

Certified Welder for Welding Code AWS D1.1-2010

This document includes:

- Certified Welder for Welding Code AWS D1.1-2010 Protocol
- Welder Qualification Paperwork
- AWS D1.1 Welder Qualification Test Procedure [Carbon Steel Plate Test – WQTP#1]
- AWS D1.1 Welder Qualification Test Procedure [Carbon Steel Plate Test – WQTP#2]
- Fillet Test Setup

Learn more at <http://www.psiusa.com/> and specifically about their welding testing program by clicking on Mechanical Testing Services and scroll down to Welding Services.

Contact Mike McCraw for radiographic testing and certification at the Greensboro PSI office.

North Carolina Agricultural Education Certification Program

Certified Welder for Welding Code AWS D1.1-2010

North Carolina Agricultural Education Courses with content in this certification area are Agricultural Mechanics I and II.

There are many types of welding certification available. The welding certification for which most of our students will first want to qualify meets Welding Code AWS D1.1. This is basic structural welding using shielded arc welding on carbon steel plate or its equivalent. There are initially two certification levels that we are recommending for our students. Carbon Steel Plate Test (WQTP #1) includes 3G (Vertical – Uphill Progression) and Carbon Steel Plate Test (WQTP #2) 3G (Vertical – Uphill Progression) and 4G (Overhead). Detailed specifications are attached for both tests to assist our Certified Welding Instructors as they prepare their agricultural mechanics students for certification.

The Company

Although there are many Certified Welding Inspectors who can assist with welding certification we have teamed up with **Professional Service Industries, Inc.** to offer a standardized program for all students in our programs. **Professional Service Industries, Inc.** is the nation's largest firm which provides engineering, scientific, technical, and management solutions to public and private sector clients. PSI provides a variety of specialty engineering and testing services to business and industry. One can learn more about PSI at <http://www.psiusa.com/> and specifically about their welding testing program by clicking on Mechanical Testing Services and then scrolling down to Welding Services.

The Process

- Our Certified Welding Instructors will use the AWS D1.1 Welder Qualification Test Procedures provided to assist their students in preparing for certification.
- Students will prepare test welds according to the attached AWS D1.1 Welder Qualification Test Procedures leaving the test weld in the 3G or 4G position until the instructor has acknowledged with the student that the weld is complete.
- Our Certified Welding Instructors will visually inspect the each test plate for cracks, craters, weld reinforcement, and undercut size.
- Once the weld test plate has passed the visual inspection, it will be subject to the bend test by our certified welding instructors.
- If the weld passes the bend test, the plate along with accompanying Welder Qualification Paperwork will be submitted to Mike McCraw for radiographic testing and certification.

WELDER QUALIFICATION PAPERWORK

School and School District	
Date of Qualification Test	
Welding Code	AWS D1.1-2010
Instructor / Student Name	
Instructor / Student ID	xxx-xx-
Process	Shielded Metal Arc
Base Metal	A36 (Carbon Steel)
Pipe Diameter	N/A
Material Thickness	3/8"
Position	3G / 4G
Weld Progression	Uphill / N/A
Filler Metal	
Specification #	A5.1
Classification	E7018
Diameter	3/32" / 1/8"
F #	4
Trade Name	
Backing	1/4" or 3/8" Plate
Shielding	N/A
Witnessed By	
Required Test(s)	Radiographic Inspection per AWS D1.1
Cost of Radiographic Testing	\$65.00 / plate (includes Paperwork); \$105.00 / 2 plates (3G & 4G) from same welder submitted at the same time. Submit this form and test plates to the below address (Attn: Mike McCraw). Please call Mike McCraw of PSI with any questions at (336)669-1457.

AWS D1.1 Welder Qualification Test Procedure Carbon Steel Plate Test (WQTP #1) (Revision 0)

Welding Process: Shielded Metal Arc Welding (SMAW)

Base Metal: A36 or equivalent

Plate Thickness: 0.375" with 22.5° Bevel

Backing Plate: 0.250" or 0.375" x 3" Wide Minimum

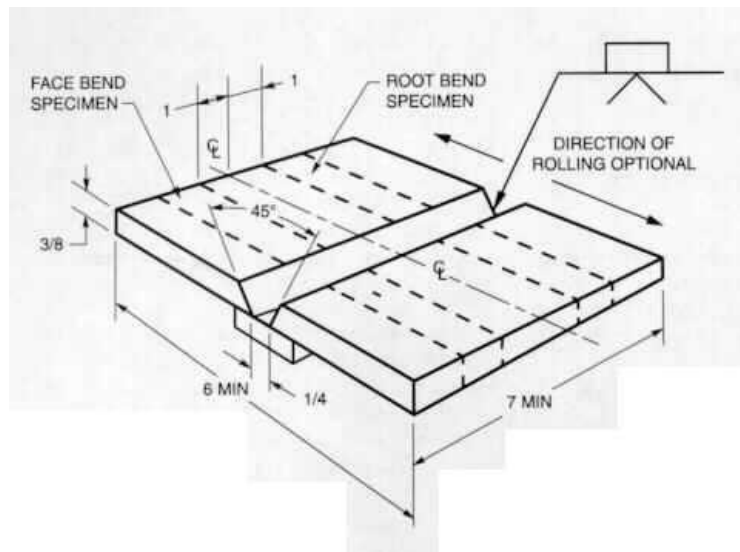
Welding Electrode: E7018 (3/32" or 1/8")

Test Position: 3G (Vertical – Uphill Progression)

Pre-Heat: 50°F, Minimum

Testing Witness: To Be Determined

Plate Details:

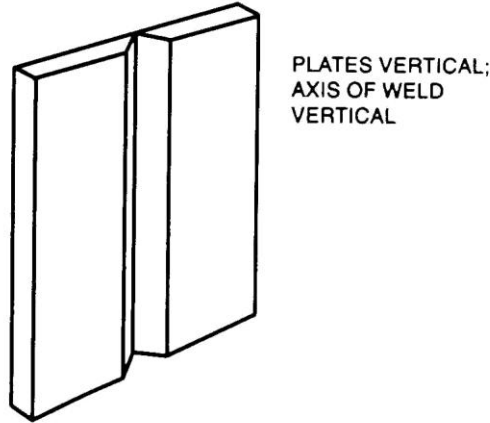


Bevel: 45° (Included Angle)

Root Gap: 1/4"

AWS D1.1 Welder Qualification Test Procedure Carbon Steel Plate Test (WQTP #1) (Revision 0)

Weld Position Details:



3G (Vertical) – Weld Progression: Uphill

Welding Variables:

Weld Pass(es)	Process	Filler Metal		Current		Volts (Range)	Travel Speed (Range)	Other (e.g., Remarks, Comments, Hot Wire Addition, Technique, Torch Angle, etc.)
		Classification	Diameter	Type and Polarity	Amps (Range)			
1 – n	SMAW	E7018	3/32” 1/8”	DCRP DCRP	70 – 110 90 – 160	19 – 22 20 – 23	2 – 7 IPM 2 – 8 IPM	

Welding Notes:

- Once test weld is placed in the 3G or 4G position, the test weld shall not be removed until completion of the weld

At the completion of the test welds, the coupons shall be visually examined in accordance with AWS D1.1, Clause 4.9.1.1 ‘Visual Inspection of Groove Welds.’

- Any crack shall be unacceptable
- All craters shall be filled to the full cross section of the weld
- Weld reinforcement shall not exceed 0.125”
- Undercut shall not exceed 0.031” (1/32”)

If the test welds meets the visual requirements of AWS D1.1, the test weld will be subjected to mechanical testing (bend testing) or radiographic testing in accordance with AWS D1.1.

AWS D1.1 Welder Qualification Test Procedure Carbon Steel Plate Test (WQTP #1) (Revision 0)

Failure of Test Weld – If the test weld fails either the visual or mechanical/radiographic testing, the welder will not be permitted to retest for 30 days.

Successful Completion of Test Weld – Successful completion of the above described tests weld will allow the welder to weld on the Covidien jobsite with the following limitations:

Welding Process: Shielded Metal Arc Welding

Welding Electrode F- Number: F1 thru F4

Welding Positions: Flat, Horizontal, Vertical

Backing: With backing, backgouging, or both

Base Metals: AWS D1.1 Base Metals

Base Metal Thickness Range:

Groove Welds: 0.125” to 0.750”

Fillet Welds: 0.125” to Unlimited

Diameter Range (Structural Piping):

Groove Welds: 24” diameter & over with backing, backgouging, or both

Fillet Welds: All Diameters

AWS D1.1 Welder Qualification Test Procedure Carbon Steel Plate Test (WQTP #2) (Revision 0)

Welding Process: Shielded Metal Arc Welding (SMAW)

