Base Load Power Hub (BLPH)

NDE PROCEDURE FOR CHECK AND GLOBE VALVES

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

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

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

1.1.1 Project Location

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

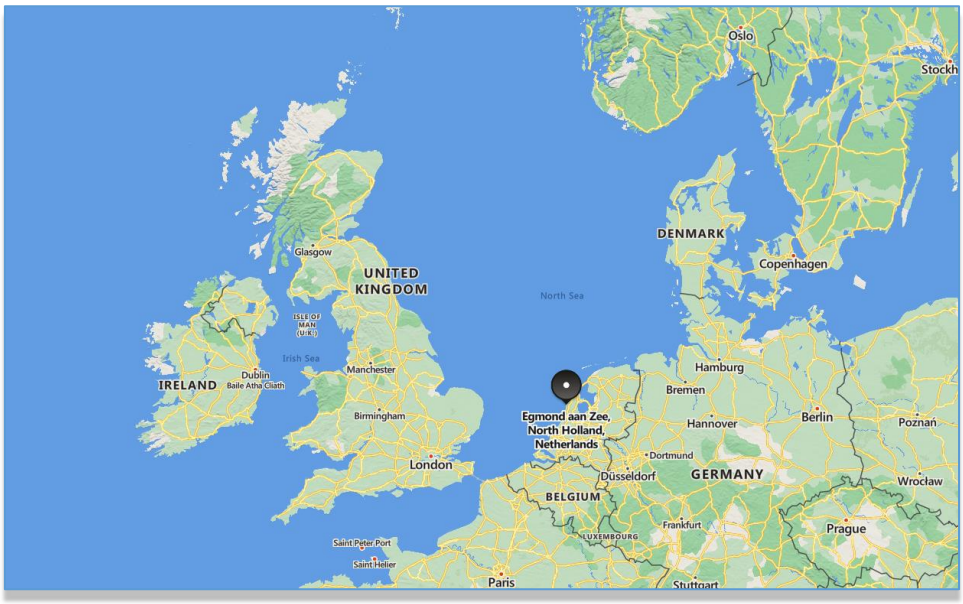


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map

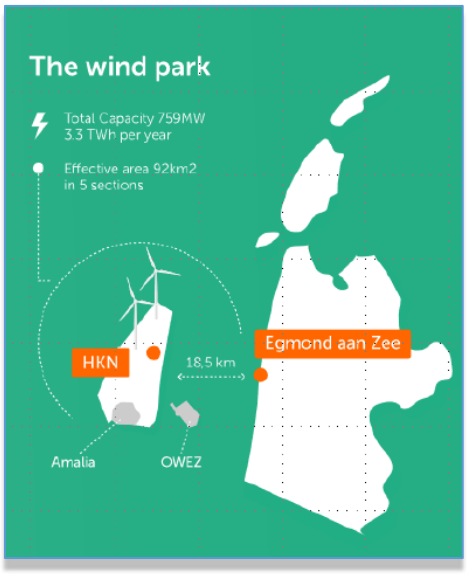


Figure 2 - Wind Park Details

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

1.1.2 Project Concept

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

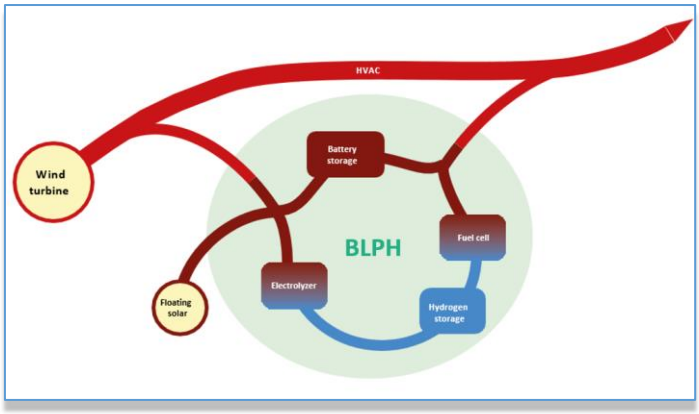


Figure 3 – BLPH Concept

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

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

2 DOCUMENT SCOPE

The document's scope is to define the index of final record book.

