

## QW-162 GUIDED-BEND TEST PROCEDURE

**QW-162.1 Jigs.** Guided-bend specimens shall be bent in test jigs that are in substantial accordance with QW-466. When using the jigs illustrated in [Figure QW-466.1](#) or [Figure QW-466.2](#), the side of the specimen turned toward the gap of the jig shall be the face for face-bend specimens, the root for root-bend specimens, and the side with the greater discontinuities, if any, for side-bend specimens. The specimen shall be forced into the die by applying load on the plunger until the curvature of the specimen is such that a  $\frac{1}{8}$  in. (3 mm) diameter wire cannot be inserted between the specimen and the die of [Figure QW-466.1](#), or the specimen is bottom ejected if the roller type of jig ([Figure QW-466.2](#)) is used.

When using the wrap around jig ([Figure QW-466.3](#)), the side of the specimen turned toward the roller shall be the face for face-bend specimens, the root for root-bend specimens, and the side with the greater discontinuities, if any, for side-bend specimens.

When specimens wider than  $1\frac{1}{2}$  in. (38 mm) are to be bent as permitted in [Figure QW-462.2](#), the test jig mandrel must be at least  $\frac{1}{4}$  in. (6 mm) wider than the specimen width.

## QW-163 ACCEPTANCE CRITERIA — BEND TESTS

The weld and heat-affected zone of a transverse weld-bend specimen shall be completely within the bent portion of the specimen after testing.

The guided-bend specimens shall have no open discontinuity in the weld or heat-affected zone exceeding  $\frac{1}{8}$  in. (3 mm), measured in any direction on the convex surface of the specimen after bending. Open discontinuities occurring on the corners of the specimen during testing shall not be considered unless there is definite evidence that they result from lack of fusion, slag inclusions, or other internal discontinuities. For corrosion-resistant weld overlay cladding, no open discontinuity exceeding  $\frac{1}{16}$  in. (1.5 mm), measured in any direction, shall be permitted in the cladding, and no open discontinuity exceeding  $\frac{1}{8}$  in. (3 mm) shall be permitted along the approximate weld interface.

## (17) QW-170 TOUGHNESS TESTS

### QW-171 TOUGHNESS TESTS

**QW-171.1 General.** Toughness tests shall be made when required by referencing codes. Test procedures and apparatus shall conform to the requirements of the referencing code. When not specified by the referencing code, the test procedures and apparatus shall conform to the requirements of SA-370.

**QW-171.2 Acceptance.** The acceptance criteria shall be in accordance with that Section specifying toughness testing requirements.

**QW-171.3 Location and Orientation of Test Specimen.** The toughness test specimen removal and preparation requirements shall be as given in the Section requiring such tests.

When qualifying pipe in the 5G or 6G position, the **notch** toughness specimens shall be removed from the shaded portion of [Figure QW-463.1\(f\)](#).

## QW-172 TOUGHNESS TESTS — DROP WEIGHT

**QW-172.1 General.** Drop-weight tests shall be made when required by referencing codes. Test procedures and apparatus shall conform to the requirements of the referencing code. When not specified by the referencing code, the test procedures and apparatus shall conform to the requirements of ASTM specification E208.

**QW-172.2 Acceptance.** The acceptance criteria shall be in accordance with that Section requiring drop weight tests.

**QW-172.3 Location and Orientation of Test Specimen.** The drop weight test specimen, the crack starter location, and the orientation shall be as given in the Section requiring such tests.

When qualifying pipe in the 5G or 6G position, the toughness specimens shall be removed from the shaded portion of [Figure QW-463.1\(f\)](#).