Base Metal: A36 or equivalent

Plate Thickness: 0.375" with 22.5° Bevel

Backing Plate: 0.250" or 0.375" x 3" Wide Minimum

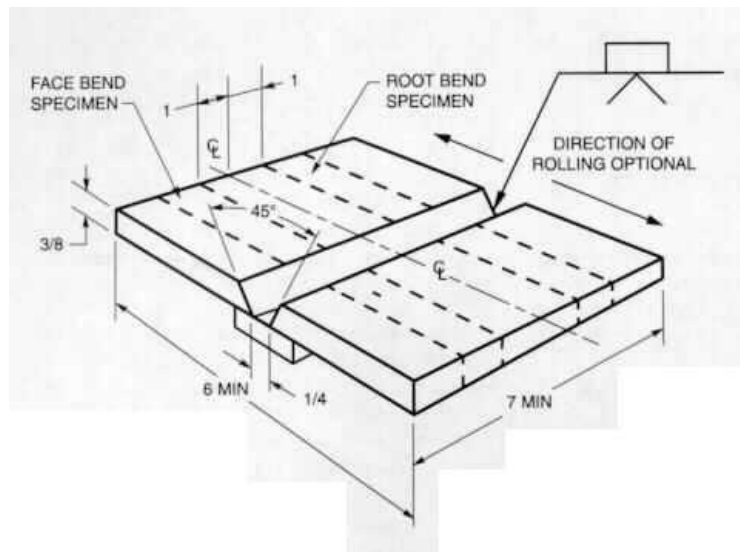
Welding Electrode: E7018 (3/32" or 1/8")

Test Position: 3G (Vertical – Uphill Progression) & 4G (Overhead)

Pre-Heat: 50°F, Minimum

Testing Witness: To Be Determined

Plate Details:

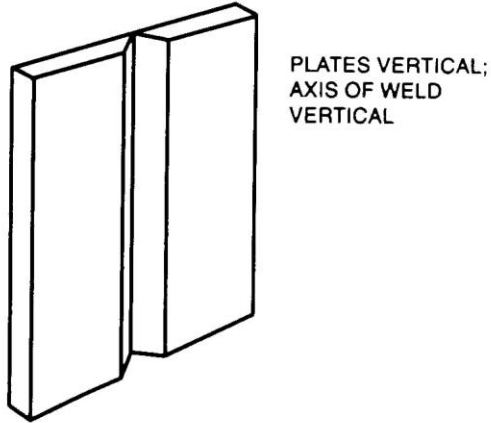


Bevel: 45° (Included Angle)

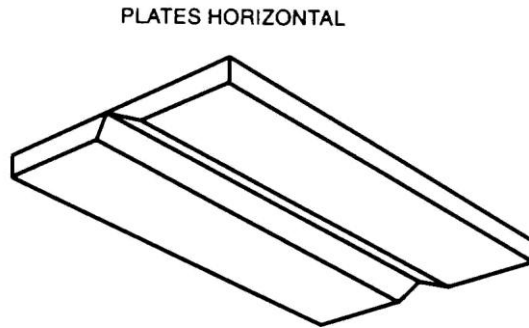
Root Gap: 1/4"

AWS D1.1 Welder Qualification Test Procedure Carbon Steel Plate Test (WQTP #2) (Revision 0)

Weld Position Details:



3G (Vertical) – Weld Progression: Uphill



4G – Overhead

Welding Variables:

Weld Pass(es)	Process	Filler Metal		Current		Volts (Range)	Travel Speed (Range)	Other (e.g., Remarks, Comments, Hot Wire Addition, Technique, Torch Angle, etc.)
		Classification	Diameter	Type and Polarity	Amps (Range)			
1 – n	SMAW	E7018	3/32"	DCRP	70 – 110	19 – 22	2 – 7 IPM	
			1/8"	DCRP	90 – 160	20 – 23	2 – 8 IPM	

AWS D1.1 Welder Qualification Test Procedure Carbon Steel Plate Test (WQTP #2) (Revision 0)

Welding Notes:

- Once test weld is placed in the 3G or 4G position, the test weld shall not be removed until completion of the weld

At the completion of the test welds, the coupons shall be visually examined in accordance with AWS D1.1, Clause 4.9.1.1 'Visual Inspection of Groove Welds.'

- Any crack shall be unacceptable
- All craters shall be filled to the full cross section of the weld
- Weld reinforcement shall not exceed 0.125"
- Undercut shall not exceed 0.031" (1/32")

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Welding Process: Shielded Metal Arc Welding

Welding Electrode F- Number: F1 thru F4

Welding Positions: All Positions

Backing: With backing, backgouging, or both

Base Metals: AWS D1.1 Base Metals

Base Metal Thickness Range:

Groove Welds: 0.125" to 0.750"

