

WELDING PROCEDURE SPECIFICATION

WPS: 2010-XXTT-HSLA100 **REV. NO.:** 0 **DATE:** 5/16/2017 ****APPLICABILITY****

WELDING PROCESS: GTAW and GTAW CODE: ASME IX and ASME IX OTHER:

SUPPORTING PQR: 2010-XXTT-HSLA100

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 Penetration & Fillet Welds

See GWS 1-06 and WFP's for joint details. Preparation: Thermal or Mechanical

Root Opening: N/A Backing: Metal Backgrind Root: Double sided joints Backing Mat.: Metal

Bkgrd Method: Gouge, Chip, Grind **GTAW Flux:** N/A **Backing Retainer:** No

FILLER METALS: Class: ER1xxS-x and ER1xxS-x

A No: N/A **SFA Class:** 5.28 **and** 5.23 **F No:** 6 **and** 6 **Size:** .045 .045 .045

Insert: N/A Insert Type: N/A Weld Metal Thickness Ranges:

Flux: Type: N/A Size: N/A AWS Root Pass: Filler Material Note: AWS Balance:

ASME Root Pass: 0.187 thru .50
ASME Balance: 0.187 thru 2.00

BASE MATERIAL:

Spec.: HSLA-100 Grade: N/A to Spec.: HSLA-100 Grade: N/A

Qualified Pipe Dia. Range: >= AWS: 24 ASME: 24

Qualified Thickness Range: AWS: ASME: 0.187 thru 2

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

Preheat Min. Temp.: 225 GAS: Shielding: Argon or N/A

Interpass Max. Temp.: $300 \, ^{\circ}\text{F}$ Gas Composition: $100 \, / \, / \, \%$ N/A $/ \, / \, \%$

Preheat Maintenance: 225 °F Gas Flow Rate cfh: 30 to 60

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:

Trailing Gas/Comp: N/A N/A %

WELDING CHARACTERISTICS:

 Current:
 DCEN and DCEN
 Tungsten Type: EWTh-2
 Transfer Mode: N/A

Ranges: Amps: 180 to 245 Tungsten Dia.: 1/8 to 5/32 Pulsing Cycle: N/A to N/A

Volts: 18 to 23 Background Current: 60-80

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/wire brush/file

Single or Multi Pass: Multi Stringer or Weave Bead (S/W): S/W or S/W Oscillation: 2X

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: 50 KJ/in Travel Speed: Gas Cup Size: #5, 6, 7

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PROCEDURE QUALIFIED FOR:

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

Comments: This WPS uses GTAW Tip-Tig with hot wire feed. Charpy Impact values meet 111 ftlbs @ -60 F. Dynamic Tear Test values meet

1058 ftlbs @ -20 F.

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzle Angle	Other
1	GTAW	ER1xxS-x	.045	180 to 195	18 to 19	3 to 5		
2	GTAW	ER1xxS-x	.045	190 to 205	19 to 20	3 to 5		
3	GTAW	ER1xxS-x	.045	200 to 215	20 to 21	3 to 5		
4	GTAW	ER1xxS-x	.045	210 to 225	21 to 22	3 to 5		

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-DE DATE: 5/16/2017

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