



WELDING PROCEDURE SPECIFICATION

WPS - 2010/3010-2X **REV. NO.:** 0 **DATE:** 10/1/2004 ****APPLICABILITY****
WELDING PROCESS/ES: GTAW and GMAW **ASME:** X **AWS:** X
SUPPORTING PQR: P-WS-220-2 P-WS-225 P-WS-232 **OTHER:**

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: Groove/fillet	Class: Full and partial penetration
See GWS 1-06 for joint details	Preparation: Mechanical/thermal-plasma
Root Opening: 1/16"-1/8"	Backing: Strap/ring/back welding
Backgrind root: Root side of joint	Backing Mat.: Argon for open butt joint
Bkgrd Method: Grind or chip	GTAW Flux: N/A Backing Retainer: N/A

FILLER METALS:	Class: R/ER-xxxx and R/ER-xxxx
A No: N/A SFA Class: 5.10 and 5.3 F No: 2x and 2x Size: .045 1/16 3/32 1/8	
Insert: N/A Insert Desc.: N/A	Weld Metal Thickness Range:
Flux: Type: N/A Size: N/A	AWS: 0.062 thru 8.000
Filler Metal Note: ER1100, ER23XX, ER40XX, ER41XX, ER5XXX	ASME: 0.062 thru 8.000

BASE MATERIALS:	P No. 2X	Gr No. All	to: P No.	2X	Gr No. All
Spec. SB-2xx (Alum.)	Grade: All	to: Spec.	SB-2xx (Alum.)	Grade: All	
Qualified Pipe Dia Range: = : 4					
Qualified Thickness Range:	AWS: 0.062 thru 8.000	ASME: 0.062 thru 8.000			

QUALIFIED POSITIONS: Groove-all	Fillet-all	Vertical Progression: V-UP
Preheat Min. Temp.: 125 °F	GAS: Shielding: GTAW-Argon or GMAW-Argon	
Interpass Max. Temp.: 600 °F	Gas Composition: 100 % 100 % 100 %	
Preheat Maintenance: 125 °F	Gas Flow Rate cfh: 10 to 25	
	Backing Gas/Comp: Argon	100 %
PWHT: Time @ °F Temp. N/A	Backing Gas Flow cfh: 25 to 40	
Temp. Range: N/A °F to N/A °F	Trailing Gas/Comp: N/A %	

PREPARED BY: KG Fellers **DATE:** 10/1/2004
Signature on file at FWO-DECS

APPROVED BY: Tobin Oruch **DATE:** 10/1/2004
Signature on file at FWO-DECS

Note:For SC/SS/ML-1/ML-2 work, this WPS requires independent review.

WELDING CHARACTERISTICS:

Current: ACHF and DCEP Tungsten type: EWTH-2 Transfer Mode: GMAW-Spray
 Ranges: Amps 150 to 225 Pulsing Cycle: N/A to N/A
 Volts 20 to 28 Background Current: N/A
 Fuel Gas: N/A Flame: N/A Braze temp. °F N/A to N/A

WELDING TECHNIQUE: For cleaning, grinding, and inspection criteria refer to Volume 2, Welding Fabrication Procedures

Technique: Stringer/weave Cleaning Method: Mechanical
 Single Pass or Multi Pass: M Stringer or Weave bead (S/W): S/W Oscillation: N/A
 GMAW Gun Angle °: 5 to 15 Forehand or Backhand for GMAW (F/B): V/UP
 GMAW/FCAW Tube to work distance: 1/2" to 3/4"
 Maximum K/J Heat Input: N/A Travel speed: N/A Gas Cup Size: 1/2"-5/8"

No single pass shall deposit greater than 1/2" thickness of material.

PROCEDURE QUALIFIED FOR:

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

Comments: ASME Weld Metal Thickness Range: GMAW=0.062" thru 8.0". AWS Weld Metal Thickness Range: GMAW=.250" thru Unlimited. 3) No single pass or bead shall be greater than 1/2" in thickness.

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzel Angle	Other
1	GTAW	R/ER-xxxx	.045	150 to 220	20 to 22	0 to 0	5 - 15	
2	GMAW	R/ER-xxxx	1/16	180 to 225	26 to 28	0 to 0		
3	GMAW	R/ER-xxxx	3/32	200 to 300	28 to 30	0 to 0		
4			1/8					
5								
6								
7								
8								

REM * Weld layers are representative only - actual number of passes and layer sequence may vary due to variations in joint design, thickness and fitup.

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.