



PRD N° 002 B

Membro degli Accordi di Mutuo  
Riconoscimento EA, IAF e ILAC  
Signatory of EA, IAF and ILAC Mutual  
Recognition Agreements**WELDING PROCEDURE QUALIFICATION RECORD (WPQR)****LEVEL 2**

N. 18VE00728PW1/A

Manufacturer **SPECIALIMPIANTI s.r.l. - Macerata (MC)**  
WPQR No. **01/18** Dated **12/11/2018**  
Manufacturer's welding procedure (WPS) No. **01/18 PC ; 01/18 PH** Dated **23/10/2018**

**RANGE OF QUALIFICATION**

Welding process	<b>111C - 111B</b>	Type	<b>Manual</b>
Joint type	<b>Pipes and branch connections with angle over 60° BW ssnb-ssmb-bs/FW 111C</b> <b>Pipes and branch connections with angle over 60° BW ssmb-bs/FW 111B</b>		
Single/Multiple pass	<b>Multiple</b>	( )	
Parent material group(s)	<b>11-11, 1-1, 11-1</b>	<b>ISO/TR 15608; ISO/TR20172; ISO/TR 20173; ISO/TR20174</b> with a specified minimum yield strength $\leq$ 240 MPa	
Parent material thickness (mm)	<b>Butt Joint = 3 to 11,08</b>	<b>Fillet Joint <math>t_1 = 3</math> to 11,08</b>	<b><math>t_2 = 3</math> to 11,08</b>
Throat thickness (mm)	<b>No restriction</b>		
Weld deposit thickness (mm)	<b>1,0 to 4,0 111C</b>	<b>3 to 7,08 111B</b>	
Outside pipe diameter (mm)	<b>30,15 and over</b>		
Filler metal make	<b>N.A.</b>	<b>Nr. of wires for process 12:</b>	
Flux make	<b>N.A.</b>	<b>Flux Designation: N.A.</b>	
Filler metal designation	<b>Covered electrode EN ISO 2560-A: E 42 2 Z C 21</b> <b>Covered electrode EN ISO 2560-A: E 42 5 B 32 H5</b>		
Shielding gas (ISO 14175)	<b>N.A.</b>	<b>Backing gas (ISO 14175)</b>	<b>With and without</b>
Type of welding current	<b>DCEP 111C, DCEP 111B</b>	<b>Heat Input kJ/cm</b>	<b>5,1 to 9,1 (111C); 3,9 to 9,4 (111B)</b>
Welding position	<b>All, vertical down excluded</b>	<b>Transfer Mode</b>	<b>N.A.</b>
Preheat min. (°C)	<b>15 (if ISO/TR 17671-2 requirements are fulfilled)</b>		
Interpass temp. Max. (°C)	<b>280</b>	<b>Postheat min. (°C)</b>	<b>N.A.</b>
Post weld heat treatment / Ageing	<b>None</b>	<b>Time (minutes)</b>	<b>N.A.</b>
Other information			
Welder's/Operator's name	<b>Cittadini Davide</b>	<b>Stamp No.</b>	<b>CD</b>
Welding test conducted by	<b>SPECIALIMPIANTI s.r.l. - Macerata (MC)</b>		
Mechanical test conducted by	<b>Control s.n.c. - Ravenna (RA)</b>	<b>Laboratory test No.</b>	<b>01PH , 01PC dated 08/11/2018</b>
At presence of RINA Surveyor	<b>D. Cimatti</b>		

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

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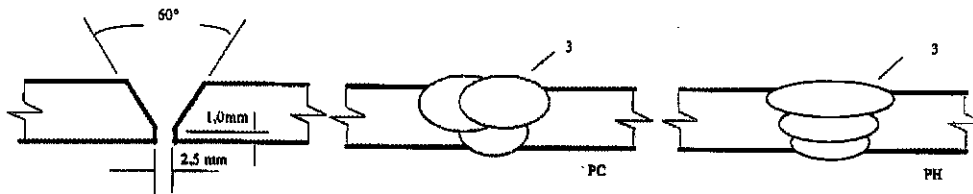
on 12 November 2018

RINA Services S.p.A.

