



Procedure Qualification Record (PQR)

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

<p>Joint Design (QW-402) Weld Type: <u> </u> Groove weld Groove Type: <u> </u> Single-V groove Backing: <u> </u> Open butt, no back weld Root Opening: <u> 1/16 </u> in. Root Face: <u> 1/8 </u> in. Groove Angle: <u> 70 </u> °</p> <div style="text-align: center;"> <p>Single V Groove</p> </div> <p>Joint Design notes would appear here</p>	<p>Base Metals (QW-403) Specification Type and 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 (in.): <u> 1 </u> Base Metal notes would appear here</p> <p>Preheat (QW-406) Minimum Preheat Temperature: <u> 300 </u> °F Preheat Maintenance: <u> </u> NA Maximum Interpass Temperature: <u> 600 </u> °F Preheat notes would appear here</p> <p>Postweld Heat Treatment (QW-407) Type: <u> </u> PWHT performed below lower transformation temp. PWHT Temperature: <u> </u> 1275 °F PWHT Holding Time: <u> </u> 2 hr. PWHT notes would appear here</p>																				
<p>First Process: <u> </u> GTAW Filler Metals (QW-404) AWS Classification: <u> </u> ER70S-2 SFA Specification: <u> 5.18 </u> F-No.: <u> </u> 6 A-No. or Chemical Composition: <u> </u> 1 Filler Metal Trade Name: <u> </u> Trade Name would appear here Filler Metal Product Form: <u> </u> Bare (Solid) Consumable Insert: <u> </u> NA GTAW Flux: <u> </u> NA Weld Deposit 't' (in.): <u> </u> 0.125</p> <p>Positions (QW-405) Position of Joint: <u> </u> 1G - Flat Weld Progression: <u> </u> N/A Notes: <u> </u> Process1 Position notes would appear here</p> <p>Gas (QW-408) Shielding: <u> </u> 100% Argon / <u> </u> 15 CFH Backing: <u> </u> None / <u> </u> - CFH Trailing: <u> </u> None / <u> </u> - CFH</p> <p>Process1 Specific Notes would appear here</p>	<p>Type: <u> </u> Manual Electrical Characteristics (QW-409) Current Type and Polarity: <u> </u> DCEN (straight) Tungsten Type: <u> </u> EWTh-2 Size: <u> </u> 3/32 Pulsed Current: <u> </u> NA</p> <p>Welding Details</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>Filler Metal Size (in.):</td> <td><u> 1/8 </u></td> <td><u> </u></td> <td><u> </u></td> </tr> <tr> <td>Amperage Used:</td> <td><u> 80 </u></td> <td><u> </u></td> <td><u> </u></td> </tr> <tr> <td>Voltage Used:</td> <td><u> 50 </u></td> <td><u> </u></td> <td><u> </u></td> </tr> <tr> <td>Travel Speed (in/min):</td> <td><u> 3 </u></td> <td><u> </u></td> <td><u> </u></td> </tr> <tr> <td>Max. Heat Input (J/in):</td> <td colspan="3"><u> </u> 1230</td> </tr> </table> <p>Technique (QW-410) Thermal Processes: <u> </u> No Stringer or Weave Bead: <u> </u> Stringer and weave bead Nozzle / Gas Cup Size: <u> </u> .5 Multiple / Single Pass (per side): <u> </u> Single and multipass</p>	Filler Metal Size (in.):	<u> 1/8 </u>	<u> </u>	<u> </u>	Amperage Used:	<u> 80 </u>	<u> </u>	<u> </u>	Voltage Used:	<u> 50 </u>	<u> </u>	<u> </u>	Travel Speed (in/min):	<u> 3 </u>	<u> </u>	<u> </u>	Max. Heat Input (J/in):	<u> </u> 1230		
Filler Metal Size (in.):	<u> 1/8 </u>	<u> </u>	<u> </u>																		
Amperage Used:	<u> 80 </u>	<u> </u>	<u> </u>																		
Voltage Used:	<u> 50 </u>	<u> </u>	<u> </u>																		
Travel Speed (in/min):	<u> 3 </u>	<u> </u>	<u> </u>																		
Max. Heat Input (J/in):	<u> </u> 1230																				

Pyramid Co.

Procedure Qualification Record (PQR)

PQR No.: Example 1a

Page 2 of 3

<p>Second Process: <u>GMAW</u></p> <p>Filler Metals (QW-404)</p> <p>AWS Classification: <u>E70C-3C</u></p> <p>SFA Specification: <u>5.18</u> F-No.: <u>6</u></p> <p>A-No. or Chemical Composition: <u>1</u></p> <p>Filler Metal Trade Name: <u>Trade Name would appear here</u></p> <p>Filler Metal Product Form: <u>Metal cored</u></p> <p>Supplemental Filler Metal: <u>n/a</u></p> <p>Weld Deposit 't' (in.): <u>0.5</u></p> <p>Pass Greater Than 1/2": <u>No</u></p> <p>Positions (QW-405)</p> <p>Position of Joint: <u>1G - Flat</u></p> <p>Weld Progression: <u>N/A</u></p> <p>Notes: <u>Process2 Position notes would appear here</u></p> <p>Gas (QW-408)</p> <p>Shielding: <u>100% Argon</u> / <u>12</u> CFH</p> <p>Backing: <u>None</u> / <u>-</u> CFH</p> <p>Trailing: <u>None</u> / <u>-</u> CFH</p> <p>Process2 Specific Notes would appear here</p>	<p>Type: <u>Machine</u></p> <p>Electrical Characteristics (QW-409)</p> <p>Current Type and Polarity: <u>DCEP (reverse)</u></p> <p>Transfer Mode: <u>Short-circuiting arc</u></p> <p>Welding Details</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>Filler Metal Size (in.):</td> <td><u>3/32</u></td> <td><u>1/8</u></td> <td><u>-</u></td> </tr> <tr> <td>Amperage Used:</td> <td><u>90</u></td> <td><u>120</u></td> <td><u>-</u></td> </tr> <tr> <td>Wire Feed Speed (in/min):</td> <td><u>4</u></td> <td></td> <td></td> </tr> <tr> <td>Voltage Used:</td> <td><u>120</u></td> <td><u>240</u></td> <td><u>-</u></td> </tr> <tr> <td>Travel Speed (in/min):</td> <td><u>4</u></td> <td><u>6</u></td> <td><u>-</u></td> </tr> <tr> <td>Max. Heat Input (J/in):</td> <td colspan="3"><u>1234</u></td> </tr> </table> <p>Technique (QW-410)</p> <p>Thermal Processes: <u>No</u></p> <p>Stringer or Weave Bead: <u>Stringer and weave bead</u></p> <p>Nozzle / Gas Cup Size: <u>.2</u></p> <p>Contact Tube to Work Distance: <u>.5</u></p> <p>Oscillation: <u>n/a</u></p> <p>Multiple or Single Electrode(s): <u>Single electrode</u></p> <p>Electrode Spacing: <u>.2</u></p> <p>Multiple / Single Pass (per side): <u>Single and multipass</u></p>	Filler Metal Size (in.):	<u>3/32</u>	<u>1/8</u>	<u>-</u>	Amperage Used:	<u>90</u>	<u>120</u>	<u>-</u>	Wire Feed Speed (in/min):	<u>4</u>			Voltage Used:	<u>120</u>	<u>240</u>	<u>-</u>	Travel Speed (in/min):	<u>4</u>	<u>6</u>	<u>-</u>	Max. Heat Input (J/in):	<u>1234</u>		
Filler Metal Size (in.):	<u>3/32</u>	<u>1/8</u>	<u>-</u>																						
Amperage Used:	<u>90</u>	<u>120</u>	<u>-</u>																						
Wire Feed Speed (in/min):	<u>4</u>																								
Voltage Used:	<u>120</u>	<u>240</u>	<u>-</u>																						
Travel Speed (in/min):	<u>4</u>	<u>6</u>	<u>-</u>																						
Max. Heat Input (J/in):	<u>1234</u>																								
