WELDING PROCEDURE SPECIFICATION

WPS - 7100-xxxx-HDPE **REV. NO.:** 1 **DATE:** 9/3/2009 ****APPLICABILITY****

WELDING PROCESS: TF **and** TF **ASME:** X **AWS:** **OTHER:** ANSI B31.3 Ch. VII

SUPPORTING PQR: 7100-HDPE Friamat

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: Electrofusion Socket Coupling - Friamat **Class:** Fittings are ASTM F-1055

See GWS 1-06 and WFP's for joint details **Preparation:** Cut pipe and rough bonding surfaces

Root Opening: 0 **Backing:** N/A

Backgrind root: N/A **Backing Mat.:** N/A

Bkgrd Method: N/A **GTAW Flux:** N/A **Backing Retainer:** N/A

FILLER METALS: **Class:** N/A **and** N/A

A No: N/A **SFA Class:** N/A **and** N/A **F No:** N/A **and** N/A **Size:** 0 0 0 0

Insert: N/A **Insert Desc.:** N/A **Weld Metal Thickness Ranges:**

Flux: Type: N/A **Size:** N/A **AWS Root Pass:** 0 **thru** 0

Filler Metal Note: N/A **AWS Balance:** 0 **thru** 0

ASME Root Pass: 0 **thru** 0

ASME Balance: 0 **thru** 0

BASE MATERIAL **P/S No.** N/A **Gr No.** N/A **to: P/S No.** N/A **Gr No.** N/A

Spec. ASTM D-3035 **Grade:** N/A **to: Spec.** ASTM D-3035 **Grade:** N/A

Qualified Pipe Dia. Range: ≥ **AWS:** 0 **ASME:** 4

Qualified Thickness Range: **AWS:** 0.000 **thru** 0.000 **ASME:** 0.250 **thru** 1.500

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

Preheat Min. Temp.: 0 **°F** **GAS: Shielding:** N/A **or** N/A

Interpass Max. Temp.: 0 **°F** **Gas Composition:** 0 / 0 / 0 **%** 0 / 0 / 0 **%**

Preheat Maintenance: 0 **°F** **Gas Flow Rate cfh:** 0 **to** 0 0 **to** 0

PWHT: Time @ °F Temp. 0 **Backing Gas/Comp:** N/A 0 **%**

Temp. Range: 0 **°F** **Backing Gas Flow cfh:** 0 **to** 0

to 0 **°F** **Trailing Gas/Comp:** N/A 0 **%**

APPROVAL: Signatures on file at ENG **DATE:** 9/2/2009

WELDING CHARACTERISTICS:

Current: N/A **and** N/A **Tungsten Type:** N/A **Transfer Mode:** N/A

Ranges: Amps 0 **to** 0 **Tungsten Dia.:** 0 **Pulsing Cycle:** N/A **to** N/A

Volts 0 **to** 0 **Background Current:** N/A

Fuel Gas: N/A **Flame:** N/A **Braze temp. °F** 0 **to** 0

WELDING TECHNIQUE: For fabrication specific requirements such as fittup, cleaning, grinding, PWHT and inspection criteria refer to Volume 2, Welding Fabrication Procedures

Technique: Automatic Machine **Cleaning Method:** Abrasive cloth/alcohol

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

GMAW Gun Angle °: 0 **to** 0 **Forehand or Backhand for GMAW (F/B):** N/A

No Pass >1/2": N/A **GMAW/FCAW Tube to work distance:** N/A

Maximum K/J Heat Input: N/A **Travel speed:** N/A **Gas Cup Size:** N/A

PROCEDURE QUALIFIED FOR:

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

Comments: Use piping manufacturer heating and joing equipment or a manufacturer approved equivelant. Heating, pressure, holding, and time @ temperature shall be in accordance with manufacturers and consensus standards, (ANSI/ASME/ASTM, etc.) WPS Data Sheets will be added for each type of plastic pipe, (i.e. PP/PE/PPE/PVDF/HDPE/etc.) that fall within the jurisdiction of ANSI/ASME B31.3 Chap. VII and are performed within the manufacturers instructions/requirements.
Bonding must be done with clean, dry pipe above 40° F. This WPS also qualifies for natural gas piping under 49 CFR Part 192.283.

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzle Angle	Other
1	TF	N/A	0	0 to 0	0 to 0	0 to 0	0 to 0	
2	TF	N/A	0	0 to 0	0 to 0	0 to 0		
3	TF	N/A	0	0 to 0	0 to 0	0 to 0		
4	TF	N/A	0	0 to 0	0 to 0	0 to 0		

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