Designation: F2658 – 24

# Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) SDR 51 and SDR 64 Sewer Pipe and Fittings[1]

This standard is issued under the fixed designation F2658; 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, workmanship, flattening resistance, impact resistance, pipe stiffness, extrusion quality, joining systems and a form of marking for type PSM poly(vinyl chloride) (PVC) SDR 51 and SDR 64 sewer pipe and fittings.

1.2 Pipe and fittings produced to this specification should be installed in accordance with Practice D2321.

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 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.

1.5 The following precautionary 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.*

1.6 *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

D1600 Terminology for Abbreviated Terms Relating to Plastics (Withdrawn 2024)[3]

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

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

D2749 Symbols for Dimensions of Plastic Pipe 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

D3034 Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings

F412 Terminology Relating to Plastic Piping Systems

2.2 *Federal Standard:*

Fed. Std. No. 123 Marking for Shipment (Civil Agencies)[4]

2.3 *Military Standard:*

MIL-STD-129 Marking for Shipment and Storage[4]

## 3. Terminology

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

3.1.1 The term PSM is not an abbreviation but rather an arbitrary designation for a product having certain dimensions.

[1] This specification is under the jurisdiction of ASTM Committee F17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.62 on Sewer.

Current edition approved April 1, 2024. Published May 2024. Previous edition approved in 2019 as F2658 – 07(2019). DOI: 10.1520/F2658-24.

[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 DLA Document Services, Building 4/D, 700 Robbins Ave., Philadelphia, PA 19111-5094, http://quicksearch.dla.mil.

## 4. Significance and Use

4.1 The requirements of this specification are intended to provide pipe and fittings suitable for non-pressure drainage of sewage and surface water.

NOTE 1—Industrial waste disposal lines should be installed only with the specific approval of the cognizant code authority since chemicals not commonly found in drains and sewers and temperatures in excess of 60 °C (140 °F) may be encountered.

NOTE 2—See D2321 Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications for installation recommendations.

## 5. Basic Materials

5.1 Pipe shall be made of PVC plastic having a cell classification of 12454 or 12364 as defined in Specification D1784.

5.2 Fittings shall be made of PVC plastic having a cell classification of 12454 or 13343 as defined in Specification D1784.

5.3 *Pipe and Fitting*—Compounds that have different cell classifications, because one or more properties are superior to those of the specified compounds, are also acceptable.

5.4 *Rework Material*—The manufacturer shall use only his own clean pipe or fitting rework material; the pipe and fittings produced shall meet all the requirements of this specification.

## 6. Joining Systems

6.1 *Solvent Cement Joints for Pipe and Fittings*—In the solvent cement joint, the pipe spigot wedges into the tapered socket and the surfaces fuse together. The tapered socket may be a portion of a molded fitting or it may be a belled end of the pipe section. Formed bells shall be concentric with the pipe axis. Fittings meeting the requirements of Specification D3034 shall also be permitted to be used with pipe meeting the requirements of this standard.

6.1.1 The assembly of joints shall be in accordance with Practice D2855.

6.1.2 *Joint Tightness*—Joints made with pipe and fittings shall show no signs of leakage when tested in accordance with 8.9.

## 7. Requirements

7.1 *Workmanship*—The pipe and fittings shall be homogeneous throughout and free from visible cracks, holes, foreign inclusions, or other injurious defects. The pipe shall be as uniform as commercially practical in color, opacity, density, and other physical properties.

7.2 *Pipe Requirements:*

7.2.1 *Diameter*—The average outside diameter of the pipe shall meet the requirements given in Table 1 when measured in accordance with 8.4.1.

7.2.2 *Wall Thickness*—Pipe wall thicknesses shall meet the requirements of Table 1 when measured in accordance with Test Method D2122 and 8.4.2. In the case of belled pipe and fittings fabricated from pipe sections, the thickness of the wall in the bell shall be considered satisfactory if it was formed from pipe meeting the preceding requirements.

**TABLE 1 Pipe Dimensions**

| Nominal Size | Outside Diameter | | Minimum Wall Thickness | |
|---|---|---|---|---|
| | Average | Tolerance on Average | SDR 51 | SDR 64 |
| 3 | 3.250 | ±0.008 | 0.064 | 0.051 |
| 4 | 4.215 | ±0.009 | 0.083 | 0.066 |
| 6 | 6.275 | ±0.011 | 0.123 | 0.098 |
| 8 | 8.400 | ±0.012 | 0.165 | 0.131 |
| 9 | 9.440 | ±0.014 | 0.185 | 0.148 |
| 10 | 10.500 | ±0.015 | 0.206 | 0.164 |
| 12 | 12.500 | ±0.018 | 0.245 | 0.195 |
| 15 | 15.300 | ±0.023 | 0.300 | 0.239 |

7.2.3 *Pipe Flattening*—There shall be no evidence of splitting, cracking, or breaking when pipe is tested in accordance with 8.6.

7.2.4 *Pipe Impact Strength*—The impact strength of the pipe shall not be less than the values given in Table 2 when tested in accordance with 8.7.

NOTE 3—This test is intended only for use as a quality control test, not as a simulated service test.

7.2.5 *Pipe Stiffness*—Pipe stiffness values for the pipe shall comply with Table 3 when tested in accordance with 8.8.

7.2.6 *Pipe Extrusion Quality*—The pipe shall not flake or disintegrate when tested in accordance with 8.10.

7.3 *Requirements for Solvent Cemented Pipe and Fittings:*

7.3.1 *Socket Diameter*—The inside diameter of the tapered socket shall comply with the dimensions listed in Table 4 when determined in accordance with 8.5.1.

7.3.2 *Socket Depth*—The socket depth shall not be less than that shown in Table 4 when measured in accordance with 8.5.2.

7.3.3 *Alternate Fittings*—Fittings meeting the requirements of Specification D3034 shall also be permitted to be used in joining pipe specified in this standard.

7.4 *Fabricated Fittings*—Any fitting made from pipe or from a combination of pipe and molded parts shall be considered a fabricated fitting and the following provisions shall apply.

7.4.1 *Over-Wrapped Fittings*—Fabricated fittings that have an over-wrap of fiberglass reinforced thermosetting resin or other similar materials shall meet all of the requirements in 7.4.2 and 7.4.3.

NOTE 4—Refer to Appendix X3 for geometric configurations of some of the fittings being produced. Consult the individual manufacturer for laying lengths.

7.4.2 *Fabricated Fittings General Requirements:*

**TABLE 2 Minimum Pipe Impact Strength at 23 °C (73 °F)**

| Nominal Pipe Size | Impact Strength, ft·lbf (J) |
|---|---|
| 3 | 100 (135) |
| 4 | 150 (203) |
| 6 | 210 (284) |
| 8 | 210 (284) |
| 9 | 220 (299) |
| 10 | 220 (299) |
| 12 | 220 (299) |
| 15 | 220 (299) |