

WPQR No.:
120047

WELDING PROCEDURE QUALIFICATION RECORD (WPQR)

according to EN ISO 15614-1:2004



Welding Procedure Qualification – Test Certificate

Manufacturer's WPQR No.: 120047 Examiner or examining body: TÜV AUSTRIA HELLAS
Manufacturer: LASERTECH S.A. Reference No.: 120047
Address: 43rd km of Old National Road Elefsina-Thiva, 322 00 THIVA
Code / Testing Standard: EN ISO 15614-1:2004
Date of Welding: 04.06.2012

Range of Qualification

Welding Process(es): EN ISO 4063-131
Type of Joint and Weld: Full and Partial Penetration in Butt (BW) and Fillet (FW) Welds/
Both (bs) with Gouging
Parent Material Group(s) and Subgroups(s): 1.2 with equal or lower specified yield strength
(acc. CR ISO 15608)- S355 (acc. EN 10025-2)
Parent Material Thickness (mm): $3,00 \text{ mm} \leq t \leq 24,00 \text{ mm}$
Weld Metal Thickness (mm): $3,00 \text{ mm} \leq t \leq 30,00 \text{ mm}$
Throat Thickness (mm): No restriction
Single run / Multi run: Multi run
Pipe Outside Diameter (mm): $\varnothing > 500 \text{ mm}$ or $\varnothing > 150 \text{ mm}$ for PA or PC rotated position
Filler Material Designation: G3Si1 / EN ISO 14341-A (ER70S-6 / AWS A5.18)
and others with equivalent characteristics
Filler Material Make: All Manufacturers
Filler Material Size: All sizes allowed provided that heat input requirements are fulfilled
Designation of Shielding Gas / Flux: M21 (EN 439)
Designation of Backing Gas: N/A
Type of Welding Current and Polarity: DC (-)
Mode of Metal Transfer: Spray
Heat Input: $0,31 \div 0,90 \text{ (kJ/mm)}$
Welding Positions: All positions except for PG and J-L045
Preheat Temperature: Ambient Temperature
Interpass Temperature: Max. 250 °C
Post-Heating: N/A
Post-Weld Heat Treatment: N/A
Other Information: %

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

Athens
Location

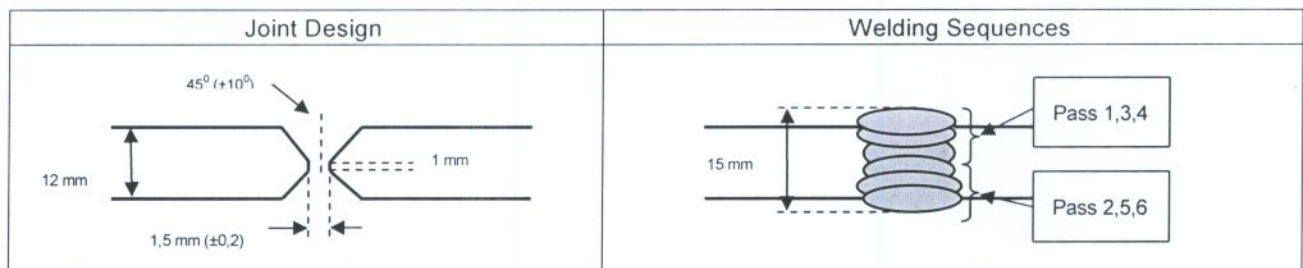
13.06.2012
Date of issue



Stergios Mentzios
Examiner or examining body
Name, date and signature

Record of Weld Test

Location:	Thiva	Examiner or examining body:	TÜV AUSTRIA HELLAS
Manufacturer's pWPS No.:	LASERTECH-3	Method of Preparation and Cleaning:	Grinding and Brushing
Manufacturer's WPQR No.:	120047	Parent Material Specification:	S355 acc. to EN 10025-2
Manufacturer:	LASERTECH S.A.	Material Thickness (mm):	12,00
Welder's name:	Vrancianu Viorel (WR1)	Pipe Outside Diameter (mm):	%
Mode of Metal Transfer:	Spray Arc	Welding Position:	PA
Joint Type and Weld:	Double "V"- BW		
Weld Preparation Details (Sketch):			



Weld Details

Run	Welding Process	Size of Filler Material (mm)	Current (A)	Voltage (V)	Type of current / Polarity	Wire Feed Speed (m/min)	Travel Speed* (mm/min)	Heat input* (kJ/mm)	Metal transfer
1	131	Ø 1,2	190 ÷ 210	21	DC (-)	4,80	350	0,55 ÷ 0,61	Spray
2	131	Ø 1,2	190 ÷ 210	21	DC (-)	4,80	350	0,55 ÷ 0,61	Spray
3	131	Ø 1,2	165 ÷ 180	18 ÷ 19	DC (-)	4,80	228	0,63 ÷ 0,72	Spray
4	131	Ø 1,2	160 ÷ 180	18 ÷ 19	DC (-)	3,80	228	0,63 ÷ 0,72	Spray
5	131	Ø 1,2	155 ÷ 180	19	DC (-)	4,80	350	0,41 ÷ 0,47	Spray
6	131	Ø 1,2	155 ÷ 180	19	DC (-)	3,80	350	0,41 ÷ 0,47	Spray

