



API WELDING PROCEDURE SPECIFICATION

WPS: API 1000-7 REV. NO.: 0 PROCESS: SMAW DATE: 9/9/2004

API-1104 QUALIFIED RANGES

Diameter: Less than 2.375" o.d. to all **Filler Metal Group:** API Group 1

Thickness: 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/Tee 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):**

| | | | |
|------|-----|--|--|
| 3/32 | 1/8 | | |
|------|-----|--|--|

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

BASE MATERIALS: **Spec:** ASTM A-53 or A-106 **to Spec:** ASTM A-53 or A-106

Thickness Welded: 0.145" thru 0.154" **to** 0.187" thru 0.750"

Pipe Diameter: Less than 2.375" 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.

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WELDING TECHNIQUE:

Line-Up Clamp: None - It should be noted that the fit-up on this joint is critical to successful weld.

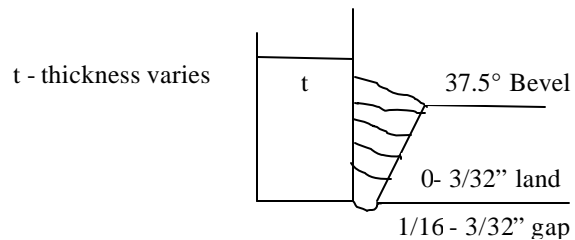
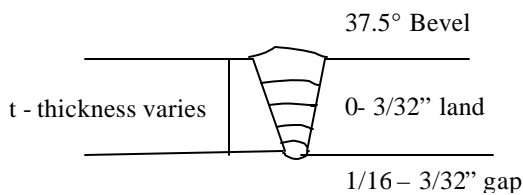
Stringer or Weave Bead: (S) Y (W) Y **Single Pass** N/A **Multi Pass** Y

Cleaning and/or Grinding: Stiff wire brush our 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 | E-6010 | 3/32 | 55-70 | 22-26 | 4-9 | |
| 2 | E-6010 | 3/32 | 55-80 | 22-26 | 4-9 | |
| 3 | E-6010 | 1/8 | 60-90 | 22-26 | 5-10 | |
| 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

**API WELDING SPECIFICATION PROCEDURE
TEST PARAMETERS**

| | | | |
|---------------------|-------------------------|------------------|--------------------------|
| Joint Type: | Full Penetration Branch | Diameter: | 1.90" o.d. to 6.625" o.d |
| Thickness: | 0.145" to 0.280" wall | Filler: | 3/32 & 1/8 E6010 (6P+) |
| Material: | ASTM A-106 gr B | Preheat: | 250°F |
| Position: | 5G Fixed | Current: | DCEP Amps: 55-70 |
| Progression: | Down | Volts: | 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. One minor pore. |
| 2. | Figure 11 | Acc. Break is clean. |
| 3. | Figure 11 | Acc. Break is clean, partial thru base material |
| 4. | Figure 11 | Acc. One repaired BT, partial thru base material |

Welders Name: William McIntosh

Z No.: 86261

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