

WELDING PROCEDURE QUALIFICATION RECORD (WPQR)

LEVEL 2

N. 18VE0048POA\4

Manufacturer **ITAQUA Srl - Trieste (TS)**

WPQR No. **062018**

Dated **20/07/2018**

Manufacturer's welding procedure (WPS) No. **001-006-2018**

Dated **13/03/2018**

RANGE OF QUALIFICATION

Welding process	136	Type	Partly mechanized
Joint type	Plates and Pipes and build-up FW		
Single/Multiple pass	Single	(Impact properties not applied)	
Parent material group(s)	1-1	ISO/TR 15608; ISO/TR20172; ISO/TR 20173; ISO/TR20174 with a specified minimum yield strength \leq 355 Mpa	
Parent material thickness (mm)	Butt Joint = N.A.	Fillet Joint $t_1 =$ 3 to 24	$t_2 =$ 3 to 24
Throat thickness (mm)	4,4 to 8,8		
Weld deposit thickness (mm)	N.A.		
Outside pipe diameter (mm)	30,15 and over *		
Filler metal make	N.A.	Nr. of wires for process 12: None	
Flux make	N.A.	Flux Designation: N.A.	
Filler metal designation	Flux-cored wire EN ISO 17632-A : T 42 2 P C 1 H5		
Shielding gas (ISO 14175)	C1	Backing gas (ISO 14175)	N.A.
Type of welding current	DCEP	Heat Input Kj/cm	Min 13,4
Welding position	All, vertical down excluded	Transfer Mode	Spray, Pulse, 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	(*) Diameter limited to max. 120,6 mm , when Rina Rules apply		

Welder's/Operator's name	Cosic Juro	Stamp No.	CJ
Welding test conducted by	ITAQUA Srl - Trieste (TS)		
Mechanical test conducted by	CTR Srl - Limena (PD)	Laboratory test No.	181587/2
At presence of RINA Surveyor	P. Danesin		

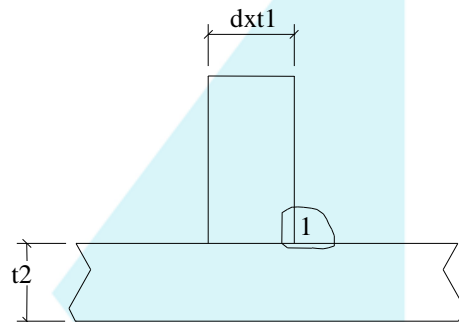
We confirm that statements in this record are correct and that the test welds were prepared, welded and tested and have fulfilled the requirements in accordance with **UNI EN ISO 15614-1: 2017** Standard. Requirements of **RINA Rules for the Classification of Ships** are also met.

Issued at: Genova on 20 July 2018


 RINA Services S.p.A.

RECORD OF WELD TEST

JOINT DETAILS AND WELDING SEQUENCES									
PIPE TO PLATE FILLET WELD IN SINGLE PASS									
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	136	1,2	230	28,5	DCEP	17,6	17,9	Spray Arc	-



PARENT MATERIAL

Material specification	EN 10210-1 to EN 10025-2		
Type or grade	S355J2H to S355J2+N		
Group(s)/Subgroup(s) No. (ISO/TR 15608; ISO/TR20172; ISO/TR 20173; ISO/TR20174)	$t_1=1.2$; $t_2=1.2$		
Thickness (mm)	$t_1=12$; $t_2=12$	Throat thickness (mm)	5,9
Diameter (mm)	60,3		
Branch connection angle	N.A.		
Other	N.A.		

WELDING CONSUMABLES

Process	136
Trade name(s)	KISWELITALIA K-71LT
Specification	EN ISO 17632-A
Classification / designation	T 42 2 P C1 H5
Size (mm)	136
Deposited metal thickness	
Groove	N.A.
Throat	5,9 mm
Flux trade name	N.A.
Consumable insert	N.A.
Other	-

GAS			
	Gas	Mixture	Flow rate (l/min.)
Shielding	CO₂ 100%		17
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	DC EP			
Ampere (range)	See table	Volts (Range)	See table	
Mode of metal transfer	Spray Arc			
Tungsten electrode size and type	N.A.			
Pulse welding details	N.A.			
Plasmawelding details	N.A.			
Waveform controlled welding machine	N.A.	Waveform control mode	N.A.	
Power source	LORCK S5XT	Welding mode	Pulse <input type="checkbox"/>	Non pulse <input checked="" type="checkbox"/>
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	Machining/Grinding
Interpass cleaning	N.A.
Method of back gouging	N.A.
Orifice or gas cup size	16 mm
Distance contact tube/workpiece (*)	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) Pipe	HV10	207
Parent metal(s) Plate	HV10	151
H.A.Z.(s) Pipe	HV10	272
H.A.Z.(s) Plate	HV10	185
Weld metal	HV10	206

OTHER TEST


MACROGRAPHIC EXAMINATION **Acceptable**
 MICROGRAPHIC EXAMINATION **Not required**
 FRACTURE TEST **Acceptable**

NON DESTRUCTIVE EXAMINATION

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

Issued at: Genova

on 20 July 2018


 RINA Services S.p.A.