2.1 REFERENCES

Doc. No.	Description
123A90-DDL-PP-SP-70000	Piping Material Classes
123A90-DDL-PP-DS-70003	Manual Valve Data Sheets
Appendix 1 extracted from doc. 123A90-DDL-PP-LIS-70002	Gate, Globe & Check Valves MTO
123A90-DDL-PP-SP-70030	TSS - Manual Valves & Strainers
1724000799-QC-DB-00008	Factory acceptance test procedure
1724000799-QC-ITP-00002_00	Inspection and test plan

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

3 VISUAL EXAMINATION

3.1 PURPOSE

Establishes the program controls for the visual inspection of products.

3.2 SCOPE

This procedure is applicable to all visual inspections of products manufactured and purchased by F.R.I. facilities.

3.3 REFERENCES

The latest effective editions of the following specification are incorporated as reference and form a part of this specifications:

- MSS SP-25 Standard Marking System for Valves, Fittings, Flanges and Unions
- MSS SP-55 Quality Standard for Steel Casting for Valves, Flanges, Fittings, And Other Piping Components.
- API Specification 6A Specification for Wellhead and Christmas Tree Equipment.
- API Specification 6D Specification for Pipeline Valves.
- API Standard 600 Steel Gate Valves – Flanged and Butt-welding Ends, Bolted Bonnets.
- API Standard 602 Gate, Globe, and Check Valves for Sizes DN 100 (NPS 4) and Smaller for the Petroleum and Natural Gas Industries.

3.4 RESPONSIBILITY

The Quality Control Department is responsible for ensuring compliance with the requirements of this specification.

3.5 DEFINITIONS

The following definitions are applicable to the use and implementation of this specification:

- Quality Control Representative – As used in this specification refers to the individual in charge of Quality at a F.R.I. facilities;
- Product – As used in this specification includes materials, parts, subassemblies, assemblies and subcontracted services.

3.6 VISUAL INSPECTION OF PRODUCTS

3.6.1 General requirements

Visual aids such as mirrors, magnifying lens, bore scopes, or other means with the resolution at least equivalent to direct visual observation may be used as needed.

Personnel performing visual inspections shall be given an annual examination to ensure natural or corrected near-distance acuity in at least one eye such that the applicant is capable of reading a minimum of Jaeger Number 2 or equivalent type and size letters at a distance of not less than 12 inches (30.5 cm) on a standard Jaeger test chart. The ability to perceive an Ortho-Rater minimum of eight or similar test pattern is also acceptable. This examination will be documented on the Vision Examination Record and filed in individuals Personnel Qualification Record file.

3.6.2 Marking visual inspection

Marking of valves, fitting, flanges and unions shall be examined in accordance with MSS-SP-25 (latest edition).

3.6.3 Welding visual inspection

Personnel performing visual inspection of welding operations and completed wells shall be qualified and certified as follows:

- AWS certified welding inspector, or
- AWS certified associated welding inspector, or
- CSWIP or EWF certified welding inspector.

3.6.4 Examination of castings or cast parts

Cast surfaces of each part shall be examined in accordance with MSS-SP-55 (latest edition).

3.6.4.1 ACCEPTANCE CRITERIA

- Defect types I: None acceptable
- Defect types II to XII: Level A and B acceptable

3.7 FORGING AND HOT-WORKED ITEMS

All visible surfaces of each part shall be examined.

3.7.1.1 ACCEPTANCE CRITERIA

The acceptance criteria are as follows:

- No hot laps, tears, cracks, or significant under-fills.
- No mismatch greater than .120 inches.
- No visible defects considered to be injurious to the intended application of the wrought finished part.

