

WELDING PROCEDURE QUALIFICATION RECORD (WPQR)
LEVEL 2
N. 20VE00912PW4/A

Manufacturer **EROS TOGNI METALCOSTRUZIONI SA - Cresciano (SVIZZERA)**
 WPQR No. **04R-20** Dated **01/12/2020**
 Manufacturer's welding procedure (WPS) No. **04-20** Dated **16/09/2020**


RANGE OF QUALIFICATION

Welding process **111** Type **Manual**
 Joint type **Plates and Pipes FW**
 Single/Multiple pass **Multiple** (**Hardness properties applied - Impact properties 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) **No restriction**
 Weld deposit thickness (mm) **N.A.**
 Outside pipe diameter (mm) **Over 500**
 Filler metal make **Covered electrode - INE 55B** Nr. of wires for process 12: **N.A.**
 Flux make **N.A.** Flux Designation: **N.A.**
 Filler metal designation **Covered electrode EN ISO 2560-A - E 42 4 B 42 H5**
 Shielding gas **N.A.** Backing gas (ISO 14175) **N.A.**
 Type of welding current **DCEP** **Heat Input kJ/cm D.2,5: 11,9 to 19,8 (*)**
D.3,2: 4,3 to 12,7 (*)
 Welding position **All, vertical down excluded** Transfer Mode **N.A.**
 Preheat min. (°C) **None** (if ISO/TR 17671-2 requirements are fulfilled) Interpass temp. Max. (°C) **300**
 Postheat min. (°C) **N.A.** Time (minutes) **N.A.**
 Post weld heat treatment / Ageing **None** Time (minutes) **N.A.**
 Other information *** for impact properties see additional test from butt weld joint (WPS 06-20)**
 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. 1400/C Rev.00 20, 3588/RE Rev.00 20 dated 01/12/2020;**
239L-20-MA Rev.0, 239L-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

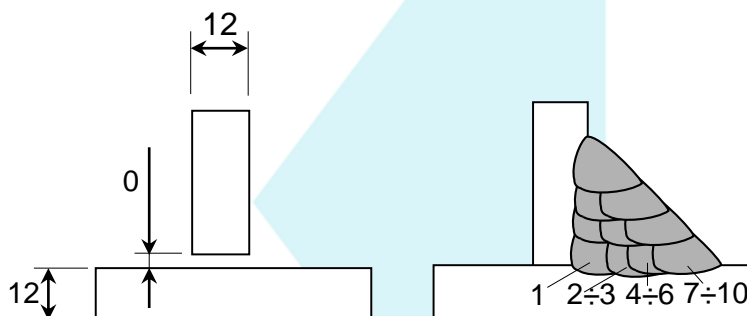
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RECORD OF WELD TEST

JOINT DETAILS AND WELDING SEQUENCES									
FILLET WELD; MULTIPASS									
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	111	2,5	110	22,5	DCEP	7,5	15,8	N.A.	-
2 to 3	111	3,2	120	23,0	DCEP	13,0	10,2	N.A.	-
4 to 6	111	3,2	120	23,0	DCEP	19,0	7,0	N.A.	-
7 to 10	111	3,2	120	23,0	DCEP	23,0	5,8	N.A.	-



PARENT MATERIAL	
Material specification	t1 = t2: EN 10025-2
Type or grade	t1 = t2: S355J2+N
Group(s)/Subgroup(s) No. (ISO/TR 15608; ISO/TR20172; ISO/TR 20173; ISO/TR20174)	t1, t2: 1.2
Thickness (mm)	t1 = t2 = 12
Diameter (mm)	N.A.
Branch connection angle	N.A.
Other	-
Throat thickness (mm)	9,5

WELDING CONSUMABLES	
Process	111
Trade name(s)	INE 55B
Specification	EN ISO 2560-A
Classification / designation	E 42 4 B 42 H5
Size (mm)	2,5 - 3,2
Deposited metal thickness	
Groove (mm)	N.A.
Throat (mm)	9,5
Flux trade name	N.A.
Consumable insert	N.A.
Other	-

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

POSITION	
Welding position	PD
Other	-

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

ELECTRICAL CHARACTERISTICS			
Current DCEP			
Ampere (range)	See table	Volts (Range)	See table
Mode of metal transfer	N.A.		
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	N.A.	Welding mode	Pulse <input type="checkbox"/> Non pulse <input checked="" type="checkbox"/>
Other	-		

TECHNIQUE	
Travel speed (range)	See table
String or weave bead	String and weave Maximum width of run N.A.
Oscillation (*)	N.A. (Amplitude/Frequency/Dwell time) N.A.
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	Multiple
Multiple or single electrodes	Single
Torch angle (*)	N.A.
Other	(*) for fully mechanized/automatic only

HARDNESS TEST		
Location	Type/load	Maximum value
Parent metal(s)	HV10	184
H.A.Z.(s)	HV10	254
Weld metal	HV10	242

OTHER TEST

MACROGRAPHIC EXAMINATION **Acceptable**
MICROGRAPHIC EXAMINATION **Not required**
IMPACT TEST **Acceptable (Sample taken from butt weld joint test with WPS 06-20)**

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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