/2024 Marchiatura Nr. 3250154-15

## COLATA N. 379514

Colata originale n. 23/79514

Certificato di analisi originario n. 14371 Rilasciato il 29/05/2023 da: RIVA ACCIAIO Spa

**MATERIALE** 20MNCR5 CAP. BREVINI SP 046-03

**COMPOSIZIONE CHIMICA**

| C [%] | Mn [%] | Si [%] | P [%] | S [%] | Cr [%] | Ni [%] | Mo [%] | Al [%] | Cu [%] | Sn [%] | Ti [%] | Ca [%] | V [%] | N [PPM] | Nb [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,1800 | 1,3000 | 0,3000 | 0,0130 | 0,0220 | 1,1600 | 0,1200 | 0,0200 | 0,0220 | 0,1800 | 0,0080 | 0,0100 | 0,0013 | 0,0050 | 110,0000 | 0,0020 |

| O2 [PPM] | H2 [PPM] |
|---|---|
| 20,0000 | 2,5000 |

**DIAMETRO IDEALE** 0 "

**GROSSEZZA GRANO AUSTENITICO**
Grano austenitico definito 6
Grano austenitico inferiore
Grano austenitico superiore

**PROVA JOMINY**

| mm | 1,5 | 3,0 | 5,0 | 7,0 | 9,0 | 11,0 | 13,0 | 15,0 | 20,0 | 25,0 | 30,0 | 35,0 | 40,0 | 45,0 | 50,0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HRC | 44 | 43 | 43 | 42 | 39 | 37 | 35 | 34 | 32 | 30 | 29 | 28 | 27 | 27 | 25 |

**CARATTERISTICHE MECCANICHE**

**RESISTENZA A TRAZIONE**
Tipo prova TRAZIONE LONGITUDINALE - UNI EN ISO 6892-1
T.T. Provetta TEMPRA E DISTENSIONE

| A [%] | HB [HB] | R [N/MM2] | RS [N/MM2] | % |
|---|---|---|---|---|
| 12,50 | 250,00 | 1.319,00 | 1.219,00 | 53,70 |

**RESILIENZA**
Tipo prova PROVA DI RESILIENZA - UNI EN ISO 148/1
T.T. Provetta TEMPRA E DISTENSIONE
Temperatura [°C] 20
Valore medio [Joule] 32,4

**MICROPUREZZA**
Metodo: ASTM/E45 METODO A JERNKONTORET

| Tipo | A/S | B/S | C/S | D/S |
|---|---|---|---|---|
| | 1,5 | 0,5 | 1,0 | 1,0 |

**NOTE**
Rapporto di riduzione tondo mm 38 = 22,58;1 | mm 30 = 36,23:1 | mm 35 = 26,62:1
Bandatura grado 3 secondo UNI 8449
ACCIAIO DEGASATO SOTTOVUOTO

I dati riportati in questo certificato sono conformi alla norma UNI EN 10204/3.1 ed all'originale da noi archiviato

Per F.A.C.E.M. SpA
Vacca Simone

230304

RIVA ACCIAIO S.P.A.
STABILIMENTO DI LESEGNO
Via Statale, 28 nord
12076 Lesegno(CN) ITALIA
Tel. 0174-718111 Fax. 0174-77251

Sede legale e amministrativa: Viale Certosa, 249 - 20151 Milano
telefono 02 30700 - telefax 02 38000346
codice fiscale, partita iva e numero iscrizione Registro Imprese Milano 08521290158

# CERTIFICATO DI COLLAUDO

*A03* Numero Certificato: 14371
Data Certificato: 29/05/2023

CERTIFICHIAMO CHE IL PRODOTTO RELATIVO A QUESTO DOCUMENTO E' CONFORME ALLE PRESCRIZIONI CITATE IN ORDINE

*B14* Norma riferimento: UNI EN 10204/2005
*B15* Tipo: 3.1

*B02* Acciaio: 20MNCRS5+HH INT 017
*B07* Anno/Numero colata: 23/79514
*B01* Profilo: LAMINATO TONDO EN 10060
*B09* Misura 1 x Misura 2: 38,00
*B04* Stato fornitura: LAMINATO TONDO
*B09* Lunghezza: 5,500 - 6,500
*A07* Ordine Cliente: SP04180
*A08* Conferma: 07 Y4P47 003
*C14* Tasso di riduzione: 22,58
*B06*

*A06* Dati Cliente:
INTERACCIAI S.P.A.
VIA PASTEUR 2
42122 REGGIO EMILIA

*C70* Processo:
FUSIONE AL FORNO ELETTRICO
COLAGGIO PROTETTO IN C.C. 160
ACCIAIO DEGASATO SOTTOVUOTO

## COMPOSIZIONE CHIMICA - ANALISI DI COLATA

| C71 C | C72 Mn | C73 Si | C74 P | C75 S | C76 Cr | C77 Ni | C78 Mo | C79 Cu | C80 Sn | C85 Al | C91 Ti |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,180 | 1,300 | 0,300 | 0,013 | 0,022 | 1,160 | 0,120 | 0,020 | 0,180 | 0,008 | 0,022 | 0,010 |

| C87 V | C88 Nb | C89 B | C92 Ca | | | | C93 N | C94 $O_{2\,[ppm]}$ | C95 $H_{2\,[ppm]}$ | | C96 CEV |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,005 | 0,002 | 0,0000 | 0,0013 | | | | 0,0110 | 20 | 2,5 | | |

## CARATTERISTICHE MECCANICHE

*C01* Prelievo: C - Colata, L - Laminato, T - Trafilato: [C]
*C03* Trattamento Termico: PROVETTA TEMPR.E DIST

PROVE DI TRAZIONE

| C08 Dim. Campione | C10 Dim. Provetta | C12 $R_{m\,[MPa]}$ | C11 $R_{e\,[MPa]}$ | C13 $A5_{\%}$ | C15 $Z_{\%}$ | |
|---|---|---|---|---|---|---|
| 11 | 10 | 1319 | 1219 | 12,5 | 53,7 | |

PROVE DI RESILIENZA

| C41 Dim. Provetta | C40 Tipo | C42 $K_{1\,[J]}$ | C42 $K_{2\,[J]}$ | C42 $K_{3\,[J]}$ | C43 $K_{s\,[J]}$ | C44 Temp. |
|---|---|---|---|---|---|---|
| 10x10 | KCU | | | | 32,4 | 20°C |

C22 HB

## PROVA JOMINY

*C03* Normalizzazione: Tempra

| C61 mm | 1,5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | | | | | C45 DI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C60 HRC | 44 | 43 | 43 | 42 | 39 | 37 | 35 | 34 | 32 | 30 | 29 | 28 | 27 | 27 | 25 | | | | | |

*C65* Grano Austenitico: MAC QUAID - EHN 6
*C62* Micropurezza: ASTM E45 - JERKONTORET METODO A
S: A1,5 B0,5 C1,0 D1,0

*C05* Bandatura: 3 BANDATURA SECONDO UNI 8449

*C31* Valori di durezza

| +AR | +A | +FP |
|---|---|---|
| HB 250 | | |

## INFORMAZIONI SUPPLEMENTARI

*B03*
BARRE LUNG. COMMERCIALE

CONTROLLO ANTIMESCOLAMENTO ESEGUITO

*D51* Note:
CONFORME 2000/53/CE, 2011/65/UE E SMI
RADIOATTIVITÀ < 0,1 BQ/G
(D.LGS. N°101 31/07/2020 E SMI)

DOCUMENTO ELETTRONICO VALIDO SENZA FIRMA

*A10* Dati DDT
N° 4998 KG. 5022

*Z04*
ID Doc. 640683 - CERTIFICATO COLATA
Cod.Colata: 379514
Nr.23/79514 Pr. 230304
Acciaio Base: S20MNCR5BPT
Forn/Cli: RIVA ACCIAIO Spa

*Z01* Responsabile C.Q.
G. Piumatti

*Z02*

**F.A.C.E.M. S.p.A.**
**F**abbricazione **A**rticoli **C**asalinghi **E** **M**etallurgici

**TRE SPADE ®**
**www.trespade.it**

**Hot & Warm Steel Forging Division**
**Partita Iva IT 00517250015**
Cod. Fisc. e n° Reg.Imp.Torino 00517250015
REA di Torino n° 151967 - Cap.Soc. 3.000.000 € i.v.
**Sede Legale:**
Via Bricherasio, 7 - 10128 Torino (TO) - Italia
Tel. +39 0124 707711
**Sede Amministrativa:**
Borgata Braidacroce, 108 - 10087 Valperga (TO) - Italia
Tel. +39 0124 707711
www.facem.com E-mail: facem@facem.com

# CERTIFICATO DI TRATTAMENTO TERMICO

# HEAT TREATMENT CERTIFICATE

Modulo MR-CQU-32 Rev. 02 del 27/03/2011

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| N. D.d.T.<br>Delivery Note No. | SDDT-2401045 | Riga<br>Row | 5 | Del<br>Of | 04/06/2024 | N. Pezzi spediti<br>N. Pieces Shipped | 156 |
| Marchiatura<br>Marking | 3250154-14 | Colata N.<br>Casting No. | 379512 | | | Kg spediti<br>Kg Shipped | 122 |
| Accorpamento N.<br>Grouping No. | 2301734 | Ordine di controllo N.<br>Inspection Order No. | CQ23-01182 | | | | |
| Cliente<br>Customer | C000001 | DANA MOTION SYSTEMS ITALIA Srl - POWER TRANSMISSION | | | | | |
| Nr. Articolo<br>Item No. | 32501541199/T | COD. 32501541199 RICOTTO | | | | Nr. Articolo FACEM<br>Item No. FACEM | SA0009/T10 |
| Acciaio di base<br>Steel | 20MNCR5 | | | | | | |
| Trattamento termico eseguito<br>Executed Heat Treatment | NORMALIZZAZIONE | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| N. totale pezzi controllati<br>N. of Controlled Pieces | 5 | | | | |
| Metodo di prova<br>Test Method | Ø Sfera<br>Ø Sphere | 0 | Kg Applicati<br>Kg Applied | 0 | SECONDO NORMA UNI EN ISO 6506-1 |

LOTTO DI TRATTAMENTO: 202311092327 - STTV01 - RIF. RILEVAZIONE: 23-1637
VALORE DUREZZA RICHIESTO: HB min 160 max 210

1) 173 HB 2) 171 HB 3) 170 HB 4) 174 HB 5) 178 HB

DATA VERIFICA: 10/11/2023 RILIEVI ESEGUITI DA: COLLAUDOV - ANDREA

TRE SPADE

Eventuali contestazioni circa il trattamento termico richiesto devono essere formulate prima di sottoporre i particolari conformi ad ulteriore lavorazione

**F.A.C.E.M. S.p.A.**
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# CERTIFICATO DI TRATTAMENTO TERMICO

# HEAT TREATMENT CERTIFICATE

Modulo MR-CQU-32 Rev. 02 del 27/03/2011

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| N. D.d.T. / Delivery Note No. | SDDT-2401045 | Riga / Row | 5 | Del / Of | 04/06/2024 | N. Pezzi spediti / N. Pieces Shipped | 1277 |
| Marchiatura / Marking | 3250154-15 | Colata N. / Casting No. | 379514 | | | Kg spediti / Kg Shipped | 1000,5 |
| Accorpamento N. / Grouping No. | 2301734 | Ordine di controllo N. / Inspection Order No. | CQ23-01183 | | | | |
| Cliente / Customer | C000001 | DANA MOTION SYSTEMS ITALIA Srl - POWER TRANSMISSION | | | | | |
| Nr. Articolo / Item No. | 32501541199/T | COD. 32501541199 RICOTTO | | | | Nr. Articolo FACEM / Item No. FACEM | SA0009/T10 |
| Acciaio di base / Steel | 20MNCR5 | | | | | | |
| Trattamento termico eseguito / Executed Heat Treatment | NORMALIZZAZIONE | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| N. totale pezzi controllati / N. of Controlled Pieces | 5 | | | | |
| Metodo di prova / Test Method | Ø Sfera / Ø Sphere | 0 | Kg Applicati / Kg Applied | 0 | SECONDO NORMA UNI EN ISO 6506-1 |

LOTTO DI TRATTAMENTO: 202311092328 - STTV01 - RIF. RILEVAZIONE: 23-1643
VALORE DUREZZA RICHIESTO: HB min 160 max 210

1) 165 HB 2) 167 HB 3) 164 HB 4) 169 HB 5) 173 HB

DATA VERIFICA: 10/11/2023 RILIEVI ESEGUITI DA: COLLAUDOV - ANDREA

TRE SPADE

Eventuali contestazioni circa il trattamento termico richiesto devono essere formulate prima di sottoporre i particolari conformi ad ulteriore lavorazione

**F.A.C.E.M. S.p.A.**
Fabbricazione Articoli Casalinghi E Metallurgici

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VAT No.: IT 00517250015
Tax Code and Turin Company Register No. 00517250015
REA di Torino n° 151967 - Cap.Soc. 3.000.000 €i.v.
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**Administration Office:**
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Tel. +39 0124 707711
www.facem.com E-mail: facem@facem.com

# CERTIFICATO DI ANALISI
# ANALYSIS CERTIFICATE

DANA MOTION SYSTEMS ITALIA Srl -POWER TRANSMISSION
POWER TRANSMISSION
Via Luciano Brevini, 1/a
42124 REGGIO EMILIA
RE
Italia

Delivery Note Ref. No. SDDT-2401045 of 04/06/2024 line 5 Item code 32501541199 (SA0009) Shipment No. 156
Your Ref. Order No. 4500629185 of 08/02/2024 Marking No. 3250154-14

## CASTING No. 379512

Original casting no. 23/79512

Original analysis certificate no. 14370 Released on 29/05/2023 by: RIVA ACCIAIO Spa

**MATERIAL** 20MNCR5 CAP. BREVINI SP 046-03

**CHEMICAL COMPOSITION**

| C [%] | Mn [%] | Si [%] | P [%] | S [%] | Cr [%] | Ni [%] | Mo [%] | Al [%] | Cu [%] | Sn [%] | Ti [%] | Ca [%] | V [%] | N [PPM] | Nb [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,1800 | 1,2800 | 0,3000 | 0,0120 | 0,0220 | 1,1700 | 0,0900 | 0,0200 | 0,0240 | 0,2000 | 0,0080 | 0,0100 | 0,0015 | 0,0050 | 100,0000 | 0,0020 |

| O2 [PPM] | H2 [PPM] |
|---|---|
| 20,0000 | 2,5000 |

**IDEAL DIAMETER** 0 "

**AUSTENITIC GRAIN SIZE**
Austenitic grain defined 6
Austenitic grain smaller
Austenitic grain larger

**JOMINY TEST**

| mm | 1,5 | 3,0 | 5,0 | 7,0 | 9,0 | 11,0 | 13,0 | 15,0 | 20,0 | 25,0 | 30,0 | 35,0 | 40,0 | 45,0 | 50,0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HRC | 44 | 43 | 43 | 42 | 38 | 36 | 34 | 33 | 31 | 29 | 28 | 27 | 26 | 25 | 23 |

**MECHANICAL PROPERTIES**

**TENSILE STRENGTH**
Test type **LONGITUDINAL TENSILE - EN ISO 6892-1**
Heat Treatment Specimen **HARDENING AND DESTRESSING**

| A [%] | HB [HB] | R [N/MM2] | RS [N/MM2] | % |
|---|---|---|---|---|
| 13,00 | 250,00 | 1.316,00 | 1.213,00 | 53,50 |

**STRENGTH**
Test type **STRENGTH TEST - EN ISO 148/1**
Heat Treatment Specimen **HARDENING AND DESTRESSING**
Temperature [°C] 20
Average value [Joule] 33,3

**MICRO-PURITY**
Method: DIN 50602/85 K4 METHOD
Type K4
12,0

**NOTES**
Reduction ratio 38 mm round bar = 22.58:1
Grade 3 banding according to UNI 8449
STEEL DEGASSED UNDER VACUUM

The data contained in this certificate complies with the EN 10204/3.1 standard and is true to the original archived at our site

For F.A.C.E.M. SpA
Vacca Simone

230303

RIVA ACCIAIO S.P.A.
LESEGNO PLANT
Via Statale, 28 nord
12076 Lesegno(CN) ITALIA
Tel. 0174-718111 Fax. 0174-77251

Registered and administration Office Viale Certosa, 249 - 20151 Milano
telephone 02 30700 - telefax 02 38000346
tax Code, VAT number and Milan Company Register number 08521290158

# TEST CERTIFICATE

A03 Certificate Number: 14370
Certificate Date: 29/05/2023

WE CERTIFY THAT THE PRODUCT COVERED BY THIS DOCUMENT COMPLIES WITH THE REQUIREMENTS STATED IN THE ORDER

B14 Reference standard: UNI EN 10204/2005
B15 Type: 3.1

B02 Steel: 20MNCRS5+HH INT 017
B07 Casting Year/Number: 23/79512
B01 Profile: ROUND ROLLED EN 10060
B09 Measurement 1 x Measurement 2: 38,00
B04 Supply status: ROUND ROLLED
B09 Length: 5,500 - 6,500
A07 Client Order: SP04180
A08 Confirmation: 07 Y4P47 003
C14 Reduction rate: 22,58
B06

A06 Client Data:
INTERACCIAI S.P.A.
VIA PASTEUR 2
42122 REGGIO EMILIA

C70 Process:
MELTING IN ELECTRIC FURNACE,
CASTING PROTECTED IN C.C. 160
STEEL DEGASSED UNDER VACUUM

## CHEMICAL COMPOSITION - CASTING ANALYSIS

| C71 C | C72 Mn | C73 Si | C74 P | C75 S | C76 Cr | C77 Ni | C78 Mo | C79 Cu | C80 Sn | C85 Al | C91 Ti |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,180 | 1,280 | 0,300 | 0,012 | 0,022 | 1,170 | 0,090 | 0,020 | 0,200 | 0,008 | 0,024 | 0,010 |

| C87 V | C88 Nb | C89 B | C92 Ca | | | | C93 N | C94 $O_{2\,[ppm]}$ | C95 $H_{2\,[ppm]}$ | | C96 CEV |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,005 | 0,002 | 0,0000 | 0,0015 | | | | 0,0100 | 20 | 2,5 | | |

## MECHANICAL PROPERTIES

C01 Sample: C-Casting L-Rolled T-Drawn — [C]

C03 Heat Treatment: SPECIMEN — HARDENING AND DESTRESSING

TENSILE TEST

| C08 Sample Size | C10 Specimen Size | C12 $R_{m\,[MPa]}$ | C11 $R_{e\,[MPa]}$ | C13 $A5_{\%}$ | C15 $Z_{\%}$ | |
|---|---|---|---|---|---|---|
| 11 | 10 | 1316 | 1213 | 13,0 | 53,5 | |

STRENGTH TESTS

| C41 Specimen Size | C40 Type | C42 $K_{1\,[J]}$ | C42 $K_{2\,[J]}$ | C42 $K_{3\,[J]}$ | C43 $K_{s\,[J]}$ | C44 Temp. |
|---|---|---|---|---|---|---|
| 10x10 | KCU | | | | 33,3 | 20°C |

C22 HB

## JOMINY TEST

C03 Normalisation: Hardening

| C61 mm | 1,5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | | | | | C45 DI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C60 HRC | 44 | 43 | 43 | 42 | 38 | 36 | 34 | 33 | 31 | 29 | 28 | 27 | 26 | 25 | 23 | | | | | |

C65 Austenitic grade: MAC QUAID - EHN 6

C62 Micro-purity: DIN50602/UNI3244
K4=12,0

C05 Banding: 3 BANDING ACCORDING TO UNI 8449

C31 Hardness values: +AR HB 250 | +A | +FP

## ADDITIONAL INFORMATION

B03
RODS OF COMMERCIAL LENGTH

ANTI-MIXING CHECK PERFORMED

D5 Notes:
COMPLIANT WITH 2000/53/EC, 2011/65/EU AS AMENDED RADIOACTIVITY < 0.1 BQ/G (ITALIAN LEGISLATIVE DECREE No.101 31/07/2020 AS AMENDED)

ELECTRONIC DOCUMENT VALID WITHOUT SIGNATURE

A10 Delivery Note Data:
N° 4998 KG. 8738

Z04

Doc. ID. 640682 - CASTING CERTIFICATE

code Casting 379512
No. 23/79512 Pr. 230303
Base Steel; S20MNCR5BPT
Supplier/Client: RIVA ACCIAIO SPA

Z01 Q.C. Manager: G. Piumatti

Z02

**F.A.C.E.M. S.p.A.**
Fabbricazione Articoli Casalinghi E Metallurgici

TRE SPADE ®
www.trespade.it

VAT No.: IT 00517250015
Tax Code and Turin Company Register No. 00517250015
REA di Torino n° 151967 - Cap.Soc. 3.000.000 €i.v.
**Registered Office:**
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Tel. +39 0124 707711
**Administration Office:**
Borgata Braidacroce, 108 - 10087 Valperga (TO) - Italia
Tel. +39 0124 707711
www.facem.com E-mail: facem@facem.com

# CERTIFICATO DI ANALISI
# ANALYSIS CERTIFICATE

DANA MOTION SYSTEMS ITALIA Srl -POWER TRANSMISSION
POWER TRANSMISSION
Via Luciano Brevini, 1/a
42124 REGGIO EMILIA
RE
Italia

Delivery Note Ref. No. SDDT-2401045 of 04/06/2024 line 5 Item code 32501541199 (SA0009) Shipment No. 156
Your Ref. Order No. 4500629185 of 08/02/2024 Marking No. 3250154-14

## CASTING No. 379514

Original casting no. 23/79514

Original analysis certificate no. 14370 Released on 29/05/2023 by: RIVA ACCIAIO Spa

**MATERIAL** 20MNCR5 CAP. BREVINI SP 046-03

**CHEMICAL COMPOSITION**

| C [%] | Mn [%] | Si [%] | P [%] | S [%] | Cr [%] | Ni [%] | Mo [%] | Al [%] | Cu [%] | Sn [%] | Ti [%] | Ca [%] | V [%] | N [PPM] | Nb [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,1800 | 1,2800 | 0,3000 | 0,0120 | 0,0220 | 1,1700 | 0,0900 | 0,0200 | 0,0240 | 0,2000 | 0,0080 | 0,0100 | 0,0015 | 0,0050 | 100,0000 | 0,0020 |

| O2 [PPM] | H2 [PPM] |
|---|---|
| 20,0000 | 2,5000 |

**IDEAL DIAMETER** 0 "

**AUSTENITIC GRAIN SIZE**
Austenitic grain defined 6
Austenitic grain smaller
Austenitic grain larger

**JOMINY TEST**

| mm | 1,5 | 3,0 | 5,0 | 7,0 | 9,0 | 11,0 | 13,0 | 15,0 | 20,0 | 25,0 | 30,0 | 35,0 | 40,0 | 45,0 | 50,0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HRC | 44 | 43 | 43 | 42 | 38 | 36 | 34 | 33 | 31 | 29 | 28 | 27 | 26 | 25 | 23 |

**MECHANICAL PROPERTIES**

**TENSILE STRENGTH**
Test type **LONGITUDINAL TENSILE - EN ISO 6892-1**
Heat Treatment Specimen **HARDENING AND DESTRESSING**

| A [%] | HB [HB] | R [N/MM2] | RS [N/MM2] | % |
|---|---|---|---|---|
| 13,00 | 250,00 | 1.316,00 | 1.213,00 | 53,50 |

**STRENGTH**
Test type **STRENGTH TEST - EN ISO 148/1**
Heat Treatment Specimen **HARDENING AND DESTRESSING**
Temperature [°C] 20
Average value [Joule] 33,3

