



WELDING PROCEDURE SPECIFICATION

WPS: 3003-xxxx-1

REV. NO.: 1

DATE: 10/3/2006

APPLICABILITY

WELDING PROCESS: GMAW and GMAW

CODE: ASME IX

OTHER:

SUPPORTING PQR: P-WS-70-1 P-WS-70-2 P-WS-204-1

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/Groove/fillet**Class:** Full & Partial Penetration & Fillets**See GWS 1-06 and WFP's for joint details.****Preparation:** Mechanical/thermal**Root Opening:** 1/16 - 3/32**Backing:** With/without**Backgrind Root:** Root if reqd.**Backing Mat.:** CS strap/ring if used**Bkgrd Method:** Grind/chip**GTAW Flux:** N/A**Backing Retainer:** N/A**FILLER METALS:****Class:** ER70S-x and ER70S-x**A No:** 1**SFA Class:** 5.18 and 5.18**F No:** 6 and 6**Size:** .035 0 0 0**Insert:** N/A**Insert Type:** N/A**Weld Metal Thickness Ranges:****Flux:** Type: N/A**Size:** N/A**AWS Root Pass:****Filler Material Note:** .045 dia. filler may be used with WPA approval.**AWS Balance:****ASME Root Pass:** .032 thru 0.125**ASME Balance:** 0.187 thru 2.0**BASE MATERIAL:**

	P No: 1	Gr No.: 1	to P No.: 1	Gr No.: 2
Spec.: CS & AS- Pipe, plate, sheet & strip	Grade: All	to Spec.: CS & AS- Pipe, plate, sheet & strip		
Qualified Pipe Dia. Range: >=	AWS: 0	ASME: 0.5		Grade: All
Qualified Thickness Range:	AWS:	ASME: 0.187 thru 2		

QUALIFIED POSITIONS:**AWS:** Plate-all**ASME:** All**Vert. Prog.:** V-UP

Preheat Min. Temp.:	70	GAS: Shielding: Ar/CO2	or	Ar/Co2
Interpass Max. Temp.:	500 °F	Gas Composition: 75 / 25 / 0 %		75 / 25 / 0 %
Preheat Maintenance:	70 °F	Gas Flow Rate cfh: 15 to 35		15 to 35
PWHT: Time @ °F Temp.:	N/A	Backing Gas/Comp: N/A		0 %
Temperature Range:	N/A °F to N/A °F	Backing Gas Flow cfh: 0 to 0		
		Trailing Gas/Comp: N/A		

WELDING CHARACTERISTICS:**Current:** DCEP and DCEP**Tungsten Type:** N/A**Transfer Mode:** Globular**Ranges:** Amps: 100 to 140**Tungsten Dia.:** N/A to N/A**Pulsing Cycle:** N/A to N/A

Volts: 17 to 20

Background Current: N/A**Fuel Gas:** N/A**Flame:** N/A**Braze Temp °F:** N/A to N/A

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:** Grind/chip/arc gouge**Single or Multi Pass:** M**Stringer or Weave Bead (S/W):** S or W**Oscillation:** N/A**GMAW Gun Angle:** 5° to 15°**Forehand or Backhand for GMAW:** Forehand**No Pass > 1/2":** True**GMAW/FCAW Tube to Work Distance (in):** 1/2"-5/8"**Maximum K/J Heat Input:** N/A KJ/in**Travel Speed:** As reqd.**Gas Cup Size:** 1/2 - 5/8**PROCEDURE QUALIFIED FOR:****Charpy "V" Notch:** N/A**Nil-Ductile Transition Temperature:** N/A**Dynamic Tear:** N/A

Comments: No comments.

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzle Angle	Other
1	GMAW	ER70S-x	.035	100 to 110	17 to 18	5 to 12	5 to 15	
2	GMAW	ER70S-x	0	110 to 120	18 to 19	10 to 14		
3	GMAW	ER70S-x	0	120 to 130	19 to 20			
4	GMAW	ER70S-x	0	130 to 140	19 to 20			

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: 10/3/2006