



Standard Practice for Guided Side Bend Evaluation of Polyethylene Pipe Butt Fusion Joint¹

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1. Scope

1.1 This practice provides information on apparatus, specimen preparation and procedure for conducting a guided three point side bend evaluation of a transverse specimen cut from a coupon removed from a butt fusion joint in polyethylene pipe having a wall thickness 1.00 in. (25.4 mm) and thicker. See Fig. 1. This practice provides a means to assess ductility of a butt fusion joint by applying a lateral (side) bending strain across a specimen taken from the full butt fusion cross-section, from outside diameter to inside diameter.

1.2 No test values are provided by this practice. The result is a non-numerical report. Criteria for test result evaluation are provided in standards or codes that specify the use of this practice by comparison to benchmark laboratory results, or by comparison to example results presented in Appendix X1 to this practice.

1.3 *Units*—The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

NOTE 1—Laboratory methods that are commonly used for testing polyethylene butt fusion joints include Test Method D638 and Test Method F2634.

NOTE 2—This practice has been developed for use on butt fusion joints in polyethylene pipe with a wall thickness of 1.00 in. or greater. The practice may be used on butt fusion joints in polyethylene pipe with thinner wall thicknesses. However, the applicability of the practice should be determined by the user of the practice.

¹ This test method is under the jurisdiction of ASTM Committee F17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.40 on Test Methods.

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2. Referenced Documents

2.1 *ASTM Standards*:²

D638 Test Method for Tensile Properties of Plastics

D1600 Terminology for Abbreviated Terms Relating to Plastics

D2122 Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings

F412 Terminology Relating to Plastic Piping Systems

F2634 Test Method for Laboratory Testing of Polyethylene (PE) Butt Fusion Joints using Tensile-Impact Method

3. Terminology

3.1 *Definitions*—Unless otherwise specified, definitions and abbreviations are in accordance with Terminologies D1600 and F412.

3.2 *Definitions of Terms Specific to This Standard*:

3.2.1 *bend angle, n*—The included angle between the surfaces of the side bend specimen on each side of the loading nose that is formed by the deflection of the side bend specimen when the loading nose extends the side bend test specimen through the test fixture rotatable supports.

3.2.2 *bend test coupon, n*—A transverse section of butt fused polyethylene pipe extending from the pipe outside wall to the pipe inside wall and having approximately equal lengths of pipe on each side of a centrally located butt fusion joint. The side bend test specimen is produced from the bend test coupon. See Fig. 1.

3.2.3 *combined fusion bead zone, n*—A transverse through-wall section of the side bend specimen that is bounded by imaginary planes that extend across the pipe wall from the inner and outer fusion bead surfaces of Pipe A and Pipe B fusion beads. See Fig. 2. Butt fusion joints typically produce beads that extend (roll) over the pipe ends both inside and outside of the joint.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.