**MICRO-PURITY**
Method: DIN 50602/85 K4 METHOD
Type K4
12,0

**NOTES**
Reduction ratio 38 mm round bar = 22.58:1
Grade 3 banding according to UNI 8449
STEEL DEGASSED UNDER VACUUM

The data contained in this certificate complies with the EN 10204/3.1 standard and is true to the original archived at our site

For F.A.C.E.M. SpA
Vacca Simone

230304

RIVA ACCIAIO S.P.A.
LESEGNO PLANT
Via Statale, 28 nord
12076 Lesegno(CN) ITALIA
Tel. 0174-718111 Fax. 0174-77251

Registered and administration Office viale Certosa, 249 - 20151 Milano
telephone 02 30700 - telefax 02 38000346
tax Code, VAT number and Milan Company Register number 08521290158

# TEST CERTIFICATE

A03 Certificate Number: 14371
Certificate Date: 29/05/2023

WE CERTIFY THAT THE PRODUCT COVERED BY THIS DOCUMENT COMPLIES WITH THE REQUIREMENTS STATED IN THE ORDER

B14 Reference standard: UNI EN 10204/2005
B15 Type: 3.1

B02 Steel: 20MNCRS5+HH INT 017
B07 Casting Year/Number: 23/79514
B01 Profile: ROUND ROLLED EN 10060
B09 Measurement 1 x Measurement 2: 38,00
B04 Supply status: ROUND ROLLED
B09 Length: 5,500 - 6,500
A07 Client Order: SP04180
A08 Confirmation: 07 Y4P47 003
C14 Reduction rate: 22,58
B06

A06 Client Data:
INTERACCIAI S.P.A.
VIA PASTEUR 2
42122 REGGIO EMILIA

C70 Process:
MELTING IN ELECTRIC FURNACE,
CASTING PROTECTED IN C.C. 160

STEEL DEGASSED UNDER VACUUM

## CHEMICAL COMPOSITION - CASTING ANALYSIS

| C71 C | C72 Mn | C73 Si | C74 P | C75 S | C76 Cr | C77 Ni | C78 Mo | C79 Cu | C80 Sn | C85 Al | C91 Ti |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,180 | 1,300 | 0,300 | 0,013 | 0,022 | 1,160 | 0,120 | 0,020 | 0,180 | 0,008 | 0,022 | 0,010 |

| C87 V | C88 Nb | C89 B | C92 Ca | | | | C93 N | C94 $O_{2\,[ppm]}$ | C95 $H_{2\,[ppm]}$ | | C96 CEV |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,005 | 0,002 | 0,0000 | 0,0013 | | | | 0,0110 | 20 | 2,5 | | |

## MECHANICAL PROPERTIES

C01 Sample: C-Casting L-Rolled T-Drawn — [C]

C03 Heat Treatment: SPECIMEN HARDENING AND DESTRESSING

TENSILE TEST

| C08 Sample Size | C10 Specimen Size | C12 $R_{m\,[MPa]}$ | C11 $R_{e\,[MPa]}$ | C13 $A5_{\%}$ | C15 $Z_{\%}$ | |
|---|---|---|---|---|---|---|
| 11 | 10 | 1319 | 1219 | 12,5 | 53,7 | |

STRENGTH TESTS

| C41 Specimen Size | C40 Type | C42 $K_{1\,[J]}$ | C42 $K_{2\,[J]}$ | C42 $K_{3\,[J]}$ | C43 $K_{s\,[J]}$ | C44 Temp. |
|---|---|---|---|---|---|---|
| 10x10 | KCU | | | | 32,4 | 20°C |

C22 HB

## JOMINY TEST

C03 Normalisation
Hardening

| C61 mm | 1,5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | | | | | C45 DI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C60 HRC | 44 | 43 | 43 | 42 | 39 | 37 | 35 | 34 | 32 | 30 | 29 | 28 | 27 | 27 | 25 | | | | | |

C65 Austenitic grade: MAC QUAID - EHN 6

C62 Micro-purity: ASTM E45 - JERKONTORET METHOD A
S: A1,5 B0,5 C1,0 D1,0

C05 Banding: 3 BANDING ACCORDING TO UNI 8449

C31 Hardness values: +AR HB 250 | +A | +FP

## ADDITIONAL INFORMATION

B03
RODS OF COMMERCIAL LENGTH

ANTI-MIXING CHECK PERFORMED

D51 Notes:
COMPLIANT WITH 2000/53/EC, 2011/65/EU AS AMENDED RADIOACTIVITY < 0.1 BQ/G (ITALIAN LEGISLATIVE DECREE No.101 31/07/2020 AS AMENDED)

ELECTRONIC DOCUMENT VALID WITHOUT SIGNATURE

A10 Delivery Note Data:
N° 4998 KG. 5022

Z04
Doc. ID. 640683 - CASTING CERTIFICATE
code Casting 379514
No. 23/79514 Pr. 230304
Base Steel; S20MNCR5BPT
Supplier/Client: RIVA ACCIAIO SPA

Z01 Q.C. Manager: G. Piumatti

Z02

**F.A.C.E.M. S.p.A.**
Fabbricazione Articoli Casalinghi E Metallurgici

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# CERTIFICATO DI TRATTAMENTO TERMICO

# HEAT TREATMENT CERTIFICATE

Form MR-CQU-32 Rev. 02 of 27/03/2011

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| N. D.d.T.<br>Delivery Note No. | SDDT-2401045 | Riga<br>Row | 5 | Del<br>Of | 04/06/2024 | N. Pezzi spediti<br>N. Pieces Shipped | 156 |
| Marchiatura<br>Marking | 3250154-14 | Colata N.<br>Casting No. | 379512 | | | Kg spediti<br>Kg Shipped | 122 |
| Accorpamento N.<br>Grouping No. | 2301734 | Ordine di controllo N.<br>Inspection Order No. | CQ23-01182 | | | | |
| Cliente<br>Customer | C000001 | DANA MOTION SYSTEMS ITALIA Srl - POWER TRANSMISSION | | | | | |
| Nr. Articolo<br>Item No. | 32501541199/T | CODE 32501541199 ANNEALED | | | | Nr. Articolo FACEM<br>Item No. FACEM | SA0009/T10 |
| Acciaio di base<br>Steel | 20MNCR5 | | | | | | |
| Trattamento termico eseguito<br>Executed Heat Treatment | NORMALISATION | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| N. totale pezzi controllati<br>N. of Controlled Pieces | 5 | | | | | |
| Metodo di prova<br>Test Method | Ø Sfera<br>Ø Sphere | 0 | Kg Applicati<br>Kg Applied | 0 | ACCORDING TO EN ISO 6506-1 STANDARD | |

TREATMENT BATCH : 202311092327 - STTV01 - REF. MEASUREMENT: 23-1637

REQUIRED HARDNESS VALUE HB min 160 max 210

1) 173 HB 2) 171 HB 3) 170 HB 4) 174 HB 5) 178 HB

CHECK DATE: 10/11/2023 MEASUREMENTS MADE BY: TESTED - ANDREA

Any complaints regarding the required heat treatment must be raised before subjecting conforming parts to further processing

**F.A.C.E.M. S.p.A.**
Fabbricazione Articoli Casalinghi E Metallurgici

**TRE SPADE ®**
www.trespade.it

**Hot & Warm Steel Forging Division**
VAT No.: **IT 00517250015**
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# CERTIFICATO DI TRATTAMENTO TERMICO

# HEAT TREATMENT CERTIFICATE

Form MR-CQU-32 Rev. 02 of 27/03/2011

| | | | | | |
|---|---|---|---|---|---|
| N. D.d.T. / Delivery Note No. | SDDT-2401045 | Riga / Row | 5 | Del / Of 04/06/2024 | N. Pezzi spediti / N. Pieces Shipped 1277 |
| Marchiatura / Marking | 3250154-15 | Colata N. / Casting No. | 379514 | | Kg spediti / Kg Shipped 1000,5 |
| Accorpamento N. / Grouping No. | 2301734 | Ordine di controllo N. / Inspection Order No. | CQ23-01183 | | |
| Cliente / Customer | C000001 | DANA MOTION SYSTEMS ITALIA Srl - POWER TRANSMISSION | | | |
| Nr. Articolo / Item No. | 32501541199/T | CODE 32501541199 ANNEALED | | | Nr. Articolo FACEM / Item No. FACEM SA0009/T10 |
| Acciaio di base / Steel | 20MNCR5 | | | | |
| Trattamento termico eseguito / Executed Heat Treatment | NORMALISATION | | | | |

| | | | | | |
|---|---|---|---|---|---|
| N. totale pezzi controllati / N. of Controlled Pieces | 5 | | | | |
| Metodo di prova / Test Method | Ø Sfera / Ø Sphere 0 | Kg Applicati / Kg Applied | 0 | ACCORDING TO EN ISO 6506-1 STANDARD | |

TREATMENT BATCH : 202311092328 - STTV01 -REF. MEASUREMENT: : 23-1643

REQUIRED HARDNESS VALUE HB min 160 max 210

1) 165 HB 2) 167 HB 3) 164 HB 4) 169 HB 5) 173 HB

CHECK DATE: 10/11/2023 MEASUREMENTS MADE BY: TESTED - ANDREA

Any complaints regarding the required heat treatment must be raised before subjecting conforming parts to further processing

| | Check Sheet<br>F0501 - R04.02 - 12.11.2012 | Inspection lot<br>030001099863 | Quantity<br>1.440 | Order Type/Number/Position<br>ZWO0 11400084 0140 | Work Center<br>0062 |
|---|---|---|---|---|---|

| PART NUMBER | REVISION | OPERATION | OPERATION DESCRIPTION |
|---|---|---|---|
| 32501541100 | W | 0140 | ipsen case-hardening furnace |

| ID | CHARACTERISTIC | METHOD | SAMPLING | UM | TARGET | MIN_MAX | #1 | #2 | #3 | #4 | #5 | #6 | #7 | #8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | MT3006<br>ROCKWELL HARDNESS C | DUR001<br>DUROMETER | ZF0004<br>4 Pieces | | | 62,00<br>58,00 | 60 | 59 | 60 | 60 | | | | |
| 20 | MT3012<br>CASE-HARDENING DEPTH (HV550) | PRO001<br>TEST SPECIMEN ACCORDING TO SP022-2 | ZF0004<br>4 Pieces | | | 0,80<br>0,60 | ,63 | ,65 | ,69 | | | | | |
| 30 | MT3023<br>P3 CORE STRENGTH | LAB001<br>LABORATORY | ZF0004<br>4 Pieces | | | 1.400,00<br>1.100,00 | 1130 | | | | | | | |
| 40 | MT0100<br>MATERIAL TYPE | VIS002<br>VISUAL INSPECTION | ZF0001<br>1 Piece | | | | B21-20MnCr5 | | | | | | | |
| 50 | MT4101<br>TEST SPECIMEN TYPE USED (SP022-02) | PRO001<br>TEST SPECIMEN ACCORDING TO SP022-2 | ZF0004<br>4 Pieces | | | | 01-TEST ON PART | | | | | | | |
| 60 | MT5100<br>PROGRAM CODE USED | VIS002<br>VISUAL INSPECTION | ZF0004<br>4 Pieces | | | | | | | | | | | |
| 70 | MT5101<br>LOAD NUMBER | VIS002<br>VISUAL INSPECTION | ZF0004<br>4 Pieces | | | | 24-07/0073 RTQ 2 | | | | | | | |
| 100 | VC3010<br>VISUAL TEST: AFTER HEAT TREATMENT | VIS001<br>VISUAL INSPECTION ACCORDING TO WI0519 | ZF0004<br>4 Pieces | | | | | | | | | | | |
| 110 | TX0038<br>NON-CONFORMITY OR RERA TEST | VIS002<br>VISUAL INSPECTION | ZF0004<br>4 Pieces | | | | | | | | | | | |

| Date Time | Signature | Remarks |
|---|---|---|
| 23.07.2024 16:04:01 | DVALCAV001 | Tested according SP022-02 , carburizing temperature below 940°C |

**F.A.C.E.M. S.p.A.**
Fabbricazione Articoli Casalinghi E Metallurgici

TRE SPADE ®
www.trespade.it

**Partita Iva IT 00517250015**
Cod. Fisc. e n° Reg.Imp.Torino 00517250015
REA di Torino n° 151967 - Cap.Soc. 3.000.000 € i.v.
**Sede Legale:**
Via Bricherasio, 7 - 10128 Torino (TO) - Italia
Tel. +39 0124 707711
**Sede Amministrativa:**
Borgata Braidacroce, 108 - 10087 Valperga (TO) - Italia
Tel. +39 0124 707711
www.facem.com E-mail: facem@facem.com

# CERTIFICATO DI ANALISI
# ANALYSIS CERTIFICATE

DANA MOTION SYSTEMS ITALIA Srl -POWER TRANSMISSION
POWER TRANSMISSION
Via Luciano Brevini, 1/a
42124 REGGIO EMILIA
RE
Italia

Rif. DDT Nr. SDDT-2400623 del 03/04/2024 riga 2 Cod. articolo 32513641199 (SA0026) Spediti Nr. 2250
Rif. Vs. Ordine Nr. 4500612666 del 04/12/2023 Marchiatura Nr. 20

## COLATA N. 379862

Colata originale n. 23/79862

Certificato di analisi originario n. 17998 Rilasciato il 26/07/2023 da: RIVA ACCIAIO Spa

**MATERIALE** 20MNCR5 UNI EN ISO 683-3

**COMPOSIZIONE CHIMICA**

| C [%] | Mn [%] | Si [%] | P [%] | S [%] | Cr [%] | Ni [%] | Mo [%] | Al [%] | Cu [%] | Sn [%] | Ti [%] | V [%] | N [PPM] | Nb [%] | O2 [PPM] | H2 [PPM] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,1800 | 1,2100 | 0,2500 | 0,0160 | 0,0230 | 1,1300 | 0,1100 | 0,0200 | 0,0220 | 0,2300 | 0,0090 | 0,0070 | 0,0040 | 105,0000 | 0,0030 | 20,0000 | 2,5000 |

**DIAMETRO IDEALE** 0 "

**GROSSEZZA GRANO AUSTENITICO**
Grano austenitico definito 6
Grano austenitico inferiore
Grano austenitico superiore

**PROVA JOMINY**

| mm | 1,5 | 3,0 | 5,0 | 7,0 | 9,0 | 11,0 | 13,0 | 15,0 | 20,0 | 25,0 | 30,0 | 35,0 | 40,0 | 45,0 | 50,0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HRC | 44 | 43 | 42 | 40 | 36 | 34 | 32 | 31 | 28 | 27 | 25 | 24 | 23 | 22 | 21 |

**CARATTERISTICHE MECCANICHE**

**RESISTENZA A TRAZIONE**
Tipo prova TRAZIONE LONGITUDINALE - UNI EN ISO 6892-1
T.T. Provetta TEMPRA E DISTENSIONE

| A [%] | HB [HB] | R [N/MM2] | RS [N/MM2] | % |
|---|---|---|---|---|
| 12,50 | 228,00 | 1.299,00 | 1.201,00 | 54,30 |

**RESILIENZA**
Tipo prova PROVA DI RESILIENZA - UNI EN ISO 148/1
T.T. Provetta TEMPRA E DISTENSIONE
Temperatura [°C] 20
Valore medio [Joule] 33,3

**MICROPUREZZA**
Metodo: ASTM/E45 METODO A JERNKONTORET

| Tipo | A/S | B/S | C/S | D/S |
|---|---|---|---|---|
| | 1,5 | 0,5 | 0,5 | 1,0 |

**NOTE**
Rapporto di riduzione tondo mm 55 = 10,78:1
ACCIAIO DEGASATO SOTTOVUOTO

I dati riportati in questo certificato sono conformi alla norma UNI EN 10204/3.1 ed all'originale da noi archiviato

Per F.A.C.E.M. SpA
Vacca Simone

230377

RIVA ACCIAIO S.P.A.
STABILIMENTO DI LESEGNO
Via Statale, 28 nord
12076 Lesegno(CN) ITALIA
Tel. 0174-718111 Fax. 0174-77251

Sede legale e amministrativa: Viale Certosa, 249 - 20151 Milano
telefono 02 30700 - telefax 02 38000346
codice fiscale, partita iva e numero iscrizione Registro Imprese Milano 08521290158

# CERTIFICATO DI COLLAUDO

*A03* Numero Certificato: 17998

Data Certificato: 26/07/2023

CERTIFICHIAMO CHE IL PRODOTTO RELATIVO A QUESTO DOCUMENTO E' CONFORME ALLE PRESCRIZIONI CITATE IN ORDINE

*B14* Norma riferimento: UNI EN 10204/2005

*B15* Tipo: 3.1

*B02* Acciaio: 20MNCRS5+HH EN 10084

*B07* Anno/Numero colata: 23/79862

*B01* Profilo: LAMINATO TONDO EN 10060

*B09* Misura 1 x Misura 2: 55,00

*B04* Stato fornitura: LAMINATO TONDO

*B09* Lunghezza: 8,000 - 9,000

*A07* Ordine Cliente: 228/2023

*A08* Conferma: 07 Y5K77 001

*C14* Tasso di riduzione: 10,78

*B06*

*A06* Dati Cliente:
BERFER SRL
CORSO TORINO 60
10086 RIVAROLO CANAVESE

*C70* Processo:
FUSIONE AL FORNO ELETTRICO
COLAGGIO PROTETTO IN C.C. 160

## COMPOSIZIONE CHIMICA - ANALISI DI COLATA

| C71 C | C72 Mn | C73 Si | C74 P | C75 S | C76 Cr | C77 Ni | C78 Mo | C79 Cu | C80 Sn | C85 Al | C91 Ti |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,180 | 1,210 | 0,250 | 0,016 | 0,023 | 1,130 | 0,110 | 0,020 | 0,230 | 0,009 | 0,022 | 0,007 |

| C87 V | C88 Nb | C89 B | C92 Ca | | | | C93 N | C94 $O_{2\,[ppm]}$ | C95 $H_{2\,[ppm]}$ | | C96 CEV |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,004 | 0,003 | 0,0000 | | | | | 0,0105 | 20 | 2,5 | | |

## CARATTERISTICHE MECCANICHE

*C01* Prelievo: C - Colata, L - Laminato, T - Trafilato: [C]

*C03* Trattamento Termico: PROVETTA TEMPR.E DIST

PROVE DI TRAZIONE

| C08 Dim. Campione | C10 Dim. Provetta | C12 $R_{m\,[MPa]}$ | C11 $R_{e\,[MPa]}$ | C13 $A5_{\%}$ | C15 $Z_{\%}$ | |
|---|---|---|---|---|---|---|
| 11 | 10 | 1299 | 1201 | 12,5 | 54,3 | |

PROVE DI RESILIENZA

| C41 Dim. Provetta | C40 Tipo | C42 $K_{1\,[J]}$ | C42 $K_{2\,[J]}$ | C42 $K_{3\,[J]}$ | C43 $K_{x\,[J]}$ | C44 Temp. |
|---|---|---|---|---|---|---|
| 10x10 | KCU | | | | 33,3 | 20°C |

C22 HB:

## PROVA JOMINY

*C03* Normalizzazione: Tempra

| C61 mm | 1,5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | | | | | C45 DI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C60 HRC | 44 | 43 | 42 | 40 | 36 | 34 | 32 | 31 | 28 | 27 | 25 | 24 | 23 | 22 | 21 | | | | | |

*C65* Grano Austenitico: MAC QUAID - EHN 6

*C62* Micropurezza:
ASTM E45 - JERKONTORET METODO A
S: A1,5 B0,5 C0,5 D1,0

*C05* Bandatura:

*C31* Valori di durezza:

+AR HB 228 | +A | +FP

## INFORMAZIONI SUPPLEMENTARI

*B03*
BARRE LUNG. COMMERCIALE

CONTROLLO ANTIMESCOLAMENTO ESEGUITO

*D51* Note:

DOCUMENTO ELETTRONICO VALIDO SENZA FIRMA

*A10* Dati DDT:
N° 6316 KG. 5015

*Z04*

ID Doc. 647303 - CERTIFICATO COLATA
Cod.Colata: 379862
Nr.23/79862 Pr. 230377
Acciaio Base: S20MNCR5
Forn/Cli: RIVA ACCIAIO Spa

*Z01* Responsabile C.Q.:
G. Piumatti

*Z02*

**F.A.C.E.M. S.p.A.**
**F**abbricazione **A**rticoli **C**asalinghi **E** **M**etallurgici

**TRE SPADE ®**
**www.trespade.it**

**Hot & Warm Steel Forging Division**
**Partita Iva IT 00517250015**
Cod. Fisc. e n° Reg.Imp.Torino 00517250015
REA di Torino n° 151967 - Cap.Soc. 3.000.000 € i.v.
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www.facem.com E-mail: facem@facem.com

# CERTIFICATO DI TRATTAMENTO TERMICO

# HEAT TREATMENT CERTIFICATE

Modulo MR-CQU-32 Rev. 02 del 27/03/2011

| | | | | | |
|---|---|---|---|---|---|
| N. D.d.T. / Delivery Note No. | SDDT-2400623 | Riga / Row | 2 | Del / Of 03/04/2024 | N. Pezzi spediti / N. Pieces Shipped 2250 |
| Marchiatura / Marking | 20 | Colata N. / Casting No. | 379862 | | Kg spediti / Kg Shipped 4692,5 |
| Accorpamento N. / Grouping No. | 2400306 | Ordine di controllo N. / Inspection Order No. | CQ24-00223 | | |
| Cliente / Customer | C000001 | DANA MOTION SYSTEMS ITALIA Srl - POWER TRANSMISSION | | | |
| Nr. Articolo / Item No. | 32513641199/T | COD. 32513641199 RICOTTO | | Nr. Articolo FACEM / Item No. FACEM | SA0026/T10 |
| Acciaio di base / Steel | 20MNCR5 | | | | |
| Trattamento termico eseguito / Executed Heat Treatment | NORMALIZZAZIONE | | | | |

| | | | | | |
|---|---|---|---|---|---|
| N. totale pezzi controllati / N. of Controlled Pieces | 20 | | | | |
| Metodo di prova / Test Method | Ø Sfera / Ø Sphere | 10 | Kg Applicati / Kg Applied | 3.000 | SECONDO NORMA UNI EN ISO 6506-1 |

LOTTO DI TRATTAMENTO: 202402281359 - STTV01 - RIF. RILEVAZIONE: 24-0407
VALORE DUREZZA RICHIESTO: HB min 160 max 210

1) 171 HB 2) 176 HB 3) 169 HB 4) 176 HB 5) 172 HB

DATA VERIFICA: 28/02/2024 RILIEVI ESEGUITI DA: COLLAUDOV - OMAR

---

LOTTO DI TRATTAMENTO: 202402281645 - STTV01 - RIF. RILEVAZIONE: 24-0409
VALORE DUREZZA RICHIESTO: HB min 160 max 210

1) 175 HB 2) 177 HB 3) 176 HB 4) 169 HB 5) 172 HB

DATA VERIFICA: 28/02/2024 RILIEVI ESEGUITI DA: COLLAUDOV - OMAR

---

LOTTO DI TRATTAMENTO: 202402281940 - STTV01 - RIF. RILEVAZIONE: 24-0410
VALORE DUREZZA RICHIESTO: HB min 160 max 210

1) 170 HB 2) 171 HB 3) 173 HB 4) 176 HB 5) 173 HB

DATA VERIFICA: 29/02/2024 RILIEVI ESEGUITI DA: COLLAUDOV - ANDREA

---

LOTTO DI TRATTAMENTO: 202402282228 - STTV01 - RIF. RILEVAZIONE: 24-0411
VALORE DUREZZA RICHIESTO: HB min 160 max 210

1) 174 HB 2) 179 HB 3) 173 HB 4) 170 HB 5) 172 HB

DATA VERIFICA: 29/02/2024 RILIEVI ESEGUITI DA: COLLAUDOV - ANDREA

---

Eventuali contestazioni circa il trattamento termico richiesto devono essere formulate prima di sottoporre i particolari conformi ad ulteriore lavorazione