Filler Material Designation and Make: G3Si1 / EN ISO 14341-A (ER70S-6 / AWS A5.18), ESAB OK AristoRod 12.50 (AG809712)

Any Special Baking or Drying:	Manufacturer's recommendations	Other Information * e.g.:	Grinding after every pass
Gas/Flux – Shielding:		Weaving (maximum width of run):	N/A
Backling:	Ar (82%) + CO ₂ (18%)	Oscillation (amplitude, frequency dwell time):	N/A
Gas Flow Rate – Shielding:		Pulse welding details:	N/A
Backling:	15 ÷ 16 Lt/min	Distance contact tube / work piece:	N/A
Tungsten Electrode Type/Size:	N/A	Plasma welding details:	N/A
Details of Back Gouging/Backling:	N/A	Torch angle:	N/A
Preheat Temperature:	Ambient		
Interpass Temperature:	Max. 250 °C		
Post-Heating:	N/A		
Post-Weld Heat Treatment:	N/A		
(Time, Temperature, Method:	N/A		
Heating and Cooling Rates)*:	N/A		



Stergios Mentzios, 04.06.2012
Inspector of TÜV AUSTRIA HELLAS

Manufacturer
Name, date and signature

*) if required

WPQR No.: 120047	WELDING PROCEDURE QUALIFICATION RECORD (WPQR) according to EN ISO 15614-1:2004	
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Test Results

Manufacturer's PQR No.: **120047** Examiner or test body: **TÜV AUSTRIA HELLAS**
 Visual (acc. EN 970): **ACCEPT** Reference No.: **120047**
 Radiography (acc. to EN 1435)*: **ACCEPT** Ultrasonic (acc. to EN 1714)*: **N/A**
 Penetrant (acc. to EN 571-1) / Magnetic Particles (acc. to EN ISO 17638)*: **ACCEPTABLE**

Tensile Tests (acc. to EN 895) – Report No.: **120613-1/13.06.12** Temperature: %

Type / No.	Re. (N/mm ²)	Rm. (N/mm ²)	A (%) on	Z (%)	Fracture Location	Remarks
Requirement	355	470+630				Typical values for S355JR
Test 1	--	556,61	N/A	N/A	Base Metal	
Test 2	--	563,02	N/A	N/A	Base Metal	

Bend Tests (acc. to EN 910) – Report No.: **120613-1/13.06.12**
 Former Diameter: **40.00 mm**

Type / No.	Bend Angle	Elongation*	Results
Root/ 1	180°	N/A	ACCEPT
Root/ 2	180°	N/A	ACCEPT
Face/ 1	180°	N/A	ACCEPT
Face/ 2	180°	N/A	ACCEPT

Macroscopic Examination (acc. to EN 1321) –
ACCEPTABLE
 Reports Nos : **120613-1 / 13.06.2012**

Impact Tests (acc. to EN 875)* – Report No.: **120613-1/13.06.12**
 Type: **Charpy** Size: **10X10X55** Requirement: %

Notch Location / Direction	Temperature °C	Values			Average	Remarks
		1	2	3		
Weld Metal	0	182	180	149	170,33	ACCEPT
HAZ	0	53	80	82	71,67	ACCEPT
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Hardness Tests (acc. to EN 1043-1)* – Report No.: **120613-1**
 Type/Load : **acc. to ISO 6507-1, ISO 6507-2 or EN 10003-1**
 Parent Metal : **max. 185**
 H.A.Z. : **max. 200**
 Weld Metal : **max. 215**

Location of Measurements (Sketch*)

Other Tests: **N/A**

Remarks: **Laboratory tests performed by SPECTRUM LABS**

Test carried out in accordance with the requirements of: **EN ISO 15614-1, EN ISO 5817 Cl. B, EN 1435, EN 571-1, EN 1321, EN 875, EN ISO 5173, EN 895, EN 970, EN 10045-1**

Laboratory Report Reference No.: **120612-1/12.06.2012, 120612-2/12.06.2012, 120613-1/13.06.2012**

Test results were **ACCEPTABLE** / **NOT ACCEPTABLE** (Delete as appropriate)

Test carried out in the presence of:


Stergios Mentzios, 13.06.2012
 Mechanical Engineer
 Inspector Level II (VT, UT, RI, PT, MT)

*) if required