## QW-180 FILLET-WELD TESTS

### QW-181 PROCEDURE AND PERFORMANCE QUALIFICATION SPECIMENS

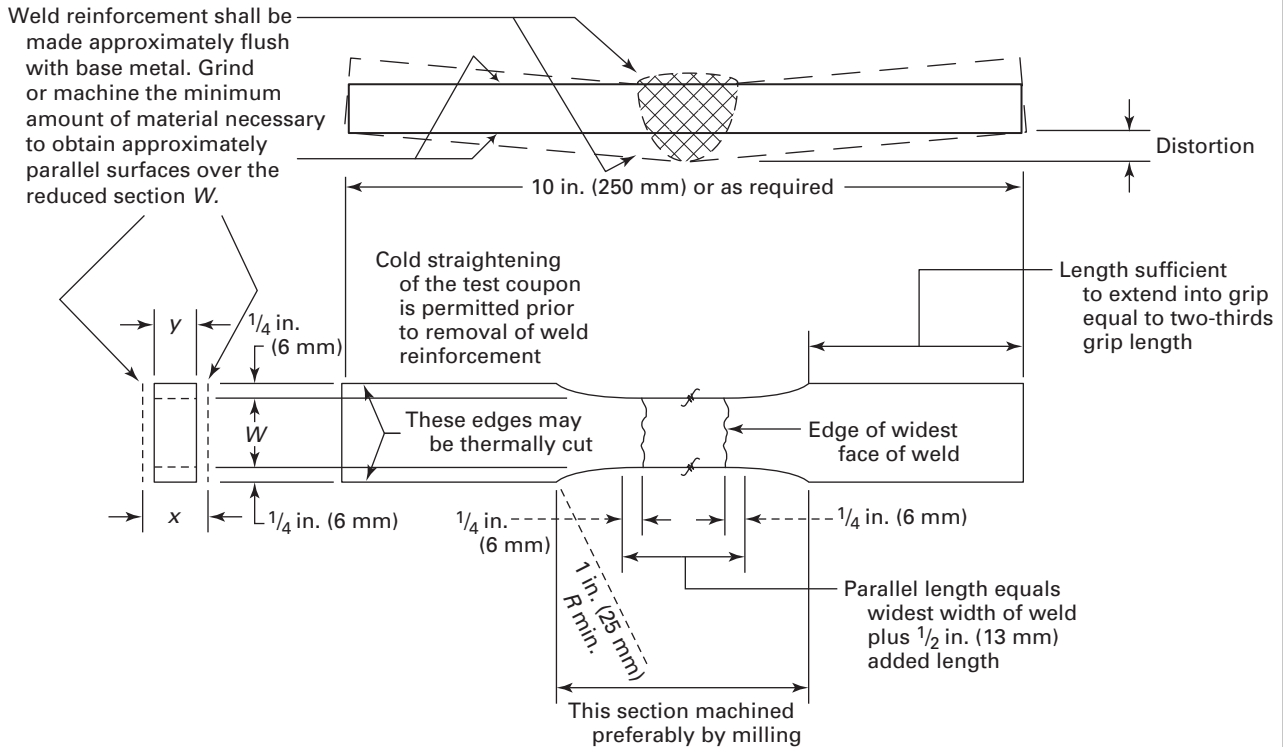
**QW-181.1 Procedure.** The dimensions and preparation of the fillet-weld test coupon for procedure qualification as required in [QW-202](#) shall conform to the requirements in [Figure QW-462.4\(a\)](#) or [Figure QW-462.4\(d\)](#). The test coupon for plate-to-plate shall be cut transversely to provide five test specimen sections, each approximately 2 in. (50 mm) long. For pipe-to-plate or pipe-to-pipe, the test coupon shall be cut transversely to provide four approximately equal test specimen sections. The test specimens shall be macro-examined to the requirements of [QW-183](#).

**QW-181.1.1 Production Assembly Mockups.** Production assembly mockups may be used in lieu of [QW-181.1](#). The mockups for plate-to-plate shall be cut transversely to provide five approximately equal test specimens not to exceed approximately 2 in. (50 mm) in length. For pipe-to-plate mockups, the mockup shall be cut transversely to provide four approximately equal test specimens. For small mockups, multiple mockups may be required to obtain the required number of test specimens. The test specimens shall be macro-examined to the requirements of [QW-183](#).

**QW-181.2 Performance.** The dimensions and the preparation of the fillet-weld test coupon for performance qualification shall conform to the requirements in [Figure](#)

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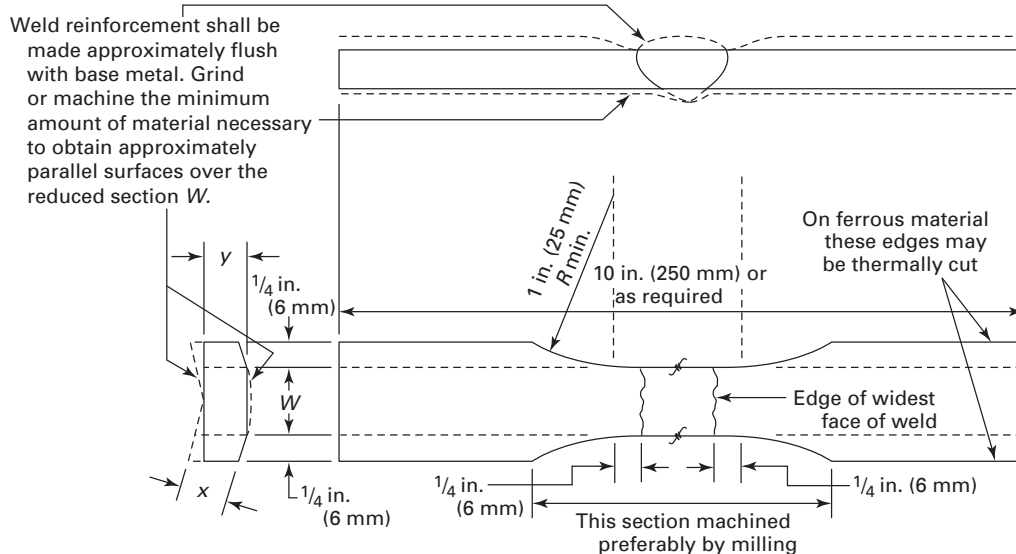
**Figure QW-462.1(a)**  
**Tension — Reduced Section — Plate**



Note to Editor: move General Note out of box, as it applies to both figures on this page, see record# 14-2165.

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**Figure QW-462.1(b)**  
**Tension — Reduced Section — Pipe**



GENERAL NOTE: Specimens having a reduced section nominal width ( $W$ ) that is greater than the nominal  $\frac{3}{4}$  -in. (19-mm) width may be used.