3.8 MACHINED PARTS

Machined parts shall be visually inspected to ensure that parts with damage from handling, corrosion or misuse are not used without resolution of the damage to such parts.

3.9 WELDED PARTS

- Visual examination of 100% of welds shall be performed after post weld heat treatment and machining operations. Examination shall include a minimum of ½ inch (13 mm) of adjacent base metal on both sides of the weld.
- Surfaces shall be sound, clean and free of flaws, cracks, ridges and others defects judged unacceptable by the Inspector and/or as per the Codes. Painting, if applicable, shall be free of cracking and loosening.

3.10 ACCEPTANCE CRITERIA

- All pressure containing welds shall have complete joint penetration
- Lack of fusion is not permitted on all pressure containing welds
- Undercut shall not reduce the thickness in the area (considering both sides) to below the minimum thickness.
- Surface Porosity and Exposed Slag are not permitted on or within 1/8" of sealing surfaces.

3.11 NON-CONFORMANCE REPORTING

Items not meeting the specified requirements shall be processed according to the requirements of F.R.I. procedure PG 8.7.

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3.12 TEST REPORT

F.R.I. SRL	**SCHEDA DI VERIFICA** *VERIFICATION FORM* ***DIMENSIONAL & VISUAL CHECK ASSEMBLED VALVE***	Date:

COMMESSA *Job Number* F19____	**OGGETTO** *Item*	**CLIENTE** *Customer*
FASI CONTROLLO *Control Step*	**NOTE** *Note:*	

DIMENSIONAL CHECK ASSEMBLED VALVES				
	Description	Drawing Number	Serial Number	*Inspection Result*
ITEM XX ACCORDING TO: • APPLICABLE DRAWINGS • MSS SP-25				

CONFORME / *Conformit* ☐	NON CONFORME / *Not Conforming* ☐	
RESPONSIBILE QUALITA' *Manufacturer*	ENTE D'ISPEZIONE *Inspection Authorities*	DATA *Date*

Figure 4-Visual examination test report sample



4 DYE PENETRANT EXAMINATION

4.1 PURPOSE

Establishes the methods, personnel requirements and acceptance criteria for performing liquid penetrant examination using the visible penetrant testing (Type II), water washable method in accordance with the requirements of ASME B.16.34.

4.2 SCOPE

This procedure is applicable when this type of liquid penetrant examination is performed on products produced by F.R.I. facilities (body, bonnet, hardfacing welds and steel products of the vales) per the requirements of the referenced specifications.

4.3 REFERENCES

The latest effective editions of the following specification are incorporated as reference and

form a part of this specification:

- ASME B16.34 – Valves –Flanged, Threaded, and Welding End.
- SNT-TC-1A – American Society for Non-destructive Testing Recommended Practice.
- ASTM E165 – Standard Test Method for Liquid Penetrant Examination.
- IO 7.1.2.01 – Training, Qualification and Certification of Non-destructive Testing (NDT) Personnel.
- ISO 9712 – Non destructive testing-Qualification and certification of personnel
- ASME V Art. 6: Liquid penetrant examination
- ASME VIII Div.1 Mandatory app. 8: Methods for liquid penetrant examination (PT)

4.4 RESPONSIBILITY

The Quality Control Inspector performing liquid penetrant examinations is responsible for ensuring compliance with the requirements of this procedure.

4.5 PENETRANT MATERIALS

- Pre cleaning: Solvent, only if necessary
- Penetrant: CGM RED W, water soluble
- Penetrant remover: Drinking Water
- Developer: CGM ROTRIVEL U WHITE W
- All penetrant materials shall be analyzed for halogens contents as per SE 165 Annex 4

Batch number of CGM RED W, water soluble & CGM ROTRIVEL U WHITE W to be added in test certificate.

4.6 DEFINITIONS

The following definitions are applicable to the use and implementation of this specification:

- Facilities – Includes all F.R.I. manufacturing sites, branch operations and field service centre;
- Relevant Indications - Only those indications with major dimensions greater than 1/16" (1.6mm) shall be considered relevant.
- Linear Indications - Indication in which the length is equal to or greater than three times its width.
- Rounded Indications - Indication which; is circular or elliptical with its length less than 3 times its width.

