



Welding Procedure Qualification Certificate (EN ISO 15614-1) Energy - Downstream, Power and Manufacturing

Manufacturer's Welding Procedure Qualification Record No.: **FOR02** Examining body Reference No: **- / -**

Manufacturer: **FOR.TEC - FORNITURE TECNOLOGICHE - S.R.L.**
Address: **VIA APPIA KM 186,900 - 81040 FRANCOLISE (CE)**
Welders Name: **ANTINONE Carmine (Stamp. AC)**

Code/Testing Standard: **EN ISO 15614-1:2012**
Date of Welding: **31 marzo 2017**

Range of Qualification

Welding Process(es): **135 (Partly Mechanized)**

Type of joint and weld: **Butt weld on plate - (range of approval: Plates and pipes BW: bs/FW)**

Parent material group(s) and sub-
Parent Material Thickness (mm): **UNI EN 10025-2: 2005 S355J2 - Group 1.2 acc. to ISO/TR 15608 (Range of approval: Subgroup 1.1 to 6,0 mm - (range of approval: 3.0 to 12.0))**

Weld Metal Thickness (mm): **6,0 mm - (range of approval: 3.0 to 12.0)**

Throat Thickness (mm): **No restriction**

Single Run/Multi Run: **Multiple run**

Outside Pipe Diameter (mm): **N.A. - Range of approval: O.D. 150 and over (PA-PC rotated pos.), 500 and over (other positions)**

Filler Material Designation: **EN ISO 14341-A: G 46 4 M21 3Si1**

Filler Material Make: **UltraMag**

Filler Material Size: **Ø 1.0 mm**

Designation of Shielding Gas/Flux: **Argon 80%+20%CO2 (EN ISO 14175: M21) - (Range of approval: CO2 max 22%)**

Designation of Backing Gas: **None**

Type of Welding Current and Polarity: **DC EP**

Mode of Metal Transfer: **Spray arc**

Heat Input: **Min. 7.3 KJ/cm**

Welding Positions: **All (Vertical down excluded)**

Preheat Temperature: **10°C**

Interpass Temperature: **250°C**

Post-Heating: **None**

Post-Weld Heat Treatment and/or

Other Information

Certified that test welds were prepared, welded and tested satisfactorily in accordance with the requirements of the code/testing standard indicated above.

Location: **FRANCOLISE (CE)**

Date of Issue: **09 maggio 2017**

Surveyor

S. Bottari

Surveyor to Lloyd's Register EMEA

A subsidiary of Lloyd's Register Group Limited

Examining Body

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Details of Test Weld

Manufacturer's provisional Welding Procedure Specification Reference No. **FT 02/17**

Examining Body: Reference No: **-/ -**

Manufacturer's Welding Procedure Qualification Record No.: **FOR02**

Manufacturer: **FOR.TEC - FORNITURE TECNOLOGICHE - S.R.L.**

Date of Welding: **31 marzo 2017**

Location: **VIA APPIA KM 186,900 - 81040 FRANCOLISE (CE)**

Welder's Name: **ANTINONE Carmine (Stamp. AC)**

Method of Preparation and Cleaning: **Machining**

Mode of Metal Transfer: **Spray arc**

Parent Material Specification: (attach material certificates)* **UNI EN 10025-2: 2005 S355J2 - Group 1.2 acc. to ISO/TR 15608**

Joint Type and Weld: **Butt weld on plate**

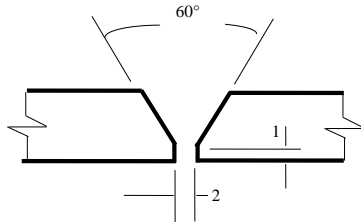
Parent Material Thickness (mm): **6.0**

Test Piece/Welding Position: **PA**

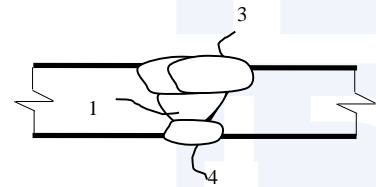
Outside Pipe Diameter (mm): **N.A.**

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 cm/min	Heat Input kJ/cm	Metal Transfer
1	135	1.0 mm	170	23	DC EP	See Amp.	18	13.0	Spray arc
2-3	135	1.0 mm	184	24.7	DC EP	See Amp.	28	9.7	Spray arc
4 (R)	135	1.0 mm	184	24.7	DC EP	See Amp.	28	9.7	Spray arc

