



Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent (DWV) Pipe and Fittings Having Post-Industrial Recycle Content¹

This standard is issued under the fixed designation F2390; 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 materials, dimensions and tolerances, pipe stiffness, crush resistance, impact resistance, hydrostatic burst resistance, and solvent cement for poly(vinyl chloride) plastic drain, waste, and vent (DWV) pipe and fittings.

1.2 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.

1.3 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.

1.4 The following safety hazards caveat pertains only to the test methods portion, Section 7, 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.*

NOTE 1—Pressurized (compressed) air or other compressed gases contain large amounts of stored energy which present serious safety hazards should a system fail for any reason.

1.5 *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.*

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. Current edition approved Aug. 1, 2021. Published August 2021. Originally approved in 2007. Last previous edition approved in 2017 as F2390–12(2017). DOI: 10.1520/F2390-21.

2. Referenced Documents

2.1 ASTM Standards:²

- D618 Practice for Conditioning Plastics for Testing
- D1599 Test Method for Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings
- D1600 Terminology for Abbreviated Terms Relating to Plastics
- D1784 Classification System and Basis for Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
- D2122 Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings
- 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
- F2135 Specification for Molded Drain, Waste, and Vent (DWV) Short-Pattern Plastic Fittings
- D3311 Specification for Drain, Waste, and Vent (DWV) Plastic Fittings Patterns
- 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
- F1498 Specification for Taper Pipe Threads 60° for Thermoplastic Pipe and Fittings
- F1866 Specification for Poly (Vinyl Chloride) (PVC) Plastic Schedule 40 Drainage and DWV Fabricated Fittings

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.

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

3. Terminology

3.1 *Definitions*—Definitions are in accordance with Terminology in **F412**, and abbreviations are in accordance with Terminology in **D1600**, unless otherwise specified.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *certificate of composition disclosure, n*—a certificate describing certain properties of an external recycled material, its formulation and source, and the specific material shipment to which it applies.

3.2.1.1 *Discussion*—Examples include polymer(s), molecular weight, percentage (and type) of inorganic material, tensile strength, modulus of elasticity, and izod impact; code or designation identifying the formulation and source information.

3.2.2 *post-industrial recycle, n*—recycled PVC material generated by a company or manufacturing plant that is different than the location producing products to this specification.

3.2.2.1 *Discussion*—Material used for a different product produced by the same manufacturer shall be considered as post-industrial recycle material for the product of this standard, unless the different product is made from the same compound.

3.2.3 *post-consumer recycle, n*—PVC plastic material used in products that have proceeded into the chain of commerce beyond the control of the original manufacturer.

3.2.3.1 *Discussion*—These materials are generally recycled by the users or consumers of the product, and have no specific identity or specificity of the compound.

3.2.3.2 *Discussion*—Post-consumer recycled material is NOT post-industrial recycle and is prohibited from use in products within this specification (see **5.4.1**)

4. Significance and Use

4.1 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—This standard specifies dimensional, performance and test requirements for plumbing and fluid handling, but does not address venting of combustion gases.

NOTE 3—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 (82.2 °C) may be encountered.

5. Materials

5.1 *Basic Materials*—The pipe and fittings shall be made from a uniform blend containing virgin PVC compound and between 10 % by weight and 50 % by weight of post-industrial recycle material. The finished compound shall meet or exceed the minimum cell classification material requirements specified in **5.2**, Virgin PVC Compounds.

5.2 *Virgin PVC Compounds*—Virgin PVC pipe compounds shall meet or exceed the requirements of Class 12454 as defined in Specification **D1784**. Virgin PVC fitting compounds shall meet or exceed the requirements of Class 12344 as defined in Specification **D1784**, but with a tensile strength of not less than 6 500 psi and a modulus of elasticity of not less than 380 000 psi. These plastics contain stabilizers, lubricants, and pigments.

5.3 *Rework Material*—The manufacturer is permitted to use his own clean pipe or fitting rework material, except as specified in **5.4**, provided that the pipe or fittings produced shall meet all the requirements of this specification.

5.4 *Post-Industrial Recycled Materials*—The pipe or fittings manufacturer shall use post-industrial recycle material, as defined in **3.2.3** at a level of at least 10 % by weight or volume, but not exceeding 50 % by weight or volume.

5.4.1 *Post-Industrial Recycle Source*—The post-industrial recycle shall be clean, of a known source, and each shipment shall be provided with a certificate of composition disclosure. Post-consumer recycled materials shall not be used.

5.4.1.1 When blending with the manufacturer's own internal rework, the total post-industrial recycle level in the finished compound shall not exceed 50 %, by weight or volume.

5.4.1.2 Composition of the post-industrial recycle shall be known by the industrial source of the material.

5.4.1.3 The material shall not be purchased from a 3rd-party (for example, grinding, re-packaging facility, broker, etc.) unless there is a documented system in place to ensure that the material is clean, free of contamination and is of a single source and single material compound.

6. Requirements

6.1 *General*—The pipe and fittings shall be 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 characteristic minimum properties, not as simulated service tests.

6.2 *Dimensions and Tolerances:*

6.2.1 *Method*—All dimensions shall be determined in accordance with Test Method **D2122**.

6.2.2 *Dimensions:*

6.2.2.1 The outside diameter and wall thicknesses of pipe shall meet the requirements of **Table 1**. The pipe shall be in either 10 ft or 20 ft (3.05 m or 6.1 m) lengths, unless otherwise specified, with an allowable tolerance of +1/2, -0 in. (+13, -0 mm).

6.2.2.2 The patterns, dimensions, and laying lengths of fittings, including adaptors, shall meet the requirements of Specification **D3311** and **Table 2**.

6.2.2.3 The patterns, dimensions, and laying lengths of Short-Pattern fittings shall meet the requirements of Specification **F2135**.

6.2.2.4 The spigot dimensions of fittings shall meet the requirements of **Table 1**.

6.2.2.5 For all fittings having taper pipe threads, threads shall conform to Specification **F1498** and be gauged in accordance with **7.5**. Fittings of nominal sizes not given in Specification **F1498** shall not have threads.

6.2.2.6 Fabricated DWV fittings shall comply with **F1866**.

6.3 *Pipe Stiffness, Deflection Load and Flattening:*

6.3.1 *Pipe*—The minimum pipe stiffness at 5 % deflection shall be in accordance with **Table 3**. The pipe shall deflect by 60 % of the nominal outside diameter (flattening) without