**F.A.C.E.M. S.p.A.**
Fabbricazione Articoli Casalinghi E Metallurgici

VAT No.: IT 00517250015
Tax Code and Turin Company Register No. 00517250015
REA di Torino n° 151967 - Cap.Soc. 3.000.000 €i.v.
**Registered Office:**
Via Bricherasio, 7 - 10128 Torino (TO) - Italia
Tel. +39 0124 707711
**Administration Office:**
Borgata Braidacroce, 108 - 10087 Valperga (TO) - Italia
Tel. +39 0124 707711
www.facem.com E-mail: facem@facem.com

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# CERTIFICATO DI ANALISI
# ANALYSIS CERTIFICATE

DANA MOTION SYSTEMS ITALIA Srl -POWER TRANSMISSION
POWER TRANSMISSION
Via Luciano Brevini, 1/a
42124 REGGIO EMILIA
RE
Italia

Delivery Note Ref. No. SDDT-2400623 of 03/04/2024 line 2
Your Ref. Order No. 4500612666 of 04/12/2023

Item code 32513641199 (SA0026)
Marking No. 20

Shipment No. 2250

## CASTING No. 379862

Original casting no. 23/79862

Original analysis certificate no. 17998 Released on 26/07/2023 by: RIVA ACCIAIO Spa

**MATERIAL** 20MNCR5 UNI EN ISO 683-3

**CHEMICAL COMPOSITION**

| C [%] | Mn [%] | Si [%] | P [%] | S [%] | Cr [%] | Ni [%] | Mo [%] | Al [%] | Cu [%] | Sn [%] | Ti [%] | V [%] | N [PPM] | Nb [%] | O2 [PPM] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,1800 | 1,2100 | 0,2500 | 0,0160 | 0,0230 | 1,1300 | 0,1100 | 0,0200 | 0,0220 | 0,2300 | 0,0090 | 0,0070 | 0,0040 | 105,0000 | 0,0030 | 20,0000 |

| H2 [PPM] |
|---|
| 2,5000 |

**IDEAL DIAMETER** 0 "

**AUSTENITIC GRAIN SIZE**

Austenitic grain defined 6
Austenitic grain smaller
Austenitic grain larger

**JOMINY TEST**

| mm | 1,5 | 3,0 | 5,0 | 7,0 | 9,0 | 11,0 | 13,0 | 15,0 | 20,0 | 25,0 | 30,0 | 35,0 | 40,0 | 45,0 | 50,0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HRC | 44 | 43 | 42 | 40 | 36 | 34 | 32 | 31 | 28 | 27 | 25 | 24 | 23 | 22 | 21 |

**MECHANICAL PROPERTIES**

**TENSILE STRENGTH**

Test type LONGITUDINAL TENSILE UNI EN ISO 6892-1
Heat Treatment Specimen HARDENING AND DESTRESSING

| A [%] | HB [HB] | R [N/MM2] | RS [N/MM2] | % |
|---|---|---|---|---|
| 12,50 | 228,00 | 1.299,00 | 1.201,00 | 54,30 |

**STRENGTH**

Test type STRENGTH TEST UNI EN ISO 148/1
Heat Treatment Specimen HARDENING AND DESTRESSING
Temperature [°C] 20
Average value [Joule] 33,3

**MICRO-PURITY**

Method: ASTM/E45 JERNKONTORET METHOD

| Type | A/S | B/S | C/S | D/S |
|---|---|---|---|---|
| | 1,5 | 0,5 | 0,5 | 1,0 |

**NOTES**

Reduction ratio 55 mm round bar = 10,78:1
STEEL DEGASSED UNDER VACUUM

The data contained in this certificate complies with the EN 10204/3.1 standard and is true to the original archived at our site

For F.A.C.E.M. SpA
Vacca Simone

230377

RIVA ACCIAIO S.P.A.
LESEGNO PLANT
Via Statale, 28 nord
12076 Lesegno(CN) ITALIA
Tel. 0174-718111 Fax. 0174-77251

Registered and administration Office Viale Certosa, 249 - 20151 Milano
telephone 02 30700 - telefax 02 38000346
tax Code, VAT number and Milan Company Register number 08521290158

# TEST CERTIFICATE

A03 Certificate Number: 17998
Certificate Date: 26/07/2023

WE CERTIFY THAT THE PRODUCT COVERED BY THIS DOCUMENT COMPLIES WITH THE REQUIREMENTS STATED IN THE ORDER

B14 Reference standard: UNI EN 10204/2005
B15 Type: 3.1

B02 Steel: 20MNCRS5+HH EN 10084
B01 Profile: ROUND ROLLED EN 10060
B04 Supply status: ROUND ROLLED
A07 Client Order: 228/2023
A08 Confirmation: 07 Y5K77 001
B06

B07 Casting Year/Number: 23/79862
Measurement 1 x Measurement 2: 55,00
B09 Length: 8,000 - 9,000
C14 Reduction rate: 10,78

A06 Client Data:
BERFER SRL
CORSO TORINO 60
10086 RIVAROLO CANAVESE

C70 Process:
MELTING IN ELECTRIC FURNACE,
CASTING PROTECTED IN C.C. 160

## CHEMICAL COMPOSITION - CASTING ANALYSIS

| C71 C | C72 Mn | C73 Si | C74 P | C75 S | C76 Cr | C77 Ni | C78 Mo | C79 Cu | C80 Sn | C85 Al | C91 Ti |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,180 | 1,210 | 0,250 | 0,016 | 0,023 | 1,130 | 0,110 | 0,020 | 0,230 | 0,009 | 0,022 | 0,007 |

| C87 V | C88 Nb | C89 B | C92 Ca | | | | C93 N | C94 $O_{2\,[ppm]}$ | C95 $H_{2\,[ppm]}$ | | C96 CEV |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,004 | 0,003 | 0,0000 | | | | | 0,0105 | 20 | 2,5 | | |

## MECHANICAL PROPERTIES

C01 Sample: C-Casting, L-Rolled, T-Drawn — [C]
C03 Heat Treatment: SPECIMEN HARDENING AND DESTRESSING

TENSILE TEST

| C08 Sample Size | C10 Specimen Size | C12 $R_{m\,[MPa]}$ | C11 $R_{e\,[MPa]}$ | C13 $A5_{\%}$ | C15 $Z_{\%}$ | |
|---|---|---|---|---|---|---|
| 11 | 10 | 1299 | 1201 | 12,5 | 54,3 | |

STRENGTH TESTS

| C41 Specimen Size | C40 Type | C42 $K_{1\,[J]}$ | C42 $K_{2\,[J]}$ | C42 $K_{3\,[J]}$ | C43 $K_{x\,[J]}$ | C44 Temp. |
|---|---|---|---|---|---|---|
| 10x10 | KCU | | | | 33,3 | 20°C |

C22 HB

## JOMINY TEST

C03 Normalisation
Hardening

| C61 mm | 1,5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | | | | | C45 DI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C60 HRC | 44 | 43 | 42 | 40 | 36 | 34 | 32 | 31 | 28 | 27 | 25 | 24 | 23 | 22 | 21 | | | | | |

C65 Austenitic grade: MAC QUAID - EHN 6
C62 Micro-purity: ASTM E45 - JERKONTORET METHOD A
S: A1,5 B0,5 C0,5 D1,0
C05 Banding
C31 Hardness values: +AR HB 228 | +A | +FP

## ADDITIONAL INFORMATION

B03
RODS OF COMMERCIAL LENGTH
ANTI-MIXING CHECK PERFORMED

D51 Notes

ELECTRONIC DOCUMENT VALID WITHOUT SIGNATURE

A10 Delivery Note Data: N° 6316 KG. 5015

Z04
Doc. ID. 647303 - CASTING CERTIFICATE
code Casting 379862
No. 23/79862 Pr. 230377
Base Steel; S20MNCR5
Supplier/Client: RIVA ACCIAIO SPA

Z01 Q.C. Manager: G. Piumatti
Z02

**F.A.C.E.M. S.p.A.**
**F**abbricazione **A**rticoli **C**asalinghi **E** **M**etallurgici

**TRE SPADE ®**
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**Hot & Warm Steel Forging Division**
**VAT No.: IT 00517250015**
(Tax Code and Turin Company Register No. 00517250015
REA di Torino n° 151967 - Cap.Soc. 3.000.000 €i.v.
**Registered Office:**
Via Bricherasio, 7 - 10128 Torino (TO) - Italia
Tel. +39 0124 707711
**Administration Office:**
Borgata Braidacroce, 108 - 10087 Valperga (TO) - Italia
Tel. +39 0124 707711
www.facem.com E-mail: facem@facem.com

# CERTIFICATO DI TRATTAMENTO TERMICO

# HEAT TREATMENT CERTIFICATE

Form MR-CQU-32 Rev. 02 of 27/03/2011

| | | | | | |
|---|---|---|---|---|---|
| N. D.d.T. / Delivery Note No. | SDDT-2400623 | Riga / Row | 2 | Del / Of 03/04/2024 | N. Pezzi spediti / N. Pieces Shipped 2250 |
| Marchiatura / Marking | 20 | Colata N. / Casting No. | 379862 | | Kg spediti / Kg Shipped 4692,5 |
| Accorpamento N. / Grouping No. | 2400306 | Ordine di controllo N. / Inspection Order No. | CQ24-00223 | | |
| Cliente / Customer | C000001 | DANA MOTION SYSTEMS ITALIA Srl - POWER TRANSMISSION | | | |
| Nr. Articolo / Item No. | 32513641199/T | CODE 32513641199 ANNEALED | | | Nr. Articolo FACEM / Item No. FACEM SA0026/T10 |
| Acciaio di base / Steel | 20MNCR5 | | | | |
| Trattamento termico eseguito / Executed Heat Treatment | NORMALISATION | | | | |

| | | | | | |
|---|---|---|---|---|---|
| N. totale pezzi controllati / N. of Controlled Pieces | 20 | | | | |
| Metodo di prova / Test Method | Ø Sfera / Ø Sphere 10 | Kg Applicati / Kg Applied | 3.000 | ACCORDING TO STANDARD | UNI EN ISO 6506-1 |

TREATMENT BATCH: 202402281359 - STTV01 - REF. MEASUREMENT: 24-0407
REQUIRED HARDNESS VALUE: HB min 160 max 210
1) 171 HB 2) 176 HB 3) 169 HB 4) 176 HB 5) 172 HB
CHECK DATE: 28/02/2024 MEASUREMENTS MADE BY: TESTED - OMAR

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TREATMENT BATCH: 202402281645 - STTV01 - REF. MEASUREMENT: 24-0409
REQUIRED HARDNESS VALUE: HB min 160 max 210
1) 175 HB 2) 177 HB 3) 176 HB 4) 169 HB 5) 172 HB
CHECK DATE: 28/02/2024 MEASUREMENTS MADE BY: TESTED - OMAR

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TREATMENT BATCH: 202402281940 - STTV01 - REF. MEASUREMENT: 24-0410
REQUIRED HARDNESS VALUE: HB min 160 max 210
1) 170 HB 2) 171 HB 3) 173 HB 4) 176 HB 5) 173 HB
CHECK DATE: 29/02/2024 MEASUREMENTS MADE BY: TESTED - ANDREA

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TREATMENT BATCH: 202402282228 - STTV01 - REF. MEASUREMENT: 24-0411
REQUIRED HARDNESS VALUE: HB min 160 max 210
1) 174 HB 2) 179 HB 3) 173 HB 4) 170 HB 5) 172 HB
CHECK DATE: 29/02/2024 MEASUREMENTS MADE BY: TESTED - ANDREA

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Any complaints regarding the required heat treatment must be raised before subjecting conforming parts to further processing

DANA

# Check Sheet

F0501 - R04.02 - 12.11.2012

| Inspection lot | Quantity | Order Type/Number/Position | Work Center |
|---|---|---|---|
| 030001097049 | 1.160 | ZWO0 11400363 0140 | 0062 |

| PART NUMBER | REVISION | OPERATION | OPERATION DESCRIPTION |
|---|---|---|---|
| 32513641100 | O | 0140 | ISPEN CASE-HARDENING FURNACE |

| ID | CHARACTERISTIC | METHOD | SAMPLING | UM | TARGET | MIN_MAX | #1 | #2 | #3 | #4 | #5 | #6 | #7 | #8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | MT3006<br>ROCKWELL HARDNESS C | DUR001<br>DUROMETER | ZF0002<br>2 Pieces | | | 62,00<br>58,00 | 59 | 58 | | | | | | |
| 20 | MT3012<br>CASE-HARDENING DEPTH (HV550) | PRO001<br>TEST SPECIMEN ACCORDING TO SP022-2 | ZF0001<br>1 Piece | | | 0,90<br>0,70 | | | | | | | | |
| 30 | MT3023<br>P3 CORE STRENGTH | LAB001<br>LABORATORY | ZF0001<br>1 Piece | | | 1.400,00<br>1.000,00 | | | | | | | | |
| 40 | MT0100<br>MATERIAL TYPE | VIS002<br>VISUAL INSPECTION | ZF0001<br>1 Piece | | | | B21-20MnCr5 | | | | | | | |
| 50 | MT4101<br>TEST SPECIMEN TYPE USED (SP022-02) | PRO001<br>TEST SPECIMEN ACCORDING TO SP022-2 | ZF0001<br>1 Piece | | | | | | | | | | | |
| 60 | MT5100<br>PROGRAM CODE USED | VIS002<br>VISUAL INSPECTION | ZF0001<br>1 Piece | | | | | | | | | | | |
| 70 | MT5101<br>LOAD NUMBER | VIS002<br>VISUAL INSPECTION | ZF0001<br>1 Piece | | | | | | | | | | | |
| 100 | VC3010<br>VISUAL TEST: AFTER HEAT TREATMENT | VIS001<br>VISUAL INSPECTION ACCORDING TO WI0519 | ZF0008<br>8 Pieces | | | | | | | | | | | |

| Date Time | Signature | Remarks |
|---|---|---|
| 26.06.2024 16:52:02 | DVALCAV001 | Tested according SP022-02 , carburizing temperature below 940°C |

# MATERIAL TEST CERTIFICATE
# (材质证书)
## ACCORDING EN10204 3.1

LANGUAGE
ENGLISH

| | | | |
|---|---|---|---|
| DANAMotionSystemsItaliaS.r.lMATERIAL STANDARD (SP046-3)（标准） | | CERTIFICATE DATE（证书日期） | CAST ID （批号） |
| B21 | 20CrMnTiH | 2023.11.16 | 22108581C |
| RAW MATERIAL ORIGIN /MATERIAL（原料产地/材料） | | CUSTOMER （客户） | |
| CAST ID：22108581C | | DanaMotionSystems Italia S.r.l . | |
| MATERIAL（材质）: 20CrMnTiH | | VIALUCIANODanaMotionSystemsItaliaS.r.l1/A-42124STRADARIO 01483 REGGIO EMILIA - ITALY (RE) ENROLLED AT REGISTER OF ENTERPRISES OF REGGIO EMILIA-NUMBER REA 75379 | |
| PART NUMBER （客户零件号码） | | QUANTITY （数量） | SUPPLIER （供应商） |
| 32602831999 | | 900 | JINANHONGZHENG SCIENCE |
| PART DESCRI PTION （零件叙述/名称） | | ORDER NUMBER/DELIVERY NOTE （订单号码/交货通知单） | DANA2315 |
| BLANK SUN PINION | | 4500586850 | |

## CHEMICAL COMPOSITION
## (化学成份)

| | %C | %Mn | %Cr | %S | %Si | %P | %Ti | ----- | ----- | ----- | ----- |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MIN | 0.17 | 0.80 | 1.00 | ----- | 0.17 | ----- | 0.04 | ----- | ----- | ----- | ----- |
| MAX | 0.23 | 1.10 | 1.30 | 0.035 | 0.37 | 0.035 | 0.10 | ----- | ----- | ----- | ----- |
| CAST | 0.185 | 0.897 | 1.15 | 0.008 | 0.22 | 0.011 | 0.07 | ----- | ----- | ----- | ----- |
| | | | | | | | | “Grain Growth:A/min=0.020%,Timin=0.04% | | | |

## MECHANICAL PROPERTIES
## （机械性能）

| TEST MEDIA AND HEAT TREATMENT （试验热处理） | | Rm[N/mm²] | Re[N/mm²] | A% | Z% | Kv[J] | SOUNDNESS | Grain Size |
|---|---|---|---|---|---|---|---|---|
| +QT WITH TEMPERING AT 190ºC （淬火、回火） | MIN | 600 | ----- | ----- | ----- | ----- | MPI | ----- |
| | MAX | 850 | ----- | ----- | ----- | ----- | ONBAR | ----- |
| | CAST | 730 | ----- | ----- | ----- | ----- | PASSED | ----- |

## REMARKS AND ADDITIONAL TESTS

MATERIAL ON DRAWING (图面材质)/32602831999
20CrMnTiH/EN10084

| APPROVAL(核准)： | CHECKED（审核）： | | ENGINEER（主办人）： |
|---|---|---|---|
| Yuan min Chen | Shan Gao | Yue zhen Yu | Chun min Liu |

# 江苏沙钢集团淮钢特钢股份有限公司产品质量证明书

# Mill Test Certificate by Jiangsu Shagang Group Huaigang Special Steel Co.,Ltd

地址：江苏省淮安市西安南路188号
ADD：NO.188, SOUTH XI'AN ROAD, HUAI'AN CITY, JIANGSU PROVINCE
TEL：0517-83033310
FAX：0517-83803715

需方：Buyer　　合同号：Contract No.　　信用证号：L/C Number　　牌号：20CrMnTi Steel Grade

HGR-13-16

产品名称：齿轮钢20CrMnTi Description of Goods　　执行标准：GB/T 3077-2015 Standard Adopted　　交货状态：热轧 State of Delivery　　加工用途：Final Applica

生产许可证：Production License No.

| 批号 Batch No | 炉号 Heat No | 规格(mm) Size | 重量(t) Weight | 件数(件) No of Bundles | C/% x10² | Si/% x10² | Mn/% x10² | P/% x10³ | S/% x10³ | Ni/% x10² | Cr/% x10² | Cu/% x10² | Mo/% x10⁴ | Ti/% x10⁴ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 42202-0509 | 22108581C | φ70*6000 | 41.25 | 15 | 20 | 25 | 96 | 23 | 6 | 2 | 117 | 2 | 30 | 510 |
| 42202-0510 | 12108372C | φ70*6000 | 77.0810 | 28 | 20 | 25 | 101 | 17 | 23 | 4 | 109 | 2 | 70 | 500 |
| | | | | | | | | | | | | | | |

| 批号 Batch No | 炉号 Heat No | 一般疏松(级) Scattered Porosity | 中心疏松(级) Central Porosity | 锭型偏析(级) IngotShape Segregate | 中心偏析(级) Central Segregation | ReI/MPa | Rm/MPa | A/% | Z/% | 热顶锻 Hot Upset Forging | KU2(J)/20℃ | 表面质量 Surface Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 42202-0509 | 22108581C | 1.0/1.0 | 1.0/1.0 | 0/0 | 0/0 | 1148/1116 | 1390/1355 | 12.0/12.5 | 53.0/55.0 | 合格 | 109.0/95.0 | 合格 |
| 42202-0510 | 12108372C | 1.0/1.0 | 1.5/1.5 | 0/0 | 0/0 | 1070/1058 | 1315/1300 | 13.0/13.5 | 54.0/55.0 | 合格 | 74.0/83.0 | 合格 |
| | | | | | | | | | | | | |

| 批号 Batch No | 炉号 Heat No | 外形尺寸 Physical Size | 工艺流程 Manufacturing Process |
|---|---|---|---|
| 42202-0509 | 22108581C | 合格 | LD→LF→(RH)→CCM |
| 42202-0510 | 12108372C | 合格 | LD→LF→(RH)→CCM |
| | | | |

说明 Note

酸浸低倍组织中白点、宏观夹杂等标准规定不允许有的缺陷，我们均保证符合标准出厂，有异议时，来函请标明钢号、批号或炉号、规格、发货单号、原因，提供质量证明书，并将实物保管好。No impermissible macro-structural defects such as flakes and macro inclusions are available. If there are any complaints, you are kindly requested to mark the Steel Grade, Batch No. or Heat No., Size, delivery sheet No., Causes and this Mill Test Certificate. The steel bars or billet with problems shall be properly kept.

备注 Explanation

除特殊要求，其它微量元素仅供参考！

签发人：Signature　　质量检验章：(盖章有效) Quality inspection stamp　　流水号：0308898 Serial Number

# JINAN HONGZHENG SCIENCE & TECHNOLOGY Co. Ltd

## HEAT TREATMENT REPORT

### ACCORDING TO UNI EN 10204 3.1

**DATE:2023.11.16**

| | | | | | |
|---|---|---|---|---|---|
| **PART NO.** | **32602831999** | **BATCH CODE** | **DANA2315** | **MATERIAL** | **20CrMnTiH** |
| **PART NAME** | **BLANK SUN PINION** | **No. OF PCS IN BATCH** | **900PCS** | **ORDER NO.** | **4500586850** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **ITEM** | **STANDARDVALUE** | **INSPECTION EQUIPMENT** | **1** | **2** | **3** | **JUDGEMENT** |
| **TENSLIE STRENGTH Of MATERIAL** | **600~850N/mm²** | **ROCKWELL'S HARDNESS TESTING EQUIP** | **730** | **720** | **730** | **OK** |
| **APPROVAL (QUALITYMANAGER)** | Yuan min Chen | **CHECK (QUALITYSUPERVISOR)** | Shan Gao | Yue zhen Yu | **QUALITY (INSPECTOR)** | Chun min Liu |

| | | | | |
|---|---|---|---|---|
| DANA | Check Sheet<br>F0501 - R04.02 - 12.11.2012 | Inspection lot<br>030001094924 | Quantity<br>570 | Order Type/Number/Position<br>ZWO0 11399726 0070 | Work Center<br>0062 |

| PART NUMBER | REVISION | OPERATION | OPERATION DESCRIPTION |
|---|---|---|---|
| 32603241900 | M | 0070 | ISPEN CASE-HARDENING FURNACE |

| ID | CHARACTERISTIC | METHOD | SAMPLING | UM | TARGET | MIN_MAX | #1 | #2 | #3 | #4 | #5 | #6 | #7 | #8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | MT3006<br>ROCKWELL HARDNESS C | DUR001<br>DUROMETER | ZF0003<br>3 Pieces | | | 62,00<br>58,00 | 60 | 61 | 60 | | | | | |
| 12 | MT3012<br>CASE-HARDENING DEPTH (HV550) | PRO001<br>TEST SPECIMEN ACCORDING TO SP022-2 | ZF0003<br>3 Pieces | | | 0,40<br>0,25 | ,45 | ,45 | ,45 | | | | | |
| 22 | MT3023<br>P3 CORE STRENGTH | LAB001<br>LABORATORY | ZF0001<br>1 Piece | | | 1.400,00<br>1.100,00 | | | | | | | | |
| 32 | MT0100<br>MATERIAL TYPE AS PER DRAWING | VIS002<br>VISUAL INSPECTION | ZF0001<br>1 Piece | | | | B21-20MnCr5 | | | | | | | |
| 42 | MT4101<br>TEST SPECIMEN TYPE USED (SP022-02) | PRO001<br>TEST SPECIMEN ACCORDING TO SP022-2 | ZF0001<br>1 Piece | | | | | | | | | | | |
| 52 | MT5100<br>PROGRAM CODE USED | VIS002<br>VISUAL INSPECTION | ZF0001<br>1 Piece | | | | | | | | | | | |
| 62 | MT5101<br>LOAD NUMBER | VIS002<br>VISUAL INSPECTION | ZF0001<br>1 Piece | | | | | | | | | | | |
| 72 | VC3010<br>VISUAL TEST: AFTER HEAT TREATMENT | VIS001<br>VISUAL INSPECTION ACCORDING TO WI0519 | ZF0008<br>8 Pieces | | | | | | | | | | | |

| Date | Time | Signature | Remarks |
|---|---|---|---|
| 27.06.2024 | 13:32:58 | DVALCAV001 | Tested according SP022-02 , carburizing temperature below 940°C |

ACCIAIERIE VENETESPA

**CERTIFICATO DI COLLAUDO – INSPECTION CERTIFICATE**
**CERTIFICAT DE RECEPTION – ABNAHMEPRÜFZEUGNIS**

**EN 10204 3.1**

**N° 640869**

**DATE:**28/03/2023

Acciaierie Venete Spa C.S. € 63.000.000,00 i.v C.F. e P.IVA 00224180281
R.I di Trento 00224180281 V.A.T. N° IT 00224180281
Sede Legale: 38051 Borgo Valsugana (TN) Via Puisle, 4 - Italy
Direzione/Amministrazione: 35127 Padova Z.I. Sud - Riviera Francia, 9 - Italy Tel. 049 828.28.20 (r.a.)