Filler Material:

Type, Designation, Trade Name: **EN ISO 14341-A: G 46 4 M21 3Si1 - UltraMag**

Any Special Baking or Drying: **None**

Other Information*:

Gas/Flux: Shielding **Ar80%+20%CO2 (ISO 14175:M21)**

Single V, both sides welding, without backgouging.

Backing **None**

Gas Flow Rate : Shielding **15 l/min**

Backing **None**

Tungsten Electrode – Type/Size: **N.A.**

Post-Weld Heat Treatment and/or Ageing **None**

Details of Back Gouging/Backing: **N.A.**

Time, Temperature, Method: **N.A.**

Heating and Cooling Rates*: **N.A.**

Preheat Temperature: **10°C**

Interpass Temperature: **250°C**

Post-Heating: **None**

Manufacturer's Name **FOR.TEC - FORNITURE**

Surveyor

Manufacturer's Signature

S. Bottari
Surveyor to Lloyd's Register EMEA

A subsidiary of Lloyd's Register Group Limited

Date: **09 maggio 2017**

Examining Body

* As Required

Test Results

Manufacturer's Welding Procedure Qualification Record No.: **FOR02** Examining Body: - / -
Reference No: - / -

Visual Examination: **Satisfactory - Report n° 388/17** Radiography*: **Satisfactory - Report n° 387/17**

Penetrant/Magnetic Particle Test*: **Satisfactory - Report n° 389-17** Ultrasonic Examination*: /

Coloration Assessment**: **N.A.**

Tensile Tests*

Type/No	Re N/mm ²	Rm N/mm ²	A% on	Z%	Fracture Location	Temperature:	Remarks
Requirements	/	470 $R_{\leq 630}$	/	/	/	/	/
503 TP1	/	582.1	/	/	Base metal	22 °C	Ductile fracture
503 TP2	/	560.1	/	/	Base metal	22 °C	Ductile fracture

Bend Tests*

Type/No	Bend Angle	Former Diameter	Elongation*	Result
503 TFBB1	180°	Ø 24 mm	N.A	OK
503 TFBB2	180°	Ø 24 mm	N.A	OK
503 TRBB1	180°	Ø 24 mm	N.A	OK
503 TRBB2	180°	Ø 24 mm	N.A	OK

Macroscopic Examination: **Satisfactory - Report n° RP 529-17**
Microscopic Examination: /

Impact Tests* Type: **KV2** Size: **10 x 5 x 55 mm** Requirement: **27 J min.**

Notch Location/Direction	Temp °C	Values (J)			Average (J)	Remarks
		1	2	3		
503 KC - VWT0/1	-20	77	66	86	76	-
503 KT - VHT1/1	-20	50	87	84	74	-

Hardness Tests* Other Tests:

Type/Load: **HV10** -

Values - Parent Metal: **179 Max.**

- H.A.Z.: **215 Max.** Remarks


- Weld Metal: **182 Max.** -

Location of Measurements (Sketch)* see attached

Tests carried out in accordance with the requirements of: **EN ISO 15614-1:2012**
Laboratory Report Reference No: **CTR LAB. - Report n° RP 529-17 dd02.05.17;387/17-388-17-389-17 dd13.04.17**

Test Results were acceptable

Test carried out in the presence of: **A. Fasanella**

Surveyor: 
S. Bottari
Surveyor toLloyd's Register EMEA
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Examining Body

* As Required
** 15614-5 only
Form 4102 (2013.12)