



Standard Specification for Field-assembled Anodeless Riser Kits for Use on Outside Diameter Controlled Polyethylene and Polyamide-11 (PA11) Gas Distribution Pipe and Tubing¹

This standard is issued under the fixed designation F2509; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope*

1.1 This specification covers requirements and test methods for field-assembled anodeless riser kits for use with outside diameter controlled polyethylene and PA11 gas distribution pipe and tubing in sizes through 2 IPS as specified in Specification [D2513](#) polyethylene and Specification [F2945](#) for PA11.

1.2 The test methods described are not intended to be routine quality control tests.

1.3 This specification covers the types of field-assembled anodeless riser kits described in [3.3.2](#).

1.4 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 not considered standard.

1.5 The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures), shall not be considered as requirements of the standard.

1.6 *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 to determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

- [A513/A513M](#) Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing
- [A53/A53M](#) Specification for Pipe, Steel, Black and Hot-

¹ This specification is under the jurisdiction of ASTM Committee [F17](#) on Plastic Piping Systems and is the direct responsibility of Subcommittee [F17.60](#) on Gas.

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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.

[Dipped, Zinc-Coated, Welded and Seamless](#)

[D638](#) Test Method for Tensile Properties of Plastics

[D1600](#) Terminology for Abbreviated Terms Relating to Plastics

[D2513](#) Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings

[F412](#) Terminology Relating to Plastic Piping Systems

[F1948](#) Specification for Metallic Mechanical Fittings for Use on Outside Diameter Controlled Thermoplastic Gas Distribution Pipe and Tubing

[F2897](#) Specification for Tracking and Traceability Encoding System of Natural Gas Distribution Components (Pipe, Tubing, Fittings, Valves, and Appurtenances)

[F2945](#) Specification for Polyamide 11 Gas Pressure Pipe, Tubing, and Fittings

2.2 ASME Standards:³

[ASME Boiler and Pressure Vessel Code](#)³

[ASME B1.20.1](#) Pipe Threads, General Purpose (Inch)⁴

[B31.8](#) Gas Transmission and Distribution Piping Systems

2.3 Federal Regulations:⁴

[United States CFR, Title 49, Part 192](#) Pipeline Safety Regulations

2.4 UL Standard:⁵

[UL 360](#) Standard for Liquid-Tight Flexible Steel Conduit

3. Terminology

3.1 The gas industry terminology used in this specification is in accordance with ASME B31.8 or the United States CFR, Title 49, Part 192, unless otherwise indicated.

3.1.1 *pipe*—used herein refers to both “pipe” and “tubing” unless specifically stated otherwise.

3.1.2 *gas*—used herein refers to any fuel gas unless specifically stated otherwise.

³ Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Three Park Ave., New York, NY 10016-5990, <http://www.asme.org>.

⁴ Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

⁵ Available from Underwriters Laboratories (UL), 2600 N.W. Lake Rd., Camas, WA 98607-8542, <http://www.ul.com>.

*A Summary of Changes section appears at the end of this standard

3.2 *Definitions*—Definitions are in accordance with Terminology **F412** unless otherwise specified. Abbreviations are in accordance with Terminology **D1600** unless otherwise specified.

3.3 *Definitions:*

3.3.1 *anodeless riser, n*—a type of mechanical fitting which is designed to transport gas from underground polyethylene or PA11 piping to above-ground metallic piping. When properly installed, the polyethylene or PA11 piping is the gas carrier in the below ground portion of an anodeless riser and is protected by a metallic riser casing when it extends above ground level.

3.3.2 *field-assembled anodeless riser kit, n*—A kit containing all of the elements required to assemble an anodeless riser at the point of installation with the exception of the gas-carrying polyethylene or PA11 piping. It consists of, at a minimum, a riser casing and a riser adapter. These components may be either integrally combined or include provisions for attachment to one another at the point of installation.

3.3.3 *mechanical fitting, n*—a device for making a connection between piping components that employs physical force to develop a leak-tight seal, produce alignment, and provide resistance to pullout caused by axial loads.

3.3.4 *riser adapter, n*—a type of mechanical fitting used to join polyethylene and PA11 pipe to a metallic piping connection (typically a pipe thread). Riser adapters are sometimes referred to as service head adapters.

3.3.5 *riser casing, n*—the metallic, non-gas carrying portion of an anodeless riser that serves as a protective conduit for the polyethylene or PA11 piping. It may be either rigid, flexible, or a combination of both.

3.3.6 *qualified installation instructions, n*—a written procedure for making a plastic mechanical joint that has been demonstrated will meet the requirements set forth in the United States CFR, Title 49, Part 192.283(b), and this standard.

4. Materials and Manufacture

4.1 *General:*

4.1.1 All materials of the riser kit shall meet the performance requirements of this specification and applicable referenced specifications. Specific materials referenced in this section are common materials used in these types of products. Alternate materials proven to provide equal or better performance shall be acceptable.

4.1.2 All burrs on metal components which could damage the polyethylene or PA11 piping during assembly shall either be removed or suitably covered with a protective device such as an ID plastic sleeve, to preclude any damage to the polyethylene or PA11 gas piping.

4.2 *Riser Casings:*

4.2.1 Rigid riser casings shall be constructed of Specification **A53/A53M** or **A513/A513M** or equivalent metallic materials with a minimum nominal 0.065 in. (1.65 mm) wall thickness within the allowable tolerance ranges of the applicable metallic piping specification.

4.2.2 Flexible riser casings shall be constructed of plastic coated flexible metallic tubing providing a crush strength of not

less than 1000 lbs. when tested in accordance with UL 360, section **11.1**. The flexible tubing shall also be capable of withstanding a tensile pull of 300 lbs. force without breaking or unwinding when tested in accordance with UL 360, section **10.5**.

