Los Alamos
NATIONAL LABORATORY

API WELDING PROCEDURE SPECIFICATION

WPS: API 1000-3 **REV. NO.:** 0 **PROCESS:** SMAW **DATE:** 9/9/2004

API-1104 QUALIFIED RANGES

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

Thickness: Less than 0.188" **Joint Type:** Butt/fillet/socket

Material: Yield less than or equal to 42 kpi

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 (GSW).

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.:** 1 **AWS Class:** E-6010

SFA Class: 5.1 **F No.:** 3 **Sizes (s):** 3/32" | 1/8" | | |

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

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: 2.375" o.d - 12.75" o.d. **to** **Pipe Diameter** 2.375" o.d. - 12.75" o.d

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

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

Progression: N/A **Temperature Range º F:** N/A

PREHEAT: **Minimum Temp º F:** 70 deg. **GAS:** **Shielding:** N/A **Backing:** N/A

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

INTERPASS TEMP. º F : 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. 2 hrs for all subsequent beads or passes.

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WELDING TECHNIQUE:

Line-Up Clamp: Full encirclement line-up clamp shall be used: line-up clamp shall be left until 50% of root bead is complete

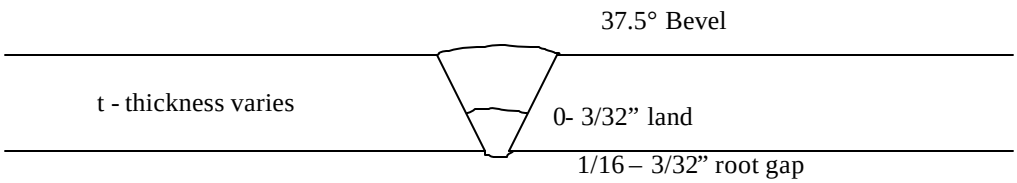
Stringer or Weave Bead: (S) Y **(W)** Y **Single Pass** N/A **Multi Pass** Y

Cleaning and/or Grinding: 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 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	3/32	55-70	22-26	7-11	
2	E-6010	1/8	60-90	22-26	9-13	
3						
4						
5						
6						
7						
8						

PREPARED BY: Kelly L. 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:** 2. 375" o.d.

Thickness: 0.154" wall **Filler:** 3/32" & 1/8" E-6010 (6P+)

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

Position: 5G Fixed **Current:** DCEP **Amps:** 55-90

Progression: Down **Volts:** 18-24

Max Time Between Passes: 5 Minutes **Travel Speed:** 7-13

GUIDED BEND TESTS

No.	Type	Result	No.	Type	Result
1.	Root	Acc. No indications	5.	N/A	
2.	Root	Acc. Two indication	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	Acc. Break is clean.
2.	Figure 5	Acc. One minor pore.
3.	N/A	
4.	N/A	

Welders Name: William McIntosh **Z No.:** 086261 **Stamp**: PF009

Tests Conducted By: Merel Johnson

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