PROCEDURE QUALIFICATION RECORD (PQR)

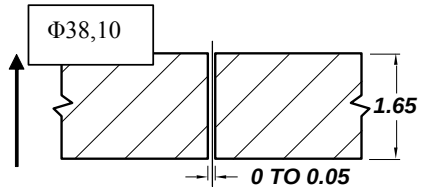
according to *SECTION IX, ASME Boiler and Pressure Vessel Code*

COMPANY NAME : ARTINOX A. RODOPOULOS TH. RODOPOULOS **TUV Order Nr.:** 02.01.539

PQR No.: I.10936/17 **Rev. :** 00 **Date :** 31/01/17 **WPS No. :** I.10935/17 **Rev. :** 00

WELDING PROCESS(ES)	*a) GTAW*		*b) -*		
***Type** (Manual, Automatic, Semi-Autom.)*	*a) Automatic - Orbital*		*b) -*		
JOINT (QW-402)					
Joint Type	SQUARE EDGE BUTT WELD				
Backing (Yes/No)	No	***Backing Material***	-	***Back-gouging (Yes/No)***	No

JOINT DESIGN OF TEST COUPON



WELDING DETAILS

Pass	Type	Filler Size (mm)	Amp.	Volts	Travel Speed mm/sec.	Heat Input KJ/mm
1	GTAW		25-60	10,34	1,1	0,118 – 0,283

BASE METALS (QW-403)							
Material Specification	SA 269		SA 269				
Type / Grade	GR TP 316		GR TP 316				
P-No.	*8*	***Gr. No.***	*1*	***to P-No.***	*8*	***Gr. No.***	*1*
Range of base metals approved: Any P- No. 8 to any P-No. 8							
Thickness (mm) *(OF TEST COUPON)*	1,65						
Deposited Thickneses	1,65						
Diameter (mm) *(OF TEST COUPON)*	38,10						
Range of Thickness (mm) *OF BASE METAL QUALIFIED (QW-451,QW-403.6)*	*Min.*		*Max.*				
	1,50		3,30				
Maximum Thickness (mm) *OF DEPOSITED WELD METAL QUALIFIED*	GTAW: 3,30						

POST HEATING		
Temperature (°C)	%	
Heating/Cooling Rate	%	
Holding Time	%	
Other	%	
POSTWELD HEAT TREATMENT (QW-407)		
Temperature (°C)	%	
Heating/Cooling Rate	%	
Holding Time	%	
Other : %	-	

GAS (QW-408)			
	GAS	*MIXTURE (%)*	*FLOW RATE*
Shielding	Ar	99,99	12 – 14 ltr/min
Trailing	%	%	% ltr/min
Backing	Ar	99,99	1-5 ltr/min

FILLER METALS (QW-404)	*a)*	*b)*
SFA Specification		
AWS Classification		
Filler Metal F-No.		
Weld Metal A-No.		
Size of Filler Metal	See Above Table	
Filler Form*(rod,electrode)*		
Trade Brand		
Trade Name		
Flux Type		
Flux Brand/Trade Name		
Other : %		

ELECTRICAL CHARACTERISTICS (QW-409)		
Current /Polarity	DC(-)	-
Amperes	See above table	-
Volts	See above table	-
Max. Heat Input (KJ/mm)	See above table	
GMAW/FCAW Metal Transfer Mode	-	
Tungsten Electrode Type & Size	Wolframe or tungsten electrode EVOLUTION 1,6 mm. Wth20 with 2% mass content for ThO2 Colour mark Red	
Other :%		

POSITION (QW-405)		**TECHNIQUE** (QW-410)	
Position of Groove	6g	***Travel Speed***	See above table
Weld Progression *(UPHILL, DOWNHILL)*	Uphill and downhill	***Bead (String or Weave)***	string
Other : %		***Oscillation***	-
		Contact Tube to Work Distance	-
		Single-pass/ Multi-Pass (per side)	Single-Pass
PREHEAT (QW-406)		***Single or Multiple Electrodes***	-
Preheat Temperature (°C)	25	***Bevel Edge Preparation***	No
Preheat Maintenance (Yes/No)	No	***Initial & Interpass Cleaning***	-

