



Pyramid Co.  
123 Any Street  
KC, MO 64015

### Procedure Qualification Record (PQR)

PQR No.: **Example 1a** WPS No.: \_\_\_\_\_ Date: **1/1/2016** Page: **1 of 4**  
Welding Process(es) / Type(s): **(1) GTAW / Manual (2) GMAW / Machine (3) SMAW / Manual** CRN: \_\_\_\_\_

<b>Joints (QW-402)</b> Weld Type: _____ Groove weld _____ Single-V groove Backing: _____ Open butt, no back weld Root Opening: <u>1/16</u> in. Root Face: <u>1/8</u> in. Groove Angle: <u>70</u> ° Joint Design notes would appear here	
<b>Base Metals (QW-403)</b> Material Spec., Type or Grade: <u>SA-516, Grade 70</u> to <u>SA-516, Grade 70</u> P-No.: <u>1</u> Group No.: <u>2</u> to P-No.: <u>1</u> Group No.: <u>2</u> Thickness of Test Coupon (in.): <u>1</u> Base Metal notes would appear here	<b>Postweld Heat Treatment (QW-407)</b> Type: <u>PWHT performed below lower transformation temp.</u> Temperature: <u>1275</u> °F Time: <u>2</u> hr PWHT notes would appear here
<b>Filler Metals (QW-404)</b> SFA Specification: <u>(1) 5.18 (2) 5.18 (3) 5.1</u> AWS Classification: <u>(1) ER70S-2 (2) E70C-3C (3) E7018</u> Filler Metal F-No: <u>(1) 6 (2) 6 (3) 4</u> Weld Metal Analysis A-No: <u>(1, 2, &amp; 3) 1</u> Size of Filler Metal (in.): <u>(1) 1/8 (2) 3/32 / 1/8 (3) 1/4</u> Weld Deposit 't' (in.): <u>(1) 0.125 (2) 0.5 (3) 0.375</u> Pass Greater Than 1/2": <u>(2) No (3) No</u> Filler Metal Product Form: <u>(1) Bare (Solid) (2) Metal cored</u> Filler Metal Trade Name: _____ Supplemental Filler Metal: <u>(2) n/a</u> Consumable Insert: <u>(1) NA</u> Flux: <u>(1) NA</u>	<b>Gas (QW-408)</b> Gas Composition / Flow Rate Shielding: <u>(1) 100% Argon / 15 CFH (2) 100% Argon / 12 CFH (3) N/A</u> Trailing: <u>(1) None (2) None (3) N/A</u> Backing: <u>(1) None (2) None (3) N/A</u>
<b>Positions (QW-405)</b> Position of Joint: <u>(1, 2, &amp; 3) 1G - Flat</u> Weld Progression: <u>(1, 2, &amp; 3) N/A</u> Notes: <u>(1) Process1 Position notes would appear here</u> <u>(2) Process2 Position notes would appear here</u> <u>(3) Process3 Position notes would appear here</u>	<b>Electrical Characteristics (QW-409)</b> Current / Polarity: <u>(1) DCEN (straight) (2) DCEP (reverse) (3) DCEN (straight)</u> Amps: <u>(1) 80 (2) 90 / 120 (3) 85</u> Volts: <u>(1) 50 (2) 120 / 240 (3) 125</u> Tungsten Type / Size: <u>(1) EWTh-2 / 3/32 (2) N/A (3) N/A</u> Transfer Mode: <u>(2) Short-circuiting arc</u> Wire Feed Speed (in/min): <u>(2) 4</u> Heat Input: <u>(1) 1230 J/in (2) 1234 J/in (3) N/R</u> Pulsed Current: <u>(1) NA</u>
<b>Preheat (QW-406)</b> Preheat Temp.: <u>300</u> °F Interpass Temp.: <u>600</u> °F Preheat Maintenance: <u>NA</u> Preheat notes would appear here	<b>Technique (QW-410)</b> Travel Speed (in/min): <u>(1) 3 (2) 4 / 6 (3) 4</u> Thermal Processes: <u>(1, 2, &amp; 3) No</u> String/Weave Bead: <u>(1) Stringer and weave bead (2) Stringer and weave bead (3) Stringer bead</u> Oscillation: <u>(1) N/A (2) n/a (3) N/A</u> Mult./Single Pass (per side): <u>(1, 2, &amp; 3) Single and multipass</u> Mult./Single Electrode: <u>(1) N/A (2) Single electrode (3) N/A</u> Electrode Spacing: <u>(2) .2</u> Nozzle/Gas Cup Size: <u>(1) .5 (2) .2</u> Contact Tube to Work Dist.: <u>(2) .5</u>

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(1) Process1 Specific Notes would appear here (2) Process2 Specific Notes would appear here (3) Process3 Specific Notes would appear here
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**Additional Welding Parameters**

Layer(s) and/or Pass(es)	Process	Filler Metal		Current		Voltage Range	Travel Speed Range (in/min)
		AWS Classification	Size (in.)	Type / Polarity	Amperage Range		
1	GTAW	ER70S-2	1/8	DCEN (straight)	80	50	3
2	GMAW	E70C-3C	1/8	DCEP (reverse)	90	120	4
3	GMAW	E70C-3C	3/32	DCEP (reverse)	120	240	6
4	GMAW	E70C-3C	3/32	DCEP (reverse)	120	240	6
5	SMAW	E7018	1/4	DCEN (straight)	85	125	4

Pass 1 is Root Pass 2-4 are Fill Pass 3 is Cover
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Notes

Any additional notes would appear here

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**Tensile Test (QW-150)**

Specimen No.	Width (in.)	Thickness (in.)	Area (in <sup>2</sup> )	Ultimate Total Load (lb)	Ultimate Stress (PSI)	Failure Type and Location
4-2 TOP	0.751	0.340	0.2553	17895	70100	Base metal
4-2 BOT	0.755	0.342	0.2582	18205	70500	Base metal

**Guided Bend Test (QW-160)**

Figure Number and Type	Result	Figure Number and Type	Result
QW-462.3(b) Face bend	Acceptable	QW-462.3(b) Root bend	Acceptable
QW-462.3(b) Face bend	Acceptable	QW-462.3(b) Root bend	Acceptable
None		None	

**Hardness Test - Vickers hardness**

Location	Readings								
	1	2	3	4	5	6	7	8	9
SA-335, Grade P11 BM	141	141	131	173	143	150	143	145	
SA-335, Grade P11 HAZ	138	150	176	186	158	142	141	142	147
Weld metal	188	193	205	196	197	209	195	196	199
Weld metal Line 2	198	200	203	201	207	203	187	132	138
SA-335, Grade P11 HAZ2	146	167	176	156	152	152			
Weld metal Line 3	144	136	135	162	160	182			

Macro-Examination Test: NA

Visual Examination: Acceptable

Chemical Analysis: C=0.1%,Cr=0.3%,Mo=0.08%,Ni=0.3%,Mn=1.7%,Si=0.6%,P=0.03%,S=0.03%,V=0.02%,Al=0.02%,Cu=0.3%,Nb=0.01%,Ti=0.03%

Liquid Penetration Test: NA

Test Notes would appear here

Welder's Name: Smith, John ID: 1 Stamp: 1

PQR was done and welding of coupon was witnessed by: Testco Contractors

Tests Conducted By: Kansas City Testing Lab Test ID.: 1L-4138

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.

Header John Smith 4/11/2013 QA Manager  
John Smith Date