

*Standard Specification
for*



**Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride)
(PVC) Composite Sewer Piping**

AASHTO DESIGNATION: M 264-92 (2000)

AASHTO M 264-92 (2000) is identical to ASTM D 2680-93 except for the following provisions:

1. Add the following to Section 2.1 of ASTM D 2680-93:

D 883 Definitions of Terms Relating to Plastics.

2. Replace the first sentence of Section 3.1.1 of ASTM D 2680-93 with the following:

Definitions are in accordance with ASTM D 883 and F 412 and abbreviations are in accordance with ASTM D 1600, unless otherwise indicated.

3. Replace the first sentence of Section 5.2.2 of ASTM D 2680-93 with the following:

The thermoplastic material shall be a rigid PVC plastic and shall meet or exceed the requirements of ASTM D 4396, for a minimum cell classification of 11432.



Designation: D 2680 – 93

Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Composite Sewer Piping¹

This standard is issued under the fixed designation D 2680; 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.

This specification has been approved for use by agencies of the Department of Defense. Consult the DOD Index of Specifications and Standards for the specific year of issue which has been adopted by the Department of Defense.

1. Scope

1.1 This specification covers thermoplastic composite pipe, fittings and a joining system for use in gravity flow, nonpressure sanitary sewer, and storm drain installations. The pipe and fittings are made of ABS or PVC plastic material. Recommended installation practices are referenced in Appendix XI.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are provided for information only.

1.3 The following safety hazards caveat pertains only to the test method portion, Section 10, of this specification: *This standard does not purport to address all of the safety problems, 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.* Specific precautionary information is given in Note 5.

2. Referenced Documents

2.1 ASTM Standards:

- D 618 Practice for Conditioning Plastics and Electrical Insulating Materials for Testing²
- D 1084 Test Methods for Viscosity of Adhesives³
- D 1600 Terminology for Abbreviated Terms Relating to Plastics⁴
- D 1784 Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds⁵
- D 2122 Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings⁵
- D 2152 Test Method for Degree of Fusion of Extruded Poly(Vinyl Chloride) (PVC) Pipe and Molded Fittings by Acetone Immersion⁵
- D 2235 Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings⁵

D 2321 Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications⁵

D 2412 Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading⁵

D 2564 Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems⁵

D 3138 Specification for Solvent Cements for Transition Joints Between Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Non-Pressure Piping Components⁵

D 3212 Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals⁵

D 3965 Specification for Rigid Acrylonitrile-Butadiene-Styrene (ABS) Compounds for Pipe and Fittings⁵

D 4396 Specification for Rigid Poly(Vinyl Chloride)(PVC) and Related Plastic Compounds for Nonpressure Piping Products⁵

F 402 Practice for Safe Handling of Solvent Cements and Primers Used for Joining Thermoplastic Pipe and Fittings⁵

F 412 Terminology Relating to Plastic Piping Systems⁵

F 477 Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe⁵

F 913 Specification for Thermoplastic Elastomeric Seals (Gaskets) for Joining Plastic Pipe⁵

2.2 Federal Standard:

Fed. Std. No. 123 Marking for Shipment (Civil Agencies)⁶

2.3 Military Standard:

MIL-STD-129 Marking for Shipment and Storage⁶

3. Terminology

3.1 Definitions:

3.1.1 *General*—Definitions are in accordance with Terminology F 412 and abbreviations are in accordance with Terminology D 1600, unless otherwise specified. The abbreviation for acrylonitrile-butadiene-styrene is ABS and the abbreviation for poly(vinyl chloride) is PVC.

3.2 Descriptions of Terms Specific to This Standard:

3.2.1 *acrylonitrile-butadiene-styrene (ABS)*—plastics containing polymers or blends of polymers, or both, in which the minimum butadiene content is 6 %; the minimum acrylonitrile content is 15 %; the minimum styrene or

¹ This specification is under the jurisdiction of ASTM Committee F-17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.62 on Sewer.

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² Annual Book of ASTM Standards, Vol 08.01.

³ Annual Book of ASTM Standards, Vol 15.06.

⁴ Annual Book of ASTM Standards, Vols 08.01 and 08.04.

⁵ Annual Book of ASTM Standards, Vol 08.04.

⁶ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

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substituted styrene content, or both, is 15 %; and the maximum content of all other monomers is not more than 5 %, plus lubricants, stabilizers, and colorants.

3.2.2 *poly (vinyl chloride) (PVC)*—plastic compounds containing poly(vinyl chloride) homopolymer, and such additives as stabilizers, lubricants, processing aids, impact improvers, and colorants as needed to provide the required processing and toughness characteristics.

4. Classification

4.1 Pipe produced in accordance with this specification shall be classified as ABS composite pipe or PVC composite pipe based on plastic materials used in manufacture.

