



Standard Specification for Polyolefin Pipe and Fittings for Drainage, Waste, and Vent Applications¹

This standard is issued under the fixed designation F3371; 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 for non-pressure polyolefin pipe and fittings for drainage, waste, and vent applications.

NOTE 1—This specification does not include requirements for pipe and fittings intended to be used to vent combustion gases.

1.2 Pipe is produced in Schedule 40 and 80 IPS sizes, in metric sizes, and in DR IPS sizes for two polyolefins; polyethylene (PE) and polypropylene (PP).

1.3 The interchangeability of pipe and fittings made by different manufacturers is not addressed in this specification.

1.4 Pipe and fittings are joined by the heat fusion method (Practice D2657 for PP butt and saddle fusion, Practice F2620 for PE butt, saddle and socket fusion and Practice F1290 for polyolefin electrofusion) or by using mechanical or gasketed joints recommended by the pipe and fitting manufacturers.

1.5 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.

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

1.7 The following safety hazards caveat pertains only to the test methods portion, Section 8, of this specification: *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.8 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recom-*

mendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

2. Referenced Documents

2.1 ASTM Standards:²

- D570 Test Method for Water Absorption of Plastics
- D618 Practice for Conditioning Plastics for Testing
- D1600 Terminology for Abbreviated Terms Relating to Plastics
- D2122 Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings
- D2321 Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
- D2412 Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
- D2444 Practice for Determination of the Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)
- D2657 Practice for Heat Fusion Joining of Polyolefin Pipe and Fittings
- D3212 Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
- D3311 Specification for Drain, Waste, and Vent (DWV) Plastic Fittings Patterns
- D3350 Specification for Polyethylene Plastics Pipe and Fittings Materials
- D4101 Classification System and Basis for Specification for Polypropylene Injection and Extrusion Materials
- F412 Terminology Relating to Plastic Piping Systems
- F477 Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
- F585 Guide for Insertion of Flexible Polyethylene Pipe Into Existing Sewers
- F913 Specification for Thermoplastic Elastomeric Seals (Gaskets) for Joining Plastic Pipe
- F1290 Practice for Electrofusion Joining Polyolefin Pipe and Fittings

¹ This test method is under the jurisdiction of ASTM Committee F17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.63 on DWV. Current edition approved April 1, 2019. Published April 2019. DOI: 10.1520/F3371-19

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.

F1498 Specification for Taper Pipe Threads 60° for Thermoplastic Pipe and Fittings

F2620 Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings

2.2 *Federal Standard*.³

Fed. Std. No. 123 Marking for Shipment (Civil Agencies)

2.3 *Military Standard*.³

MIL-STD-129 Marking for Shipment and Storage

2.4 *ISO Standard*.⁴

ISO 265-1 Pipes and Fittings of Plastics Materials – Fittings for Domestic and Industrial Waste Pipes – Basic Dimensions: Metric Series – Part 1: Unplasticized Poly (Vinyl Chloride) (PVC-U)

3. Terminology

3.1 Definitions:

3.1.1 Definitions used in this specification are in accordance with the definitions given in Terminology **F412**, and abbreviations are in accordance with Terminology **D1600**, unless otherwise indicated.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *fire retardant*—material that exhibit reduced surface burning characteristics and resist propagation of fire.

3.2.2 *toe-in, n*—a small reduction of the outside diameter at the cut end of a length of thermoplastic pipe.

4. Classification

4.1 *General*—This specification covers polyolefin pipe made from polyethylene or polypropylene in Schedule 40 and 80 IPS sizes, metric sizes, and DR IPS sizes.

4.2 This specification also includes molded fittings and in larger sizes (8, 10, 12 in.) fabricated fittings.

4.3 The requirements of this specification are intended to provide pipe and fittings suitable for the drainage and venting of sewage and certain other liquid wastes.

