



**API WELDING PROCEDURE SPECIFICATION**

**WPS:** API 1000-9      **REV. NO.:** 0      **PROCESS:** SMAW      **DATE:** 9/9/2004

**API-1104 QUALIFIED RANGES**

**Diameter:** 2.375" o.d. thru 12.75" o.d. to all      **Filler Metal Group:** API Group 1

**Thickness:** 0.187" thru 0.750" to 0.187" thru 0.750"      **Joint Type:** Branch / Fillet

**Material:** Yield less than or equal to 42,000 KPI

**Positions:**      **Fixed:**       **Rolled:**  N/A      **Progression:** Down

**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:** Branch / Fillet      **Class:** Full Penetration

**Joint Description:** Open Butt single V- welded from one side only.

**Sketch Number:** See pg. 2 for typical sketch and bead sequence.

**FILLER MATERIALS:**      **API Group No.:** 1      **AWS Class:** E-6010

**SFA Class:** 5.1      **F No.:** 3      **Sizes (s):**

5/32	1/8		
------	-----	--	--

**Number of Beads:** See pg. 2 for typical number and 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:**      0.187" - 0.750"      **to**      0.187" - 0.750"

**Pipe Diameter:**      2.375" o.d. thru 12.75" o.d.      **to Pipe Diameter**      All

**ASME P No.:** 1      **Group:** 1      **to P No.:** 1      **Group:** 1

**POSITIONS:**      **Fixed:**       **Rolled:**  N/A      **PWHT: Time @ ° F Temp.:** N/A

**Progression:** Down      **Temperature Range ° F:** N/A

**PREHEAT:**      **Minimum Temp ° F:** 200      **GAS: Shielding:** N/A      **Backing:** N/A

**NOTE:** See time between passes.      **Composition:** N/A

**INTERPASS TEMP.:** 200 – 600 ° F      **Flow Rate:**      **CFH** N/A

**ELECTRICAL CHARACTERISTICS:**

**Current:** DC      **Polarity:** EP      **Ranges Amps:** See pg. 2

**Transfer Mode:** N/A      **WFS/IPM:** N/A      **Volts:** See pg. 2

**Electrode size and Type** See pg. 2      **Travel/IPM** See pg. 2

**MAX. TIME BETWEEN PASSES:** 5 minutes between passes or maintain strict preheat temperature.

WPS No.: API-1000-9 Rev. No.: 0 Date: 9/9/2004

**WELDING TECHNIQUE:**

**Line-Up Clamp:** None Fit-up on this joint is critical to successful welds.

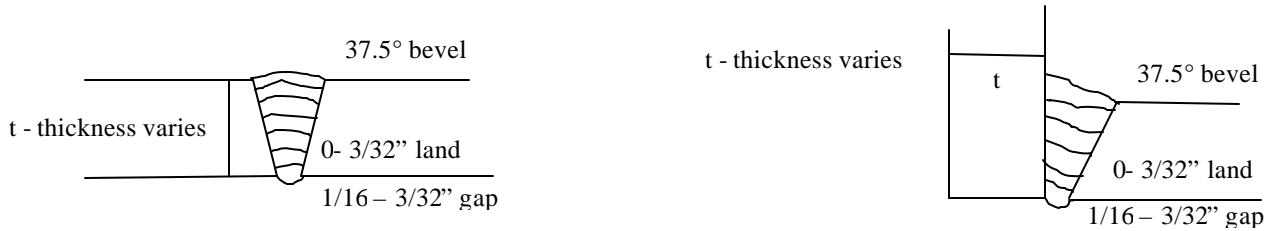
**Stringer or Weave Bead:** (S)  Y  (W)  Y  **Single Pass**  N/A  **Multi Pass**  Y

**Cleaning and/or Grinding:** \_\_\_\_\_

**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 <sup>3</sup>/<sub>4</sub> 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	E-6010	5/32	110-140	22-26	5-10	
2	E-6010	5/32	135-160	22	6-11	
3	E-6010	5/32	135-160	22	6-11	
4	E-6010	5/32	135-160	22	6-11	
5	E-6010	5/32	135-160	22	6-11	
6	E-6010	1/8	90-130	22	6-11	
7						
8						

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

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

## API WELDING SPECIFICATION PROCEDURE

## TEST PARAMETERS

<b>Point Type:</b>	Full Penetration Branch	<b>Diameter:</b>	12.75" o.d. to 12.75" o.d.	
<b>Thickness:</b>	0.750" wall	<b>Filler:</b>	5/32 & 1/8	E6010 (6P+)
<b>Material:</b>	ASTM A-106 gr B	<b>Preheat:</b>	250 °F	
<b>Position:</b>	5G Fixed	<b>Current:</b>	DCEP	<b>Amps:</b> 110-160
<b>Progression:</b>	Down	<b>Volts:</b>	22-26	

## GUIDED BEND TESTS

No.	Type	Result	No.	Type	Result
1.			5.	N/A	
2.			6.	N/A	
3.			7.	N/A	
4.			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 11	Acc. Break is clean
2.	Figure 11	Acc. Break is clean, HAZ & Base metal
3.	Figure 11	Acc. Break is clean, partial HAZ
4.	Figure 11	Acc. Break is clean

Welders Name: William McIntoshZ No.: 86261Stamp: PF009Tests 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 BinghamDate: 09/30/92