WELDING PROCEDURE QUALIFICATION RECORD (WPQR)

N. **2017NAPO538/1**

Manufacturer **UNITEk (ANGRI-SALERNO)**

WPQR No. **U05/2017** Dated **29.12.2017**

Manufacturer's welding procedure (WPS) No. **U05/2017** Dated **29.01.2017**

RANGE OF APPROVAL

Welding process **141** Type **Manual**

Joint type **Pipes and branch connections with angle over 60° BW bsng-bsgg/FW 141**

Single/Multiple pass	**Multiple**		
Parent material group(s)	**34**	ISO/TR 15608	
Parent material thickness (mm)	Butt Joint = **1 to 4**	Fillet Joint t_1 = **1 to 4**	t_2 = **1 to 4**
Throat thickness (mm)	**No Restrictions 141**	-	-
Weld deposit thickness (mm)	**1 to 4 141**	-	-
Outside diameter (mm)	**No Restrictions**		
Filler metal type	**Solid rod**		
Shielding gas (ISO 14175)	**I1**	Backing gas (ISO 14175)	**I1**
Type of welding current	**DCEN**	Heat input Kj/cm	**No Restrictions**
Welding position	**ALL, vertical down excluded**		
Preheat min. (°C)	**10**	Interpass temp. Max. (°C)	**150**
Post weld heat treatment / Ageing	**N.A.**		
Other information	-		

Welders name **CAROTENUTO WALTER** Stamp No. **CW**

Welding test conducted by **UNITEk (ANGRI-SALERNO)**

Mechanical test conducted by **A.Q.C. LABORATORY** Laboratory test No. **18/004 (M,N,O)**

At presence of RINA Surveyor **MARCO BUONOCORE**

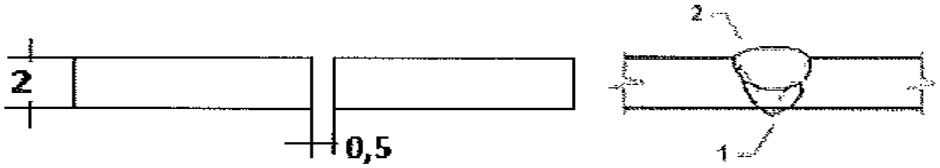
We certify that statements in this certificate are correct and that the test welds were prepared, welded and tested in accordance with the requirements of **UNI EN ISO 15614-6: 2007** Standard

Issued at: Genova on 27/04/2018

RINA Services S.p.A.

Certificate No. 2017NAPO538/1

JOINT DETAILS AND WELDING SEQUENCES PIPE TO PIPE SQUARE EDGE JOINT ; ONE SIDE WITHOUT BACkING								
Pass No.	Process	Filler metal diam. (mm)	Filler metal classification	Amps	Volt	Travel speed (cm/min)	Heat input (kJ/cm)	Other
1	**141**	**2.4**	**ALLOY67CUNI**	**72**	**10.5**	**5**	**5.4**	-
2	**141**	**2.4**	**ALLOY67CUNI**	**74**	**12.5**	**6**	**5.6**	-



PARENT MATERIAL

Material specification	**DIN86019**		
Type or grade	**CUNi10Fe1.6MnF30**		
Group(s)/Subgroup(s) No. (ISO/TR15608)	**34**		
Thickness (mm)	**2**	Throat thickness (mm)	**N.A.**
Diameter (mm)	**76**		
Branch connection angle	**N.A.**		
Other	-		

WELDING CONSUMABLES

Process	**141**
Trade name(s)	**ALLOY67CUNI**
Specification	**AWS A5.7**
Classification / designation	**ER CU NI**
Size (mm)	**2.4**
Deposited metal thickness	**2**
Groove	-
Throat	-
Flux trade name	**N.A.**
Consumable insert	**N.A.**
Other	-

GAS

	Gas	Mixture	Flow rate (l/min.)
Shielding	**Ar 99,9%**		**9**
Trailing			
Backing	**Ar 99%**		**7**

POSITION

Welding position **PA**

Other **-**

PREHEAT

Preheat temperature **10**

Interpass temperature **150**

Other **-**

POSTWELD HEAT TREATMENT

Temperature **N.A.**

Time **N.A.**

Other **-**

ELECTRICAL CHARACTERISTICS

Current **DCEN**

Ampere (range) **See table** Volts (Range) **See table**

Mode of metal transfer **N.A.**

Tungsten electrode size and type **1.6 mm ; EN ISO 6848 W20**

Other **-**

TECHNIQUE

Travel speed (range) **See table**

String or weave bead **STRING**

Oscillation (*) **N.A.**

Method of groove/edge preparation **Machining/Grinding**

Interpass cleaning **Grinding/Brushing**

Method of back gouging **N.A.**

Orifice or gas cup size **8 mm**

Stand off distance (*) **1 to 5 mm**

Multiple or single pass **MULTIPLE**

Multiple or single electrodes **SINGLE**

Torch angle (*) **N.A.**

Other (*) for fully mechanized/robotic only

TRANSVERSE TENSILE TEST (A.Q.C. REPORT 18/004 O PAGE ½)						
Spec. (No.)	Width (mm)	Thickness (mm)	Area (mm^2)	Total load (N)	R_m. (N/mm^2)	Fracture location
DE-1	**5.75**	**2.11**	**12.13**	**3700**	**305**	**DUCTILE FRACTURE OUT OF WELD**
DE-2	**5.49**	**1.85**	**10.15**	**2900**	**285**	**DUCTILE FRACTURE OUT OF WELD**

BEND TEST (A.Q.C. REPORT 18/004 O PAGE ½)		
Type	No.	Result
FACE TRANSVERSE (TFBB)	**2 OFF**	**Acceptable**
ROOT TRANSVERSE (TRBB)	**2 OFF**	**Acceptable**

OTHER TEST

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

NON DESTRUCTIVE EXAMINATION

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

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