5. Materials and Manufacture

5.1 ABS composite pipe or PVC composite pipe shall consist of two concentric thermoplastic tubes integrally braced across the annulus. The resultant annular space is filled to provide continuous support between the inner and outer tubes.

5.2 *Compounds*—The ABS and PVC composite pipe and fittings shall be produced from the following compounds:

5.2.1 *ABS*—The pipe shall be made from a rigid ABS plastic and shall meet or exceed the requirements of Specification D 3965 for a minimum cell classification of 1-0-2-2-3. The fittings shall be made from ABS plastic and shall meet or exceed the requirements of Specification D 3965 for cell classifications of 1-0-2-2-3 or 4-2-2-2-2. Clean rework ABS, generated from the manufacturer's own pipe extrusion and fittings may be used by the same manufacturer, provided that the pipe and fittings produced meet all the requirements of this specification.

5.2.2 *PVC*—The thermoplastic material shall be a rigid PVC plastic and shall meet or exceed the requirements of Specification D 1784, for a minimum cell classification of 12454B or 12454C or of Specification D 4396, for a minimum cell classification of 11432. Homopolymer PVC compounds that have higher cell classifications, because one or more properties are superior to those of the specified compounds, are also acceptable. Clean rework PVC, generated from the manufacturer's own pipe and fittings production may be used by the same manufacturer provided that the pipe and fittings produced meet all the requirements of this specification.

5.3 The other component shall be portland cement-perlite concrete or other inert filler material exhibiting the same degree of performance, that essentially fills the truss annulus

to form a composite pipe that meets the requirements of this specification.

5.4 *Gaskets*—Elastomeric seals (gaskets) shall comply with requirements described in Specifications F 477 and F 913.

NOTE—Gasket joints manufactured for PVC composite pipe only.

5.5 *Lubricants*—The lubricant used for the assembly of gasket joints shall have no detrimental effect on the gasket or on the pipe.

6. Performance Requirements

6.1 *Pipe Stiffness*—Pipe tested in accordance with 10.2 shall have a minimum pipe stiffness of 200 lb/in./in. (1380 kPa) at 5% deflection.

6.2 *Pipe Deflection*—Pipe tested in accordance with 10.2 shall deflect a minimum of 7.5 % without rupture of inner or outer wall.

NOTE 1—The purpose of the quality control tests in 6.1 and 6.2 is to furnish test results for a consumer only upon his request at the time of order and prior to shipment from the point of manufacture.

6.3 *Acid Conditioning*—Pipe tested in accordance with 10.3 shall meet the requirements of 6.1 and 6.2.

NOTE 2—This test is intended only for use as a qualification test, not for use as a simulated service test nor a quality control test.

6.4 *Joint Tightness:*

6.4.1 *Solvent Cement Joints*—Pipe and fittings attached to the pipe shall show no signs of leakage when tested in accordance with 10.4.1 (See Note 2).

6.4.2 *Gasket Joints for PVC Composite Pipe*—Joints shall show no signs of leakage when tested in accordance with 10.4.2 (See Note 2).

6.5 *Extrusion Quality*—When tested in accordance with 10.5, PVC extruded pipe tubes shall not flake or disintegrate.

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

7. Other Requirements

7.1 *Joints and Fittings* as shown in Figs. 1 and 2, shall be molded or fabricated from materials described in Section 5. Joints and fittings may be factory-attached to the pipe or furnished loose, at the option of the purchaser.

7.2 *Solvent Cement Joints:*

7.2.1 *Solvent Cement Joint*—In the solvent cement joint, the pipe spigot wedges into the tapered socket and the surfaces fuse together.

7.2.2 *ABS Solvent Cement Joints*—Primer for priming solvent cemented joints shall be MEK (methyl ethyl ketone) and the cement shall be MEK containing a minimum of

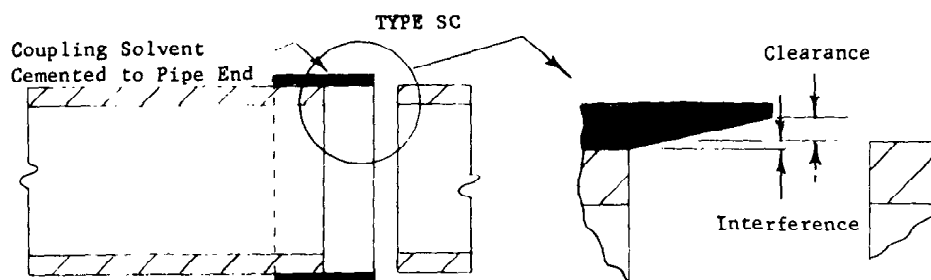


FIG. 1 Assembly of Joints