**CLIENTE**
CUSTOMER
CLIENT
KUNDE

**101567 - INTERACCIAI SPA**
VIA PASTEUR 2
42100 REGGIO EMILIA (RE)

**ORDINE CLIENTE** - PURCHASE ORDER
COMMANDE CLIENT - KUNDENAUFTRAG
REDS1078

**ORDINE** - ORDER
COMMANDE - AUFTRAG
168886 / 20

**ARTICOLO (ACCIAIO)**- ITEM (STEEL) - ITEM (ACIER) - ARTIKEL (STAHL)

**PROFILO** - PROFILE
PROFIL - ABMESSUNG
**TONDO 48 mm (EN 10060 - NORMAL)**

**STATO DI FORNITURA**- DELIVERY CONDITION
CONDITION DE LIVRAISON – LIEFERZUSTAND
**RICOTTURA DI CESOIABILITA**

**STATO DI ESECUZIONE** - STATE OF EXECUTION
ETAT DE L'ÉXECUTION - AUSFÜHRUNG
**LAMINATO RULLATO**

**COLATA** - HEAT - COULEE - SCHMELZE
**293753**

**MARCA ACCIAIO** - STEEL GRADE - MARQUE ACIER - STAHLGÜTE
**17NICRMO6-4+HH**

**NORMA** - SPECIFICATION - NORME - NORM
**INTERACCIAI INT017 REV03 (S=0.020-0.035%)**

**PESO** - WEIGHT
POIDS - GEWICHT (Kg) **5230**

**COLLI** - ITEMS
COLIS - KOLLI (Nr) **2**

**DDT** - DELIVERY NOTE
BON DE LIVRAISON - LIEFERSCHEIN **L1001989** **03/04/2023**

**BLUMO** - BLOOM
BLOOM - KNÜPPEL **160 X 160 mm**

**RIDUZIONE** - REDUCTION
REDUCTION - UMFORMUNGSGRAD **14.1**

**STAB. SPEDIZIONE: ODOLO (BS)**

**COMPOSIZIONE CHIMICA (%)** - CHEMICAL COMPOSITION (%) - COMPOSITION CHIMIQUE (%) - CHEMISCHE ZUSAMMENSETZUNG (%)

| C | Si | Mn | P | S | Cu | Cr | Ni | Sn | Al | As | Mo |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.1870 | 0.2210 | 0.8450 | 0.0110 | 0.0300 | 0.2090 | 0.9610 | 1.2740 | 0.0080 | 0.0290 | 0.0050 | 0.1840 |

| V | B | Nb | Ca | Sb |
|---|---|---|---|---|
| 0.0070 | 0.0004 | 0.0010 | 0.0008 | 0.0013 |

**ANALISI GAS** - GAS ANALYSIS - ANALYSE GAZ - GAS ANALYSE
$H_2$= 1.3 (ppm) | $O_2$= 16 (ppm) | $N_2$= 90 (ppm) 0.0090 (%)

**D.I. (ASTM A255)**

FUSIONE: FORNO ELETTRICO (EAF) - ELABORAZIONE FUORI FORNO: AFFINAZIONE (LF) - COLAGGIO: COLATA CONTINUA (CC)

**CARATTERISTICHE MECCANICHE** - MECHANICAL PROPERTIES
CARACTERISTIQUES MECANIQUES-MECHANISCHE EIGENSCHAFTEN

**TRAZIONE**-TENSILE TESTING-TRACTION-ZUGVERSUCH **EN ISO 6892-1**

**RESILIENZA** - IMPACT TEST - RESILIENCE - ZÄHIGKEIT **EN ISO 148-1**

**DUREZZA** - HARDNESS - DURETE - HÄRTE **EN ISO 6506-1**

| PROVINO - SAMPLE - EPROUVETTE - MUSTER | mm | STATO - CONDITION - ETAT - ZUSTAND | TRATTAMENTO TERMICO - HEAT TREATMENT - TRAITMENT THERMIQUE - WÄRMEBEHANDLUNG | | | Rm MPa | Re MPa | A % | Z % | TIPO - TYPE - TYPE - ART | KU °C | KU J | KU J | Mean J | | | HB | HB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COLATA - HEAT - COULEE-SCHMELZE | 11 | BONIFICATO | 850°C | OLIO | 180°C | 1435 | 1119 | 12 | 41 | | 20 | 35 | 37 | 36 | 36 | | | |
| | | | | | | | | | | | | | | | | | | |
| VALORI ALLO STATO DI FORNITURA - VALUES IN DELIVERY CONDITION - WERTE IM LIEFERZUSTAND ▶ | | | | | | | | | | | | | | | | | | 185 |

THE PRODUCT COMPLIES WITH THE REQUIREMENTS OF THE EUROPEAN DIRECTIVE 2000/53/EC

**RADIOACTIVITY MEETS SPECIFICATION 2013/59/EURATOM <= [0,10] Bq/g**

**TEMPRABILITA'** - HARDENABILITY
TREMPABILITE - HÄRTBARKEIT
**EN ISO 642**

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MM | 1.5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | | |
| HRC | 44.4 | 44.3 | 43.8 | 43.1 | 42.3 | 41.5 | 40.0 | 37.9 | 34.4 | 33.1 | 31.7 | 30.7 | 29.9 | 29.7 | 29.4 | | |

**GRANO** - GRAIN
GRAIN - KORNGRÖSSE
**EN ISO 643**
**AUSTENITICO**
**8 - 8**

**INCLUSIONI NON METALLICHE** - NON METALLIC INCLUSIONS - INCLUSIONS NON METALLIQUES - NICHTMETALLISCHE EINSCHLÜSSE

| A (SS) | | B (OA) | | C (OS) | | D (OG) | | |
|---|---|---|---|---|---|---|---|---|
| Thin | Heavy | Thin | Heavy | Thin | Heavy | Thin | Heavy | |
| | | | | | | | | |

**DIN 50602 (K)**
K **4** *(OXIDE)* = **5**
K *(SULFIDE)* =
K *(TOTAL)* =

**MACRO** - MACROETCHING
MACRO - MAKRO ÄTZUNG

**MACROINCLUSIONI** - MACROINCLUSIONS
MACRO INCLUSIONS - MAKRO EINSCHLÜSSE

**CONTROLLO ANTIMESCOLAMENTO** - ANTIMIXING CONTROL
CONTROLE ANTIMELANGE - VERWECHSLUNGSPRÜFUNG **100%**

**ENTI COLLAUDATORI**
INSPECTION AUTHORITIES
SERVICE D'ESSAI
ABNAHMEBEHÖRDE

**NOTE** – NOTES – NOTES - ANMERKUNGEN

4500624042- DDT 264-20.03.2024 -
cod 9042031-543 PEZZI - GI.GI.ESSE SRL-
COL: ACC.V 293753

RGQ SERENA ROSSI

GI.GI.ESSE S.R.L.
Tel. 0522.697040 - Fax 0522.751564
C.F./P.I. 02161960353
Sede Legale: Via Zuccarelli, 8/A
42012 Campagnola Emilia (RE)
E-mail: info@gigiessesrl.it

**CONTROLLO QUALITA'** - QUALITY CONTROL - CONTROLE QUALITE - QUALITÄTSTELLE

I.Pelizzari

SERVIZIO QUALITA' ACCIAIERIE VENETE SPA

CERTIFICATO CONFORME AL CAPITOLATO E SPECIFICHE DI RIFERIMENTO -CERTIFICATE IN COMPLIANCE WITH THE SPECIFICATION AND ITS REFERENCES-CERTIFICAT EN ACCOMPLIANCE AVEC LE CAHIER DES CHARGES ET SES REFERENCES-ZERTIFIKAT IN ÜBEREINSTIMMUNG MIT DER SPEZIFIKATION UND DESSEN BEZÜGE

ACCIAIERIE VENETESPA

# CERTIFICATO DI COLLAUDO – INSPECTION CERTIFICATE
# CERTIFICAT DE RECEPTION – ABNAHMEPRÜFZEUGNIS

## EN 10204 3.1

**N° 640869**

**DATE:**28/03/2023


Acciaierie Venete Spa C.S. € 63.000.000,00 i.v C.F. e P.IVA 00224180281
Trento company register 00224180281 V.A.T. N° IT 00224180281
Registered Office 38051 Borgo Valsugana (TN) Via Puisle, 4 - Italy
Management/Administration : 35127 Padova Z.I. Sud - Riviera Francia, 9 - Italy Tel. 049 828.28.20 (r.a.)


**CLIENTE**
CUSTOMER
CLIENT
KUNDE

**101567 - INTERACCIAI SPA**
VIA PASTEUR 2
42100 REGGIO EMILIA (RE)

**ORDINE CLIENTE** - PURCHASE ORDER
COMMANDE CLIENT - KUNDENAUFTRAG
REDS1078

**ORDINE** - ORDER
COMMANDE - AUFTRAG
168886 / 20

**ARTICOLO (ACCIAIO)**- ITEM (STEEL) - ITEM (ACIER) - ARTIKEL (STAHL)

**PROFILO** - PROFILE
PROFIL - ABMESSUNG **48 MM ROUND BAR (EN 10060 - NORMAL)**

**STATO DI FORNITURA**- DELIVERY CONDITION
CONDITION DE LIVRAISON – LIEFERZUSTAND **ANNEALING FOR SHEARABILITY**

**STATO DI ESECUZIONE** - STATE OF EXECUTION
ETAT DE L'ÉXECUTION - AUSFÜHRUNG **ROLLED**

**COLATA** - HEAT - COULEE - SCHMELZE: **293753**

**MARCA ACCIAIO** - STEEL GRADE - MARQUE ACIER - STAHLGÜTE: **17NICRMO6-4+HH**

**NORMA** - SPECIFICATION - NORME - NORM: **INTERACCIAI INT017 REV03 (S=0.020-0.035%)**

**PESO** - WEIGHT
POIDS - GEWICHT (Kg) **5230**

**COLLI** - ITEMS
COLIS - KOLLI (Nr) **2**

**DDT** - DELIVERY NOTE
BON DE LIVRAISON - LIEFERSCHEIN **L1001989** **03/04/2023**

**BLUMO** - BLOOM
BLOOM - KNÜPPEL **160 X 160 mm**

**RIDUZIONE** - REDUCTION
REDUCTION - UMFORMUNGSGRAD **14.1**

**SHIPMENT PLANT** : **ODOLO (BS)**

**COMPOSIZIONE CHIMICA (%)** - CHEMICAL COMPOSITION (%) - COMPOSITION CHIMIQUE (%) - CHEMISCHE ZUSAMMENSETZUNG (%)

| C | Si | Mn | P | S | Cu | Cr | Ni | Sn | Al | As | Mo |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.1870 | 0.2210 | 0.8450 | 0.0110 | 0.0300 | 0.2090 | 0.9610 | 1.2740 | 0.0080 | 0.0290 | 0.0050 | 0.1840 |

| V | B | Nb | Ca | Sb |
|---|---|---|---|---|
| 0.0070 | 0.0004 | 0.0010 | 0.0008 | 0.0013 |

**ANALISI GAS** - GAS ANALYSIS - ANALYSE GAZ - GAS ANALYSE
$H_2$= 1.3 (ppm) | $O_2$= 16 (ppm) | $N_2$= 90 (ppm) 0.0090 (%)

**D.I. (ASTM A255)**

MELTING: ELECTRIC FURNACE (EAF) - PROCESSING OUTSIDE FURNACE: REFINING (LF) - CASTING: CONTINUOUS CASTING (CC)

**CARATTERISTICHE MECCANICHE** - MECHANICAL PROPERTIES
CARACTERISTIQUES MECANIQUES-MECHANISCHE EIGENSCHAFTEN

**TRAZIONE**-TENSILE TESTING-TRACTION-ZUGVERSUCH **EN ISO 6892-1**

**RESILIENZA** - IMPACT TEST - RESILIENCE - ZÄHIGKEIT **EN ISO 148-1**

**DUREZZA** - HARDNESS - DURETE - HÄRTE **EN ISO 6506-1**

| PROVINO - SAMPLE EPROUVETTE - MUSTER | mm | STATO - CONDITION ETAT - ZUSTAND | TRATTAMENTO TERMICO - HEAT TREATMENT TRAITMENT THERMIQUE - WÄRMEBEHANDLUNG | | | Rm MPa | Re MPa | A % | Z % | TIPO - TYPE - TYPE - ART | KU °C | KU J | KU J | Mean J | | | HB | HB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COLATA - HEAT COULEE-SCHMELZE | 11 | HEAT-TREATED | 850°C | OIL | 180°C | 1435 | 1119 | 12 | 41 | | 20 | 35 | 37 | 36 | 36 | | | |
| VALORI ALLO STATO DI FORNITURA - VALUES IN DELIVERY CONDITION - WERTE IM LIEFERZUSTAND ▶ | | | | | | | | | | | | | | | | | 185 | |

THE PRODUCT COMPLIES WITH THE REQUIREMENTS OF THE EUROPEAN DIRECTIVE 2000/53/EC

**RADIOACTIVITY MEETS SPECIFICATION 2013/59/EURATOM <= [0,10] Bq/g**

**TEMPRABILITA'** - HARDENABILITY
TREMPABILITE - HÄRTBARKEIT
**EN ISO 642**

| | 1.5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MM | 1.5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| HRC | 44.4 | 44.3 | 43.8 | 43.1 | 42.3 | 41.5 | 40.0 | 37.9 | 34.4 | 33.1 | 31.7 | 30.7 | 29.9 | 29.7 | 29.4 |

**GRANO** - GRAIN
GRAIN - KORNGRÖSSE
**EN ISO 643**
**AUSTENITIC**
**8 - 8**

**INCLUSIONI NON METALLICHE** - NON METALLIC INCLUSIONS - INCLUSIONS NON METALLIQUES - NICHTMETALLISCHE EINSCHLÜSSE

| A (SS) | | B (OA) | | C (OS) | | D (OG) | | |
|---|---|---|---|---|---|---|---|---|
| Thin | Heavy | Thin | Heavy | Thin | Heavy | Thin | Heavy | |

**DIN 50602 (K)**
K 4 *(OXIDE)* = 5
K *(SULFIDE)* =
K *(TOTAL)* =

**MACRO** - MACROETCHING
MACRO - MAKRO ÄTZUNG

**MACROINCLUSIONI** - MACROINCLUSIONS
MACRO INCLUSIONS - MAKRO EINSCHLÜSSE

**CONTROLLO ANTIMESCOLAMENTO** - ANTIMIXING CONTROL
CONTROLE ANTIMELANGE - VERWECHSLUNGSPRÜFUNG **100%**

**ENTI COLLAUDATORI**
INSPECTION AUTHORITIES
SERVICE D'ESSAI
ABNAHMEBEHÖRDE

**NOTE** – NOTES – NOTES - ANMERKUNGEN

4500624042 DELIVERY NOTE 264-20.03.2024 -
code 9042031-543 PIECES - GI.GI.ESSE SRL-
CASTING ACC.V 293753

RGQ SERENA ROSSI

GI.GI.ESSE S.R.L.
Tel. 0522.697040 - Fax 0522.751564
C.F./P.IVA 02161960352
Sede Legale: Via Cupa Alta, 8/A
42012 Campagnola Emilia (RE)
E-mail: info@gigiessesrl.it

**CONTROLLO QUALITA'** - QUALITY CONTROL - CONTROLE QUALITE - QUALITÄTSTELLE

I.Pelizzari

SERVIZIO QUALITÀ ACCIAIERIE VENETE SPA

**QUALITY SERVICE**

CERTIFICATO CONFORME AL CAPITOLATO E SPECIFICHE DI RIFERIMENTO -CERTIFICATE IN COMPLIANCE WITH THE SPECIFICATION AND ITS REFERENCES-CERTIFICAT EN ACCOMPLIANCE AVEC LE CAHIER DES CHARGES ET SES REFERENCES-ZERTIFIKAT IN ÜBEREINSTIMMUNG MIT DER SPEZIFIKATION UND DESSEN BEZÜGE

| | | | | | |
|---|---|---|---|---|---|
| DANA | Check Sheet<br>F0501 - R04.02 - 12.11.2012 | Inspection lot<br>030001090587 | Quantity<br>540 | Order Type/Number/Position<br>ZWO1 11394771 0080 | Work Center<br>0062 |

| PART NUMBER | REVISION | | OPERATION | OPERATION DESCRIPTION |
|---|---|---|---|---|
| 32730430300 | I | | 0080 | ISPEN CASE-HARDENING FURNACE |

| ID | CHARACTERISTIC | METHOD | SAMPLING | UM | TARGET | MIN_MAX | #1 | #2 | #3 | #4 | #5 | #6 | #7 | #8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | MT3006<br>P1 ROCKWELL HARDNESS C | DUR001<br>DUROMETER | ZF0003<br>3 Pieces | | | 62,00<br>58,00 | 59 | 60 | 59 | | | | | |
| 20 | MT3012<br>P2 CASE-HARDENING DEPTH (HV550) | PRO001<br>TEST SPECIMEN ACCORDING TO SP022-2 | ZF0003<br>3 Pieces | | | 0,60<br>0,40 | ,65 | ,65 | ,65 | | | | | |
| 30 | MT3023<br>P3 CORE STRENGTH | LAB001<br>LABORATORY | ZF0001<br>1 Piece | | | 1.400,00<br>1.100,00 | | | | | | | | |
| 40 | MT0100<br>MATERIAL TYPE AS PER DRAWING | VIS002<br>VISUAL INSPECTION | ZF0001<br>1 Piece | | | | B01-18CrNiMo7-6 | | | | | | | |
| 50 | MT4101<br>TEST SPECIMEN TYPE USED (SP022-02) | PRO001<br>TEST SPECIMEN ACCORDING TO SP022-2 | ZF0001<br>1 Piece | | | | | | | | | | | |
| 60 | MT5100<br>PROGRAM CODE USED | VIS002<br>VISUAL INSPECTION | ZF0001<br>1 Piece | | | | | | | | | | | |
| 70 | MT5101<br>LOAD NUMBER | VIS002<br>VISUAL INSPECTION | ZF0001<br>1 Piece | | | | | | | | | | | |
| 80 | VC3010<br>VISUAL TEST: AFTER HEAT TREATMENT | VIS001<br>VISUAL INSPECTION ACCORDING TO WI0519 | ZF0008<br>8 Pieces | | | | | | | | | | | |

| Date | Time | Signature | Remarks |
|---|---|---|---|
| 16.07.2024 | 16:39:16 | DVALCAV001 | Tested according SP022-02 , carburizing temperature below 940°C |

JSW Steel Italy
Piombino

ORDINE / ORDER
RE05404
DATA / DATE
09.02.2022

NR. 2022 100000058148 -

DATA / DATE
13.04.2022

# CERTIFICATO DI COLLAUDO
# INSPECTION CERTIFICATE
(according to EN 10204 3.1)

2222312

INTERACCIAI REGGIO EM.
P. COLLETTA 32
42100 Z.I. VILLAGGIO CROSTOLO
Italia

| | | | |
|---|---|---|---|
| CONFERMA/OUR ORDER | : 1300005474 | PROFILE/PROFILE | : Barra/Tondo |
| LOTTO/ITEM | : 000140 | DIMENSIONI/SIZE | : 68,00 |
| COLATA/HEAT | : P0JS2100A34262 | QUALITA'/STEELGRADE | : |
| STATO/DELIVERY C | : RICOTTO LAVORABILE | NORMA/SPECIFICATION | 18NICRMO5_17NICRMO6-4+HH<br>: INT.017 R.3_05.12.2016 |

ANALISI DI COLATA / CHEMICAL ANALYSIS-PROPERTIES

| | C% | MN% | S% | P% | SI% | CU% |
|---|---|---|---|---|---|---|
| **RISULTATO:** | **0.1950** | **0.8050** | **0.0250** | **0.0130** | **0.2580** | **0.0080** |
| Minimo: | 0.1500 | 0.6000 | 0.0200 | 0.0000 | 0.1500 | 0.0000 |
| Massimo: | 0.2000 | 0.9000 | 0.0400 | 0.0250 | 0.4000 | 0.3000 |
| | AL% | MO% | NI% | CR% | O% | N% |
| **RISULTATO:** | **0.0250** | **0.2020** | **1.2700** | **0.8740** | **0.0012** | **0.0083** |
| Minimo: | 0.0200 | 0.1500 | 1.2000 | 0.8000 | 0.0000 | 0.0060 |
| Massimo: | 0.3500 | 0.2500 | 1.5000 | 1.0000 | 0.0025 | 0.0150 |
| | CA% | B% | H% | | | |
| **RISULTATO:** | **0.0006** | **0.0003** | **0.00016** | | | |
| Minimo: | 0.0000 | 0.0000 | 0.00000 | | | |
| Massimo: | 0.0015 | 0.0008 | 0.00035 | | | |

RESPONS. QUALITA' Piombino - E. CHIMISSO

**JSW Steel Italy Piombino S.p.A.**
**Soggetta a Direzione e Coordinamento di JSW Steel ltd**
Largo Caduti sul Lavoro, 21 57025 Piombino (Livorno)Tel. +39-0565-64111 Fax +39-0565-36514
email steelpiombino@pec.jswitaly.com - www.jswitaly.com

ACCREDIA
SAFETY SYSTEM CERTIFICATION DNV·GL OHSAS 18001
ISO 14001 BUREAU VERITAS Certification
ISO 9001 BUREAU VERITAS Certification
REG. (UE) N. 333/2011 BUREAU VERITAS Certification

