



WELDING PROCEDURE SPECIFICATION

WPS - 2007-FOSC-8-A1 **REV. NO.:** 0 **DATE:** 4/22/2010 ****APPLICABILITY****
WELDING PROCESS: GTAW-P-A and **ASME:** X **AWS:** **OTHER:**
SUPPORTING PQR: FCS-4 Wire Helium

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	Class:	Full Penetration
See GWS 1-06 and WFP's for joint details	Preparation:	Faced square and cleaned
Root Opening: N/A	Backing:	Gas
Backgrind root: N/A	Backing Mat.:	Gas
Bkgrd Method: N/A	GTAW Flux: N/A	Backing Retainer: N/A

FILLER METALS:		Class: ER316L	and	N/A
A No: 8	SFA Class: 5.9 and N/A	F No: 6 and N/A	Size: .035	
Insert: N/A	Insert Desc.: N/A	Weld Metal Thickness Ranges:		
Flux: Type: N/A	Size: N/A	AWS Root Pass:	thru	
Filler Metal Note: Wire feed varies from 0 - 30 ipm		AWS Balance:	thru	
		ASME Root Pass:	0.062	thru 0.150
		ASME Balance:	0.062	thru 0.150

BASE MATERIAL	P/S No. 8	Gr No. 1	to: P/S No. 8	Gr No. 1
Spec. ASTM A312 Type 316L	Grade:	to: Spec. ASTM A312 Type 316L	Grade:	
Qualified Pipe Dia. Range: ≥	AWS:	ASME: 0		
Qualified Thickness Range:	AWS:	thru	ASME: 0.062	thru 0.150

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

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

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 15 **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 **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	.035	50 to 140	11 to 15	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 possession and use of LANL procedures and qualifications.