



**API WELDING PROCEDURE SPECIFICATION**

WPS: API 6000-1      REV. NO.: 0      PROCESS: OFW      DATE: 9/9/2004

**API-1104 QUALIFIED RANGES**

**Diameter:** Less than 2.375" o.d.      **Filler Metal Group:** API Group 6  
**Thickness:** Less than 0.188" nom.      **Joint Type:** Butt/fillet/socket  
**Material:** Yield less than or equal to 42 kpi  
**Positions:**      **Fixed:**       **Rolled:**  N/A      **Progression:** Up

**NOTE:** This WPS shall be used in conjunction with the applicable sections of the Los Alamos National Laboratories Welding Standards Manual (GWS)

**WELD JOINT:**      **Type:** Butt      **Class:** Full Penetration  
**Joint Description:** Open Butt single V- welded from one side  
**Sketch Number:** See pg. 2 for typical sketch and bead sequence.

**FILLER MATERIALS:**      **API Group No.:** 6      **AWS Class:** RG-60  
**SFA Class:** 5.2      **F No.:** 6      **Sizes (s):**

1/8"			
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**Number of Beads:** See pg. 2 for typical number of beads.

**BASE MATERIALS:**      **Spec:** ASTM A 53 or A 106 A/B      **to Spec:** ASTM A 53 or A 106 A/B  
**Thickness Welded:** Less than 0.188"      **to** Less than 0.188"  
**Pipe Diameter:** Less than 2.375" o.d.      **to Pipe Diameter** Less than 2.375" o.d.  
**ASME P No.:** 1      **Group:** 1      **to P No.:** 1      **Group:** 1

**POSITIONS:**      **Fixed:**       **Rolled:**  N/A      **PWHT: Time @ ° F Temp.:** N/A  
**Progression:** Up      **Temperature Range ° F:** N/A

**PREHEAT:**      **Minimum Temp ° F:** 70 deg.      **GAS:**      **Fuel:** Oxy-Acty      **Backing:** N/A  
**INTERPASS TEMP. ° F:** N/A.      **Flame Type:** Neutral  
**Tip Size:** #2      **Psi:** 4 - 6

**ELECTRICAL CHARACTERISTICS:**  
**Current:** N/A      **Polarity:** N/A      **Ranges Amps:** N/A  
**Transfer Mode:** N/A      **WFS/IPM:** N/A      **Volts:** N/A  
**Electrode size and Type:** N/A      **Travel/IPM** See pg. 2

**MAX. TIME BETWEEN PASSES:** 5 minutes between root pass and second pass.

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**WELDING TECHNIQUE:**

**Line-Up Clamp:** Optional, if line-up clamp is used, it will be left in placed until 50% of the root bead is complete.

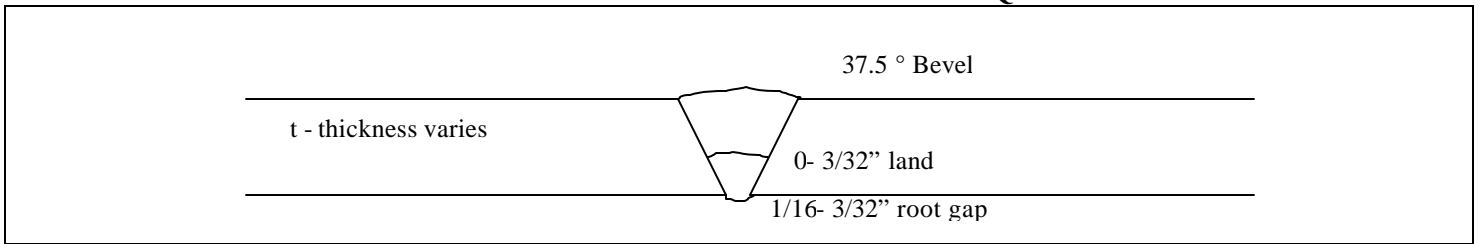
**Stringer or Weave Bead:** (S)  Y  (W)  N/A  **Single Pass**  N/A  **Multi Pass**  Y

**Cleaning and/or Grinding:** Stiff wire brush or power grinder. Grind tacks & stringer bead to a smooth contour.

**PROCEDURE QUALIFIED FOR:** Charpy V Notch  N/A  NDTT  N/A  D.T.  N/A

**Maximum K/J Heat Input:** N/A

**JOINT SKETCH AND BEAD NUMBER AND SEQUENCE**



**NOTE: Weld layers are representative only 3/4 actual number of passes and layer sequence may vary due to variation in joint design, thickness and fit-up.**

**TYPICAL WELDING PARAMETERS**

Pass Number	Filler/ Electrode	Size	Amps	Volts	Travel Speed in/min.	Other
1	RG-60	1/8	N/A	N/A	3-7	Tip size # 2
2	RG-60	1/8	N/A	N/A	3-7	Tip size # 2
3						
4						
5						
6						
7						
8						

**PREPARED BY:** Kelly Bingham **DATE:** 9/9/2004  
Signature on file

**APPROVED BY:** Tobin Oruch **DATE:** 9/9/2004  
Signature on file

**PROCEDURE QUALIFICATION TEST REPORT  
TEST PARAMETERS**

Two Coupons Tested

**Point Type:** Open Butt Single V Full Penetration      **Diameter:** 1.90" o.d.

**Thickness:** 0.145" wall      **Filler:** 1/8" RG-60

**Material:** ASTM A 106 gr B      **Preheat:** 70 ° F

**Position:** 5G Fixed      **Fuel:** Oxy-Acty.      **Tip:** 2

**Progression:** Up      **Flame:** Neutral

**Time Between Passes:** 5 Minutes      **Travel Speed:** 3-7

**GUIDED BEND TESTS**

No.	Type	Result	No.	Type	Result
1.	Root	Acc. No indications	5.	N/A	
2.	Root	Acc. No indications	6.	N/A	
3.	N/A		7.	N/A	
4.	N/A		8.	N/A	

**TENSILE TESTS**

No.	Specimen Type	Area Sq./ in	Applied Load	Ultimate Tensile	Character of failure and location
1.	N/A				
2.	N/A				
3.	N/A				
4.	N/A				

**NICK-BREAK TESTS**

No.	Type	Remarks on Nick-Break tests
1.	Figure 5	Break is clean.
2.	Figure 5	Break is clean.
3.	N/A	
4.	N/A	

**Welders Name:** William Mcintosh**Z No.:** 086261**Stamp:** PF009**Tests Conducted By:** Max Goforth

**We certify that the statements herein are correct and that the tests were conducted in accordance with API-1104.**

**Authorized By:** Kelly Bingham**Date:** 09/30/92

Signature on File