

## WELDING PROCEDURE QUALIFICATION RECORD (WPQR) LEVEL 2

N. 20VE00912PW3/A

Manufacturer **EROS TOGNI METALCOSTRUZIONI SA - Cresciano (SVIZZERA)**  
 WPQR No. **03R-20** Dated **01/12/2020**  
 Manufacturer's welding procedure (WPS) No. **03-20** Dated **16/09/2020**

### RANGE OF QUALIFICATION


Welding process	<b>135</b>	Type	<b>Partly mechanized</b>
Joint type	<b>Plates and Pipes FW</b>		
Single/Multiple pass	<b>Single</b>	<b>(Hardness properties applied)</b>	
Parent material group(s)	<b>1-1</b>	ISO/TR 15608; ISO/TR20172; ISO/TR 20173; ISO/TR20174 with a specified minimum yield strength $\leq$ <b>355 MPa</b>	
Parent material thickness (mm)	Butt Joint = <b>N.A.</b>	Fillet Joint $t_1 =$ <b>3 to 16</b>	$t_2 =$ <b>3 to 40</b>
Throat thickness (mm)	<b>3,375 to 6,75</b>		
Weld deposit thickness (mm)	<b>N.A.</b>		
Outside pipe diameter (mm)	<b>30,15 and over</b>		
Filler metal make	<b>N.A.</b>	Nr. of wires for process 12: <b>N.A.</b>	
Flux make	<b>N.A.</b>	Flux Designation: <b>N.A.</b>	
Filler metal designation	<b>Solid wire EN ISO 14341-A - G46 5 M21 4Si1</b>		
Shielding gas	<b>82%Ar+18%CO<sub>2</sub> (ISO 14175 M21) CO<sub>2</sub> max deviation±20%;</b>		
Backing gas (ISO 14175)	<b>N.A.</b>		
Type of welding current	<b>DCEP</b>	Heat Input kJ/cm	<b>Min 13,2</b>
Welding position	<b>PB</b>	Transfer Mode	<b>Spray Globular</b>
Preheat min. (°C)	<b>None</b> (if ISO/TR 17671-2 requirements are fulfilled) Interpass temp. Max. (°C) <b>N.A.</b>		
Postheat min. (°C)	<b>N.A.</b>	Time (minutes)	<b>N.A.</b>
Post weld heat treatment / Ageing	<b>None</b>	Time (minutes)	<b>N.A.</b>
Other information	<b>-</b>		

Welder's/Operator's name **AGUSTONI PASCAL** Stamp No. **AP**  
 Welding test conducted by **EROS TOGNI METALCOSTRUZIONI SA**  
 Mechanical test conducted by **SSM S.R.L.** Laboratory test No. **1399/C Rev.00 20 dated 01/12/2020**  
**238L-20-MA Rev.0, 238L-20-DU Rev.0 dated 01/12/2020**

At presence of RINA Surveyor **Domenico Zema**

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: 2019** Standard

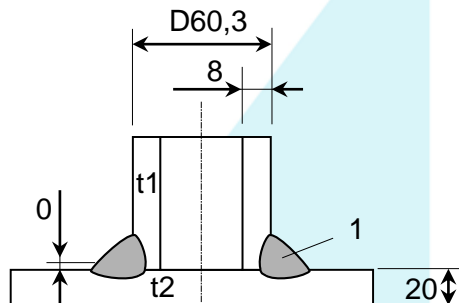
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RINA Services S.p.A.  
 PED No. Bo. 0474

**RECORD OF WELD TEST**

JOINT DETAILS AND WELDING SEQUENCES									
FILLET WELD; 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	135	1,2	300	30,5	DCEP	25,0	17,6	Spray Arc	-



PARENT MATERIAL	
Material specification	t1: EN 10210-1; t2: EN 10025-2
Type or grade	t1: S355J2H; t2: S355J2C+N
Group(s)/Subgroup(s) No. (ISO/TR 15608; ISO/TR20172; ISO/TR 20173; ISO/TR20174)	t1, t2: 1.2
Thickness (mm)	t1 = 8,0; t2 = 20,0 Throat thickness (mm) 4,5
Diameter (mm)	60,3
Branch connection angle	N.A.
Other	-

WELDING CONSUMABLES	
Process	135
Trade name(s)	SIDERGAS S7
Specification	EN ISO 14341-A
Classification / designation	G46 5 M21 4Si1
Size (mm)	1,2
Deposited metal thickness	
Groove (mm)	N.A.
Throat (mm)	4,5
Flux trade name	N.A.
Consumable insert	None
Other	-

<b>GAS</b>			
	Gas	Mixture	Flow rate (l/min.)
Shielding	-	<b>82%Ar + 18%CO2</b>	<b>15</b>
Trailing	<b>N.A.</b>	-	-
Backing	<b>N.A.</b>	-	-

<b>POSITION</b>	
Welding position	<b>PB</b>
Other	-

<b>PREHEAT</b>		<b>POSTWELD HEAT TREATMENT</b>	
Preheat temperature	<b>15°C</b>	Temperature	<b>None</b> Time <b>N.A.</b>
Interpass temperature	<b>N.A.</b>	Method	<b>N.A.</b>
Postheat temperature	<b>N.A.</b> Time <b>N.A.</b>	Other	-

<b>ELECTRICAL CHARACTERISTICS</b>			
Current <b>DCEP</b>			
Ampere (range)	<b>See table</b>	Volts (Range)	<b>See table</b>
Mode of metal transfer	<b>Spray arc</b>		
Tungsten electrode size and type	<b>N.A.</b>		
Pulse welding details	<b>N.A.</b>		
Plasmawelding details	<b>N.A.</b>		
Waveform control mode	<b>N.A.</b>		
Waveform controlled welding machine	<b>N.A.</b>		
Power source	<b>N.A.</b>		
Welding mode	Pulse <input type="checkbox"/>	Non pulse <input checked="" type="checkbox"/>	
Other	-		

<b>TECHNIQUE</b>	
Travel speed (range)	<b>See table</b>
String or weave bead	<b>String</b> Maximum width of run <b>N.A.</b>
Oscillation (*)	<b>N.A.</b> (Amplitude/Frequency/Dwell time)
Method of groove/edge preparation	<b>Machining/Grinding</b>
Interpass cleaning	<b>N.A.</b>
Method of back gouging	<b>N.A.</b>
Orifice or gas cup size	<b>16 mm</b>
Distance contact tube/workpiece (*)	<b>N.A.</b>
Multiple or single pass	<b>Single</b>
Multiple or single electrodes	<b>Single</b>
Torch angle (*)	<b>N.A.</b>
Other	(*) for fully mechanized/automatic only -

<b>HARDNESS TEST</b>		
Location	Type/load	Maximum value
Parent metal(s)	<b>HV10</b>	<b>207</b>
H.A.Z.(s)	<b>HV10</b>	<b>313</b>
Weld metal	<b>HV10</b>	<b>277</b>

**OTHER TEST**

MACROGRAPHIC EXAMINATION      **Acceptable**  
MICROGRAPHIC EXAMINATION      **Not required**

**NON DESTRUCTIVE EXAMINATION**

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

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