4.7 QUALIFICATION OF PERSONNEL

Personnel performing examinations shall be qualified and certified in accordance with requirements specified in IO 7.1.2.01 and SNT-TC-1A, or ISO 9712 Level II as a minimum.

Personnel performing evaluation of findings shall be qualified and certified in accordance with requirements specified in IO 7.1.2.01 and SNT-TC-1A, or ISO 9712 Level III as a minimum.

All personnel performing examinations per this procedure shall have an annual vision examination that complies with the requirements of IO 7.1.2.01 and SNT-TC- 1A.

Colours Perception Tests shall be required every year, as required ASME VIII Div.1 Mandatory app.8.

4.8 HEALTH, SAFETY, AND ENVIRONMENT (HSE)

- Ventilation

Requirement: The dye penetrant testing must be carried out in a well-ventilated area.

Reason: Adequate ventilation ensures that any fumes or vapors generated during the process are dispersed, reducing the risk of inhalation and maintaining a safe working environment.

- Confined Spaces

Requirement: If the testing is conducted in a confined space, local extraction must be used.

Reason: Local extraction systems help remove hazardous substances from the air, ensuring that the confined space remains safe for workers.

- Personal Protective Equipment (PPE)

Requirement: Correct PPE must be worn at all times during the dye penetrant testing.

Reason: PPE, such as gloves, goggles, and protective clothing, protects workers from exposure to harmful chemicals and reduces the risk of injury.

- Worksite Location

Requirement: The dye penetrant worksite must be located away from sources of heat, sparks, or naked flames.

Reason: Dye penetrant materials can be flammable. Keeping the worksite away from heat sources, sparks, or open flames minimizes the risk of fire or explosion.

4.9 LIQUID PENETRANT EXAMINATION – VISIBLE PENETRANT TESTING METHOD

4.9.1 Extent of examination area

4.9.1.1 BODY & BONNETS REQUIREMENTS

All accessible wetted and all accessible sealing surfaces of each finished part shall be liquid penetrant inspected after final heat treatment and final machining operations.

4.9.1.2 WELD (FABRICATION, WELD REPAIR, OVERLAY AND HARD FACING)

Examinations shall include the entire weld area plus 1" (25mm) of the adjacent base material on both sides of the weld. Examination shall be done from 72 hours after welding.

4.9.2 Process methods and penetrant materials

The process shall be Visible penetrant and Water-washable (ASTM E165, Type II, Method A).

Penetrant materials for liquid penetrant examination shall be capable of detecting discontinuities of the smallest relevant size required by the acceptance criteria.

Intermixing of penetrant materials from one family with a different family shall not be permitted.

4.9.3 Examination process

4.9.3.1 SURFACE PREPARATION

Surface preparation of as-welded, as-rolled, as-cast or as-forged conditions shall be accomplished by grinding, machining or other methods which may be necessary when surface irregularities could mask indications of unacceptable discontinuities.

1) The surface to be examined and all adjacent areas within at least 1" shall be dry and free of any dirt, grease, lint, scale, welding flux, weld splatter, oil or other extraneous matter that could obscure surface openings or otherwise interfere with the examination.
2) Typical cleaning agents that may be used are detergents, organic solvents, descaling solutions and paint removers. Degreasing and ultrasonic cleaning methods may also be used.
3) Drying of the prepared and cleaned surfaces for examination shall be accomplished by normal evaporation or with circulating hot air. After solvent cleaning if any, surfaces shall be left to dry 10 minutes minimum before applying penetrant. Drying may be accomplished by warming the parts in drying ovens, forced hot air or exposed to ambient temperature.

4.9.3.2 LIGHT INTENSITY

Visible penetrant indications can be examined in either natural or artificial light. Adequate illumination is required to ensure no loss in the sensitivity of the examination. A minimum light intensity at the examination site of 100 fc (1076 lx) is required.