JSW Steel Italy
Piombino

ORDINE / ORDER
RE05404
DATA / DATE
09.02.2022

NR. 2022 100000058148 -

DATA / DATE
13.04.2022

# CERTIFICATO DI COLLAUDO
# INSPECTION CERTIFICATE
(according to EN 10204 3.1)

| JOMINY HRC | TP : NORMALE IN MM | | NORMA: EN ISO 642 | | | |
|---|---|---|---|---|---|---|
| DISTANZE: | 1,5 | 3 | 5 | 7 | 9 | 11 |
| **RISULTATO:** | **44.7** | **44.5** | **44.0** | **42.7** | **41.1** | **39.0** |
| Minimo: | 43.0 | 43.0 | 40.0 | 38.0 | 35.5 | 34.0 |
| Massimo: | 48.0 | 48.0 | 47.0 | 46.0 | 45.0 | 43.5 |
| DISTANZE: | 13 | 15 | 20 | 25 | 30 | 35 |
| **RISULTATO:** | **36.8** | **35.3** | **33.3** | **31.3** | **29.1** | **28.1** |
| Minimo: | 32.0 | 31.0 | 29.0 | 27.0 | 26.0 | 25.0 |
| Massimo: | 41.0 | 40.0 | 37.0 | 35.5 | 34.5 | 33.5 |
| DISTANZE: | 40 | 45 | 50 | | | |
| **RISULTATO:** | **27.6** | **27.1** | **26.4** | | | |
| Minimo: | 24.0 | 0.0 | 0.0 | | | |
| Massimo: | 33.0 | 32.5 | 32.0 | | | |

- GRANO AUSTENITICO NORMA:EN ISO 643

| | |
|---|---|
| **VALORE** | **7/7** |
| Minimo: | 6 |
| Massimo: | 8 |

- BANDATURA UNI GRADO : 3 NORMA : UNI 8449/83

Minimo : 0
Massimo: 3

- INCLUSIONI K NORMA :UNI 3244/80

GRADO :K4

| | |
|---|---|
| INDICI: | O |
| **RISULTATO:** | **0.0** |
| Minimo: | 0.0 |
| Massimo: | 25.0 |

RAPPORTO DI RIDUZIONE

| | |
|---|---|
| **VALORE:** | **13.30** |
| Minimo: | 3.9 |
| Massimo: | . |

DIM. CC: 220 x 220

RESPONS. QUALITA' Piombino - E. CHIMISSO

**JSW Steel Italy Piombino S.p.A.**
**Soggetta a Direzione e Coordinamento di JSW Steel ltd**
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email steelpiombino@pec.jswitaly.com - www.jswitaly.com

ACCREDIA
SAFETY SYSTEM CERTIFICATION DNV·GL OHSAS 18001
ISO 14001 BUREAU VERITAS Certification
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REG. (UE) N. 333/2011 BUREAU VERITAS Certification

JSW Steel Italy
Piombino

ORDINE / ORDER
RE05404
DATA / DATE
09.02.2022

NR. 2022 100000058148 -

DATA / DATE
13.04.2022

# CERTIFICATO DI COLLAUDO
# INSPECTION CERTIFICATE
(according to EN 10204 3.1)

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- TRAZIONE — NORMA : EN 10002-1
TT : TEMPRA E DISTENSIONE — DIM. SAGGIO: 11 MM
TIPO PROVA : LONGITUDINALE

| | RM N/mm² | RE N/mm² | A% |
|---|---|---|---|
| **RISULTATO:** | **1460** | **1238** | **10.4** |
| Minimo: | 1230 | 980 | 8.0 |
| Massimo: | 1520 | . | . |

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- DUREZZA — NORMA : EN 10003-1
TT : RICOTT.DI LAVORABILITA — PUNTO ESECUZIONE : SUPERFICIE
SAGGIO : — TIPO DUREZZA: HBW

| | |
|---|---|
| **VALORE:** | **182.0** |
| Minimo: | 0.0 |
| Massimo: | 210.0 |

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- RESILIENZA — METODO: KU (J)
NORMA : EN 10045-1 — TT : TEMPRA E DISTENSIONE
TIPO PROVA : LONGITUDINALE — TEMPERATURA: +20,0 °C

| | | | | | |
|---|---|---|---|---|---|
| **RISULTATO(J):** | **33.0** | **31.0** | **31.0** | **MEDIA(J):** | **31.7** |
| Minimo: | 21.0 | 21.0 | 21.0 | | 30.0 |
| Massimo: | . | . | . | | . |

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MATERIALE DEGASATO
**Controllo antimescolamento effettuato 100%.**

**Controlli superficiali ed interni effettuati al 100%**

Paese di laminazione: ITALIA.
Il materialefornito non contiene elementi non consentiti o in concentrazione dichiarabile (tipo piombo, cadmio, mercurio, cromo (VI), ecc.) secondo quanto definito nella VDA-List.
In base ai controlli radiometrici effettuati secondo quanto previsto dall'Art. 72 del D.Lgs. 101/2020 (che attua la direttiva 2013/59/Euratom), il materiale non presenta livelli anomali di radioattività.

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RESPONS. QUALITA' Piombino - E. CHIMISSO

4500626889- DDT 304-03.04.2024 - cod 32733500088-280 PEZZI - GI.GI.ESSE SRL-COLI JSW A34262

RGQ SERENA ROSSI

**JSW Steel Italy Piombino S.p.A.**
**Soggetta a Direzione e Coordinamento di JSW Steel ltd**
Largo Caduti sul Lavoro, 21 57025 Piombino (Livorno)Tel. +39-0565-64111 Fax +39-0565-36514
email steelpiombino@pec.jswitaly.com - www.jswitaly.com

GI.GI.ESSE S.R.L.
Tel. 0522.667040 - Fax 0522.751564
C.F./P.I. 02161260352
Sede Legale: Via Puccini, 6/A
42012 Campagnola Emilia (RE)
E-mail: info@gigiessesrl.it

ACCIAIERIE VENETESPA

# CERTIFICATO DI COLLAUDO – INSPECTION CERTIFICATE
# CERTIFICAT DE RECEPTION – ABNAHMEPRÜFZEUGNIS

## EN 10204 3.1

**N° 646672**

**DATE:**27/04/2023

Acciaierie Venete Spa C.S. € 63.000.000,00 i.v C.F. e P.IVA 00224180281
R.I di Trento 00224180281 V.A.T. N° IT 00224180281
Sede Legale: 38051 Borgo Valsugana (TN) Via Puisle, 4 - Italy
Direzione/Amministrazione: 35127 Padova Z.I. Sud - Riviera Francia, 9 - Italy Tel. 049 828.28.20 (r.a.)

**CLIENTE**
CUSTOMER
CLIENT
KUNDE

**101567 - INTERACCIAI SPA**
VIA PASTEUR 2
42100 REGGIO EMILIA (RE)

**ORDINE CLIENTE** - PURCHASE ORDER
COMMANDE CLIENT - KUNDENAUFTRAG
REDS1078

**ORDINE** - ORDER
COMMANDE - AUFTRAG
168886 / 110

**ARTICOLO (ACCIAIO)**- ITEM (STEEL) - ITEM (ACIER) - ARTIKEL (STAHL)

**PROFILO** - PROFILE
PROFIL - ABMESSUNG
**TONDO 68 mm (EN 10060 - NORMAL)**

**STATO DI FORNITURA**- DELIVERY CONDITION
CONDITION DE LIVRAISON – LIEFERZUSTAND
**RICOTTURA DI CESOIABILITA**

**STATO DI ESECUZIONE** - STATE OF EXECUTION
ETAT DE L'ÉXECUTION - AUSFÜHRUNG
**LAMINATO RULLATO**

**COLATA** - HEAT - COULEE - SCHMELZE
**295279**

**MARCA ACCIAIO** - STEEL GRADE - MARQUE ACIER - STAHLGÜTE
**17NICRMO6-4+HH**

**NORMA** - SPECIFICATION - NORME - NORM
**INTERACCIAI INT017 REV03 (S=0.020-0.035%)**

**PESO** - WEIGHT
POIDS - GEWICHT (Kg) **4823**

**COLLI** - ITEMS
COLIS - KOLLI (Nr) **2**

**DDT** - DELIVERY NOTE
BON DE LIVRAISON - LIEFERSCHEIN **L1002679** **04/05/2023**

**BLUMO** - BLOOM
BLOOM - KNÜPPEL **160 X 160 mm**

**RIDUZIONE** - REDUCTION
REDUCTION - UMFORMUNGSGRAD **7.0**

**STAB. SPEDIZIONE: ODOLO (BS)**

**COMPOSIZIONE CHIMICA (%)** - CHEMICAL COMPOSITION (%) - COMPOSITION CHIMIQUE (%) - CHEMISCHE ZUSAMMENSETZUNG (%)

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C 0.1800 | Si 0.2100 | Mn 0.8440 | P 0.0100 | S 0.0300 | Cu 0.2040 | Cr 0.9170 | Ni 1.2960 | Sn 0.0080 | Al 0.0290 | As 0.0050 | Mo 0.1870 | | | |
| V 0.0060 | B 0.0005 | Nb 0.0020 | Ca 0.0010 | Sb 0.0037 | | | | | | | | | | |

**ANALISI GAS** - GAS ANALYSIS - ANALYSE GAZ - GAS ANALYSE
$H_2$= 1.3 (ppm) | $O_2$= 14 (ppm) | $N_2$= 105 (ppm) 0.0105 (%)

**D.I. (ASTM A255)**

FUSIONE: FORNO ELETTRICO (EAF) - ELABORAZIONE FUORI FORNO: AFFINAZIONE (LF) - COLAGGIO: COLATA CONTINUA (CC)

**CARATTERISTICHE MECCANICHE** - MECHANICAL PROPERTIES
CARACTERISTIQUES MECANIQUES-MECHANISCHE EIGENSCHAFTEN

**TRAZIONE**-TENSILE TESTING-TRACTION-ZUGVERSUCH **EN ISO 6892-1**

**RESILIENZA** - IMPACT TEST - RESILIENCE - ZÄHIGKEIT **EN ISO 148-1**

**DUREZZA** - HARDNESS - DURETE - HÄRTE **EN ISO 6506-1**

| PROVINO - SAMPLE / EPROUVETTE - MUSTER | mm | STATO - CONDITION / ETAT - ZUSTAND | TRATTAMENTO TERMICO - HEAT TREATMENT / TRAITMENT THERMIQUE - WÄRMEBEHANDLUNG | | | Rm MPa | Re MPa | A % | Z % | TIPO - TYPE - TYPE - ART | KU °C | KU J | KU J | Mean J | | | HB | HB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COLATA - HEAT / COULEE-SCHMELZE | 11 | BONIFICATO | 850°C | OLIO | 180°C | 1411 | 1115 | 12 | 42 | 20 | 36 | 36 | 38 | 36 | | | | |
| | | | | | | | | | | | | | | | | | | |
| VALORI ALLO STATO DI FORNITURA - VALUES IN DELIVERY CONDITION - WERTE IM LIEFERZUSTAND ▶ | | | | | | | | | | | | | | | | | 203 | |

THE PRODUCT COMPLIES WITH THE REQUIREMENTS OF THE EUROPEAN DIRECTIVE 2000/53/EC

**RADIOACTIVITY MEETS SPECIFICATION 2013/59/EURATOM <= [0,10] Bq/g**

**TEMPRABILITA'** - HARDENABILITY
TREMPABILITE - HÄRTBARKEIT
**EN ISO 642**

| MM | 1.5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HRC | 44.1 | 43.9 | 42.8 | 40.3 | 37.9 | 36.0 | 33.9 | 32.5 | 29.7 | 28.3 | 27.4 | 27.0 | 26.5 | 26.0 | 25.7 |

**GRANO** - GRAIN
GRAIN - KORNGRÖSSE
**EN ISO 643**
**AUSTENITICO**
**6 - 8**

**INCLUSIONI NON METALLICHE** - NON METALLIC INCLUSIONS - INCLUSIONS NON METALLIQUES - NICHTMETALLISCHE EINSCHLÜSSE

| A (SS) | | B (OA) | | C (OS) | | D (OG) | | |
|---|---|---|---|---|---|---|---|---|
| Thin | Heavy | Thin | Heavy | Thin | Heavy | Thin | Heavy | |
| | | | | | | | | |

**DIN 50602 (K)**
K **4** *(OXIDE)* = **6**
K *(SULFIDE)* =
K *(TOTAL)* =

**MACRO** - MACROETCHING
MACRO - MAKRO ÄTZUNG

**MACROINCLUSIONI** - MACROINCLUSIONS
MACRO INCLUSIONS - MAKRO EINSCHLÜSSE

**CONTROLLO ANTIMESCOLAMENTO** - ANTIMIXING CONTROL
CONTROLE ANTIMELANGE - VERWECHSLUNGSPRÜFUNG **100%**

**ENTI COLLAUDATORI**
INSPECTION AUTHORITIES
SERVICE D'ESSAI
ABNAHMEBEHÖRDE

**NOTE** – NOTES – NOTES - ANMERKUNGEN

4500626889- DDT 304-03.04.2024 -
cod 32733500088-240 PEZZI - GI.GI.ESSE SRL-
COL: ACC.V 295279

**CONTROLLO QUALITA'** - QUALITY CONTROL - CONTROLE QUALITE - QUALITÄTSTELLE

I.Pelizzari

SERVIZIO QUALITA' ACCIAIERIE VENETE SPA

RCQ SERENA ROSSI

GI.GI.ESSE S.R.L.
Tel. 0522.667040 - Fax 0522.751564
C.F./P.I. 02161860352
Sede Legale: Via Zuccardi, 8/A
42012 Campagnola Emilia (RE)
E-mail: info@gigiesse.it

CERTIFICATO CONFORME AL CAPITOLATO E SPECIFICHE DI RIFERIMENTO -CERTIFICATE IN COMPLIANCE WITH THE SPECIFICATION AND ITS REFERENCES-CERTIFICAT EN ACCOMPLIANCE AVEC LE CAHIER DES CHARGES ET SES REFERENCES-ZERTIFIKAT IN ÜBEREINSTIMMUNG MIT DER SPEZIFIKATION UND DESSEN BEZÜGE

JSW Steel Italy
Piombino

ORDINE / ORDER
RE05404
DATA / DATE
09.02.2022

NR. 2022 100000058148 -

DATA / DATE
13.04.2022

# CERTIFICATO DI COLLAUDO
# INSPECTION CERTIFICATE
(according to EN 10204 3.1)

222312

INTERACCIAI REGGIO EM.
P. COLLETTA 32
42100 Z.I. VILLAGGIO CROSTOLO
Italia

| | | | |
|---|---|---|---|
| CONFERMA/OUR ORDER | : 1300005474 | PROFILE/PROFILE | : Bar/round |
| LOTTO/ITEM | : 000140 | DIMENSIONI/SIZE | : 68,00 |
| COLATA/HEAT | : P0JS2100A34262 | QUALITA'/STEELGRADE | : |
| STATO/DELIVERY C | : MACHINING ANNEALED | NORMA/SPECIFICATION | 18NICRMO5_17NICRMO6-4+HH<br>: INT.017 R.3_05.12.2016 |

ANALISI DI COLATA / CHEMICAL ANALYSIS-PROPERTIES

| | C% | MN% | S% | P% | SI% | CU% |
|---|---|---|---|---|---|---|
| RESULT: | **0.1950** | **0.8050** | **0.0250** | **0.0130** | **0.2580** | **0.0080** |
| Minimum: | 0.1500 | 0.6000 | 0.0200 | 0.0000 | 0.1500 | 0.0000 |
| Maximum: | 0.2000 | 0.9000 | 0.0400 | 0.0250 | 0.4000 | 0.3000 |
| | AL% | MO% | NI% | CR% | O% | N% |
| RESULT: | **0.0250** | **0.2020** | **1.2700** | **0.8740** | **0.0012** | **0.0083** |
| Minimum: | 0.0200 | 0.1500 | 1.2000 | 0.8000 | 0.0000 | 0.0060 |
| Maximum: | 0.3500 | 0.2500 | 1.5000 | 1.0000 | 0.0025 | 0.0150 |
| | CA% | B% | H% | | | |
| RESULT: | **0.0006** | **0.0003** | **0.00016** | | | |
| Minimum: | 0.0000 | 0.0000 | 0.00000 | | | |
| Maximum: | 0.0015 | 0.0008 | 0.00035 | | | |

QUALITY MANAGER Piombino - E. CHIMISSO

**JSW Steel Italy Piombino S.p.A.**
**Company subject to the management and coordination of JSW Steel ltd**
Largo Caduti sul Lavoro, 21 57025 Piombino (Livorno)Tel. +39-0565-64111 Fax +39-0565-36514
email steelpiombino@pec.jswitaly.com - www.jswitaly.com

ACCREDIA
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JSW Steel Italy
Piombino

ORDINE / ORDER
RE05404
DATA / DATE
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NR. 2022 100000058148 -

DATA / DATE
13.04.2022

# CERTIFICATO DI COLLAUDO
# INSPECTION CERTIFICATE
(according to EN 10204 3.1)

JOMINY HRC TEST TYPE: NORMAL IN MM STANDARD: EN ISO 642

| DISTANCES: | 1,5 | 3 | 5 | 7 | 9 | 11 |
|---|---|---|---|---|---|---|
| RESULT: | **44.7** | **44.5** | **44.0** | **42.7** | **41.1** | **39.0** |
| Minimum: | 43.0 | 43.0 | 40.0 | 38.0 | 35.5 | 34.0 |
| Maximum: | 48.0 | 48.0 | 47.0 | 46.0 | 45.0 | 43.5 |
| DISTANCES: | 13 | 15 | 20 | 25 | 30 | 35 |
| RESULT: | **36.8** | **35.3** | **33.3** | **31.3** | **29.1** | **28.1** |
| Minimum: | 32.0 | 31.0 | 29.0 | 27.0 | 26.0 | 25.0 |
| Maximum: | 41.0 | 40.0 | 37.0 | 35.5 | 34.5 | 33.5 |
| DISTANCES: | 40 | 45 | 50 | | | |
| RESULT: | **27.6** | **27.1** | **26.4** | | | |
| Minimum: | 24.0 | 0.0 | 0.0 | | | |
| Maximum: | 33.0 | 32.5 | 32.0 | | | |

- AUSTENITIC GRAIN STANDARD: EN ISO 643

| | |
|---|---|
| VALUE | **7/7** |
| Minimum: | 6 |
| Maximum: | 8 |

- UNI BANDING GRADE: 3 STANDARD: UNI 8449/83

Minimum: 0
Maximum: 3

- K INCLUSION STANDARD: :UNI 3244/80

| | |
|---|---|
| GRADE: | K4 |
| INDICES: | O |
| RESULT: | **0.0** |
| Minimum: | 0.0 |
| Maximum: | 25.0 |

REDUCTION RATIO

| | |
|---|---|
| VALUE | **13.30** |
| Minimum: | 3.9 |
| Maximum: | |

SAMPLE SIZE: 220 x 220

QUALITY MANAGER Piombino - E. CHIMISSO

**JSW Steel Italy Piombino S.p.A.**
**Company subject to the management and coordination of JSW Steel ltd**
Largo Caduti sul Lavoro, 21 57025 Piombino (Livorno)Tel. +39-0565-64111 Fax +39-0565-36514
email steelpiombino@pec.jswitaly.com - www.jswitaly.com

ACCREDIA
SAFETY SYSTEM CERTIFICATION DNV·GL OHSAS 18001
ISO 14001 BUREAU VERITAS Certification
ISO 9001 BUREAU VERITAS Certification
REG. (UE) N. 333/2011 BUREAU VERITAS Certification

JSW Steel Italy
Piombino

ORDINE / ORDER
RE05404
DATA / DATE
09.02.2022

NR. 2022 100000058148 -

DATA / DATE
13.04.2022

# CERTIFICATO DI COLLAUDO
# INSPECTION CERTIFICATE
(according to EN 10204 3.1)

- TRACTION — STANDARD: EN 10002-1
HT: HARDENING AND DESTRESSING — SAMPLE SIZE: 11 MM
TEST TYPE: LONGITUDINAL

| | RM N/mm² | RE N/mm² | A% |
|---|---|---|---|
| RESULT: | **1460** | **1238** | **10.4** |
| Minimum: | 1230 | 980 | 8.0 |
| Maximum: | 1520 | . | . |

- HARDNESS: — STANDARD: EN 10003-1
HT: WORKABILITY ANNEALING — PROCESSING POINT: SURFACE
SAMPLE: — HARDNESS TYPE: HBW

| | |
|---|---|
| VALUE | **182.0** |
| Minimum: | 0.0 |
| Maximum: | 210.0 |

- STRENGTH — METHOD ): KU (J)
STANDARD: EN 10045-1 — HT: HARDENING AND DESTRESSING
TEST TYPE: LONGITUDINAL — TEMPERATURE: +20,0 °C

| | | | | | |
|---|---|---|---|---|---|
| RESULT (J): | **33.0** | **31.0** | **31.0** | **MEDIA(J):** | **31.7** |
| Minimum: | 21.0 | 21.0 | 21.0 | | 30.0 |
| Maximum: | . | . | . | | . |

DEGASSED MATERIAL
**100% anti-mixing check performed**
**100% surface and internal check performed.**

Rolling country: ITALY

The material supplied does not contain elements that are not permitted or concentrations of such elements that must be declared (such as lead, cadmium, mercury, chromium (VI), etc.) as defined in the VDA-List.

On the basis of the radiometric checks carried out in accordance with Art. 72 of Italian Legislative Decree no. 101/2020 (implementing Directive 2013/59/Euratom), the material does not exhibit abnormal levels of radioactivity.

QUALITY MANAGER Piombino - E. CHIMISSO

4500626889 DELIVERY NOTE 304-03.04.2024 code 32733500088-280 PIECES GI.GI.ESSE SRL-COLL JSW A34262

RGQ SERENA ROSSI

JSW Steel Italy Piombino S.p.A.
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Largo Caduti sul Lavoro, 21 57025 Piombino (Livorno)Tel. +39-0565-64111 Fax +39-0565-36514
email steelpiombino@pec.jswitaly.com - www.jswitaly.com

GI.GI.ESSE S.R.L.
Tel. 0522.667040 - Fax 0522.751564
C.F./P.I. 02161860352
Sede Legale: Via Puccini, 6/A
42012 Campagnola Emilia (RE)
E-mail: info@gigiessesrl.it

ACCIAIERIE VENETESPA

# CERTIFICATO DI COLLAUDO – INSPECTION CERTIFICATE
# CERTIFICAT DE RECEPTION – ABNAHMEPRÜFZEUGNIS
## EN 10204 3.1

**N° 646672**

**DATE:**27/04/2023


Acciaierie Venete Spa C.S. € 63.000.000,00 i.v C.F. e P.IVA 00224180281
Trento company register 00224180281 V.A.T. N° IT 00224180281
Registered Office : 38051 Borgo Valsugana (TN) Via Puisle, 4 - Italy
Management/Administration : 35127 Padova Z.I. Sud - Riviera Francia, 9 - Italy Tel. 049 828.28.20 (r.a.)


