



Standard Specification for Primers for Use in Solvent Cement Joints of Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings¹

This standard is issued under the fixed designation F656; 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 primers for use with poly(vinyl chloride) (PVC) pipe and fittings that are to be joined by PVC solvent cements meeting the requirements of Specification [D2564](#).

1.2 These primers are used in pressure and nonpressure applications with plain end pipe and either socket-type fittings or bell end pipe. These primers prepare the surface of pipe and fittings before the application of solvent cement. The primer's effect on the set and cure time of the joint is dependent on the cement, pipe size, application method, temperature, and humidity.

1.3 A procedure for using the primer with cement is given in Practice [D2855](#).

1.4 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.

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

1.6 The following safety hazards caveat pertains only to the test methods portion, Section 6, 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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

¹ This specification is under the jurisdiction of ASTM Committee [F17](#) on Plastic Piping Systems and is the direct responsibility of Subcommittee [F17.20](#) on Joining. Current edition approved Aug. 1, 2015. Published August 2015. Originally approved in 1980. Last previous edition approved in 2010 as F656 – 10. DOI: 10.1520/F0656-15.

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.

- [D1600 Terminology for Abbreviated Terms Relating to Plastics](#)
- [D1784 Specification for Rigid Poly\(Vinyl Chloride\) \(PVC\) Compounds and Chlorinated Poly\(Vinyl Chloride\) \(CPVC\) Compounds](#)
- [D2564 Specification for Solvent Cements for Poly\(Vinyl Chloride\) \(PVC\) Plastic Piping Systems](#)
- [D2855 Practice for Making Solvent-Cemented Joints with Poly\(Vinyl Chloride\) \(PVC\) Pipe and Fittings](#)
- [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](#)
- [F493 Specification for Solvent Cements for Chlorinated Poly\(Vinyl Chloride\) \(CPVC\) Plastic Pipe and Fittings](#)

2.2 NSF/ANSI Standards:³

- [Standard No. 14 for Plastics Piping System Components and Related Materials](#)
- [Standard No. 61 for Drinking Water System Components – Health Effects](#)

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 Definitions:

3.2.1 *fluorescent primer*—a primer which is clear and colorless when viewed under visible light such as sunlight and indoor lighting, but which is readily visible when viewed under UV light (also known as, black light).

3.2.2 *primer*—an organic solvent or a blend of solvents, which enhances adhesion, applied to plastic pipe and fittings prior to application of a solvent cement.

4. Material Requirements

4.1 The primer shall be an organic liquid with a viscosity no greater than 65 centipoise at 25°C and shall not contain any undissolved particles.

³ Available from NSF International, P.O. Box 130140, 789 N. Dixboro Rd., Ann Arbor, MI 48113-0140, <http://www.nsf.org>.

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

4.2 The solvent system to be used in the formulation of this primer is not specified.

NOTE 1—If required for identification purposes, colorants shall be used in the primer. It is recommended that orange not be used, since this is the recommended color for CPVC solvent cement covered under Specification F493.

NOTE 2—When colorants are used in the primer for identification purposes a fluorescent primer meeting the requirements of this specification and visible under UV (black) light may be acceptable.

5. Detail Requirements

5.1 *Dissolving Ability*—The primer shall be capable of dissolving at least 10 % by weight of PVC resin at $73.4 \pm 3.6^\circ\text{F}$ ($23 \pm 2^\circ\text{C}$) within 60 min, as specified in 5.1. The PVC resin shall be a resin used to make poly(vinyl chloride) molding or extrusion compound meeting the requirements of Class 12454-B, as classified in Specification D1784.

5.2 *Stability*—The 10 % resin-primer solution mixed in accordance with 6.1.1 shall be tested for stability in accordance with 6.2.