Light meter shall be calibrated at last once a year or whenever a meter has been repaired. If light meters have not been used for one year or more, calibration shall be done.

4.9.3.3 APPLICATION OF PENETRANT

After the parts or surface to be examined has been cleaned, dried, and is within the specified temperature range, the penetrant shall be applied to the surface to be examined so that the entire part or area under examination is completely covered with penetrant.

1) The penetrant shall be applied by pressurized spray can.
2) The minimum penetrant dwell time shall be ten (10) minutes for temperatures between 50°F (10°C) and 125°F (52°C) of the surfaces being examined.
3) Penetrant shall remain on the surface (dwell time) for 30 minutes maximum, penetrant shall not be allowed to dry

4) Any complete drying of penetrant on surfaces to be examined during the penetration dwell time shall void the examination requiring a repeat of the process beginning with the cleaning of the examination area.

4.9.3.4 PENETRANT REMOVAL

Penetrant removal shall be accomplished by rinsing penetrant from surfaces by spraying with drinking water. It is essential to exercise proper process control in removal of excess surface penetrant to assure against over washing. Standard water line pressure shall not exceed 40 psi (275 KPa) and water temperature shall be within the range of 50°F (10°C) and 100°F (38°C) and rinse time shall not exceed two (2) minutes. Excessive washing will void the examination requiring a repeat of the process beginning with the cleaning of the examination area.

4.9.3.5 DRYING

Drying shall be performed before either dry or non-aqueous developer is applied. Drying is not required prior to application of aqueous developer.

1) The surfaces may be dried by blotting with clean materials or by using circulating warm air, provided the temperature of the surface is not raised above 125 °F (52 °C). The maximum length of time that a part may remain in the dryer shall be no longer than twice the time required for evaporation of surface moisture. A maximum of five (5) minutes drying time, after all visible traces of surface moisture have been removed, shall be allowed to assure that all traces of surface moisture have evaporated from the surfaces being examined

4.9.3.6 DEVELOPING

Non-aqueous wet Developer (form "e") shall be used.

1) Application of non-aqueous developers shall be after drying time has elapsed to draw penetrant out of the discontinuities.

2) Developers shall be applied, after agitation, in one of the following manners:
   a) Non-aqueous developers shall be applied by pressurized spray can.
3) Pools of wet developer in cavities on the surfaces to be examined shall not be permitted.
4) Non-aqueous developers shall be dried by normal evaporation.

4.9.3.7 EXAMINATION

1) Interpretation shall be performed after a developing time has elapsed allowing bleed out of the penetrant. The elapsed developing time shall be a minimum of 5 minutes and a maximum of 30 minutes. If bleed out does not alter the examination results, longer periods are permitted.
2) Mirrors shall be used as required to maximize the surface area examined.
3) Final interpretation shall be made not less than 10 min nor more than 60 min after developing time.

4.9.3.8 POST EXAMINATION CLEANING

Post cleaning shall be performed upon completion of the liquid penetrant examination using solvent, water or other methods to remove all traces of the test materials as promptly as possible.

4.10 ACCEPTANCE CRITERIA ASME B16.34

4.10.1.1 CASTINGS

Maximum acceptable indications are as follows:

- Linear indications
  - 8mm (0.3-in.) long for material up to13 mm (0.5 in.) thick.
  - 13 mm (0.5-in.) long for materials 13mm to 25 mm (0.5 to 1 in.) thick.
  - 18 mm (0.7-in.) long for material over 25mm (1" in.) thick.

For linear indication, the indications must be separated by a distance greater than the length of an acceptable indication

- Rounded indications
  - 8 mm (0.3-in.) diameter for material up to13 mm (0.5 in.) thick.
  - 13 mm (0.5-in.) diameter for material over 13 mm (0,5 in) thick.

Four or more rounded indications in a line separated by 1,5mm (0,06 in.) or less edge to edge are unacceptable.

