8.1: Weld Procedure Specification (ASME WPS)-SMAW

National Aeronautics and Space Administration
John C. Stennis Space Center
Stennis Space Center, MS 39529-6000

ASME - WELDING PROCEDURE SPECIFICATIONS (WPS)

Welding Procedure Specification Record Number	Date	Revision Number
NASA-A572-SMAW	September 30, 2024	1

Qualified To	Company Name
ASME Boiler and Pressure Vessel Code	Syncom Space Services (S3)
Supporting PQR(s)	**Reference Docs.**
NASA-A572-SMAW-PQR	SSTD-8070-0135-WELD
Scope	**Joint**
Welding ASTM A572 Structural Steels	Single V Groove, Single Bevel Groove

BASE METALS (QW-403)

Type	ASTM A572 Gr. 50	P-no.	1	Grp-no.	1or2
Welded To	ASTM A572 Gr. 50	P-no.	1	Grp-no.	1or2
Backing	None	P-no.		Grp-no.	
Retainers					
Notes	See Note A.				

THICKNESS RANGE QUALIFIED

	As-welded Min.	As-welded Max.	With PWHT Min.	With PWHT Max.
Complete Pen.	0.1875"	8.00"	N/A	N/A
Complete Pen.				
Impact Tested				
Impact Tested				
Fillet Welds	No limit			

DIAMETER RANGE QUALIFIED

	As-welded Min.	As-welded Max.	With PWHT Min.	With PWHT Max.
Nominal Pipe Size	ALL			

FILLER METALS (QW-404)

Process	SFA	Classification	F-no.	A-no.	Chemical Analysis or Trade Name	THICKNESS RANGE QUALIFIED As-welded Min.	As-welded Max.	With PWHT Min.	With PWHT Max.
SMAW	5.1	E6010	3	1	See Note B.	3/32"	1/8"	N/A	N/A
SMAW	5.1	E7018	4	1	See Note B.	3/32"	3/16"	N/A	N/A
Cons. Insert		N/A							
Flux									

WELDING PROCEDURE

Welding Process	SMAW - E6010	SMAW - E7018	
Type	Manual	Manual	
Minimum preheat/interpass temperature (°F)	330°F (See Note C.)	330°F (See Note C.)	
Maximum interpass temperature (°F)	600°F	600°F	
Tungsten Size	N/A	N/A	
Tungsten Type	N/A	N/A	
Filler Metal Size (in.)	3/32" - 1/8"	3/32" - 3/16"	
Layer Number	Root and Hot Pass	Fill	
Position of Groove	1G	1G	
Weld Progression	N/A	N/A	
Current/Polarity	DCEP	DCEP	
Amperes	50 - 150	85 - 250	
Volts	20 - 30	20 - 35	
Travel Speed (in./min)	3 - 14 ipm	4 - 14 ipm	
Maximum Heat Input (kj/in)			
DC Pulsing Current			
Shielding: Gas Type	N/A	N/A	
Flow Rate (cfh)			
Trailing: Gas Type	N/A	N/A	
Flow Rate (cfh)			
Backing: Gas Type	N/A	N/A	
Flow Rate (cfh)			
String or Weave	String or Weave	String or Weave	
Orifice/Gas Cup Size	N/A	N/A	
Multi/Single Pass per Side	Multiple	Multiple	
Weld Deposit Chemistry			
Notes			

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Welding Procedure Specification Record Number	Date	Revision Number
NASA-A572-SMAW	September 30, 2024	1
Qualified To	**Company Name**	
ASME Boiler and Pressure Vessel Code	Syncom Space Services (S3)	

BASE METALS (QW-403)

Peening	Not allowed.
Surface Preparation	See Note D.
Initial/Interpass Cleaning	See Note D.
Back Gouging Method	N/A

NOTES

A. Groove Thickness Range: 0.1875" - 8.00"

Maximum Pass Thickness: ≤1/2"

B. Filler Metal Product Form: Low Hydrogen

C. Preheat maintenance 330°F - 460°F.

D. Remove all contamination and water from surface. Remove all slag on weld and adjacent base metal using steel brushes.

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Signature 1

Engineer Name	Signature
Skip Wright	
Date 10-07-24	

Signature 2

Quality Name	Signature
Richard Ladner	
Date 10-7-24	

Signature 3

Customer Reviewer Name	Signature
Benjamin McGrath	
Date 10.07.24	

Signature 4

Customer Name	Signature
Date	

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ASME - WELDING PROCEDURE SPECIFICATIONS (WPS)

