Designation: F2817 – 13

An American National Standard

Standard Specification for Poly (Vinyl Chloride) (PVC) Gas Pressure Pipe and Fittings For Maintenance or Repair[1]

This standard is issued under the fixed designation F2817; 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 PVC pipe and tubing for use only to maintain or repair existing PVC gas piping. This specification covers requirements for fittings for use to maintain or repair existing PVC gas piping.

1.1.1 In-plant quality control programs are specified in Annex A1.

1.2 The text of this specification references notes and, 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.

1.3 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 The following is an index of the annexes in this specification:

Annex	Subject
Annex A1	In-Plant Quality Control for PVC materials up to 6 in.

1.5 *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.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D543 Practices for Evaluating the Resistance of Plastics to Chemical Reagents

D618 Practice for Conditioning Plastics for Testing

D638 Test Method for Tensile Properties of Plastics

D1598 Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure

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 Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds

D1898 Practice for Sampling of Plastics (Withdrawn 1998)[3]

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

D2290 Test Method for Apparent Hoop Tensile Strength of Plastic or Reinforced Plastic Pipe

D2412 Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading

D2444 Test Method for Determination of the Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)

D2466 Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40

D2564 Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems

D2837 Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products

F412 Terminology Relating to Plastic Piping Systems

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

2.2 *Plastic Pipe Institute:*[4]

PPI TR-4 Hydrostatic Design Bases and Maximum Recommended Hydrostatic Design Stresses for Thermoplastic Piping Materials

[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.

Current edition approved Aug. 1, 2013. Published August 2013. Originally approved in 2010. Last previous edition approved in 2010 as F2817–10. DOI: 10.1520/F2817–13.

[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.

[3] The last approved version of this historical standard is referenced on www.astm.org.

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

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

PPI TR-9 Recommended Design Factors and Design Coefficients for Thermoplastic Pressure Pipe

2.3 *Other Standards:*

ANSI B31.8 Gas Transmission and Distribution Piping Systems[5]

CFR Part 192 Transportation Of Natural And Other Gas By Pipeline: Minimum Federal Safety Standards[6]

MIL-STD-1235 Single- and Multi-Level Continuous Sampling Procedures and Tables for Inspection by Attributes[6]

3. Terminology

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

3.2 The gas industry terminology used in this specification is in accordance with ANSI B31.8 or 49 CFR Part 192, unless otherwise indicated.

3.3 The term pipe used herein refers to both pipe and tubing unless specifically stated otherwise.

3.4 *pipe material designation code*—code for thermoplastic pipe materials defined by the Plastics Pipe Institute in PPI TR-4.

3.5 *category 1 mechanical fitting, n*—fitting for assembling pipes, which includes a compression zone(s) to provide for pressure integrity, leak tightness, and resistance to end loads sufficient to cause no less than 25 % elongation of the PVC piping as described in this specification.

3.6 *in-line fitting, n*—mechanical fitting used to make a mechanical joint where the bore axis of the compression and sealing zones of the fitting is essentially the same as the connected piping, for example, couplings, ells, and tees.

3.7 *mechanical saddle fitting, n*—mechanical fitting used to make a mechanical joint that allows a lateral connection to an existing main in which a portion of the fitting is contoured to match the O.D. of the pipe to which it is attached.

[5] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

[6] Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, http://dodssp.daps.dla.mil.

4. Materials

4.1 *General*—The plastic used to make PVC pipe and PVC fittings shall be virgin plastic or reworked plastic (see 4.2) and shall have a Plastics Pipe Institute (PPI) long-term hydrostatic design stress and hydrostatic design basis rating.

4.2 *Rework Material*—Clean rework material of the same commercial designation, generated from the manufacturer's own pipe and fitting production shall not be used unless the pipe and fitting produced meet all the requirements of this specification.

4.3 *Compound*—The PVC compounds used for pipe and fittings shall equal or exceed the following classes described in Specification D1784, PVC 12454, or 14333. The minimum HDB at 73°F (23°C) shall be 3150 psi.

4.4 *Elevated Temperature Service*—PVC piping materials intended for use at temperatures above 73°F (23°C) shall have the PPI hydrostatic design basis (HDB) determined at the specific temperature in accordance with Test Method D2837. PVC piping materials intended for use at temperatures above 73°F (23°C) shall use the PVC temperature derating factors specified in PPI TR-9.

5. Requirements

5.1 *General*—Pipe shall be supplied in straight lengths.

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

5.3 *Pipe and Tubing:*

5.3.1 *Outside Diameter*—The outside diameters and tolerances shall be as shown in Table 1 when measured in accordance with Test Method D2122. The tolerances for out-of-roundness shall apply only on pipe prior to shipment.

5.3.2 *Wall Thickness*—The wall thicknesses and tolerances shall be as shown in Table 2 when measured in accordance with Test Method D2122.

5.4 *PVC Socket Cement Fitting Dimensions and Tolerances:*

TABLE 1 IPS PVC Pipe—Outside Diameters and Tolerances

Nominal Pipe Size (NPS)	Average Outside Diameter, in. (mm)	Tolerances, in. (mm)		
		For Average	Maximum Out-of-Roundness (Maximum – Minimum Diameter)	
			SDR21	SDR17, SDR13.5, SDR11
⅛	0.405 (10.29)	±0.004 (0.10)	...	0.016 (0.41)
¼	0.540 (13.72)	±0.004 (0.10)	...	0.016 (0.41)
⅜	0.675 (17.14)	±0.004 (0.10)	...	0.016 (0.41)
½	0.840 (21.34)	±0.004 (0.10)	...	0.016 (0.41)
¾	1.050 (26.67)	±0.004 (0.10)	...	0.020 (0.51)
1¼ 4	1.660 (42.16)	±0.005 (0.13)	0.030 (0.76)	0.024 (0.61)
1½	1.900 (48.26)	±0.006 (0.15)	0.060 (1.52)	0.024 (0.61)
2	2.375 (60.32)	±0.006 (0.15)	0.060 (1.52)	0.024 (0.61)
3	3.500 (88.90)	±0.008 (0.20)	0.060 (1.52)	0.030 (0.76)
4	4.500 (114.30)	±0.009 (0.23)	0.100 (2.54)	0.030 (0.76)
6	6.625 (168.28)	±0.011 (0.28)	0.100 (2.54)	0.070 (1.78)