



WELDING PROCEDURE SPECIFICATION

WPS: 2010-XXTT-1**REV. NO.:** 0**DATE:** 7/23/2014 ****APPLICABILITY******WELDING PROCESS:** GTAW**CODE:** ASME IX and AWS B2.1**OTHER:****SUPPORTING PQR:** WS-3A 218-1 227-2 227-1
WS-4-F WS-4-E

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: Butt/Fillet**Class:** Full & Partial Penetration & Fillets**See GWS 1-06 and WFP's for joint details.****Preparation:** Grind or wire brush**Root Opening:****Backing:** N/A**Backgrind Root:** When required**Backing Mat.:** None**Bkgrd Method:** Gouge, Chip, Grind**GTAW Flux:** N/A**Backing Retainer:** No**FILLER METALS:****Class:** ER70S-x and Mill-100S-1**A No:** 1**SFA Class:** 5.18**F No:** 6 **Size:** .035 .045**Insert:** No**Insert Type:** N/A**Weld Metal Thickness Ranges:****Flux:** **Type:** N/A**Size:** N/A**AWS Root Pass:****AWS Balance:** .020 thru 1.062**Filler Material Note:** Welding without filler is not permitted**ASME Root Pass:****ASME Balance:** .040 thru 1.062**BASE MATERIAL:**

Spec.:	P No: 1	Gr No.: All	to P No.: 1	Gr No.: All
Qualified Pipe Dia. Range: >=	Grade:	to Spec.:		Grade:
Qualified Thickness Range:	AWS: 0	ASME: 0		
	AWS: 0.02 thru 1.062	ASME: 0.04 thru 1.062		

QUALIFIED POSITIONS:**AWS:** All**ASME:** All**Vert. Prog.:** Up

Preheat Min. Temp.: 50	GAS: Shielding: Argon	or
Interpass Max. Temp.: 300 °F	Gas Composition: 100 / / %	/ / %
Preheat Maintenance: 100 °F	Gas Flow Rate cfh: 25 to 50	
PWHT: Time @ °F Temp.:	Backing Gas/Comp: N/A	
Temperature Range:	Backing Gas Flow cfh:	
	Trailing Gas/Comp:	

WELDING CHARACTERISTICS:

Current: DCEN and DCEN	Tungsten Type: EWLA-1.5	Transfer Mode: N/A
Ranges:	Tungsten Dia.: 1/8	Pulsing Cycle:
Amps: 30		Background Current:
Volts: 12		Braze Temp °F:
Fuel Gas:	Flame:	

WELDING TECHNIQUE: For fabrication specific requirements such as fitup, cleaning, grinding, PWHT and inspection criteria, refer to Volume 2, Welding Fabrication Procedures.

Technique: Semi-Automatic**Cleaning Method:** Chip/grind/file/wire brush**Single or Multi Pass:** S or M**Stringer or Weave Bead (S/W):** S/W**Oscillation:** N/A**GMAW Gun Angle:****Forehand or Backhand for GMAW:** N/A**No Pass > 1/2":** Yes**GMAW/FCAW Tube to Work Distance (in):** N/A**Maximum K/J Heat Input:****Travel Speed:****Gas Cup Size:****PROCEDURE QUALIFIED FOR:****Charpy "V" Notch:** No**Nil-Ductile Transition Temperature:** No**Dynamic Tear:** No

Comments: This WPS is to be used with TIP-TIG GTAW Process.

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzle Angle	Other
1	GTAW	ER70S-x	.035	30 to 250	12 to 25	2 to 12		
2		Mill-100S-1	.045					
3		Mill-100S-1						
4		Mill-100S-1						

REM. * Weld layers are representative only - actual number pf 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 the reason of Subcontractor's and their employees posession and use of LANL procedures and qualifications.

APPROVAL: Signatures on file at ES-FE

DATE: