Universal Industrial Sales

Welding Procedure Specification

CP-2 FCAW

WPS No. CP-2 FCAW Revision 1 Date 8/23/2006 By David J. Lund

Authorized By Martin Snow Date 12/13/2005 Prequalified ☒

Welding Process(es) FCAW Type: Manual ☐ Machine ☐ Semi-Auto ☒ Auto ☐

Supporting PQR(s)

JOINT

Type Butt Joint w/backing

Backing Yes ☒ No ☐ Single Weld ☐ Double Weld ☐

Backing Material A36

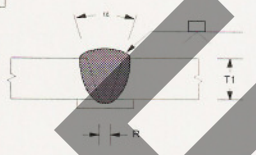
Root Opening 1/4 -3/8 Root Face Dimension 0

Groove Angle 30&45 deg Radius (J-U) na

Back Gouge Yes ☐ No ☒

Method

Single-V-groove weld (2)
Butt joint (B)



Welding Process	Joint Designation	Base Metal Thickness (Unlimited) T1	T2	Groove Preparation: Root Opening	Groove Angle	Tolerances: As Collected (see 3.13.1)	As Fit Up (see 3.13.1)	Permitted Welding Positions	Gas Shielding for FCAW	Notes
GMAW FCAW	B-U2a-GF	U	-	R = 3/16	α = 30°	R = +1/16, -0 α = +10°, -0°	+1/4, -1/16 +10°, -5°	F,V,OH	Required	1
				R = 3/8	α = 30°			F,V,OH	Required	10
				R = 1/4	α = 45°			F,V,OH	Required	

BASE METALS

Material Spec. Table 3.1 D1.1 to

Type or Grade Group I and II to

Thickness: Groove (in) All - Unlimited

Fillet (in) All - Unlimited

Diameter (Pipe, in) 8.00" - 48.00"

FILLER METALS

AWS Specification A5.20

AWS Classification E71 T1

SHIELDING

Flux

Electrode-Flux (Class)

Gas CO2

Composition 100%

Flow Rate 25-35 CFH

Gas Cup Size 3/4 "

PREHEAT

Preheat Temp., Min. 150

Thickness	Temperature
Up to 3/4"	150deg
Over 3/4" to 1-1/2"	150 deg
Over 1-1/2" to 2-1/2"	225 deg
Over 2-1/2"	300 deg

Interpass Temp., Min. 150 Max.

POSITION

Position of Groove All Fillet All

Vertical Progression: ☒ Up ☐ Down

ELECTRICAL CHARACTERISTICS

Transfer Mode (GMAW):

Short-Circuiting ☐ Globular ☐ Spray ☐

Current: AC ☐ DCEP ☒ DCEN ☐ Pulsed ☐

Other

Tungsten Electrode (GTAW):

Size Type

TECHNIQUE

Stringer or Weave Bead Stringer

Multi-pass or Single Pass (per side) Multiple

Number of Electrodes 1

Electrode Spacing: Longitudinal

Lateral

Angle

Contact Tube to Work Distance 3/4"

Peening

Interpass Cleaning Wire Brush, Grinder

POSTWELD HEAT TREATMENT

PWHT Required ☐

Temp. NR Time NR

WELDING PROCEDURE

Layer/Pass	Process	Filler Metal Class	Diameter	Cur. Type	Amps or WFS	Volts	Travel Speed	Other Notes
1 to 10	FCAW	E71 T1	.045	DCEP	230-280 A	24-27	5-18 ipm	Flat 1G
1 to 10	FCAW	E71 T1	1/16	DCEP	260-320 A	26-30	8-20 ipm	Flat 1G
1 to 10	FCAW	E71 T1	.045	DCEP	180-220 A	23-26	3-15ipm	Vertical 3G
1 to 10	FCAW	E71 T1	1/16	DCEP	195-240 A	24-27	5-18 ipm	Vertical 3G

SAMPLE

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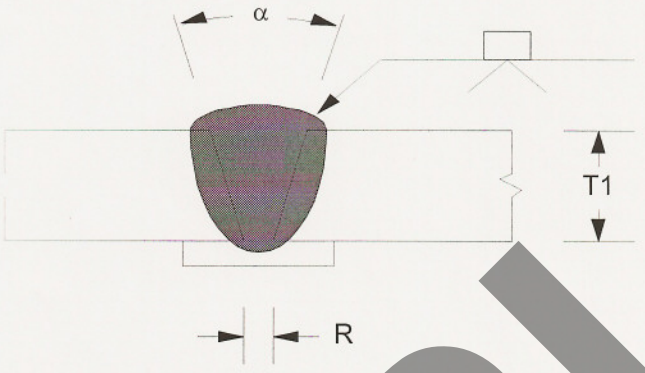
Single-V-groove weld (2)
Butt joint (B)



Welding Process	Joint Designation	Base Metal Thickness (U=unlimited) T1	T 2	Groove Preparation: Root Opening	Groove Angle	Tolerances: As Detailed (see 3.13.1)	As Fit Up (see 3.13.1)	Permitted Welding Positions	Gas Shielding for FCAW	Notes
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				R = 1/4	α = 45°			F,V,OH	Required	

MEMO

1 Surfaces to be welded and surfaces adjacent to the weld , shall be free from loose or thick scale. slag, rust, moisture,grease, and other forien material that would prevent proper welding. Surfaces for Cyclically loaded structures, " All " mill scale shall be removed from surfaces to be welded.(D1.1 section 5.15)

2. In Process Cleaning, before welding over previously deposited weld metal, all slag shall be removed removed from the weld and adjacent base metal, This requirement shall apply not only to sucessive layers but to successive beads and to the crater area when any welding has been interupted.

Notes:

1. Not Prequalified for GMAW-s nor GTAW (Refer to Annex A).

10. The orentiation of the two members in the joints may vary from 135 deg to 180 deg for butt joints, or 45 to 135 deg for corner joints, or 45 to 90 deg for T-joints.

SAMPLE