



Designation: **F656—15 F656 – 21**

An American National Standard

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.7 *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

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

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

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~~ April 1, 2021. Published ~~August 2015~~ April 2021. Originally approved in 1980. Last previous edition approved in ~~2010~~ 2015 as **F656—10**; **F656 – 15**. DOI: ~~10.1520/F0656-15~~ 10.1520/F0656-21.

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

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
 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 ± 2 °C and shall not contain any undissolved particles.

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 $73.473 \text{ °F} \pm 3.6 \text{ °F}$ ($23.4 \text{ °C} \pm 2 \text{ °C}$) 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 $73.473 \text{ °F} \pm 3.6 \text{ °F}$ ($23.4 \text{ °C} \pm 2 \text{ °C}$). 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 $73.473 \text{ °F} \pm 3.6 \text{ °F}$ ($23.4 \text{ °C} \pm 2 \text{ °C}$).

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.

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

6.2 *Stability*—Hold the resin-primer solution at ~~40°F (5°C)~~ 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, tradename 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.