Fillet Welds: 0.125" to Unlimited

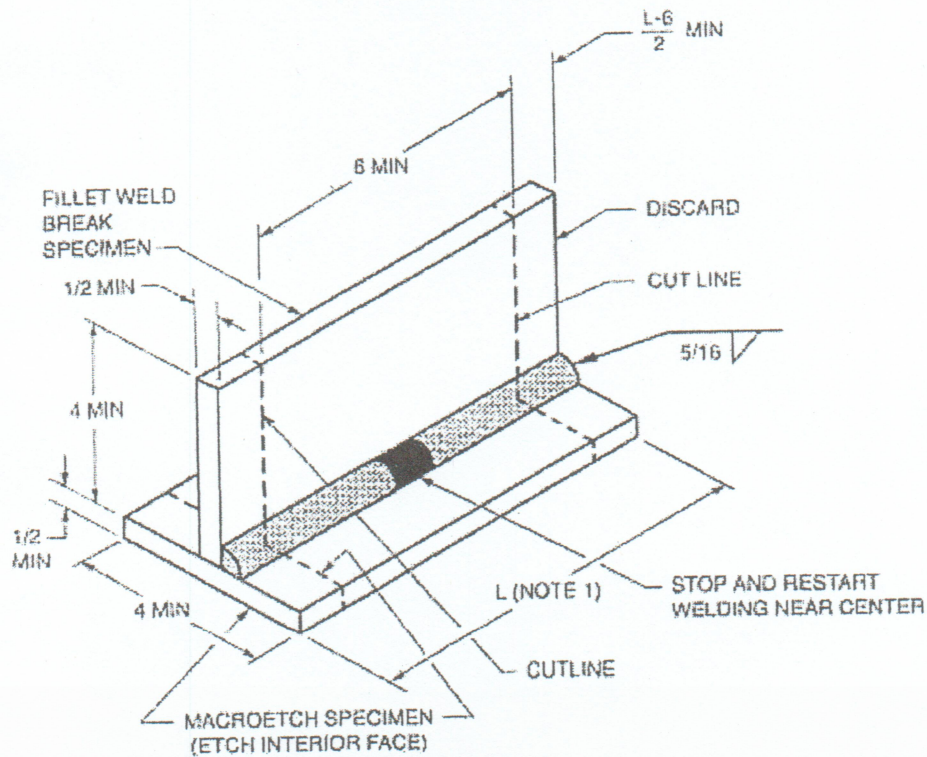
Diameter Range (Structural Piping):

Groove Welds: 24" diameter & over with backing, backgouging, or both

Fillet Welds: All Diameters

AWS D1.1 – Structural Welding Code

Fillet Test Set-Up

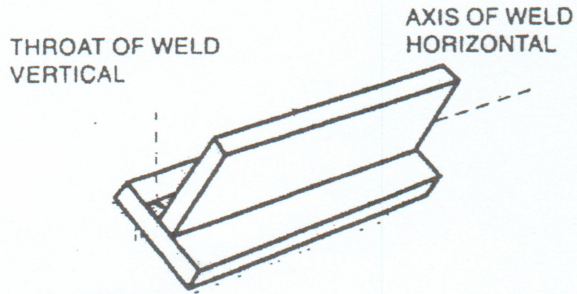


NOTES:

- Minimum plate length shall be 8" for welder qualification.
- Weld **1 side** of the joint only.
- Tack weld the setup in the outer 1" on the back side.
- This sketch is for plate set-up only. Refer the position sheet for welding positions.

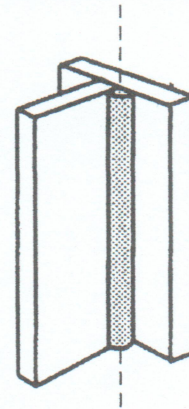
AWS D1.1 – Structural Welding Code

Fillet Weld Positions

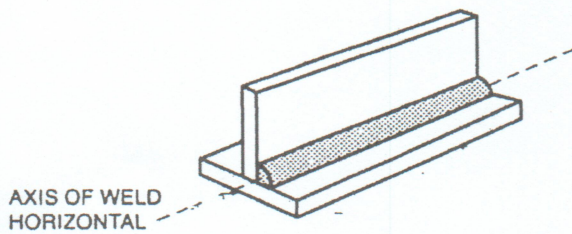


1F – Flat Position

AXIS OF WELD VERTICAL



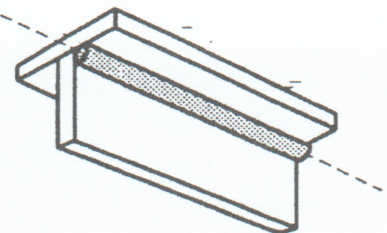
3F – Vertical Position



NOTE: ONE PLATE MUST BE HORIZONTAL

2F – Horizontal Position

AXIS OF WELD
HORIZONTAL



NOTE: ONE PLATE MUST BE HORIZONTAL

4F – Overhead Position