**CLIENTE**
CUSTOMER
CLIENT
KUNDE

**101567 - INTERACCIAI SPA**
VIA PASTEUR 2
42100 REGGIO EMILIA (RE)

**ORDINE CLIENTE** - PURCHASE ORDER
COMMANDE CLIENT - KUNDENAUFTRAG
REDS1078

**ORDINE** - ORDER
COMMANDE - AUFTRAG
168886 / 110

**ARTICOLO (ACCIAIO)**- ITEM (STEEL) - ITEM (ACIER) - ARTIKEL (STAHL)

**PROFILO** - PROFILE
PROFIL - ABMESSUNG **68 MM ROUND BAR (EN 10060 - NORMAL)**

**STATO DI FORNITURA**- DELIVERY CONDITION
CONDITION DE LIVRAISON – LIEFERZUSTAND **ANNEALING FOR SHEARABILITY**

**STATO DI ESECUZIONE** - STATE OF EXECUTION
ETAT DE L'ÉXECUTION - AUSFÜHRUNG **ROLLED**

**COLATA** - HEAT - COULEE - SCHMELZE: **295279**

**MARCA ACCIAIO** - STEEL GRADE - MARQUE ACIER - STAHLGÜTE: **17NICRMO6-4+HH**

**NORMA** - SPECIFICATION - NORME - NORM
**INTERACCIAI INT017 REV03 (S=0.020-0.035%)**

**PESO** - WEIGHT
POIDS - GEWICHT (Kg) **4823**

**COLLI** - ITEMS
COLIS - KOLLI (Nr) **2**

**DDT** - DELIVERY NOTE
BON DE LIVRAISON - LIEFERSCHEIN **L1002679** **04/05/2023**

**BLUMO** - BLOOM
BLOOM - KNÜPPEL **160 X 160 mm**

**RIDUZIONE** - REDUCTION
REDUCTION - UMFORMUNGSGRAD **7.0**

**SHIPMENT PLANT** **ODOLO (BS)**

**COMPOSIZIONE CHIMICA (%)** - CHEMICAL COMPOSITION (%) - COMPOSITION CHIMIQUE (%) - CHEMISCHE ZUSAMMENSETZUNG (%)

| C | Si | Mn | P | S | Cu | Cr | Ni | Sn | Al | As | Mo |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.1800 | 0.2100 | 0.8440 | 0.0100 | 0.0300 | 0.2040 | 0.9170 | 1.2960 | 0.0080 | 0.0290 | 0.0050 | 0.1870 |

| V | B | Nb | Ca | Sb |
|---|---|---|---|---|
| 0.0060 | 0.0005 | 0.0020 | 0.0010 | 0.0037 |

**ANALISI GAS** - GAS ANALYSIS - ANALYSE GAZ - GAS ANALYSE
$H_2$= 1.3 (ppm) | $O_2$= 14 (ppm) | $N_2$= 105 (ppm) 0.0105 (%)

**D.I. (ASTM A255)**

MELTING: ELECTRIC FURNACE (EAF) - PROCESSING OUTSIDE FURNACE: REFINING (LF) - CASTING: CONTINUOUS CASTING (CC)

**CARATTERISTICHE MECCANICHE** - MECHANICAL PROPERTIES
CARACTERISTIQUES MECANIQUES-MECHANISCHE EIGENSCHAFTEN

**TRAZIONE**-TENSILE TESTING-TRACTION-ZUGVERSUCH **EN ISO 6892-1**

**RESILIENZA** - IMPACT TEST - RESILIENCE - ZÄHIGKEIT **EN ISO 148-1**

**DUREZZA** - HARDNESS - DURETE - HÄRTE **EN ISO 6506-1**

| PROVINO - SAMPLE - EPROUVETTE - MUSTER | mm | STATO - CONDITION - ETAT - ZUSTAND | TRATTAMENTO TERMICO - HEAT TREATMENT - TRAITMENT THERMIQUE - WÄRMEBEHANDLUNG | | | Rm MPa | Re MPa | A % | Z % | TIPO - TYPE - TYPE - ART KU °C | J | J | J | Mean J | | | HB | HB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COLATA - HEAT - COULEE-SCHMELZE | 11 | HEAT-TREATED | 850°C | OIL | 180°C | 1411 | 1115 | 12 | 42 | 20 | 36 | 36 | 38 | 36 | | | | |
| | | | | | | | | | | | | | | | | | | |
| VALORI ALLO STATO DI FORNITURA - VALUES IN DELIVERY CONDITION - WERTE IM LIEFERZUSTAND ▶ | | | | | | | | | | | | | | | | | 203 | |

THE PRODUCT COMPLIES WITH THE REQUIREMENTS OF THE EUROPEAN DIRECTIVE 2000/53/EC

**RADIOACTIVITY MEETS SPECIFICATION 2013/59/EURATOM <= [0,10] Bq/g**

**TEMPRABILITA'** - HARDENABILITY
TREMPABILITE - HÄRTBARKEIT
**EN ISO 642**

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MM | 1.5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | | |
| HRC | 44.1 | 43.9 | 42.8 | 40.3 | 37.9 | 36.0 | 33.9 | 32.5 | 29.7 | 28.3 | 27.4 | 27.0 | 26.5 | 26.0 | 25.7 | | |

**GRANO** - GRAIN
GRAIN - KORNGRÖSSE
**EN ISO 643**
**AUSTENITIC**
**6 - 8**

**INCLUSIONI NON METALLICHE** - NON METALLIC INCLUSIONS - INCLUSIONS NON METALLIQUES - NICHTMETALLISCHE EINSCHLÜSSE

| A (SS) | | B (OA) | | C (OS) | | D (OG) | | |
|---|---|---|---|---|---|---|---|---|
| Thin | Heavy | Thin | Heavy | Thin | Heavy | Thin | Heavy | |

**DIN 50602 (K)**
K 4 *(OXIDE)* = 6
K *(SULFIDE)* =
K *(TOTAL)* =

**MACRO** - MACROETCHING
MACRO - MAKRO ÄTZUNG

**MACROINCLUSIONI** - MACROINCLUSIONS
MACRO INCLUSIONS - MAKRO EINSCHLÜSSE

**CONTROLLO ANTIMESCOLAMENTO** - ANTIMIXING CONTROL
CONTROLE ANTIMELANGE - VERWECHSLUNGSPRÜFUNG **100%**

**ENTI COLLAUDATORI**
INSPECTION AUTHORITIES
SERVICE D'ESSAI
ABNAHMEBEHÖRDE

**NOTE** – NOTES – NOTES - ANMERKUNGEN

4500626889-DELIVERY NOTE 304-03.04.2024 -
code 32733500088-240 PIECES - GI.GI.ESSE SRL-
CASTING : ACC.V 295279

**CONTROLLO QUALITA'** - QUALITY CONTROL - CONTROLE QUALITE - QUALITÄTSTELLE

I.Pelizzari

SERVIZIO QUALITÀ ACCIAIERIE VENETE SPA

QUALITY SERVICE

RCQ SERENA ROSSI

GI.GI.ESSE S.R.L.
Tel. 0522.667040 - Fax 0522.751564
C.F./P.I. 02161260352
Sede Legale: Via Zuccardi, 8/A
42012 Campagnola Emilia (RE)
E-mail: info@gigiesserl.it

CERTIFICATO CONFORME AL CAPITOLATO E SPECIFICHE DI RIFERIMENTO -CERTIFICATE IN COMPLIANCE WITH THE SPECIFICATION AND ITS REFERENCES-CERTIFICAT EN ACCOMPLIANCE AVEC LE CAHIER DES CHARGES ET SES REFERENCES-ZERTIFIKAT IN ÜBEREINSTIMMUNG MIT DER SPEZIFIKATION UND DESSEN BEZÜGE

DANA

# Check Sheet

F0501 - R04.02 - 12.11.2012

| Inspection lot | Quantity | Order Type/Number/Position | Work Center |
|---|---|---|---|
| 030001094616 | 560 | ZWO1 11386265 0080 | 0062 |

| PART NUMBER | REVISION | OPERATION | OPERATION DESCRIPTION |
|---|---|---|---|
| 32733530300 | H | 0080 | ISPEN CASE-HARDENING FURNACE |

| ID | CHARACTERISTIC | METHOD | SAMPLING | UM | TARGET | MIN_MAX | #1 | #2 | #3 | #4 | #5 | #6 | #7 | #8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | MT3006<br>P1 ROCKWELL HARDNESS C | DUR001<br>DUROMETER | ZF0003<br>3 Pieces | HRC | | 62,00<br>58,00 | 60 | 60 | 59 | | | | | |
| 20 | MT3012<br>P2 CASE-HARDENING DEPTH (HV550) | PRO001<br>TEST SPECIMEN ACCORDING TO SP022-2 | ZF0003<br>3 Pieces | mm | | 0,80<br>0,60 | ,86 | ,85 | ,85 | | | | | |
| 30 | MT3023<br>P3 CORE STRENGTH | LAB001<br>LABORATORY | ZF0001<br>1 Piece | N/mm2 | | 1.400,00<br>1.100,00 | | | | | | | | |
| 40 | MT0100<br>MATERIAL TYPE AS PER DRAWING | VIS002<br>VISUAL INSPECTION | ZF0001<br>1 Piece | | | | B01-18CrNiMo7-6 | | | | | | | |
| 50 | MT4101<br>TEST SPECIMEN TYPE USED (SP022-02) | PRO001<br>TEST SPECIMEN ACCORDING TO SP022-2 | ZF0004<br>4 Pieces | | | | 01-TEST ON PART | | | | | | | |
| 60 | MT5100<br>PROGRAM CODE USED | VIS002<br>VISUAL INSPECTION | ZF0004<br>4 Pieces | | | | | | | | | | | |
| 70 | MT5101<br>LOAD NUMBER | VIS002<br>VISUAL INSPECTION | ZF0004<br>4 Pieces | | | | 24-07/0041 RTQ 4 | | | | | | | |
| 80 | VC3010<br>VISUAL TEST: AFTER HEAT TREATMENT | VIS001<br>VISUAL INSPECTION ACCORDING TO WI0519 | ZF0008<br>8 Pieces | | | | | | | | | | | |

| Date Time | Signature | Remarks |
|---|---|---|
| 11.07.2024 13:40:40 | DVALCAV001 | Tested according SP022-02 , carburizing temperature below 940°C |

CITIC PACIFIC SPECIAL STEEL

DAYE SPECIAL STEEL CO., LTD.
NO. 316 HUANGSHI AVENUE, HUANGSHI, HUBEI, CHINA PC:435000

# MANUFACTURER S INSPECTION CERTIFICATE

CERTIFICATE NO.:H722075170

ACCORDING TO UNI EN10204:3.1

INVOICE NO:YGBITA22809INR-3C
TO:INTERACCIAI - SOCIETA' PER AZIONI VIA LOUIS PASTEUR 2 42122 REGGIO NELL'EMILIA,ITALY
DESCRIPTION OF GOODS: HOT ROLLED HIGH QUALITY ALLOY STEEL ROUND BARS

| Batch No. | Grade | Heat No. | Size(MM) | Pieces | Bundles | Weight(MT) | Total Length(M) | Delivery Condition |
|---|---|---|---|---|---|---|---|---|
| H722075170 | 42CrMoS4+HH+QT | 2014133E | 145 | 24 | 8 | 17.984 | 138.9 | quenched and tempered |

Ⅰ、Chemical Composition:(%):

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ladle: | C:0.40 | Si:0.23 | Mn:0.75 | P:0.013 | S:0.024 | Cr:1.10 | Ni:0.16 | Mo:0.24 | Cu:0.03 | Al:0.026 | V:0.010 | Ti:0.0061 | As:0.0044 | Sn:0.0016 | Pb:0.0005 |
| Product: | radioactivity:0.02 Bq/g | | | | | | | | | | | | | | |

Ⅱ、Macrostructure Examination:

| | | | |
|---|---|---|---|
| 1、test standard: | ASTM E381 | 2、C(level): | 1.0 1.0 |
| 3、S(level): | 1.0 1.0 | 4、R(level): | 1.0 1.0 |

Ⅲ、Mechanical Properties Examination:

| | | | |
|---|---|---|---|
| 1、tensile test temp: | R.M Temp | 2、tensile test direction: | longitudinal |
| 3、tensile test standard: | EN 10002-1 | 4、yield strength Rp0.2(MPa): | 756 |
| 5、tensile strength Rm(MPa): | 905 | 6、elongation after fracture A(%): | 22.0 |
| 7、reduction of area Z(%): | 68 | 8、impact test temp: | R.M Temp |
| 9、impact test direction: | longitudinal | 10、impact notch depth: | 2mm |
| 11、impact test standard: | EN 10045-1 | 12、charpyimpact absorbed energy KV2(J) : | 130 128 125 |
| 13、J1.5(mm-HRC): | 58.0 | 14、J3(mm-HRC): | 58.0 |
| 15、J5(mm-HRC): | 57.5 | 16、J7(mm-HRC): | 57.0 |
| 17、J9(mm-HRC): | 56.5 | 18、J11(mm-HRC): | 56.0 |
| 19、J13(mm-HRC): | 55.0 | 20、J15(mm-HRC): | 53.5 |
| 21、J20(mm-HRC): | 50.5 | 22、J25(mm-HRC): | 46.5 |
| 23、J30(mm-HRC): | 44.0 | 24、J35(mm-HRC): | 41.5 |
| 25、J40(mm-HRC): | 40.0 | 26、J45(mm-HRC): | 38.5 |
| 27、J50(mm-HRC): | 38.5 | | |

4500548192- DDT 810-01.08.2023 - cod 9022943-55PEZZI- GI.GI.ESSE SRL- COL: CPSS 2014133E

Ⅳ、Microstructure Examination:

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1、inclusion test standard: | ASTM E45 | | | | | | 2、A-thin(level): | 2.0 | 2.5 | 2.0 | 2.5 | 2.0 | 2.5 |
| 3、A-thick(level): | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 4、B-thin(level): | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| 5、B-thick(level): | 0 | 0 | 0 | 0 | 0 | 0 | 6、C-thin(level): | 0 | 0 | 0 | 0 | 0 | 0 |
| 7、C-thick(level): | 0 | 0 | 0 | 0 | 0 | 0 | 8、D-thin(level): | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| 9、D-thick(level): | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 10、K4[0] property values: | 0.6 | | | | | |
| 11、grain size test standard: | ISO 643 | | | | | | 12、grain size(level): | 8 | | | | | |

Ⅴ、NDT:

1、UT :good 2、standard:SEP1921-1984 3、level:3D/d 4、residual magnetic field(A/cm):2

Ⅵ、Heat Treatment Process:

| | | | | | |
|---|---|---|---|---|---|
| 1、quenching temperature(℃): | 850 | quenching soaking time(min): | 193 | quenching cooling method: | water cooling |
| start temp. of quench media(℃): | 25 | finish temp. of quench media(℃): | 29 | | |
| 2、tempering temperature(℃): | 650 | tempering soaking time(min): | 245 | tempering cooling method: | air cooling |

Ⅶ、Dimensions,Appearance and Surface Quality:

1、dimension,appearance and surface quality: good 2、delivery hardness HBW: 266-277

Ⅷ、Others:

1、manufacturing process:BOF+LF+RH+CC 2、reduction ratio:13.2

| Date: | 2022-07-29 | Inspector: | Ming Chao | Manager of Inspection: | Liuguanghui |
|---|---|---|---|---|---|

Note:

(1) We hereby certify that the material herein described has been manufactured, sampled, tested and inspected in accordance with the requirements of specifications and purchase order, and meet the requirements

(2) When there is any complaint, you are kindly requested to mark the Steel Grade, Heat No., Size, Delivery Date, Causes and reserve the material in the condition of delivery

(3) Our company's quality management system has been certified by TÜV SÜD for fulfilling all requirements of ISO9001:2015&IATF16949:2016&AS9100D.

The defects per the requirement such as flakes,sub-surface bubble,macro inclusion in macrostructure of acid etched surface are not allowed and we assure the parts quality for delivery.; Free from ratioactive.Free from mercury and cadmium.No welding repair.The tensile and impact specimens been taken from delivery condition.; All products have met EN 10083-3 requirements,tolerances acc. to EN 10060.

SIDERIT
TRATTAMENTI TERMICI
STABILIMENTO ZOLA PREDOSA

SEDE LEGALE:
SIDERIT S.r.l. con Socio Unico
Società soggetta a direzione
e coordinamento di Proterm S.r.l.
Via Casteldebole 2/A
40069 Zola Predosa (BO) – IT
Tel. 051752321
Cap. Soc. EUR 2.184.000,00 i.v.
P.IVA C.F e R.I. 01603891209 - R.E.A. 350684/BO

STABILIMENTO PRODUTTIVO:
SIDERIT ZOLA PREDOSA
Via Casteldebole 2/A
40069 Zola Predosa (BO) – IT
Tel. 051752321

AZIENDA CON SISTEMA DI GESTIONE CERTIFICATO DA KIWA-CERMET
SECONDO UNI EN ISO 9001:2015 CERTIFICATO NUMERO 008

COMPANY WITH MANAGEMENT SYSTEM CERTIFIED BY KIWA-CERMET
IN COMPLIANCE WITH THE STANDARD UNI EN ISO 9001:2015 (CERT. N. 008)

*Prove di durezza eseguite secondo normative UNI EN ISO 6506, 6507 e 6508.*
*Spessore degli strati induriti UNI 11153 laddove non diversamente indicato nel CSR cliente.*

*Eventuali contestazioni dovranno essere comunicate prima dell'esecuzione di ulteriori lavorazioni e dell'utilizzo dei particolari.*

| | | | |
|---|---|---|---|
| **CERTIFICATO DI COLLAUDO**<br>TEST CERTIFICATE | **2319125** | **DATA**<br>DATE | **13/07/2023** |

*UNI EN 10204:2005 - 3.1* *Pos05a06r1*

**Spett.le:** **GI.GI.ESSE SRL**
VIA ZUCCARDI 8/A
42012 CAMPAGNOLA EMILIA RE

| | | | |
|---|---|---|---|
| **DISEGNO**<br>Part Number | **9022943** | **COMMESSA**<br>Committed | |
| **DESCRIZIONE**<br>Description | **PIGNONE** | **ORDINE**<br>Order | |
| **DDT**<br>Delivery note | **702** | **Q.TA'**<br>Pieces | **55 (TOT)** |
| **DATA DDT**<br>Delivery note date | **05/07/2023** | **PESO [Kg]**<br>Weight [Kg] | **621,00** |
| **MATERIALE**<br>Material | **42CrMo4** | **CONTENITORI**<br>Cases | **377** |
| **COLATA**<br>Heat Code | **2014133E** | **PARTITA**<br>Batch | **2316300** |

**TRATTAMENTO TERMICO**
Heat Treatment

**BONIFICA GREZZI**
**PALLINATURA GREZZI**
**COLLAUDO GREZZI**

**MODALITA' DI LAVORO**
Work Details

**ANALISI DI COLLAUDO**
Laboratory analysis

| **Specifiche**<br>Specification | **Richieste**<br>Required | **Risultati**<br>Results | **u.m.** |
|---|---|---|---|
| **Rm da prova di durezza**<br>Rm from hardness test | **800 - 950** | **885-891** | **MPa** |

**Specifiche cliente**
Customer standard

**Esame microstrutturale**
Microstructural Analisys

| | | | |
|---|---|---|---|
| **Strumento**<br>Tool device code | **Reicherter Briviskop 3000H** | **Classe funzionale**<br>Class | |
| **Note**<br>Notes | | **Settore applicazione**<br>Area | |
| **Collaudatore**<br>Inspector | **PATTARA** | **ESITO** | CONFORME |
| **Responsabile collaudo**<br>Lab Supervisor | **Claudio Mellini** | COMPLIANCE RESULT | |

4500548192- DDT 810-01.08.2023 - cod 9022943-55PEZZI-GI.GI.ESSE SRL-COL: CPSS 2014133E

ECQ SERENA ROSSI

GI.GI.ESSE S.R.L.
Tel. 0522.667040 - Fax (522.751564
C.F./P.I. 02161960357
Sede Legale: Via Zuccardi, 8/A
42012 Campagnola Emilia (RE)
E-mail: info@gigiessesrl.it

INFORMAZIONI RISERVATE. È VIETATA LA DIVULGAZIONE E L'UTILIZZO SE NON ESPRESSAMENTE AUTORIZZATI DALLA DIREZIONE AZIENDALE.

SIDERIT
TRATTAMENTI TERMICI
STABILIMENTO ZOLA PREDOSA

SEDE LEGALE:
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e coordinamento di Proterm S.r.l.
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Via Casteldebole 2/A
40069 Zola Predosa (BO) – IT
Tel. 051752321

AZIENDA CON SISTEMA DI GESTIONE CERTIFICATO DA KIWA-CERMET
SECONDO UNI EN ISO 9001:2015 CERTIFICATO NUMERO 008

COMPANY WITH MANAGEMENT SYSTEM CERTIFIED BY KIWA-CERMET
IN COMPLIANCE WITH THE STANDARD UNI EN ISO 9001:2015 (CERT. N. 008)

*Prove di durezza eseguite secondo normative UNI EN ISO 6506, 6507 e 6508.*
*Spessore degli strati induriti UNI 11153 laddove non diversamente indicato nel CSR cliente.*

*Eventuali contestazioni dovranno essere comunicate prima dell'esecuzione di ulteriori lavorazioni e dell'utilizzo dei particolari.*

| | | | |
|---|---|---|---|
| **CERTIFICATO DI COLLAUDO**<br>TEST CERTIFICATE | **2319125** | **DATA**<br>DATE | **13/07/2023** |

*UNI EN 10204:2005 - 3.1* *Pos05a06r1*

**Spett.le:** **GI.GI.ESSE SRL**
VIA ZUCCARDI 8/A
42012 CAMPAGNOLA EMILIA RE

| | | | |
|---|---|---|---|
| **DISEGNO**<br>Part Number | **9022943** | **COMMESSA**<br>Committed | |
| **DESCRIZIONE**<br>Description | **PIGNONE** PINION | **ORDINE**<br>Order | |
| **DDT**<br>Delivery note | **702** | **Q.TA'**<br>Pieces | **55 (TOT)** |
| **DATA DDT**<br>Delivery note date | **05/07/2023** | **PESO [Kg]**<br>Weight [Kg] | **621,00** |
| **MATERIALE**<br>Material | **42CrMo4** | **CONTENITORI**<br>Cases | 377 |
| **COLATA**<br>Heat Code | **2014133E** | **PARTITA**<br>Batch | **2316300** |

**TRATTAMENTO TERMICO**
Heat Treatment

**BONIFICA GREZZI** RAW TEMPERING
**PALLINATURA GREZZI** RAW SHOT PEENING
**COLLAUDO GREZZI** RAW TEST

**MODALITA' DI LAVORO**
Work Details

**ANALISI DI COLLAUDO**
Laboratory analysis

| Specifiche<br>Specification | Richieste<br>Required | Risultati<br>Results | u.m. |
|---|---|---|---|
| **Rm da prova di durezza**<br>Rm from hardness test | **800 - 950** | **885-891** | **MPa** |

**Specifiche cliente**
Customer standard

**Esame microstrutturale**
Microstructural Analisys

| | | | |
|---|---|---|---|
| **Strumento**<br>Tool device code | **Reicherter Briviskop 3000H** | **Classe funzionale**<br>Class | |
| **Note**<br>Notes | | **Settore applicazione**<br>Area | |
| **Collaudatore**<br>Inspector | **PATTARA** | **ESITO** | |
| **Responsabile collaudo**<br>Lab Supervisor | **Claudio Mellini** | COMPLIANCE RESULT | CONFORME<br>COMPLIANT |

4500548192- DDT 810-01.08.2023 - cod 9022943-55PEZZI-GI.GI.ESSE SRL-COL: CPSS 2014133E

ECQ SERENA ROSSI

GI.GI.ESSE S.R.L.
Tel. 0522.667040 - Fax (522.751564
C.F./P.I. 02161960357
Sede Legale: Via Zuccardi, 8/A
42012 Campagnola Emilia (RE)
E-mail: info@gigiessesrl.it

INFORMAZIONI RISERVATE. È VIETATA LA DIVULGAZIONE E L'UTILIZZO SE NON ESPRESSAMENTE AUTORIZZATI DALLA DIREZIONE AZIENDALE.