Welding Procedure Specification Record Number	Date	Revision Number
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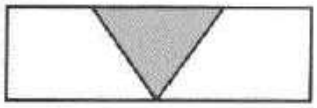
Qualified To	**Company Name**	
ASME Boiler and Pressure Vessel Code	Syncom Space Services (S3)	

Weld Joint Designs

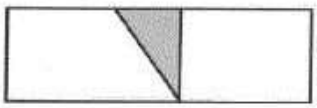
Attachment #1

Single-V Groove



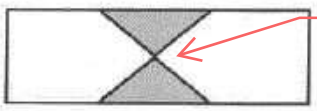
Groove Angle: 50 to 75 deg
Root Opening: 1/16 to 3/16 in.
Root Face: 0 to 1/16 in.
Misalignment: 1/16-in. max.

Single-Bevel Groove



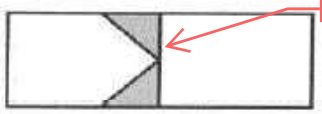
Groove Angle: 37.5 to 45 deg
Root Opening: 1/16 to 3/16 in.
Root Face: 0 to 1/16 in.
Misalignment: 1/16-in. max.

Double-V Groove



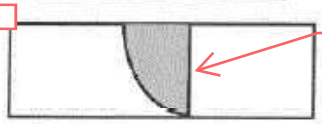
Groove Angle: 50 to 75 deg
Root Opening: 1/16 to 3/16 in.
Root Face: 0 to 1/16 in.
Misalignment: 1/16-in. max.

Double-Bevel Groove



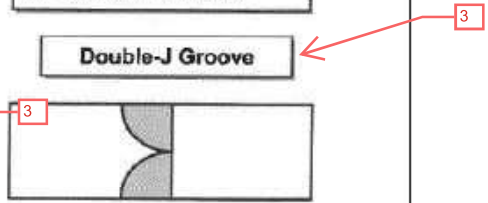
Groove Angle: 37.5 to 45 deg
Root Opening: 1/16 to 3/16 in.
Root Face: 0 to 1/16 in.
Misalignment: 1/16-in. max.

Single-J Groove



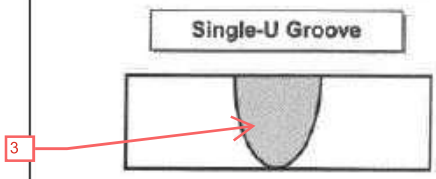
Groove Angle: 37.5 to 45 deg
Groove Radius: 3/8 in.
Root Opening: 1/16 to 3/16 in.
Root Face: 0 to 1/16 in.
Misalignment: 1/16-in. max.

Double-J Groove



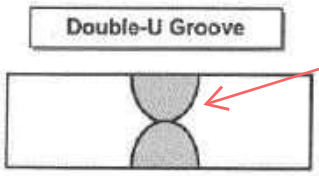
Groove Angle: 37.5 to 46 deg
Groove Radius: 3/8 in.
Root Opening: 1/16 to 3/16 in.
Root Face: 0 to 1/16 in.
Misalignment: 1/16-in. max.

Single-U Groove



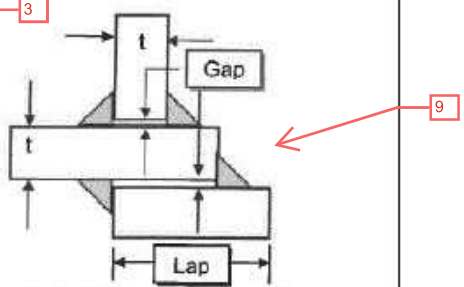
Groove Angle: 50 to 75 deg
Groove Radius: 3/8 in.
Root Opening: 1/16 to 3/16 in.
Root Face: 0 to 1/16 in.
Misalignment: 1/16-in. max.

Double-U Groove



Groove Angle: 50 to 75 deg
Groove Radius: 3/8 in.
Root Opening: 1/16 to 3/16 in.
Root Face: 0 to 1/16 in.
Misalignment: 1/16-in. max.

Fillet Weld T or Lap



Gap: 1/16-in. max. / Lap: 5 x t or 1 in. min.