Certificate No. 18VE00728PW1/A

**RECORD OF WELD TEST**

JOINT DETAILS AND WELDING SEQUENCES									
PIPE TO PIPE SINGLE-V BUTT JOINT; ONE SIDE WELDING WITHOUT BACKING (111C), WITH BACKING (111B)									
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	111C	2,5	55	25	DCEP	9	7,3	N.A.	Pos. PC
2	111B	2,5	67	23	DCEP	13	5,7	N.A.	Pos. PC
3	111B	2,5	67	23	DCEP	14	5,3	N.A.	Pos. PC
1	111C	2,5	53	23	DCEP	8,5	6,9	N.A.	Pos. PH
2	111B	2,5	68	23	DCEP	12	6,3	N.A.	Pos. PH
3	111B	2,5	68	23	DCEP	10	7,5	N.A.	Pos. PH



PARENT MATERIAL			
Material specification	ASTM A106		
Type or grade	Gr. B		
Group(s)/Subgroup(s) No. (ISO/TR 15608; ISO/TR20172; ISO/TR 20173; ISO/TR20174)	11.1		
Thickness (mm)	5,54	Throat thickness (mm)	N.A.
Diameter (mm)	60,3		
Branch connection angle	N.A.		
Other	-		

WELDING CONSUMABLES			
Process	111C	111B	
Trade name(s)	CITOFLEX 55	TENSILFRO 70	
Specification	EN ISO 2560-A	EN ISO 2560-A	
Classification / designation	E 42 2 Z C 21	E 42 5 B 32 H5	
Size (mm)	2,5	2,5	
Deposited metal thickness			
Groove	2,0	3,54	
Throat	N.A.	N.A.	
Flux trade name	N.A.	N.A.	
Consumable insert	N.A.	N.A.	
Other	-	-	

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GAS			
	Gas	Mixture	Flow rate (l/min.)
Shielding	-	-	-
Trailing	-	-	-
Backing	-	-	-

POSITION	
Welding position	PC and PH
Other	-

PREHEAT		POSTWELD HEAT TREATMENT	
Preheat temperature	15 °C	Temperature	None Time N.A.
Interpass temperature	Max. 250°C	Method	N.A.
Postheat temperature	N.A. Time N.A.	Other	-

ELECTRICAL CHARACTERISTICS			
Current	DCEP (111C, 111B)		
Ampere (range)	See table	Volts (Range)	See table
Mode of metal transfer	N.A.		
Tungsten electrode size and type			
Pulse welding details	N.A.		
Plasmawelding details	N.A.		
Waveform controlled welding machine	N.A.	Waveform control mode	N.A.
Power source	LINCOLN INVERTEC V270	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 10 mm
Oscillation (*)	N.A. (Amplitude/Frequency/Dwell time)
Method of groove/edge preparation	Machining/Grinding
Interpass cleaning	Grinding/Brushing
Method of back gouging	N.A.
Orifice or gas cup size	N.A.
Distance contact tube/workpiece (*)	N.A.
Multiple or single pass	Single (111C) ; Multiple (111B)
Multiple or single electrodes	Single
Torch angle (*)	N.A.
Other (*)	for fully mechanized/robotic only

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TRANSVERSE TENSILE TEST						
Spec. (No.)	Width (mm)	Thickness (mm)	Area (mm <sup>2</sup> )	Total load (N)	R <sub>m</sub> (N/mm <sup>2</sup> )	Fracture location
TWT/A	12,0	5,0	60,0	34720	579	Ductile failure out of weld
TWT/B	12,0	4,6	55,2	33120	605	Ductile failure out of weld

BEND TEST			
Type	No.	Bend Angle	Result
FACE TRANSVERSE	2 OFF	180°	Acceptable
ROOT TRANSVERSE	2 OFF	180°	Acceptable

IMPACT TEST					
Sub-size specimens 2,5x10 mm					
Spec No.	Notch location	Notch type	Test Temp. (°C)	Impact values (J)	Average (J)
VWT <sub>0/1,5</sub>	WELD	ISO-V	-10	23 - 19 - 20	20
VHT <sub>1,5/1,5</sub>	H.A.Z.	ISO-V	-10	29 - 23 - 23	18

HARDNESS TEST		
Location	Type/load	Maximum value
Parent metal(s)	HV10	160
H.A.Z.(s)	HV10	201
Weld metal	HV10	151

All mechanical tests have been carried out in the test coupon welded in PH position, except for hardness test, carried out in PC position.

**OTHER TEST**

MACROGRAPHIC EXAMINATION      Acceptable (PC, PH)  
 MICROGRAPHIC EXAMINATION      Not required

**NON DESTRUCTIVE EXAMINATION**

VISUAL EXAMINATION              Acceptable (PC, PH)  
 RADIOGRAPHIC EXAMINATION      Acceptable (PC, PH)  
 PENETRANT TEST                    Acceptable (PC, PH)  
 MAGNETIC PARTICLE                Not required  
 ULTRASONIC TEST                  Not required

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