



WELDING PROCEDURE SPECIFICATION

WPS - 1000-D1.8-1 **REV. NO.: 1** **DATE: 5/1/2008** ****APPLICABILITY****
WELDING PROCESS: SMAW and SMAW **ASME:** **AWS: X** **OTHER: AISC-341 Demand Critical**
SUPPORTING PQR: PQT No. 1000-D1.8-1

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: Groove & Fillet welds	Class: Full & Partial Penetration & Fillets
See GWS 1-06 and WFP's for joint details	Preparation: Thermal/Mechanical
Root Opening: .25 - .500	Backing: With
Backgrind root: When specified	Backing Mat.: Metal or as specified
Bkgrd Method: Thermal or mechanical	GTAW Flux: N/A Backing Retainer: N/A

FILLER METALS		Class: E7018	and	E7018
A No: 1	SFA Class: 5.1 an 5.1	F No: 4 an 4	Size: 3/32	1/8 5/32
Insert: N/A	Insert Desc.: N/A	Weld Metal Thickness Ranges:		
Flux: Type: N/A	Size: N/A	AWS Root Pass: 0.125	thru	0.250
Filler Metal Note: Welder shall use ESAB Atom Arc 7018-SR or 7018-1 for this Procedure		AWS Balance: 0.125	thru	99
		ASME Root Pass:	thru	
		ASME Balance:	thru	

BASE MATERIAL	P/S No.	Gr No. 1	to: P/S No.	Gr No. 2
Spec. AWS Group I	Grade:	to: Spec. AWS Group I or II		Grade:
Qualified Pipe Dia. Range: ≥	AWS: 24	ASME:		
Qualified Thickness Range:	AWS: 0.125	thru 99.000	ASME:	thru

QUALIFIED POSITIONS:	AWS: All	ASME:	Vert. Prog.:	Up
Preheat Min. Temp.: 50 °F	GAS: Shielding:	N/A	or	N/A
Interpass Max. Temp.: 550 °F	Gas Composition:	/	/	% / / %
Preheat Maintenance: 50 °F	Gas Flow Rate cfh:	to		to
PWHT: Time @ °F Temp. N/A	Backing Gas/Comp:	N/A		%
Temp. Range:	Backing Gas Flow cfh:	to		
to °F	Trailing Gas/Comp:	N/A		0 %

APPROVAL: Signatures on file at ENG **DATE:** 5/1/2008

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WELDING CHARACTERISTICS:

Current: DCEP and DCEP **Tungsten Type:** N/A **Transfer Mode:** N/A
Ranges: Amps 70 to **Tungsten Dia.:** N/A **Pulsing Cycle:** N/A to N/A
 Volts 14 to 21 **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 fittup, cleaning, grinding, PWHT and inspection criteria refer to Volume 2, Welding Fabrication Procedures

Technique: Manual **Cleaning Method:** Chipping, Grinding
Single Pass or Multi Pass: Multi **Stringer or Weave bead (S/W):** S or W **Oscillation:** 3x
GMAW Gun Angle °: to **Forehand or Backhand for GMAW (F/B):** N/A
No Pass >1/2": True **GMAW/FCAW Tube to work distance:** N/A
Maximum K/J Heat Input: **Travel speed:** Varies 3 - 12 **Gas Cup Size:** N/A

PROCEDURE QUALIFIED FOR:

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

Comments: This WPS is specifically qualified for Demand Critical welds required by AISC 341-05 & AWS D1.8 Siesmic Welding including qualified for Charpy-V-Notch in weld metal to 115 ftlbs@ -20°F. HAZ +1mm qualified to 75 ftlbs@+50 F°. HAZ +5mm is qualified to 89 ftlbs@ +50 F°.

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzle Angle	Other
1	SMAW	E7018	3/32	70 to 100	14 to 16	3 to 6	to	
2	SMAW	E7018	1/8	120 to 140	15 to 17	4 to 8		
3	SMAW	E7018	5/32	140 to 170	16 to 18	4 to 8		
4	SMAW	E7018	5/32	140 to 170	17 to 19	6 to 10		
5								
6								

REM. * Weld layers are representative only - actual number of passes and layer sequence may vary due to variations in joint design, thickness and fitup.

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 possession and use of LANL procedures and qualifications.