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PROCEDURE QUALIFICATION RECORD (PQR)

according to *SECTION IX, ASME Boiler and Pressure Vessel Code*

COMPANY NAME : ARTINOX A. RODOPOULOS TH. RODOPOULOS **TUV Order Nr.:** 02.01.539

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Max. Interpass Temperature (°C)	250	*Orifice or Gas Cup Size (mm)*	1
Other : %		*Other : %*	-

TENSILE TEST (QW-150)

SPECIMEN No.	*WIDTH (mm)*	*THICKNESS (mm)*	*AREA (mm^2)*	*ULTIMATE TOTAL LOAD (KN)*	*ULTIMATE UNIT STRESS (N/mm^2)*	*TYPE OF FAILURE AND LOCATION*
1	11,8 x 270	1,60	119,50	40880	556.14	BM
2	12 x 270	1,60	119,50	42880	550.42	BM

GUIDED-BEND TESTS (QW-160)

TYPE & FIGURE No.	*RESULT*	*TYPE & FIGURE No.*	*RESULT*
ROOTB 1	Acceptable	FACEB 1	Acceptable
ROOTB 2	Acceptable	FACEB 2	Acceptable

TOUGHNESS TESTS (QW-170)

SPECIMEN No.	*NOTCH TYPE*	*DIMENSIONS (mm)*	*TEMPERATURE (°C)*	*IMPACT VALUES (J)*			*MEAN VALUE (J)*	*COMMENTS*
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-

HARDNESS TESTS

SPECIMEN No.	*BASE METAL (HV)*		*HEAT AFFECTED ZONE (HV)*		*WELD METAL (HV)*	
	Min.	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*
-	-	-	-	-	-	-

FILLET WELD TEST (QW-180)

RESULT SATISFACTORY (YES/NO)	-	*PENETRATION INTO PARENT METAL (YES/NO)*	-	*MACRO RESULTS*	-

OTHER TESTS

TYPE OF TESTS	RT, PT, VC, MACRO
OTHER	-

WELDER'S NAME	RODOPOULOS ANTREAS	*WELDER'S STAMP No.*	W1
TESTS CONDUCTED BY	TCL CO – TEST AND CONTROL LABS	*WELD CONDUCTED IN THE PRESENCE OF*	K. ANGELAKOS

LABORATORY TEST RESULTS

TEST TYPE	*RESULT*	*REPORT No.*	*TEST TYPE*	*RESULT*	*REPORT No.*
RADIOGRAPHIC	Accepted	RT/A/16/318	*TOUGHNESS*	-	-
TENSILE	Accepted	TT/A/688/19.12.16	*MACRO*	Accepted	MC/A/16/686
BEND	Accepted	BT/A/16/687	*PENETRANT*	Accepted	PT/A/16/072
HARDNESS	-	-	*CHEMICAL ANALYSIS*	-	-
OTHER	**VISUAL EXAMINATION TEST REPORT VE/A/16/122**				

We certify that the statements in this record are correct and that the test welds were prepared welded and tested in accordance with the requirements of Section IX of the ASME Code.

% : Not Applicable

DATE OF ISSUE: **31/01/17**

ΕΠΙΘΕΩΡΗΣΕΙΣ - ΠΙΣΤΟΠΟΙΗΣΕΙΣ
TÜV HELLAS A.E.
Μέλος του TÜV NORD Group
Λ. Μεσογείων 282 - 155 62 Αθήνα - 210 6540195

CERTIFIED BY: **TUV HELLAS (TUV NORD) S.A NO.BO. 0654**

INSPECTOR **K. ANGELAKOS**

SIGNATURE

STAMP

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