

WELDING PROCEDURE **SPECIFICATION**

WPS: 5000-xxxx-HY80/HSLA100D1.1 **REV. NO.:** 1 **DATE:** 7/3/2012 **APPLICABILITY**

WELDING PROCESS: SAW CODE: AWS D1.1 OTHER:

SUPPORTING PQR: 5000-HY80/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: Class: Full & Partial Penetration & Fillets

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

Backing: Metal **Root Opening: Backgrind Root:** Backing Mat.: Metal When required

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

FILLER METALS: Class: Mill-100S-1

N/A SFA Class: N/A and N/A F No: N/A and N/A A No: Size: .045 1/16 3/32 1/8

Insert: N/A Insert Type: N/A Weld Metal Thickness Ranges: Flux: Type: Mil800-H Size: N/A AWS Root Pass: .125 thru .250 Filler Material Note: AWS Balance: .375 thru 99

> ASME Root Pass: 0 thru 0 ASME Balance: 0 thru 0

BASE MATERIAL:

P No: N/A Gr No.: N/A to P No.: N/A Gr No.: N/A

Spec.: HY80 or HSLA100 Grade: N/A to Spec.: HY80 or HSLA100 Grade: N/A

AWS: 24 Qualified Pipe Dia. Range: >= ASME: 0

Qualified Thickness Range: AWS: 0.375 thru 99 ASME: 0 thru 0

Vert. Prog.: N/A **QUALIFIED POSITIONS:** AWS: 1G ASME: N/A

Preheat Min. Temp.: GAS: Shielding: N/A N/A 200 or

Interpass Max. Temp.: 400 °F Gas Composition: N/A / N/A / N/A %N/A / N/A / N/A %

Preheat Maintenance: 200 °F Gas Flow Rate cfh: 0 to 0 0 **to** 0 PWHT: Time @ °F Temp.: Backing Gas/Comp: N/A N/A % 0

Temperature Range: N/A °F to N/A °F Backing Gas Flow cfh: 0

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

WELDING CHARACTERISTICS:

Current: Tungsten Type: N/A Transfer Mode: N/A **DCEN** Ranges: Amps: 200 Tungsten Dia.: N/A Pulsing Cycle: 0 to 0

> Volts: 18 Background Current: 0

Fuel Gas: N/A Braze Temp °F: N/A to N/A Flame: 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: Cleaning Method: Chip/grind/file/wire brush Machine

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Single or Multi Pass: Multi Stringer or Weave Bead (S/W): S or N/A Oscillation: N/A

GMAW Gun Angle: $0 \degree$ to $0 \degree$ Forehand or Backhand for GMAW: N/A
No Pass > 1/2": N/A GMAW/FCAW Tube to Work Distance (in): N/A

Maximum K/J Heat Input: 62000 KJ/in Travel Speed: Gas Cup Size: N/A

PROCEDURE QUALIFIED FOR:

Charpy "V" Notch: Yes Nil-Ductile Transition Temperature: No Dynamic Tear: Yes

Comments: Note 1.) Welds are qualified with DT of weld material @-40° F of 614 ft-lbs. Westmoreland Report #2-64863 Note2.) Welds are

qualified with Charpy of weld material @-90° F of 68 ft-lbs. Sherry Labs Report #B12051281

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzle Angle	Other
1	SAW	Mill-100S-1	.045	200 to 240	18 to 22	2.3 to 3.0	0 to 0	
2			1/16	345 to 390	24 to 28	8 to 12		
3			3/32	340 to 600	26 to 34	9 to 12		
4			1/8	350 to 600	26 to 34	9 to 12		

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: 7/11/2012

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