



WELDING PROCEDURE SPECIFICATION

WPS: 2010-XXTT-1grp3

REV. NO.: 0

DATE: 3/29/2018 ****APPLICABILITY****

WELDING PROCESS: GTAW and GTAW

CODE: ASME IX and Sec. VIII Div 3 OTHER: AWS D1.1

SUPPORTING PQR: 2010-XXTT-1grp3

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 & Partial Penetration & Fillets

See GWS 1-06 and WFP's for joint details.

Preparation: Thermal or Mechanical

Root Opening: N/A

Backing: Optional

Backgrnd Root: When required

Backing Mat.: None

Bkgrd Method: Gouge, Chip, Grind

GTAW Flux: N/A

Backing Retainer: N/A

FILLER METALS:

A No: 1

SFA Class: 5.28 and 5.28

Class: ER80S-D2 and ER90S-D2

Insert: N/A

Insert Type: N/A

F No: 6 and 6 Size: .045 .062 .045 .062

Flux: Type: N/A

Size: N/A

Weld Metal Thickness Ranges:

Filler Material Note: This filler material is dual certified to both ER80S-D2 & ER90S-D2

AWS Root Pass: .125 thru 8.00

AWS Balance: .125 thru 8.00

ASME Root Pass: .187 thru 3.00

ASME Balance: .187 thru 3.00

BASE MATERIAL:

	P No: 1	Gr No.: 3	to P No.: 1	Gr No.: 3
Spec.: A-537 Gr 2	Grade: 2	to Spec.: A-537 Gr 2		Grade: 2
Qualified Pipe Dia. Range: >=	AWS: 24	ASME: 24		
Qualified Thickness Range:	AWS: 0.125 thru 8	ASME: 0.187 thru 3		

QUALIFIED POSITIONS:	AWS: 1G, 3G	ASME: 1G, 3G	Vert. Prog.: Up
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Preheat Min. Temp.: 225	GAS: Shielding: Argon	or	Argon
Interpass Max. Temp.: 300 °F	Gas Composition: 100 / 100 / 100 %		100 / 100 / 100 %
Preheat Maintenance: 275 °F	Gas Flow Rate cfh: 20 to 35		20 to 35
PWHT: Time @ °F Temp.: N/A	Backing Gas/Comp: N/A		N/A %
Temperature Range: N/A °F to N/A °F	Backing Gas Flow cfh: 0 to 0		
	Trailing Gas/Comp: N/A		N/A %

WELDING CHARACTERISTICS:

Current: DCEN and DCEN	Tungsten Type: EWLA-1.5	Transfer Mode: N/A
Ranges: Amps: 180 to 245	Tungsten Dia.: 3/32 to 1/8	Pulsing Cycle: N/A
Volts: 18 to 23		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: Manual	Cleaning Method: Chip/grind/file/wire brush
Single or Multi Pass: Multi	Stringer or Weave Bead (S/W): S/W or S/W
GMAW Gun Angle: 10° to 20°	Oscillation: 3X
No Pass > 1/2": Yes	Forehand or Backhand for GMAW: N/A
	GMAW/FCAW Tube to Work Distance (in): N/A

Maximum K/J Heat Input: 50 KJ/in

Travel Speed: N/A

Gas Cup Size: 3/8 - 5/8

PROCEDURE QUALIFIED FOR:

Charpy "V" Notch: Yes

Nil-Ductile Transition Temperature: No

Dynamic Tear: Yes

Comments: Note: This WPS is run with GTAW Tip Tig

This PQR was run on two plates to collect all required samples. DT average 90.88 ftlb @ -200 F CVN = 27 ftlbs @ 0F and 27 ftlbs @ -20F

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzle Angle	Other
1	GTAW	ER80S-D2	.045	180 to 185	18	3 to 6	10 to 20	
2	GTAW	ER90S-D2	.062	190 to 195		3 to 6		
3	GTAW	ER90S-D2	.045	200 to 205		3 to 6		
4	GTAW	ER90S-D2	.062	210 to 220				

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 the reason of Subcontractor's and their employees possession and use of LANL procedures and qualifications.

APPROVAL: Signatures on file at ES-DE**DATE:** 4/4/2018