<p>Third Process: <u>SMAW</u></p> <p>Filler Metals (QW-404)</p> <p>AWS Classification: <u>E7018</u></p> <p>SFA Specification: <u>5.1</u> F-No.: <u>4</u></p> <p>A-No. or Chemical Composition: <u>1</u></p> <p>Filler Metal Trade Name: <u>Trade Name would appear here</u></p> <p>Weld Deposit 't' (in.): <u>0.375</u></p> <p>Pass Greater Than 1/2": <u>No</u></p> <p>Positions (QW-405)</p> <p>Position of Joint: <u>1G - Flat</u></p> <p>Weld Progression: <u>N/A</u></p> <p>Notes: <u>Process3 Position notes would appear here</u></p> <p>Process3 Specific Notes would appear here</p>	<p>Type: <u>Manual</u></p> <p>Electrical Characteristics (QW-409)</p> <p>Current Type and Polarity: <u>DCEN (straight)</u></p> <p>Welding Details</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>Filler Metal Size (in.):</td> <td><u>1/4</u></td> <td><u>-</u></td> <td><u>-</u></td> </tr> <tr> <td>Amperage Used:</td> <td><u>85</u></td> <td><u>-</u></td> <td><u>-</u></td> </tr> <tr> <td>Voltage Used:</td> <td><u>125</u></td> <td><u>-</u></td> <td><u>-</u></td> </tr> <tr> <td>Travel Speed (in/min):</td> <td><u>4</u></td> <td><u>-</u></td> <td><u>-</u></td> </tr> <tr> <td>Max. Heat Input (J/in):</td> <td colspan="3"><u>N/R</u></td> </tr> </table> <p>Technique (QW-410)</p> <p>Thermal Processes: <u>No</u></p> <p>Stringer or Weave Bead: <u>Stringer bead</u></p> <p>Multiple / Single Pass (per side): <u>Single and multipass</u></p>	Filler Metal Size (in.):	<u>1/4</u>	<u>-</u>	<u>-</u>	Amperage Used:	<u>85</u>	<u>-</u>	<u>-</u>	Voltage Used:	<u>125</u>	<u>-</u>	<u>-</u>	Travel Speed (in/min):	<u>4</u>	<u>-</u>	<u>-</u>	Max. Heat Input (J/in):	<u>N/R</u>						
Filler Metal Size (in.):	<u>1/4</u>	<u>-</u>	<u>-</u>																						
Amperage Used:	<u>85</u>	<u>-</u>	<u>-</u>																						
Voltage Used:	<u>125</u>	<u>-</u>	<u>-</u>																						
Travel Speed (in/min):	<u>4</u>	<u>-</u>	<u>-</u>																						
Max. Heat Input (J/in):	<u>N/R</u>																								

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 and 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 5 is Cover

Notes

Any additional notes would appear here

Pyramid Co.

Procedure Qualification Record (PQR)

PQR No.: Example 1a

Page 3 of 3

Tensile Test (QW-150)

Specimen No.	Width (in.)	Thickness (in.)	Area (in ²)	Ultimate Total Load (lb)	Ultimate Unit 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 Tests (QW-160)

Type and Figure No.	Result	Type and Figure No.	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

Hardness Test - Vickers hardness

Location	Readings								
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			

Visual Examination: Acceptable

Liquid Penetrant Test: NA

Macro-Examination Test: NA

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%

Test Notes would appear here

Welder's Name: Smith, John I.D.: 1 Stamp No.: 1

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

Test conducted by: Kansas City Testing Lab Lab Test No.: 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