# MATERIAL TEST CERTIFICATE
# (材质证书)
## ACCORDING EN10204 3.1

LANGUAGE
ENGLISH

| | | | |
|---|---|---|---|
| DANAMotionSystemsItaliaS.r.l.MATERIAL STANDARD (SP046-3)（标准） | | CERTIFICATE DATE （证书日期） | CAST ID （批号） |
| B21 | C45 GB699-88 | 2024.01.15 | Y236-00653 |
| RAW MATERIAL ORIGIN /MATERIAL（原料产地/材料） | | CUSTOMER （客户） | |
| CAST ID：Y236-00653 | | DanaMotionSystems Italia S.r.l. | |
| MATERIAL（材质）:C45 GB699-88 | | VIA LUCIANO BREVINI 1/A -42124 STRADARIO 01483 REGGIO EMILIA - ITALY (RE) ENROLLED AT REGISTER OF ENTERPRISES OF REGGIO EMILIA-NUMBER REA 75379 | |
| PART NUMBER （客户零件号码） | | QUANTITY（数量） | SUPPLIER（供应商） |
| 34512831895 | | 3000 | JINANHONGZHENG SCIENCE |
| PART DESCRI PTION （零件叙述/名称） | | ORDERNUMBER/DELIVERY NOTE （订单号码/交货通知单） | DANA2401 |
| PRE-MACHINED PLANET CARRIER | | 4500611892 | |

## CHEMICAL COMPOSITION
## (化学成份)

| | %C | %Mn | %S | %Si | %P | ----- | ----- | ----- | ----- | ----- | ----- |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MIN | 0.42 | 0.50 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| MAX | 0.50 | 0.80 | 0.035 | 0.40 | 0.030 | ----- | ----- | ----- | ----- | ----- | ----- |
| CAST | 0.457 | 0.638 | 0.012 | 0.21 | 0.007 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | | | | | | “Grain Growth:A/min=0.020%,Timin=0.04% | | | |

## MECHANICAL PROPERTIES
## （机械性能）

| TEST MEDIA AND HEAT TREATMENT （试验热处理） | | Rm[N/mm²] | Re[N/mm²] | A% | Z% | Kv[J] | SOUNDNESS | Grain Size |
|---|---|---|---|---|---|---|---|---|
| +QT WITH TEMPERING AT 190ºC （淬火、回火） | MIN | 650 | ----- | ----- | ----- | ----- | MPI | ----- |
| | MAX | 800 | ----- | ----- | ----- | ----- | ONBAR | ----- |
| | CAST | 710 | ----- | ----- | ----- | ----- | PASSED | ----- |

## REMARKS AND ADDITIONAL TESTS

MATERIAL ON DRAWING (图面材质)/34512831895
C45 GB699-88/EN10084

| APPROVAL(核准)： | CHECKED（审核）： | | ENGINEER（主办人）： |
|---|---|---|---|
| Yuan min Chen | Shan Gao | Yue zhen Yu | Chun min Liu |

莱钢®

# 产品质量证明书
# INSPECTION CERTIFICATE

地址：中国山东省济南市钢城区府前大街99号
No.99Fuqian Street,GangCheng District,JiNan ShanDong,China

| 质保书号/Sheet No: | | 产品名称/Description of Goods: | 优质碳素结构钢 | 钢种/Grade: | 45 |
|---|---|---|---|---|---|
| 合同号/Contract No: | | 交货状态/Condition: | 热轧 | 执行标准/Specification: | GB/T699-2015 |
| 出口批号/Export No: | | 收货单位/Sold To: | [illegible] | | R-LGPBB-QESP16-18 |

| 序号 No | 炉号 Heat No | 规格 Size(mm) | 件数 Bundles | 支数 Pieces | 重量 Net Weigth(MT) | 化学成分/Chemical Composition(%) | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | C | Si | Mn | P | S | Cr | Ni | Cu | Ti | Mo | V | W | B | Alt | Nb | Als | Ca | As | Sb | Pb | Sn | Bi | CEV |
| 1 | Y236-00653 | 65 | 6 | 114 | 18.085 | 0.46 | 0.23 | 0.55 | 0.018 | 0.003 | 0.049 | 0.015 | 0.024 | 0.0020 | 0.001 | 0.001 | 0.0000 | 0.0003 | 0.016 | 0.0007 | 0.000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | ---- |
| 2 | Y236-00649 | 65 | 3 | 54 | 8.55 | 0.46 | 0.23 | 0.58 | 0.018 | 0.009 | 0.067 | 0.019 | 0.026 | 0.0030 | 0.005 | 0.002 | 0.0000 | 0.0005 | 0.035 | 0.0008 | 0.000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | ---- |
| 3 | Y236-00652 | 65 | 6 | 114 | 18.075 | 0.43 | 0.23 | 0.57 | 0.018 | 0.009 | 0.047 | 0.019 | 0.022 | 0.0030 | 0.000 | 0.002 | 0.0000 | 0.0005 | 0.016 | 0.0008 | 0.000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | ---- |
| 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| 序号 No | 一般疏松 Scattered Porosit Grade | 中心疏松 Center Unsoundn -ess Grade | 偏析 Segrega -tion Grade | 中心偏析 Center Segregat -ion Grade | 锭型偏析 Ingot Segregat -ion Grade | 边缘点偏 Edge Segregat -ion Grade | 一般点偏 General Segregat -ion Grade | 显微组织 Microsc -opid Structure | 非金属夹杂物/Nonmetal Impurity(Grade) | | | | | | | | | 脱碳层 Decarbu -rization mm | 带状组织 Bandst -ructure Grade | 抗拉强度 Tensile Strength Rm(N/mm) | 屈服强度 Yield Streng th Rel (N/mm) | 延伸率 Percentage Elongation A(%) | 收缩率 Percentage Reduxtion of Area Z(%) | 冲击功 Charpy Impact Ak(J) | 硬度 Brinell Hardn -ess HB | 末端淬透性 Terminal Hardena -bility | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | A | | B | | C | | D | | DS | | | | | | | | | | |
| | | | | | | | | | 细 T | 粗 H | 细 T | 粗 H | 细 T | 粗 H | 细 T | 粗 H | | | | | | | | | | | |
| 1 | 0.5 | 1.0 | ---- | 0.0 | 0.0 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 654 | 381 | 23.0 | 46.0 | ---- | ---- | J9 | J15 |
| | 0.5 | 1.0 | ---- | 0.0 | 0.0 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 643 | 372 | 23.0 | 47.0 | ---- | ---- | ---- | ---- |
| 2 | 0.5 | 1.0 | ---- | 0.0 | 0.0 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 658 | 421 | 22.5 | 45.0 | ---- | ---- | J9 | J15 |
| | 0.5 | 1.0 | ---- | 0.0 | 0.0 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 664 | 402 | 22.5 | 47.0 | ---- | ---- | ---- | ---- |
| 3 | 0.5 | 1.0 | ---- | 0.0 | 0.0 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 657 | 386 | 23.0 | 47.0 | ---- | ---- | J9 | J15 |
| | 0.5 | 1.0 | ---- | 0.0 | 0.0 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 660 | 391 | 23.0 | 46.0 | ---- | ---- | ---- | ---- |
| 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| 序号 No | 热顶锻 Forging Test | 晶粒度 Grain Size Grade | H (ppm) | N (ppm) | O (ppm) |
|---|---|---|---|---|---|
| 1 | 合格 | ---- | ---- | ---- | ---- |
| 2 | 合格 | ---- | ---- | ---- | ---- |
| 3 | 合格 | ---- | ---- | ---- | ---- |
| 4 | | | | | |

本公司是中国冶金行业首批通过ISO9001、ISO14001、OHSAS18001三体系认证企业，可为冶金、机械、汽车、造船、石油、化工、军工等行业提供5大类、10多个钢种、60多个规格的优质特殊钢。其中齿轮钢、轴承钢、45和40Cr热轧圆钢四种优特钢产品获得“山东名牌产品”荣誉称号，20CrMnTiH、45、40Cr热轧圆钢三种优特钢产品获得“冶金产品实物质量金杯奖”荣誉称号。优钢产品销售电话：（0531）76925288 售后服务电话：（0531）76891016 物流服务热线：（0531）76829827

| | |
|---|---|
| 说明 Explain | ①材料的表面质量和外形尺寸均合格。Surface quality and shape size of material are all qualified.<br>②有异议时，来函请标明钢号、批号、规格、发货日期、原因，并将实物保管好。<br>When there is any complain,you are kindly requested to mark the Steel Grade,Heat No.,Size,Delivery Date,Causes and materials in the condition.<br>③本质量证明书复印无效。The press copy invalid. |
| 备注 Remarks | |

质保书电签专用章

SHANDONG IRON AND STEEL COMPANY LTD. LAIWU COMPANY 质量证明章

填写人/Principat: 张晔　　复核人/Signature: 高小军　　质量部门盖章有效/Stamp of Quality Assurance

# JINAN HONGZHENG SCIENCE & TECHNOLOGY Co. Ltd

## HEAT TREATMENT REPORT

ACCORDING TO UNI EN 10204 3.1

DATE:2024.01.15

| | | | | | | |
|---|---|---|---|---|---|---|
| PART NO. | 34512831895 | BATCH CODE | DANA2401 | MATERIAL | C45 GB699-88 | |
| PART NAME | PIN | No. OF PCS IN BATCH | 3000PCS | ORDER NO. | 4500611892 | |
| ITEM | STANDARDVALUE | INSPECTION EQUIPMENT | 1 | 2 | 3 | JUDGEMENT |
| HEAT TREATMENT | HARDENING AND TEMPERING | BRINELL TESTER | OK | OK | OK | OK |
| HARDNESS OF SURFACE | HB190~240 | BRINELL TESTER | 205~210 | | | OK |
| APPROVAL (QUALITY MANAGER) | Yuan min Chen | CHECK (QUALITY SUPERVISOR) | Shan Gao | Yue zhen Yu | QUALITY (INSPECTOR) | Chun min Liu |

# MATERIAL TEST CERTIFICATE
# (材质证书)
## ACCORDING EN10204 3.1

LANGUAGE
ENGLISH

| | | | |
|---|---|---|---|
| DANAMotionSystemsItaliaS.r.l.MATERIAL STANDARD (SP046-3)（标准） | | CERTIFICATE DATE（证书日期） | CAST ID （批号） |
| B21 | C45 GB699-88 | 2024.3.19 | 23C00098 |
| RAW MATERIAL ORIGIN /MATERIAL（原料产地/材料） | | CUSTOMER （客户） | |
| CAST ID：23C00098 | | Dana MotionSystems Italia S.r.l. | |
| MATERIAL（材质）:C45 GB699-88 | | VIA LUCIANO BREVINI 1/A -42124 STRADARIO 01483 REGGIO EMILIA - ITALY (RE) ENROLLED AT REGISTER OF ENTERPRISES OF REGGIO EMILIA-NUMBER REA 75379 | |
| PART NUMBER （客户零件号码） | | QUANTITY （数量） | SUPPLIER （供应商） |
| 34546131895 | | 2700 | JINANHONGZHENG SCIENCE |
| PART DESCRI PTION （零件叙述/名称） | | ORDER NUMBER/DELIVERY NOTE （订单号码/交货通知单） | DANA2316-1 |
| PLANETARY CARRIER | | 4500591063 | |

## CHEMICAL COMPOSITION
## (化学成份)

| | %C | %Mn | %S | %Si | %P | ----- | ----- | ----- | ----- | ----- | ----- |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MIN | 0.42 | 0.50 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| MAX | 0.50 | 0.80 | 0.035 | 0.40 | 0.030 | ----- | ----- | ----- | ----- | ----- | ----- |
| CAST | 0.447 | 0.565 | 0.007 | 0.18 | 0.013 | ----- | ----- | ----- | ----- | ----- | ----- |

“Grain Growth:A/min=0.020%,Timin=0.04%

## MECHANICAL PROPERTIES
## （机械性能）

| TEST MEDIA AND HEAT TREATMENT （试验热处理） | | Rm[N/mm²] | Re[N/mm²] | A% | Z% | Kv[J] | SOUNDNESS | Grain Size |
|---|---|---|---|---|---|---|---|---|
| +QT WITH TEMPERING AT 190ºC （淬火、回火） | MIN | 650 | ----- | ----- | ------ | ------ | MPI | ------ |
| | MAX | 800 | ----- | ------ | ------ | ------ | ONBAR | ------ |
| | CAST | 710 | ----- | ------ | ------ | ------ | PASSED | ------ |

REMARKS AND ADDITIONAL TESTS

MATERIAL ON DRAWING (图面材质)/34546131895
C45 GB699-88b/EN10084

| APPROVAL(核准)： | CHECKED（审核）： | | ENGINEER（主办人）： |
|---|---|---|---|
| Yuan min Chen | Shan Gao | Yue zhen Yu | Chun min Liu |

# 芜湖新兴铸管有限责任公司

## 产品质量证明书

| | | | |
|---|---|---|---|
| 收货单位Purchaser | 玉环新洲机械实业有限公司 | 产品名称Name | 优质碳素结构钢 |
| 牌号Steel Grade | 45 | 技术标准Specification | GB/T 699-2015 |
| 车号Wagon No. | 1657078 | 发货日期Date of issuance | 1/20/2023 |
| 交货状态Delivery status | 热轧 | 尺寸规格Size specifications | Φ60mm |

运输计划号Transportation plan No S202301032301019

| 序号 | 批号 | 炉号 | 件数 | 重量 | C | Si | Mn | P | S | Cr | Ni | Cu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 23100238 | 23C00098 | 14 | 37.724 | 0.44 | 0.22 | 0.6 | 0.013 | 0.008 | 0.03 | 0.01 | 0.01 |
| | | | | | | | | | | | | |

| 序号 | 下屈服强度 Yeld Strength X | 抗拉强度 Tensile Strength | 断后伸长率 Percentage of elongation A | 断面收缩率 Area Reduction | 一般疏松 Generally porosity | 中心疏松 Center porosity | 锭型偏析 Pattern segregation | 中心偏析 tempering | 尺寸外形和表面质量 Dimensions and surface quality | 生产日期 Production Date |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 401,400 | 644,641 | 24,22 | 47,46 | 0.5,0.5 | 1.5,1.5 | 0,0 | 0,0 | 合格 | 23/01/18 |
| | | | | | | | | | | |

| 序号 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| | | | | | | | | | | |

说明 1.有异议时，来函请标明钢号、炉号、规格、发货日期、原因，并将实物保管好。
When there is any complain,you are kindly requested to mark the steel Grade,Heat No,Size,Delivery Date,causes and materials in the condition.

芜湖新兴铸管有限责任公司 质保书专用章

制单人:邹越　　审核人：徐琨　　质保书盖章：

# JINAN HONGZHENG SCIENCE & TECHNOLOGY Co. Ltd

## HEAT TREATMENT REPORT

ACCORDING TO UNI EN 10204 3.1 DATE:2024.3.19

| | | | | | | |
|---|---|---|---|---|---|---|
| PART NO. | 34546131895 | BATCH CODE | DANA2316-1 | | MATERIAL | C45 GB699-88 |
| PART NAME | PLANETARY CARRIER | No. OF PCS IN BATCH | 2700pcs | | ORDER NO. | 4500591063 |
| ITEM | STANDARD VALUE | INSPECTION EQUIPMENT | 1 | 2 | 3 | JUDGEMENT |
| HEAT TREATMENT | HARDENING AND TEMPERING | BRINELL TESTER | OK | OK | OK | OK |
| HARDNESS OF SURFACE | HB190~240 | BRINELL TESTER | 203~215 | | | OK |
| APPROVAL (QUALITY MANAGER) | Yuan min Chen | CHECK (QUALITY SUPERVISOR) | Shan Gao | Yue zhen Yu | QUALITY (INSPECTOR) | Chun min Liu |

# Certificate of conformity 3.1 UNI EN 10204

| | | | |
|---|---|---|---|
| Certificate # | 3100021272000010 | Material Grade | BR GJS-600-10 |
| Customer | DANA MOTION DIV. POWER | Marking on castings | 3MG |
| Supplier Code | 45138 | Material Reference Standard | SP 046-07 |
| Customer Item code | 345F4400095 | Zanardi batch ID | 30010115A |
| Item Description | SEMIL.PORT.EM1065/FEc/3,5 | Customer Order reference | 4500639713 |
| Delivery note # | 666/00 | Number of delivered parts | 555 |

## MATERIAL CONTROL

### Mechanical properties

| | Tensile strength UTS [N/mm2] | Yield strength 0,2% [N/mm2] | Elongation A [%] | HB min | HB max |
|---|---|---|---|---|---|
| Measured | 687 | 406 | 11,2 | 192 | 212 |

Type of specimen: Separately cast sample following UNI ISO 1083/1563, Y25 sample Ø=14mm L0=70 mm

### Metallographic Test on castings

| | |
|---|---|
| Structure | Perlitic - Ferritic |
| Graphite | Spheroidal graphite type VI, Graphite Dimensions 6-7, standard UNI EN ISO 945 |
| Spheroidization | Micrographic check for nodularization carried out at the end of 100% pouring ladles |

### Chemical Analisys

| | C% | Si% | Mn% | P% | S% | Mg% |
|---|---|---|---|---|---|---|
| Measured | 3,49 | 2,52 | 0,163 | 0,040 | 0,0061 | 0,048 |

**Place and date** Minerbe (VR) Apr 16, 2024 11:53:20 AM

**Internal Manager signature**

**Head of Material Laboratory** Matteo Pernumian

**External Manager signature**

**The manufacturer's authorized inspection representative**

# Certificate of conformity 3.1 UNI EN 10204

| | | | |
|---|---|---|---|
| Certificate # | 3100021272000010 | Material Grade | BR GJS-600-10 |
| Customer | DANA MOTION DIV. POWER | Marking on castings | 4A5 |
| Supplier Code | 45138 | Material Reference Standard | SP 046-07 |
| Customer Item code | 345F4400095 | Zanardi batch ID | 30010377A |
| Item Description | SEMIL.PORT.EM1065/FEc/3,5 | Customer Order reference | 4500639713 |
| Delivery note # | 666/00 | Number of delivered parts | 365 |

## MATERIAL CONTROL

### Mechanical properties

| | Tensile strength UTS [N/mm2] | Yield strength 0,2% [N/mm2] | Elongation A [%] | HB min | HB max |
|---|---|---|---|---|---|
| Measured | 634 | 397 | 11,5 | 190 | 230 |

Type of specimen: Separately cast sample following UNI ISO 1083/1563, Y25 sample Ø=14mm L0=70 mm

### Metallographic Test on castings

| | |
|---|---|
| Structure | Perlitic - Ferritic |
| Graphite | Spheroidal graphite type VI, Graphite Dimensions 6-7, standard UNI EN ISO 945 |
| Spheroidization | Micrographic check for nodularization carried out at the end of 100% pouring ladles |

### Chemical Analisys

| | C% | Si% | Mn% | P% | S% | Mg% |
|---|---|---|---|---|---|---|
| Measured | 3,52 | 2,48 | 0,164 | 0,037 | 0,0084 | 0,049 |

**Place and date** Minerbe (VR) Apr 16, 2024 11:53:20 AM

**Internal Manager signature**

**Head of Material Laboratory** Matteo Pernumian

**External Manager signature**

**The manufacturer's authorized inspection representative**

REMAZEL ENGINEERING

# DIMENSIONAL CONTROL CERTIFICATE

| Certificate N° | |
|---|---|
| DimAW003 | |
| **Date** | 04/11/2024 |

| | | | |
|---|---|---|---|
| **Supplier** | Rosetti Marino | **Order N°** | 1724001010123A90A |
| **Job** | 24-27012 | **Drawing** | 011-0008-C2442 Rev. / |
| **Project** | DAVIT CRANE | **Serial N°** | 1;2 |
| **QCP** | 24-27012_ITP-001 | **Phase** | 4.09 |

| Nominal Dimension | Real Dimension | Instruments |
|---|---|---|
| 1A:116mm | 116mm | CAL-0111 |
| 1B:80mm | 80mm | CAL-0111 |
| 1C:6mm | 6mm | CAL-0111 |
| 1H:Ø30mm | Ø30mm | CAL-0111 |
| | | |
| 2A:116mm | 116mm | CAL-0111 |
| 2B:80mm | 80mm | CAL-0111 |
| 2C:6mm | 6mm | CAL-0111 |
| 2H:Ø30mm | Ø30mm | CAL-0111 |