4.10.1.2 FORGINGS

Maximum acceptable indications are as follows:

- Linear indications

- 5 mm (0.2-in.)-long for material up to13 mm (0.5 in.) or less thick.
- 10 mm (0.4-in.) long for materials over 13 mm (0,5 in.) to 25 mm (1.0 in.) thick
- 15 mm (0.6-in.) long for material over 25 mm (1" in.) thick.

For linear indication, the indications must be separated by a distance greater than the length of an acceptable indication

- Rounded indications
  - 5mm (0.2-in.) diameter for material up to 13mm (0.5 in.) thick.
  - 8mm (0.3-in.) diameter for material over 13 mm (0,5 in.) thick.

Four or more rounded indications in a line separated by 15 mm (0,06 in.) or less edge to edge are unacceptable.

4.11 TEST REPORT SAMPLE

F.R.I. SRL	RAPPORTO DI PROVA CONTROLLO LIQUIDI PENETRANTI *Liquid Penetrant Test Report*	PT XXXX/ YEAR Page 1 / 1

COMMESSA *Job Number* F20 .	**OGGETTO** *Item*	**CLIENTE** *Customer*
PROCEDURE DI COLLAUDO: *Examination Procedure: PND 03 REV. 2*	**STANDARD DI ACCETTAZIONE:** *Acceptance Standard: PND 03 REV. 2*	
MATERIALE: *Material:* ***ASTM A105***	**CONDIZIONI SUPERFICIALE:** *Surface Conditions:* ***MACHINING***	**TEMP. DELLA SUPERFICIE: (°C)** *Surface Temperature:*
TRATTAMENTO TERMICO: *Heat Treatment:*	**FASE DI LAVORAZIONE:** *Working Step:*	

SGRASSANTE *Cleaner Remover*			
MARCA *Trade Mark*	NOME II° - N° di Lotto *Name- Batch n°*	APPLICAZIONE *Application System*	TEMPO DI ASCIUGATURA. *Dried time*
CGM	VELNET - SOLNET	Spray	10'

PENETRANTE *Penetrant:*			
MARCA *Trade Mark*	TIPO "II" - N° di Lotto *Type – Batch n°*	APPLICAZIONE *Application System*	TEMPO PEN. *Dwell time*
CGM	RED WW	Spray	10'

METODO DI RIMOZIONE "A" *Penetrant removal*		**CONDIZIONI DI VISIONE** *Lighting conditions*	
CON ACQUA	TEMPO MASSIMO DI ASCIUGATURA Dried Time: 5'	☐ Visibile *Visible*	>1076 lx
		☐ Fluorescente *Fluorescent*	>1000 µW/cm2 < 20 lx

RILEVATORE *Developer:*			
MARCA *Trade Mark*	FORMA "e" II°- N° di Lotto *Form - batch n°*	APPLICAZIONE *Application System*	TEMPO D' SVILUPPO ED INTERPRETAZIONE *Development and interpretation time*
CGM	ROTRIVEL U	Spray	5 ÷30 min

PARTICOLARE CONTROLLATO / *Part Checked* *S/N:* - *BODY* - *CLOSURE*	ESITO / *Result* ☐ CONFORME *Conforming* ☐ NON CONFORME *Not Conforming* NOTES / *Notes:*

QUALITÀ *Quality Dept.* *Erik Del Forno – Lev. II* *Cert. 18VE00043PN1*	COSTRUTTORE *Manufacturer*	DATA *Date*

Figure 5-Dye penetrant examination test report sample

FRANCESCO BORGHESI
LEVEL III UNI EN ISO 9712 SNT TC 1A
UT RT MT PT VT ET LT IT

5 NDE PERSONNEL QUALIFICATIONS

NDT OPERATOR QUALIFICATION CERTIFICATE

RINA

No. **23TO00426PN6/RN**

Validity renewal of certificate n° 18VE00043PN18

Operator	**GABRICI VALENTINO**		
Born in	**UDINE (UD)**	on	**19/10/2000**
Employed by	**FABBRICAZIONE RAPPRESENTANZE INDUSTRIALI S.r.l.**		
Located in	**Povoletto (UD)**		

this is to certify that the non destructive test operator is qualified by examinations at the level 2 according to ISO 9712:2012 standard and to RINA Rule RC/C 14

in the method: **VISUAL**

for the following industrial sectors:

