Marshal Engineering

19/253 **Jerusalem** #223740

Preliminary
WELDING PROCEDURE SPECIFICATION
to ASME Section IX (QW – 482)

WPS No.	**P1-GT/SM**	Rev.	**0**	Supporting PQR	**pending**

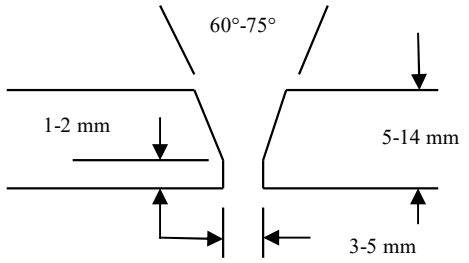
Prepared:	C. Daon	Title:	CWI	Date:	**Jan. 17, 2013**	Sign.	Arc-Eyes Ltd. Chaim Daon ICWI, RT-II
Approved:		Title:		Date:		Sign.	

Welding Processes	**GTAW/SMAW**	Type	**Manual**

JOINTS (QW – 402)

Joint Design	**Groove or Fillet**
Backing	**No**
Root Opening	**3-5 mm**
Root Face	**0-2 mm**
Bevel Angle	**30°-37 ½°**

Sample welds



BASE METALS (QW – 403)

P – No.	**1**	Group No.	**1**	to	P – No.	**1**	Group No.	**1**

or

Specification Type and Grade	**API 5L X42-X56**
to Specification Type and Grade	**Same**

Thickness Range					
Base Metal:	Groove:	**5 mm - 14 mm**	Fillet:	**All**
Pipe Diameter Range	Groove:	**All**	Fillet:	**All**

FILLER METALS (QW – 404)

	GTAW	**SMAW**
Specification No. (SFA)	**5.18**	**5.1**
AWS No. (Class)	**ER 70S-2/3/6**	**E 7018**
F – No.	**6**	**4**
A – No.	**1**	**1**
Size of Filler Metals (mm)	**2.4**	**2.5, 3.25**

Maximum Weld Metal Thickness	
Groove	**19 mm**
Fillet	**All**
Consumable Insert	**No**
Retainers	**No**

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POSITIONS (QW – 405)		POSTWELD HEAT TREAT (QW – 407)	
Positions of Groove	**All**	Temperature Range	**NA**
Welding Progression	**Uphill**	Time Range	
Positions of Fillet	**All**	Other	

PREHEAT (QW – 406)		GAS (QW – 408)			
Preheat Temp. Min.	**50°**		Gas Composition		
Interpass Temp. Max.	**300°**		Gas	Mixture	Flow Rate
Preheat Maintenance	**No**	Shielding	**Argon**	**99.9%**	**8-15 lpm**
		Other	**None**		

ELECTRICAL CHARACTERISTICS (QW – 409)

Current AC or DC	**DC**	Polarity	**GTAW-EN/SMAW-EP**
Amps (Range)	**80-135/80-140**	Volts (Range)	**11-13/23-25**
Tungsten Electrode Size and Type	**SFA 5.12 EWTh-2(red), 2.4 mm**		

TECHNIQUE (QW – 410)

String or Weave Bead	**String, cap may be slight weave**
GTAW Orifice or Gas Cup Size	**8-10 mm**
Initial and Interpass Cleaning	**Brushing and/or grinding**
Method of Back Gouging	**NA**
Multiple or single Pass (per side)	**Multiple**
Multiple or Single Electrodes	**Single**
Peening	**No**

Weld Layer	Process	Filler Metal		Current		Volt Range	Travel Speed cm/min	Heat Input Kj/in
		Classification	Diameter mm	Type & Polarity	Amp. Range			
Root	**GTAW**	**ER 70S-2/3/6**	**2.4**	**DCSP**	**80-135**	**11-13**	**8-10**	**NA**
Rest	**SMAW**	**E 7018**	**2.5**	**DCRP**	**80-110**	**23-25**	**8-12**	
			3.25		**110-140**		**8-12**	

Remarks:

1. Surfaces to be welded shall be free of pits, gouges, cracks, and other visible defects.
2. The surfaces to be welded and ajoining base material shall have all oil, grease, dirt, moisture, and other foreign contaminates removed for a minimum distance of 1 inch on each side of the weld joint.
3. Surface contaminants shall be removed by power brushing, grinding, and/or non-toxic cleaning solvents.
4. Tack welds shall be completely removed or incorporated into the weld and shall be suitably prepared by grinding the surface smooth and feathering the edges.
5. E7018 are low hydrogen electrodes. They must be baked for 2 hours at 300°C prior to use and then kept in portable ovens next to the welder. Electrodes may be rebaked only once. Vacuum packed electrodes may be used and then there is no need for initial baking.
6. This WPS must be approved with a PQR as required by the ASME Code. The PQR shall be performed by a 3rd party recognized by the Israel Association of Engineers.