| | | |
|---|---|---|
| Result | Accepted | X |
| | Not Accepted | |

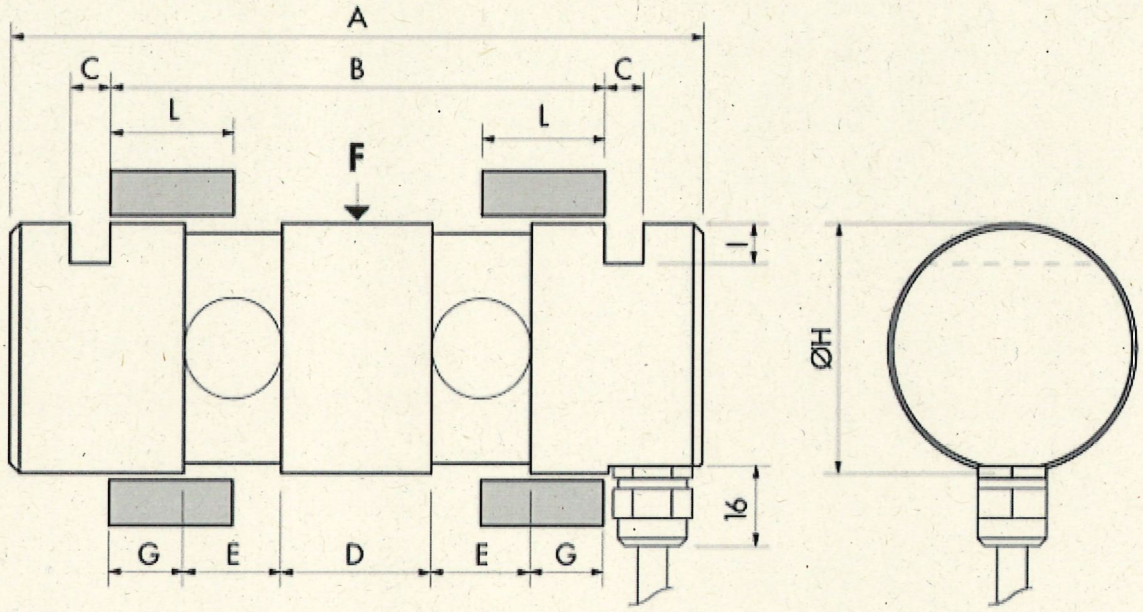
**Note:**

| Supplier | Client | Customer |
|---|---|---|
| | | REMAZEL C. Ziber ☒W ☐R |

PAVONESISTEMI

# Cella di Carico a Perno **PSPRX**

disponibile con certificazione • EAC

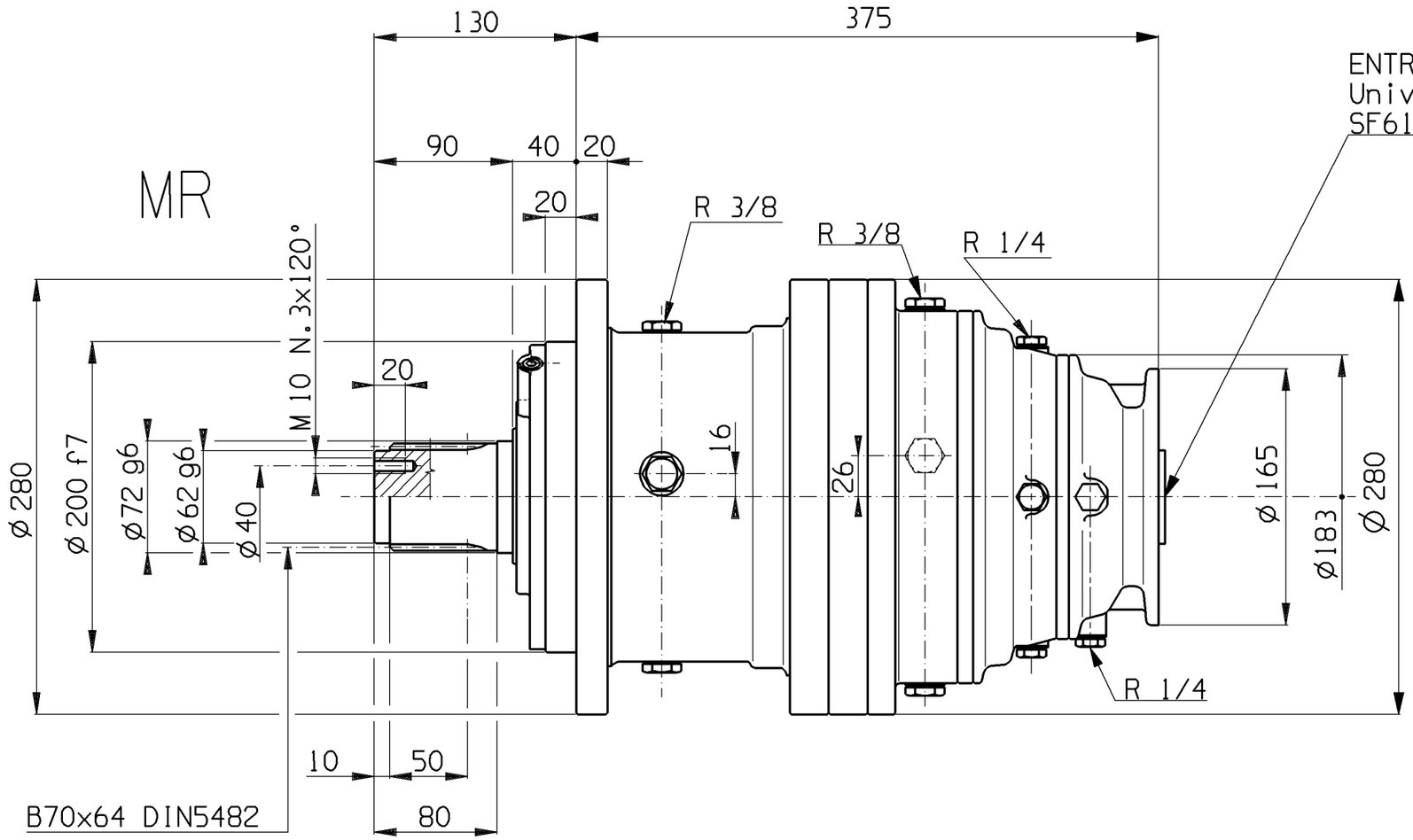



## Modello PRX, portata nominale da 500 Kg a 4000 Kg, a doppio taglio, Inox, IP65

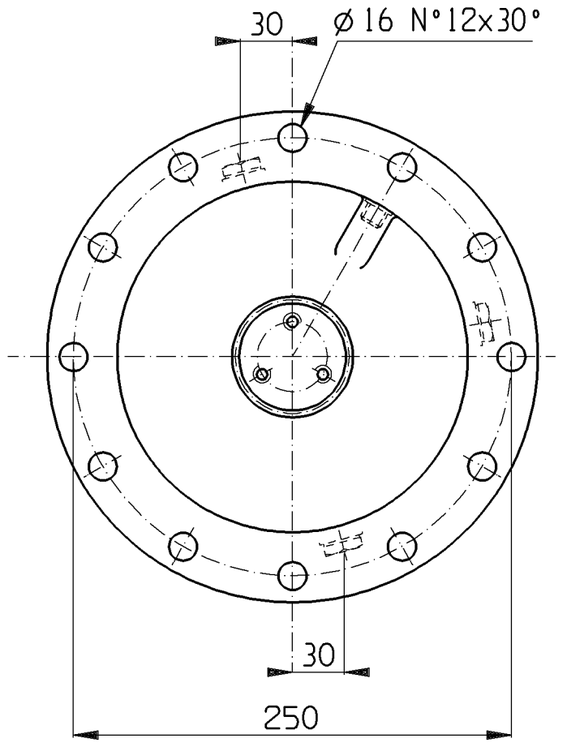
| MODELLO | PORTATA NOMINALE (KG) | A | B | C | D | E | G | ØH | I |
|---|---|---|---|---|---|---|---|---|---|
| PRX (ex PRN) | 500 - 4.000 | 116 | 80 | 6 | 20 | 20 | 10 | 30 | 6 |
| PRX | 5.000 - 20.000 | 140 | 100 | 8 | 30 | 20 | 15 | 50 | 8 |
| PRX | 30.000 - 60.000 | 260 | 220 | 20 | 100 | 30 | 30 | 80 | 15 |
| PRX | 80.000 - 100.000 | 305 | 235 | 20 | 115 | 30 | 30 | 100 | 15 |

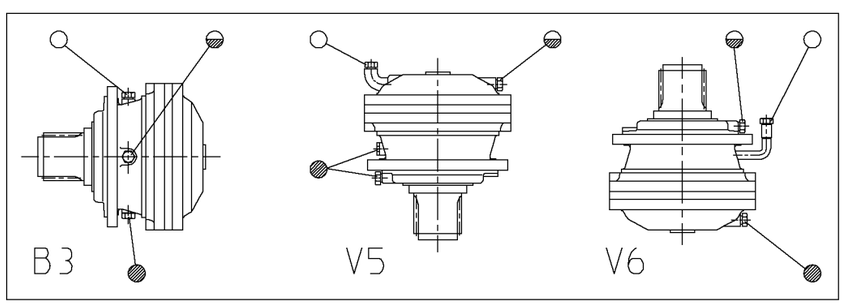
Tutti i dati indicati possono essere soggetti a variazione senza preavviso.
Tutte le misure indicate sono espresse in millimetri (mm).

MR




ENTRATA UNIVERSALE
Universal input:
SF611000001A003




TAPPI OLIO - OIL PLUGS

- TAPPO CARICO E SFIATO FILLING AND BREATHER PLUG
- TAPPO LIVELLO OIL LEVEL PLUG
- TAPPO MAGNETICO E SCARICO MAGNETIC AND DRAIN PLUG
- INGRASSATORE GREASING
- TAPPO CARICO/SFIATO OLIO FRENO BRAKE BREATHER PLUG
- TAPPO LIVELLO OLIO FRENO BRAKE OIL LEVEL PLUG
- TAPPO SCARICO OLIO FRENO BRAKE DRAIN PLUG
- ATTACCO COMANDO APERTURA FRENO BRAKE RELEASING PLUG

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| MOD. | | MOD. DATA | MODIFICATO DA | CONTROLLATO DA |
|---|---|---|---|---|
| A | Tolleranze diametri 62 e 72 erano f7 (PA1470) | 17.09.07 | A.Neroni | K.Foutekova |

DENOMINAZIONE/DRAWING DESCRIPTION:
ET3065/MR/../00

DISEGNATO DRAWN BY: Neroni
CONTROLLATO CHECKED BY: V.Montanari
SCALA/SCALE: 1:3,5
DATA/DATE: 20.05.96
SOSTITUISCE IL REPLACES CODE: SD-650/3005
SOSTITUITO DA REPLACED BY CODE:

brevini power transmission
brevini riduttori

FOGLIO SHEET: A3

DISEGNO N° / DRAWING N° :
SI011D80201A003

**Danfoss A/S**
DK-6430 Nordborg
Denmark
CVR nr.: 20 16 57 15

Telephone: +45 7488 2222
Fax: +45 7449 0949

# EU DECLARATION OF CONFORMITY

## Danfoss A/S

### Vacon Ltd

declares under our sole responsibility that the

Product(s) Vacon NXS/P AC drive

Type(s) Vacon NXS/P 0003 2...0300 2
Vacon NXS/P 0003 5...1030 5
Vacon NXS/P 0004 6...0820 6

Covered by this declaration is in conformity with the following directive(s), standard(s) or other normative document(s), provided that the product is used in accordance with our instructions.

Safety: EN 61800-5-1: 2007
EN 60204-1: 2009+A1:2009 (as relevant)

EMC: EN 61800-3: 2004 + A1: 2012

and conforms to the relevant safety provisions of Low Voltage Directive 2006/95/EC (until April 19th, 2016), 2014/35/EU (from April 20th, 2016) and EMC Directive 2004/108/EC (until April 19th, 2016), 2014/30/EU (from April 20th, 2016).

The year the CE marking was affixed: 2002

| Date | Issued by | | Date | Approved by | |
|---|---|---|---|---|---|
| | Signature | | | Signature | |
| 15-04-2016 | Name | **Antti Vuola** | 15-04-2016 | Name | **Timo Kasi** |
| | Title | **Head of Standard Drives** | | Title | **VP, Design Center Finland and Italy** |

Danfoss only vouches for the correctness of the English version of this declaration. In the event of the declaration being translated into any other language, the translator concerned shall be liable for the correctness of the translation.

| SEA METAL SRL | *PAINTING REPORT*<br>*Rapporto di pitturazione* | M 02 Rev. 02<br>del 12/05/2023 | | |
|---|---|---|---|---|
| | | *PR:* | 40/2024 | Date: 11/11/2024 |

| | | | |
|---|---|---|---|
| *Customer:* | Remazel | *Painting Procedure:* | 24-27012-PP-001 |
| *Project :* | Davit Crane | *Place of Activities:* | Sea Metal |
| *Purchase order:* | 240005843 | *Item:* | C09-0001-P0002 - Carpenteria colonna fissa |

***ITEM INSPECTED:***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| STEEL PREPARATION (ISO 8501-3 - GRADE Sa 2 1/2) | **ACCEPTABLE** | ☑ | **NOT ACCEPTABLE** | ☐ | **NOT APPL.** | ☐ |
| VISUAL CHECK PRIOR TO BLASTING : | **ACCEPTABLE** | ☑ | **NOT ACCEPTABLE** | ☐ | **NOT APPL.** | ☐ |
| CLEANING OF PIECE BEFORE BLASTING : | **ACCEPTABLE** | ☑ | **NOT ACCEPTABLE** | ☐ | **NOT APPL.** | ☐ |
| SURFACE CLEANLINESS: (ISO 8501-1) | **ACCEPTABLE** | ☑ | **NOT ACCEPTABLE** | ☐ | **NOT APPL.** | ☐ |
| SURFACE CLEANLINESS: (ISO 8502-3 RATING 2) | **ACCEPTABLE** | ☑ | **NOT ACCEPTABLE** | ☐ | **NOT APPL.** | ☐ |
| ROUGHNESS : (profile : 70 µm - Medium G) | **ACCEPTABLE** | ☑ | **NOT ACCEPTABLE** | ☐ | **NOT APPL.** | ☐ |

| Tape 1: | Tape 2: | Tape 3: |
|---|---|---|
| | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SALT TEST: (ISO 8502-6, ISO8502-9 ) | <30 mg/m² | **ACCEPTABLE** | ☑ | **NOT ACCEPTABLE** | ☐ | **NOT APPL.** | ☐ |
| Result 15,6 (mg/m²) | Result (mg/m²) | Result (mg/m²) | | Result (mg/m²) | | | |
| VISUAL CHECK AFTER TO BLASTING : | | **ACCEPTABLE** | ☑ | **NOT ACCEPTABLE** | ☐ | **NOT APPL.** | ☐ |

**EXPOSED EXTERIOR AND INTERIOR SURFACES:**

**FIRST LAYER**

| | | | | | |
|---|---|---|---|---|---|
| DATE : 11/11/24 | HOUR : 9:00 | HUMIDITY : | < 85% | | 36,3 |
| TYPE OF COAT : Jotamastic 90 Alu | | AIR TEMP.: | > 5°C | | 17,4 |
| PAINT BATCH NUMBER BASE: 3405346-1-*-1:3 | | STEEL TEMP.: | MIN. DEW P. + 3 °C. | | 18,4 |
| PAINT BATCH NUMBER CURING AGENT: 3463065-1-*-1:2 | | DEW POINT : | | | 2,3 |
| NDFT: 150 µm | | THICKNESS RESULT : | | | |
| Used paint: | | N° OF READING: 30 | MIN | (Range: -___/+___ of NDFT) | 150 |
| | | | AVERAGE | (Range: -___/+___ of NDFT) | 175 |
| RESULT : **ACCEPTABLE** ☑ **NOT ACCEPTABLE** ☐ | | | MAX | (Range: -___/+___ of NDFT) | 200 |

**SECOND LAYER**

| | | | | | |
|---|---|---|---|---|---|
| DATE : 12/11/24 | HOUR : 9:00 | HUMIDITY : | < 85% | | 46 |
| TYPE OF COAT : Jotamastic 90 Alu | | AIR TEMP.: | > 5°C | | 12,6 |
| PAINT BATCH NUMBER BASE: 3405346-1-*-1:3 | | STEEL TEMP.: | MIN. DEW P. +3°C. | | 12,3 |
| PAINT BATCH NUMBER CURING AGENT: 3463065-1-*-1:2 | | DEW POINT : | | | 1,3 |
| NDFT: 150 µm | | THICKNESS RESULT : | | | |
| Used paint: | | N° OF READING: 30 | MIN | (Range: -___/+___ of NDFT) | 270 |
| | | | AVERAGE | (Range: -___/+___ of NDFT) | 330 |
| RESULT : **ACCEPTABLE** ☑ **NOT ACCEPTABLE** ☐ | | | MAX | (Range: -___/+___ of NDFT) | 380 |

**THIRD LAYER**

| | | | | | |
|---|---|---|---|---|---|
| DATE : 13/11/24 | HOUR : 9:30 | HUMIDITY : | < 85% | | 43,4 |
| TYPE OF COAT : Hardtop XP RAL 7038 | | AIR TEMP.: | > 5°C | | 11,6 |
| PAINT BATCH NUMBER BASE: 3656202-1-*-1:3 | | STEEL TEMP.: | MIN. DEW P. +3°C. | | 11,2 |
| PAINT BATCH NUMBER CURING AGENT: 3614977-1-*-1:2 | | DEW POINT : | | | -0,6 |
| NDFT: 60 µm | | THICKNESS RESULT : | | | |
| Used paint: | | N° OF READING: | MIN | (Range: -___/+___ of NDFT) | 336 |
| | | | AVERAGE | (Range: -___/+___ of NDFT) | 411 |
| RESULT : **ACCEPTABLE** ☑ **NOT ACCEPTABLE** ☐ | | | MAX | (Range: -___/+___ of NDFT) | 496 |

**FOURTH LAYER**

| | | | | | |
|---|---|---|---|---|---|
| DATE : | HOUR : | HUMIDITY : | < 85% | | |
| TYPE OF COAT : | | AIR TEMP.: | > 5°C | | |
| PAINT BATCH NUMBER BASE: | | STEEL TEMP.: | MIN. DEW P. +3°C. | | |
| PAINT BATCH NUMBER CURING AGENT: | | DEW POINT : | | | |
| NDFT: µm | | THICKNESS RESULT : | | | |
| Used paint: | | N° OF READING: | MIN | (Range: -___/+___ of NDFT) | 0 |
| | | | AVERAGE | (Range: -___/+___ of NDFT) | 0 |
| RESULT : **ACCEPT.** ☐ **NOT ACCEPT.** ☐ **N.A.** ☐ | | | MAX | (Range: -___/+___ of NDFT) | 0 |

DUST TEST : DUST QUANTITY RATE(1÷5):1 DUST PARTICLE SIZE (1÷5):1

TEST

NOTE:

REMAZEL C. Ziber ☐W ☐R

DFT equipment : Thickness gauge Elcometer RE06311 Calibration on smooth surface (correction value=25 µm)

***REMARKS:***

| **REDATTO DA** *COMPILED FROM* | **ISPETTORE** *INSPECTOR* | **ISPETTORE** *INSPECTOR* | **CLIENTE** *CUSTOMER* |
|---|---|---|---|
| LUCA TRIPOLI N°5402 Sea Metal S.r.l. FROSIO LEVEL III | Data emissione: 14/11/2024 | | ROSETTI MARINO SpA Michele Sacchi Quality Control Dept. NACE # 35744 |
| | BIANCOLILLO MATTEO FROSIO Gruppo IapAC LEVEL II<br>Matteo Biancolillo<br>Frosio Certified # 12558 | Luca Tripoli<br>Frosio Certified # 5402 | |

REVIEW 16-12-2024

| SEA METAL SRL | PAINTING REPORT<br>Rapporto di pitturazione | M 02 Rev. 02<br>del 12/05/2023 | | | |
|---|---|---|---|---|---|
| | | PR: | 49/2024 | Date: | 22/11/2024 |

| | | | |
|---|---|---|---|
| *Customer:* | Remazel | *Painting Procedure:* | 24-27012-PP-001 |
| *Project :* | Davit Crane | *Place of Activities:* | Sea Metal |
| *Purchase order:* | 240005843 | *Item:* | C09-0001-P0005+C09-0001-P0007+C09-0001-P0086+C09-0001-P0034+C09-0001-P0076+C09-0001-P0022+C09-0001-P0067+C09-0001-P0023+C09-0001-P0024+C09-0001-P0025+C09-0001-P0028+C09-0001-P0084+C09-0001-P0056+C09-0001-P0057+C09-0001-P0088+C09-0001-P0096 C09-0001-P0045 |

***ITEM INSPECTED:***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| STEEL PREPARATION (ISO 8501-3 - GRADE Sa 2 1/2) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| VISUAL CHECK PRIOR TO BLASTING : | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| CLEANING OF PIECE BEFORE BLASTING : | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| SURFACE CLEANLINESS: (ISO 8501-1) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| SURFACE CLEANLINESS: (ISO 8502-3 RATING 2) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |
| ROUGHNESS : (profile : 75 µm - Medium G) | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ | |

| Tape 1: | Tape 2: | Tape 3: |
|---|---|---|
| | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SALT TEST: (ISO 8502-6, ISO8502-9 ) | <30 mg/m² | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ |
| Result 4,8 (mg/m²) | Result (mg/m²) | Result (mg/m²) | | Result (mg/m²) | | | |
| VISUAL CHECK AFTER TO BLASTING : | | ACCEPTABLE | ☑ | NOT ACCEPTABLE | ☐ | NOT APPL. | ☐ |

**EXPOSED EXTERIOR AND INTERIOR SURFACES:**

**FIRST LAYER**

| | | | | |
|---|---|---|---|---|
| DATE : 22/11/24 HOUR : 9:00 | HUMIDITY : | < 85% | | 66,2 |
| TYPE OF COAT : Jotamastic 90 Alu | AIR TEMP.: | > 5°C | | 12,9 |
| PAINT BATCH NUMBER BASE: 3674207-1-*-1:2 | STEEL TEMP.: | MIN. DEW P. + 3 °C. | | 12,8 |
| PAINT BATCH NUMBER CURING AGENT: 3650855-1-*-1:2 | DEW POINT : | | | 6,7 |
| NDFT: 150 µm | THICKNESS RESULT : | | | |
| Used paint: | N° OF READING: | MIN | (Range: -___/+___ of NDFT) | 150 |
| RESULT : ACCEPTABLE ☑ NOT ACCEPTABLE ☐ | 30 | AVERAGE | (Range: -___/+___ of NDFT) | 180 |
| | | MAX | (Range: -___/+___ of NDFT) | 206 |

**SECOND LAYER**

| | | | | |
|---|---|---|---|---|
| DATE : 25/11/24 HOUR : 9:00 | HUMIDITY : | < 85% | | 67,5 |
| TYPE OF COAT : Jotamastic 90 Alu | AIR TEMP.: | > 5°C | | 12,9 |
| PAINT BATCH NUMBER BASE: 3405346-1-*-1:3 | STEEL TEMP.: | MIN. DEW P. +3°C. | | 12,5 |
| PAINT BATCH NUMBER CURING AGENT: 3650855-1-*-1:2 | DEW POINT : | | | 7,0 |
| NDFT: 150 µm | THICKNESS RESULT : | | | |
| Used paint: | N° OF READING: | MIN | (Range: -___/+___ of NDFT) | 294 |
| RESULT : ACCEPTABLE ☑ NOT ACCEPTABLE ☐ | 30 | AVERAGE | (Range: -___/+___ of NDFT) | 335 |
| | | MAX | (Range: -___/+___ of NDFT) | 396 |

**THIRD LAYER**

| | | | | |
|---|---|---|---|---|
| DATE : 26/11/24 HOUR : 9:30 | HUMIDITY : | < 85% | | 68,0 |
| TYPE OF COAT : Hardtop XP RAL 7038 | AIR TEMP.: | > 5°C | | 13,6 |
| PAINT BATCH NUMBER BASE: 3689831-1-*-1:2 | STEEL TEMP.: | MIN. DEW P. +3°C. | | 13,4 |
| PAINT BATCH NUMBER CURING AGENT: 3685294-1-*-1:2 | DEW POINT : | | | 7,9 |
| NDFT: 60 µm | THICKNESS RESULT : | | | |
| Used paint: | N° OF READING: | MIN | (Range: -___/+___ of NDFT) | 336 |
| RESULT : ACCEPTABLE ☑ NOT ACCEPTABLE ☐ | | AVERAGE | (Range: -___/+___ of NDFT) | 400 |
| | | MAX | (Range: -___/+___ of NDFT) | 494 |

**FOURTH LAYER**

| | | | | |
|---|---|---|---|---|
| DATE : HOUR : | HUMIDITY : | < 85% | | |
| TYPE OF COAT : | AIR TEMP.: | > 5°C | | |
| PAINT BATCH NUMBER BASE: | STEEL TEMP.: | MIN. DEW P. +3°C. | | |
| PAINT BATCH NUMBER CURING AGENT: | DEW POINT : | | | |
| NDFT: µm | THICKNESS RESULT : | | | |
| Used paint: | N° OF READING: | MIN | (Range: -___/+___ of NDFT) | 0 |
| RESULT : ACCEPT. ☐ NOT ACCEPT. ☐ N.A. ☐ | | AVERAGE | (Range: -___/+___ of NDFT) | 0 |
| | | MAX | (Range: -___/+___ of NDFT) | 0 |

DUST TEST : DUST QUANTITY RATE(1÷5):1 DUST PARTICLE SIZE (1÷5):1

TEST

NOTE:

DFT equipment : Thickness gauge Elcometer RE06311 Calibration on smooth surface (correction value=25 µm)

*REMARKS:*

| REDATTO DA<br>*COMPILED FROM* | ISPETTORE<br>*INSPECTOR* | ISPETTORE<br>*INSPECTOR* | CLIENTE<br>*CUSTOMER* |
|---|---|---|---|
| Sea Metal S.r.l. | Data emissione 27/11/2024 | | ROSETTI MARINO SpA<br>Michele Sacchi<br>Quality Control Dept. |
| | Matteo Biancolillo<br>Frosio Certified # 12558 | Luca Tripoli<br>Frosio Certified # 5402 | |

NACE # 35744
REVIEW 16-12-2024