

WELDING PROCEDURE **SPECIFICATION**

WPS - 2015-FOSC-8-A1 **REV. NO.:** 0 **DATE:** 4/22/2010 **APPLICABILITY**

WELDING PROCESS: GTAW-P-A and ASME: X AWS: **OTHER:**

SUPPORTING POR: FCS-4 Wire 75-25

JOINT: This WPS shall be used in conjunction with the General Welding Standards (GWS) and Welding Fabrication Procedure (WFP) sections and criteria for joint details, repairs, NDE, inspection etc.

Weld Joint Type: Square Butt **Full Penetration** Class: See GWS 1-06 and WFP's for joint details Preparation: Faced square and cleaned N/A **Backing:** Gas **Root Opening: Backgrind root:** N/A **Backing Mat.:** Gas **GTAW Flux:** N/A **Bkgrd Method:** N/A **Backing Retainer:** N/A ER316L **FILLER METALS:** Class: and N/A 5.9 and N/A 6 and N/AA No: 8 **SFA Class:** F No: **Size:** 0.03

Insert Desc.: N/A Insert: N/A

Weld Metal Thickness Ranges: Flux: Type: N/A Size: N/A thru **AWS Root Pass:**

AWS Balance: Filler Metal Note: Wire feed varies from 0 - 30 ipm thru

ASME Root Pass: 0.062 thru 0.150 **ASME Balance:** 0.062 thru 0.150

P/S No. 8 BASE MATERIAL Gr No. 1 to: P/S No. 8 Gr No. 1 Spec. ASTM A312 Type 316L to: Spec. ASTM A312 Type 316L **Grade:** Grade:

AWS: 0 Qualified Pipe Dia. Range: ≥ **ASME:**

Qualified Thickness Range: AWS: thru **ASME:** 0.062 thru 0.150

OUALIFIED POSITIONS: AWS: ASME: All Vert. Prog.: N/A Preheat Min. Temp.: 50°F **GAS: Shielding:** Helium/Argon or 25 / % **Interpass Max. Temp.:** N/A°F **Gas Composition:** 75 / / % Gas Flow Rate cfh: **Preheat Maintenance:** N/A°F 25 45 to to PWHT: Time @ °F Temp. N/A **Backing Gas/Comp:** Helium 100 % Temp. Range: N/A°F **Backing Gas Flow cfh:** 1 to 1 N/A °F Trailing Gas/Comp: N/A 0 % to

APPROVAL: Signatures on file at ENG DATE: 4/22/2010

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WELDING CHARACTERISTICS:

Current: DCEN and Tungsten Type: EWTh-2 Transfer Mode: N/A

Ranges: Amps 50 to 150 Tungsten Dia.: 0.093 Pulsing Cycle: 1.2 to

Volts 11 to 13 Background Current: 40%

Fuel Gas: N/A Flame: N/A Braze temp. °F N/A to N/A

WELDING TECHNIQUE: For fabrication specific requirements such as fittup, cleaning, grinding, PWHT and

inspection criteria refer to Volume 2, Welding Fabrication Procedures

Technique: Automatic part rotated **Cleaning Method:** Wipe with solvent

Single Pass or Multi Pass: S Stringer or Weave bead (S/W): S or S Oscillation: N

GMAW Gun Angle °: to Forehand or Backhand for GMAW (F/B): N/A

No Pass >1/2": True GMAW/FCAW Tube to work distance: N/A

Maximum K/J Heat Input: N/A Travel speed: 6 ipm Gas Cup Size: N/A

PROCEDURE QUALIFIED FOR:

Charpy "V" Notch: N/A Nil-Ductil Transition Temperature: N/A Dynamic Tear: N/A

Comments: This WPS was qualified for Pu Oxide Storage containers in a Glovebox.

1) All welding is performed in a Helium atmosphere inside a glove-box.

| Weld Layer | Manual Process | Filler Metals | Size | Amp Range | Volt Range | Travel/ipm | Nozzle Angle | Other |
|---------------|-------------------|---------------|------|------------------|-----------------|---------------|-----------------|-------|
| 1 | GTAW-P-A | ER316L | 0.03 | 50 to 150 | 11 to 13 | 4 to 6 | to | |
| 2 | | N/A | | to | to | to | | |
| 3 | | N/A | | to | to | to | | |
| 4 | | N/A | | to | to | to | | |

REM. * Weld layers are representative only - actual number of passes and layer sequence may vary.

ML-1/2 projects or jobs must determine if the supporting documentation for this WPS complies with quality requirements of the project/job.

Use of LANL Welding Procedures and Welder Qualifications for non-LANL work shall be at the sole risk and responsibility of the Subcontractor, and the Subcontractor shall indemnify and save LANL and the Government harmless from any and all claims, demands, actions or causes of action, and for any expense or loss by reason of Subcontractor's and their employees posession and use of LANL procedures and qualifications.

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