PRE AND IN-SERVICE TESTING (s)

Previous certificate expiry date: 26/03/2023 Renewal of validity done on: 21/06/2023

This certificate is valid from	**21 June 2023**	to	**26 March 2028**
Issued at	**GENOVA**	on	**21 June 2023**

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.
Via Corsica 12 - 16128 Genova

Figure 6-Personnel qualification visual inspection level 2

NDT OPERATOR QUALIFICATION CERTIFICATE

RINA

No. **23TO00426PN5/RN**

Validity renewal of certificate n° 18VE00043PN17

Operator	**GABRICI VALENTINO**		
Born in	**UDINE (UD)**	on	**19/10/2000**
Employed by	**FABBRICAZIONE RAPPRESENTANZE INDUSTRIALI S.r.l.**		
Located in	**Povoletto (UD)**		

this is to certify that the non destructive test operator is qualified by examinations at the level 2 according to ISO 9712:2012 standard and to RINA Rule RC/C 14

in the method:

DYE PENETRANT

for the following industrial sectors:

PRE AND IN-SERVICE TESTING (s)

Previous certificate expiry date: 26/03/2023

Renewal of validity done on: 21/06/2023

This certificate is valid from	**21 June 2023**	to	**26 March 2028**
Issued at	**GENOVA**	on	**21 June 2023**

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.
Via Corsica 12 - 16128 Genova

Figure 7-Personnel qualification dye penetrant examination level 2

NDT OPERATOR QUALIFICATION CERTIFICATE

RINA

No. **23TO00426PN3/RN**

Validity renewal of certificate n° 18VE00043PN5

Operator	**DEL FORNO ERIK**		
Born in	**UDINE (UD)**	on	**18/10/1978**
Employed by	**FABBRICAZIONE RAPPRESENTANZE INDUSTRIALI S.r.l.**		
Located in	**Povoletto (UD)**		

this is to certify that the non destructive test operator is qualified by examinations at the level 2 according to ISO 9712:2012 standard and to RINA Rule RC/C 14

in the method:

VISUAL

for the following industrial sectors:

PRE AND IN-SERVICE TESTING (s)

Previous certificate expiry date: 26/03/2023

Renewal of validity done on: 21/06/2023

This certificate is valid from	**21 June 2023**	to	**26 March 2028**
Issued at	**GENOVA**	on	**21 June 2023**

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.
Via Corsica 12 - 16128 Genova

Figure 8-Personnel qualification visual inspection level 2

NDT OPERATOR QUALIFICATION CERTIFICATE

RINA

No. **23TO00426PN1/RN**

Validity renewal of certificate n° 18VE00043PN1

Operator	**DEL FORNO ERIK**		
Born in	**UDINE (UD)**	on	**18/10/1978**
Employed by	**FABBRICAZIONE RAPPRESENTANZE INDUSTRIALI S.r.l.**		
Located in	**Povoletto (UD)**		

this is to certify that the non destructive test operator is qualified by examinations at the level 2 according to ISO 9712:2012 standard and to RINA Rule RC/C 14

in the method:

DYE PENETRANT

for the following industrial sectors:

PRE AND IN-SERVICE TESTING (s)

Previous certificate expiry date: 28/03/2023

Renewal of validity done on: 21/06/2023

This certificate is valid from	**21 June 2023**	to	**28 March 2028**
Issued at	**GENOVA**	on	**21 June 2023**

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.
Via Corsica 12 - 16128 Genova

Figure 9-Personnel qualification dye penetrant examination level 2