6. Test Methods

6.1 *Dissolving Ability*:

6.1.1 Weigh 270 g of the primer being tested into a closed mixing container. Weigh out 30 g of PVC resin. Adjust the temperature of the primer to $73.4 \pm 3.6^\circ\text{F}$ ($23 \pm 2^\circ\text{C}$). Begin mixing the primer, using a laboratory mixer designed for mixing flammable liquids. Add the resin to the primer and continue mixing for 60 min at a mixing speed of 1500 r/min or less, using a mixing blade and speed so that the maximum temperature of the mixture during the mixing period is 90°F (32°C) or less. After 60 min, turn off the mixer and adjust the temperature to $73.4 \pm 3.6^\circ\text{F}$ ($23 \pm 2^\circ\text{C}$).

6.1.2 Visually observe whether the resin is completely dissolved. The solution shall be smooth, nongrainy, free-flowing, and shall not contain any undissolved resin.

6.2 *Stability*—Hold the resin-primer solution at 40°F (5°C) for 24 h and then observe that (1) the resin is still completely dissolved, (2) the solution is free flowing, and (3) there are no signs of stringiness or gelatin structure.

7. Retest and Rejection

7.1 If the results of any test(s) do not meet the requirements of this specification, the test(s) shall be conducted again only by agreement between the purchaser and the seller. Under such agreement, minimum requirements shall not be lowered, nor tests omitted, substituted, changed, or modified, nor shall specification limits be changed. If upon retest, failure occurs, the quantity of product represented by the test(s) does not meet the requirements of this specification.

8. Report

8.1 Report the following information:

- 8.1.1 Name of primer manufacturer,
- 8.1.2 Lot number,
- 8.1.3 Dissolving ability, pass or fail, and
- 8.1.4 Stability, pass or fail.

9. Container Labeling and Marking

9.1 Container labeling of primer shall include the following:

- 9.1.1 Manufacturer's or supplier's name and address, trade-name or trademark.
- 9.1.2 This designation: "ASTM F656".
- 9.1.3 Function of material (Primer for PVC pipe and fittings. Product name shall be Primer.).
- 9.1.4 Procedure or instructions for application and use.
- 9.1.5 Lot number of batch on container.

NOTE 3—Solvent cement intended for use in the joining of potable water piping should be evaluated and certified as safe for this purpose by a testing agency acceptable to the local health authority. The evaluation should be in accordance with requirements for chemical extraction, taste, and odor that are no less restrictive than those included in NSF/ANSI Standard No. 14. The seal or mark of the laboratory making the evaluation should be included on the container.

9.1.6 End-use applications (examples: potable water, pressure use).

9.1.7 All warnings and cautions necessitated by:

- 9.1.7.1 Ingredients,
- 9.1.7.2 Handling and distribution of the product,
- 9.1.7.3 Intended use, and
- 9.1.7.4 Requirements of law (such as the Federal Hazardous Substances Act). These are intended to warn those who handle or use the product against potential hazards, such as flammability, toxicity, etc.

NOTE 4—It is recommended that the color of the contents be indicated on the label.

10. Safe Handling of Primer

10.1 Primers for plastic pipe are made from flammable liquids. Keep them away from all sources of ignition. Maintain ventilation to reduce fire hazard and to minimize breathing of solvent vapors. Avoid contact of primers with skin and eyes.

10.2 Refer to Practice F402 for additional information.

11. Quality Assurance

11.1 When the product is marked with this designation, F656, the manufacturer affirms that the product was manufactured, inspected, sampled, and tested in accordance with this specification and has been found to meet the requirements of this specification.

SUPPLEMENTARY REQUIREMENTS

POTABLE WATER REQUIREMENT

This requirement applies whenever a regulatory authority or user calls for the product to be used to convey or to be in contact with potable water.

S1. Products intended for contact with potable water shall be evaluated, tested, and certified for conformance with NSF/ANSI Standard No. 61 or the health effects portion of NSF/

ANSI Standard No. 14 by an acceptable certifying organization when required by the regulatory authority having jurisdiction.

SUMMARY OF CHANGES

Committee F17 has identified the location of selected changes to this standard since the last issue (F656–10) that may impact the use of this standard.

(1) Added the definition of a primer (found in Terminology F412) to the Terminology section.

(2) Added specific language for primer viscosity requirements to Material Requirements section.

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