4.3 *Moisture Seal:*

4.3.1 The riser casing shall include a bushing or seal at the point where the PE pipe will enter the casing. This seal shall protect the PE pipe from being damaged by the casing end during field assembly and resist the entry of moisture into the casing interior after installation.

4.4 Specifications outlining the properties of the field-assembled riser kit shall be available from the manufacturer upon request.

5. Physical Properties

5.1 *Thread Requirements:*

5.1.1 All gas carrying pipe threads shall comply with ASME B1.20.1

5.2 *Bend Radius Requirements:*

5.2.1 The bend radius of prebent rigid casings shall be such that the PE piping can be inserted during field-assembly without causing damage to the PE pipe.

5.3 *Coatings:*

5.3.1 Field-assembled riser kit coatings, if any, shall be as agreed upon between the buyer and seller.

5.4 *Welding Requirements:*

5.4.1 All gas pressure containing factory welding shall comply with the requirements of the ASME Boiler and Pressure Vessel Code, Section IX or API 1104.

6. Dimensions, Mass, and Permissible Variations

6.1 Because of the varying designs, the actual spread of dimensions is quite different from manufacturer to manufacturer. A table of dimensions and tolerances encompassing these differences would be meaningless and without value and, therefore, are omitted from this specification.

7. Design Qualification Requirements

7.1 The riser adapter shall meet the requirements of Standard Specification **F1948** for category 1 mechanical fittings.

7.2 *Riser Adapter to Riser Casing Connection:*

7.2.1 The connection between the riser adapter and riser casing shall be demonstrated to withstand a pull force greater than 300 lbs. when tested in accordance with **8.2**. Separation of the casing material from the riser adapter shall constitute failure of this test. In designs where the riser casing is constructed of a minimum of schedule 40 steel pipe and the connection to the riser adapter is made using a standard ASME B1.20.1 pipe thread, the design shall be considered to meet the requirements of this section and no testing is required.

8. Test Methods

8.1 *General:*

8.1.1 Unless otherwise specified, prior to testing, condition all samples at an ambient temperature of $67 \pm 10^\circ\text{F}$ ($19.4 \pm 5.6^\circ\text{C}$) for not less than 4 h.

8.1.2 Unless otherwise specified, the test conditions shall be $67 \pm 10^\circ\text{F}$ ($19.4 \pm 5.6^\circ\text{C}$).

8.1.3 Unless otherwise specified, the number of specimens shall be six.

8.2 *Tensile Pull Testing*—Riser Adapter to Casing Connection:

8.2.1 Conduct this test on each different riser adapter to riser casing connection. For kits where this connection is intended to be assembled at the point of installation, it shall be assembled in accordance with the manufacturer's installation procedures.

8.2.2 No polyethylene or PA11 piping shall be assembled within the riser kit while conducting this test.

8.2.3 Affix the connection to be tested in a tensile apparatus in accordance with Test Method **D638**. The equipment shall be capable of subjecting the joint to a constant pull at the rate specified in section **8.2.5**.

8.2.4 The minimum length of casing material shall be 6 in. (15.2 cm).

8.2.5 Tensile pull test the connection at a constant pull rate of $0.2 \pm 25\%$ in./min. ($5 \pm 25\%$ mm/min).

9. Product Instructions

9.1 Qualified installation instructions shall be available from the manufacturer and supplied with the field-assembled riser kit.

10. Product Marking

10.1 If the riser adapter and riser casing comprising the field-assembled anodeless riser kit are integrally combined, they shall be marked with the following:

10.1.1 The manufacturer's name or trademark.

10.1.2 A marking that is traceable (by the manufacturer) to a date, or date range of manufacture.

10.1.3 The nominal PE or PA11 pipe size (including IPS or CTS designation) or the actual OD dimension (in inches), and either the wall thickness (in inches) or dimension ratio of the polyethylene or PA11 piping end connection.

10.1.4 The material designation PE or PA11 indicating the riser has been qualified for use with polyethylene or PA11 piping by the manufacturer.

10.1.5 This designation: F2509.

10.2 If the riser adapter and riser casing comprising the field-assembled anodeless riser kit are supplied as separate components (not integrally combined,) they shall be marked as indicated below:

10.2.1 The riser adapter shall be marked as required by ASTM **F1948**.

10.2.2 The riser casing shall be marked with the following:

10.2.2.1 The manufacturer's name or trademark.

10.2.2.2 A marking that is traceable (by the manufacturer) to a date, or date range of manufacture.

10.2.2.3 This designation: F2509.

10.3 Field assembled risers intended for transport of natural gas shall be marked with the 16-character gas distribution component traceability identifier in accordance with Specification **F2897**. The 16-character code shall be expressed in alphanumeric format and Code 128 bar code format with a minimum bar thickness value of 0.005 in. or an alternative 1D or 2D bar code symbology as agreed upon between manufacturer and end user. All fittings shall have the 16-character codes marked or affixed to the product, product packaging, or any manner agreed upon between manufacturer and end user.

11. Quality Assurance

11.1 When the product is marked with this designation, F2509, the manufacturer affirms that the product was manufactured, inspected, sampled and tested in accordance with this specification and has been found to meet the requirements of this specification.

12. Keywords

12.1 gas; service head adapter; SHA; field-assembled riser; anodeless riser; fuel gas piping; plastic gas piping; polyamide 11 (PA11) piping; polyethylene piping; mechanical fitting; riser adapter; riser casing

SUMMARY OF CHANGES

Committee F17 has identified the location of selected changes to this standard since the last issue (F2509–12) that may impact the use of this standard.

(1) Revisions were made to add Polyamide 11 (PA11) piping to this specification.

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