

Lesson 7 - Preparing to Bend a Welder Qualification Test Fact Sheet

Steps to Prepare to Bend a Welder Qualification Test

- Visual inspection
- Lay out cut lines
- Stamp information onto test specimens
- Cut bend test specimens
- Remove backing
- Grind weld reinforcement flush
- Grind bend test specimens

Visual Inspection of the Weld Test

- AWS D1.1:2015 – Structural Steel paragraphs 4.9.1 and 4.9.1.1 describe Visual Inspection Criteria for Groove Welds for qualification.
- If the weld fails visual inspection, the weld test conductor or inspector is not required to further test the weld specimen, and the weld test fails.
- If the weld passes visual inspection, the weld test conductor or inspector will cut and test the weld test specimen.

Groove Welds Shall Meet the Following Requirements:

- Any crack shall be unacceptable, regardless of size.
- All craters shall be filled to the full cross section of the weld.
- Weld reinforcement shall not exceed 1/8 in (3mm). The weld profile shall conform to Figure 5.4 and shall have complete fusion.
- Undercut shall not exceed 1/32 in (1 mm).
- The weld root for CJP grooves shall be inspected, and shall not have any cracks, incomplete fusion, or inadequate joint penetration.

Visual Inspection Tools

- Palmgren gauge to measure reinforcement height
- V-WAC gauge to measure undercut
- Bridge cam to measure the weld
- Steel ruler
- Magnifying glass
- Flashlight

Laying Out the Cut Lines for the Bend Test Specimens

- Starting from the center of the plate, measure 1" each direction and draw lines across the plate.
- From each of those lines, measure 1-1/2" and draw lines.
- There should be 2" of scrap in the middle, and 1" of scrap on each end (keep the 2" strip in the middle until bend test is completed).
- The 1-1/2" strips will be prepared for guided bend testing.
- One strip will be bent so that the face of the weld is stressed.
- One strip will be bent so that the root of the weld is stressed.

Stamping the Bend Test Specimens (the 1-1/2 strips to be cut)

- Initials/welder stamp number
- Position the test plate that was welded
- Joint design of the test plate
- F on one strip, R on the other strip
- Test conductors need to keep the test specimens for a certain amount of time, so they need to be identified for future reference
- This format is only a suggestion. The weld test conductor or inspector may choose a different format for stamping and identifying guided bend test specifications

Example:
CR CR
3G 3G
F R

Cut Bend Test Specimens

- Can be cut using:
 - Saw
 - Thermal cutting
 - Machining
- Test specimens should be a minimum of 6" long x 1-1/2" wide.

Remove Backing

- Can be removed using:
 - Saw
 - Thermal cutting
 - Machining
- When removing the backing, avoid gouging or cutting into the root of the weld or the base metal.

Grind Weld Reinforcement Flush

- Reinforcement can be ground down by:
 - Grinding – pedestal or hand held grinder
 - Sanding – belt sander or sanding disc on hand held grinder
 - Machining
- Avoid gouging or grinding the base metal.
- Thinning the base metal should be avoided.

Grind Weld Test Specimens Smooth

- Sand the face and root of the weld test specimen flush and smooth.
- Grind or sand a small radius along the edges of the specimen.
- Keep grinding/sanding marks smooth and even.
- Grinding/sanding marks **MUST** be going in the same direction with the grain of the base metal.

Dimensions of a Prepared Bend Test Specimen

- Minimum of 6" long
- 1 1/2" wide
- Maximum of 1/8" radius
- 3/8" thick, may reduce thickness no more than 1/32"

Source: American Welding Society (AWS) D1.1:2015 Structural Welding Code - Steel

