



WELDING PROCEDURE QUALIFICATION RECORD (WPQR)

N. 18.TQ.IT.022-YESS-WPQR-003

Manufacturer **Yess Yakma ve Enerji Sistemleri Sanayi ve Ticaret LTD.ŞTİ.**
WPQR No. **YES-WPQR-003** Dated **05/06/2018**
Manufacturer's welding procedure (WPS) No. **YESS-WPS-03** Dated **04/06/2018**

RANGE OF APPROVAL

Welding process **141** Type **Manual**
Joint type **BW**

Single/Multiple pass **Multiple , ssgb**
Parent material group(s) **5.2** **ISO/TR 15608**

Parent material thickness (mm) **Butt Joint = 5,0** Fillet Joint $t_1 = \text{N/A}$ $t_2 = \text{N/A}$
Throat thickness (mm) **N/A**
Weld deposit thickness (mm) **N/A**
Outside diameter (mm) **48,3**
Filler metal type **EN ISO 21952-A , W CrMo2Si**
Shielding gas (ISO 14175) **I1** **Backing gas** **None**
(ISO 14175)
Type of welding current **DCEN** Heat input Kj/cm **See table on page 2**
Welding position **HL-045**
Preheat min. (°C) **200** Interpass temp. Max. (°C) **Less than 350**
Post weld heat treatment / Ageing **No**
Other information **None**

Welders name **Bülent DÜNDAR** Stamp No. **W01**
Welding test conducted by **Ethem GUNGOR**
Mechanical test conducted by **Borusan Mannesmann A.S.** Laboratory test No. **N/A**
At presence of RINA Surveyor **Yes**

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 15614-1: 2017** Standard. Certified that all required activities were carried out above mentioned standards and codes

Issued at: **ISTANBUL - TURKEY**

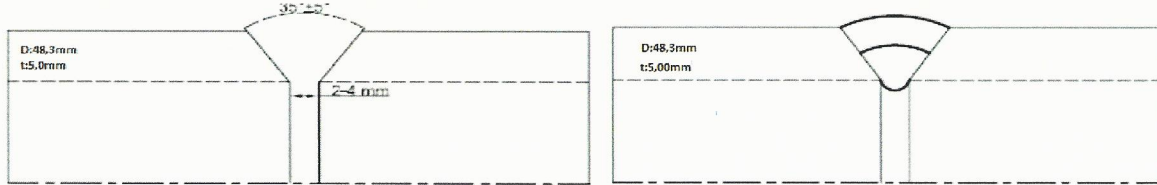
on **05/06/2018**



RINA - REGISTRO ITALIANO NAVALE

Certificate No. 18.TQ.IT.022-YESS-WPQR-003**JOINT DETAILS AND WELDING SEQUENCES**

Pass No.	Process	Filler metal diam. (mm)	Filler metal classification	Amps	Volt	Travel speed (cm/min)	Heat input (kJ/mm)	Other
1	141	Φ 2,40	W CrMo2Si	85	9	4,0	1,35	DCEN
2	141	Φ 2,40	W CrMo2Si	105	11	4,0	1,82	DCEN

**PARENT MATERIAL**Material specification **EN 10216-2**Type or grade **10CrMo9-10**Group(s)/Subgroup(s) No. (ISO/TR 15608) **5.2**Thickness (mm) **5,0**Throat thickness (mm) **N/A**Diameter (mm) **48,3**Branch connection angle **70**Other **N/A****WELDING CONSUMABLES**Process **141**Trade name(s) **AS TIG CrMo2**Specification **EN ISO 21952-A**Classification / designation **W CrMo2Si**Size (mm) **2,40**Deposited metal thickness **-**Groove **-**Throat **-**Flux trade name **NA**Consumable insert **NA**Other **-****GAS**

	Gas	Mixture	Flow rate (l/min.)
Shielding	Argon	%99,99	9
Trailing	NA	NA	NA
Backing	NA	NA	NA

POSITIONWelding position **HL-045**Other **N/A**

PREHEAT		POSTWELD HEAT TREATMENT	
Preheat temperature	200	Temperature	NA
Interpass temperature	Less than 350	Time	NA
Other	-	Other	-

ELECTRICAL CHARACTERISTICS			
Current	DCEN		
Ampere (range)	See table on page 2	Volts (Range)	See table on page 2
Mode of metal transfer	Globular		
Tungsten electrode size and type	N/A		
Other	N/A		

TECHNIQUE			
Travel speed (range)	See table	--	
String or weave bead	String & Weave		
Oscillation (*)	--		
Method of groove/edge preparation	Grinding		
Interpass cleaning	Grinding/Brushing		
Method of back gouging	N/A		
Orifice or gas cup size	--		
Stand off distance (*)	--		
Multiple or single pass	Multiple Pass		
Multiple or single electrodes	Single		
Torch angle (*)	--		
Other	(*) for fully mechanized/robotic only		

TRANSVERSE TENSILE TEST						
Spec. (No.)	Width (mm)	Thickness (mm)	A (%)	Total load (N)	R _m (N/mm ²)	Fracture location
1	-	-	-	-	-	-
2	-	-	-	-	-	-

ALL-WELD METAL TENSILE TEST							
Spec. (No.)	Diameter (mm)	Area (mm)	L ₀ (mm)	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Note
1	48,3	24,7	5,05	-	549	15	Broked from Material
2	48,3	24,7	4,99	-	534	17	Broked from Material

BEND TEST		
Type	No.	Result
FACE TRANSVERSE	1-2	Satisfactory
ROOT TRANSVERSE	1-2	Satisfactory
SIDE TRANSVERSE	-	-

