Los Alamos
NATIONAL LABORATORY

API WELDING PROCEDURE SPECIFICATION

WPS: API 1000-12 **REV. NO.:** 0 **PROCESS:** SMAW **DATE:** 9/9/2004

API-1104 QUALIFIED RANGES

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

Thickness: 0.187" thru 0.750" **Joint Type:** Butt

Material: Yield greater than 42 kip to – equal to or less than 65 kip

Positions: **Fixed:** X **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:** Butt **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):** 1/8 | 5/32 | 5/32 |

Number of Beads: See pg. 2 for typical number and of beads

BASE MATERIALS: **Spec:** ASTM A53 or A 106 A/B **to** **Spec:** API 5L X42 /X52

Thickness Welded: 0.187" - 0.750" **to** 0.187" - 0.750"

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

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

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

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

PREHEAT: **Minimum Temp ° F:** 70 **GAS:** **Shielding:** N/A **Backing:** N/A

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

INTERPASS TEMP.: N/A **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 root pass and second pass.

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WELDING TECHNIQUE:

Line-Up Clamp: Optional, if used line-up clamp shall be left until 50% of root bead is complete.

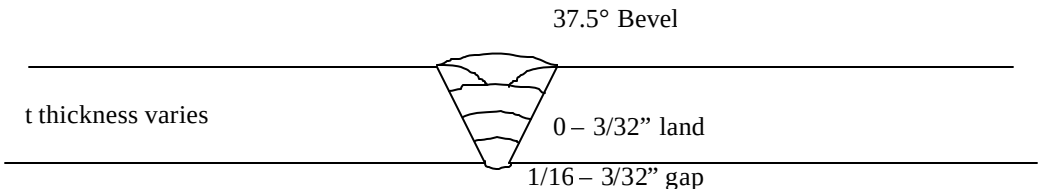
Stringer or Weave Bead: (S) Y **(W)** Y **Single Pass** N/A **Multi Pass** Y

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 ¾ 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	1/8	70 -100	22 - 26	9 – 12"	
2	E-6010	5/32	125 –132	22 - 26	9 – 13	
3	E-6010	5/32	125 –132	22 - 26	9 – 13	
4	E-6010	5/32	125 –132	22 - 26	9 – 13	
5	E-6010	5/32	125 –132	22 - 26	9 – 13	
6	E-6010	5/32	125 –132	22 - 26	9 – 13	
7	E-6010	5/32	125 –132	22 - 26	9 – 13	
8	E-6010	5/32	125 –132	22 - 26	9 – 13	

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

Point Type:	Full Penetration Single V Butt	**Diameter:**	8.644" o.d.
Thickness:	0.322" wall	**Filler:**	1/8" & 5/32" E-6010
Material:	API 5L X42 /X52 to ASTM A53	**Preheat:**	70*F
Position:	5G Fixed	**Current:**	DCEP **Amps:** 70-125
Progression:	Down	**Volts:**	22-26

GUIDED BEND TESTS

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

TENSILE TESTS

No.	Specimen Type	Area Sq./ in	Applied Load	Ultimate Tensile	Character of failure and location
1.	Figure 4	.3051	23,619	77,408	Base metal cup and cone
2.	Figure 4	.3213	23,232	72,305	Base metal cup and cone
3.	N/A				
4.	N/A				

NICK-BREAK TESTS

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

Welders Name: Scott Simonich **Z No.:** 200360 **Stamp**: SC002
Tests Conducted By: Brett McNeil

We certify that the statements herein are correct and that the tests were conducted in accordance with API-1104.
Authorized By: Kelly Bingham _____ **Date:** 10/30/03
Signature on File