NOTE 2—Industrial waste disposal lines should be installed only with the specific approval of the cognizant building code authority since chemicals not commonly found in drains and sewers and temperatures in excess of 180 °F (82 °C) may be encountered.

5. Materials and Manufacture

5.1 Polyethylene (PE) virgin material for pipe or fittings shall be from a single compound manufacturer and shall be made from PE material that meets or exceeds the cell-classification requirements of 112110, 213330, or 324430 as defined in Specification **D3350**.

5.2 Polypropylene (PP) virgin material for pipe or fittings shall meet the requirements for polypropylene Group 01, 02, or 03, as defined in Specification **D4101**.

³ Available from DLA Document Services, Building 4/D, 700 Robbins Ave., Philadelphia, PA 19111-5094, <http://quicksearch.dla.mil>.

⁴ Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <http://www.iso.org>.

5.3 The polyolefin material shall contain suitable stabilizers and antioxidants and may contain pigments and fillers not detrimental to pipe and fittings provided the pipe and fittings produced meet the requirements of this specification.

5.3.1 Polyolefin material can be produced in both regular and flame-retardant compounds for pipe and fittings.

5.4 *Rework Material*—Clean rework material generated from the manufacturer’s own pipe or fitting products may be used by the same manufacturer, using the same type and grade resin, provided that the pipe or fittings produced meet the requirements of this specification.

5.5 *Gaskets*—The elastomeric seal (gasket) shall comply with the requirements of Specification **F477** or **F913** at the time the fittings are manufactured.

5.6 *Lubricant*—The lubricant used for field assembly shall be the type recommended by the manufacturer of the gasketed joint.

6. Requirements

6.1 *General*—The pipe and fittings shall be homogeneous throughout and free of visible cracks, holes, foreign inclusions, or other injurious defects. The pipe shall be as uniform as commercially practicable in color, opacity, density, and other physical properties.

6.1.1 The requirements in this section are intended only for use as quality control tests, not as simulated service tests.

6.2 Dimensions and Tolerances—Pipe:

6.2.1 Standard dimensions and tolerances shall meet the requirements as shown in **Table 1**, **Table 2**, and **Table 3** and when measured in accordance with Test Method **D2122**. The tolerance for out-of-roundness shall apply only to pipe prior to shipment.

6.2.2 Metric dimensions and tolerances shall meet the requirements as shown in **Table 4** and **Table 5** and when measured in accordance with Test Method **D2122**. The tolerance for out-of-roundness shall apply only to pipe prior to shipment.

6.2.3 *Toe-In*—The outside diameter when measured in accordance with Test Method **D2122** shall meet the requirements of **Table 1** or **Table 4** when measured at any point within 1.5

TABLE 1 Outside Diameters and Tolerances for Polyolefin Pipe in. (mm)

Nominal Pipe	Size Average Outside	Diameter Tolerance	Out-of-Roundness (maximum minus minimum)
1¼	1.660 (42.16)	±0.005 (±0.13)	0.050 (1.27)
1½ ^A	1.750 (44.45)	±0.010 (±0.25)	0.060 (1.52)
1½	1.900 (48.26)	±0.006 (±0.15)	0.060 (1.52)
2	2.375 (60.32)	±0.006 (±0.15)	0.070 (1.78)
3	3.500 (88.90)	±0.008 (±0.20)	0.080 (2.03)
4	4.500 (114.30)	±0.009 (±0.23)	0.100 (2.54)
6	6.625 (168.28)	±0.011 (±0.28)	0.100 (2.54)
8	8.625 (219.08)	±0.015 (±0.38)	0.150 (3.81)
10	10.750 (273.05)	±0.015 (±0.38)	0.150 (3.81)
12	12.750 (323.85)	±0.015 (±0.38)	0.150 (3.81)

^ANot an IPS size. Pipe shall be used with compatible fittings designed for this outside diameter. The wall thickness is the same as 1½ in. IPS Schedule 40 shown in **Table 2**.