



Standard Specification for Poly(Vinyl Chloride) (PVC) Schedule 40 Drain, Waste, and Vent Pipe with a Cellular Core¹

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1. Scope*

1.1 This specification covers coextruded poly(vinyl chloride) (PVC) plastic drain, waste and vent pipe made to Schedule 40 iron pipe sizes (IPS) and produced by the coextrusion process with concentric inner and outer solid PVC layers and the core consisting of closed-cell cellular PVC. Plastic which does not meet the material requirements specified in Section 5 is excluded from single layer and all coextruded layers.

1.2 Fittings meeting the requirements of Specification D2665 and D3311 are suitable for use with pipe meeting the requirements of this specification.

1.3 Poly(vinyl chloride) plastic which does not meet the definitions of virgin PVC plastic as given in 5.1 is excluded, as performance of plastic other than those defined as virgin was not determined. PVC rework plastic which meets the requirements of rework plastic as given in 5.2 is acceptable.

1.4 Reprocessed plastic or recycled plastic as defined in Terminology D883 is excluded.

1.5 Recommendations for storage, joining and installation are provided in Appendix X1, Appendix X2, and Appendix X3 respectively.

1.6 The text of this specification references notes, footnotes and appendices 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 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.

1.8 *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.

1.9 *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 Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

- D618 Practice for Conditioning Plastics for Testing
- D883 Terminology Relating to Plastics
- D1600 Terminology for Abbreviated Terms Relating to Plastics
- D2122 Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings
- D2152 Test Method for Adequacy of Fusion of Extruded Poly(Vinyl Chloride) (PVC) Pipe and Molded Fittings by Acetone Immersion
- 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)
- D2564 Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems
- D2665 Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
- D2855 Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets
- D3311 Specification for Drain, Waste, and Vent (DWV)

¹ This specification is under the jurisdiction of ASTM Committee F17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.63 on DWV.

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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.

Plastic Fittings Patterns

D4396 Specification for Rigid Poly(Vinyl Chloride) (PVC) and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds for Plastic Pipe and Fittings Used in Nonpressure Applications

F402 Practice for Safe Handling of Solvent Cements, Primers, and Cleaners Used for Joining Thermoplastic Pipe and Fittings

F412 Terminology Relating to Plastic Piping Systems

F628 Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe With a Cellular Core

F656 Specification for Primers for Use in Solvent Cement Joints of Poly(Vinyl Chloride) (PVC) Plastic 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 *Plastic Pipe Institute*.⁴

PPI-TR-7 Recommended Method For Calculation of Nominal Weight of Plastic Pipe

3. Terminology

3.1 *Definitions*—Definitions are in accordance with Terminology **F412** and abbreviations are in accordance with Terminology **D1600**, unless otherwise specified. The abbreviations for poly(vinyl chloride) plastic is PVC.

3.2 *coextruded pipe*—pipe consisting of two or more concentric layers of material bonded together in processing by any combination of temperature, pressure, grafting, crosslinking or adhesion.

3.3 *Definitions of Terms Specific to This Standard*:

3.3.1 *IPS schedule 40 series*—Pipe pipe produced to an iron pipe outside diameter with a Schedule 40 wall thickness.

3.3.2 *recycled plastic*—a plastic prepared from discarded articles that have been cleaned and reground.

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

⁴ Available from Plastics Pipe Institute (PPI), 105 Decker Court, Suite 825, Irving, TX 75062, <http://www.plasticpipe.org>.

4. Classification

4.1 Pipe produced in accordance with this specification is intended to provide pipe suitable for the drainage and venting of sewage and certain other liquid wastes.

NOTE 1—Before installing pipe for waste disposal use, the approval of the cognizant building code authority should be obtained as conditions not commonly found in normal use may be encountered and temperatures in excess of 140°F (60°C) may be encountered.

NOTE 2—This specification does not include requirements for pipe intended to be used to vent combustion gases.

5. Materials

5.1 *Material Specification*—The PVC material shall conform to the requirements prescribed in Specification **D4396** with a cell classification of 11432. PVC material which has a higher cell class than that listed is acceptable.

5.2 *Rework Material*—The manufacturer shall use only his own clean rework pipe material conforming with these cell class requirements. It shall be used only in the core layer if it contains any residual blowing agent. The pipe produced shall meet all requirements of this specification.

5.3 *Cellular Material*—Cellular PVC used in the core layer shall be of a closed cell structure when tested in accordance with **6.3.6**.

6. Requirements

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

6.2 *Dimensions and Tolerances*:

6.2.1 *Outside Diameter*—the outside diameter and tolerances shall meet the requirements of **Table 1** when measured in accordance with Test Method **D2122**. The tolerances for out-of-roundness shall apply to pipe prior to shipment.

6.2.2 *Wall Thickness*—The wall thickness and tolerances shall meet the requirements of **Table 2** when measured in accordance with Test Method **D2122**.

6.2.3 *Length*—The pipe length may be 7 ft, 10 ft, 12 ft, or 20 ft with a tolerance on length of +1/2, -0 in., unless otherwise specified.

6.3 *Performance Requirements*:

TABLE 1 Outside Diameter and Tolerances

Nominal Pipe Size,	Outside Diameter,	Tolerance on Average	Out-of-Roundness
in.	in. (mm)	Outside Diameter, in. (mm)	in. (mm)
1¼	1.660 (42.16)	±0.005 (0.13)	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)	0.060 (1.52)
3	3.500 (88.90)	±0.008 (0.20)	0.060 (1.52)
3 ½	4.000 (101.60)	±0.008 (0.20)	0.100 (2.54)
4	4.500 (114.30)	±0.009 (0.23)	0.100 (2.54)
5	5.563 (141.30)	±0.010 (0.25)	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)