



Designation: C308 – 18 (Reapproved 2023)

Standard Practice for Working, Initial Setting, and Service Strength Setting Times of Chemical-Resistant Resin Mortars¹

This standard is issued under the fixed designation C308; 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 These methods are used to estimate the working, initial setting, and service strength setting times of chemical-resistant resin mortars.

1.2 The values stated in SI units are to be regarded as standard. The values given in parentheses are mathematical conversions to inch-pound units that are provided for information only and are not considered standard.

1.3 *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.*

1.4 *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

- C279 Specification for Chemical-Resistant Masonry Units
- C307 Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing
- C904 Terminology Relating to Chemical-Resistant Nonmetallic Materials

3. Terminology

3.1 **Definitions**—For definitions of terms used in these test methods, see Terminology C904.

¹ This practice is under the jurisdiction of Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of D01.46 on Industrial Protective Coatings.

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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.

4. Significance and Use

4.1 These methods offer a means of estimating the working time, initial setting time and service strength setting time of chemical-resistant resin mortars. The results obtained should serve as a guide in, but not as the sole basis for, selection of a chemical-resistant mortar for a particular application.

5. Apparatus

5.1 **Weighing Equipment**—Shall be capable of weighing materials or specimens to $\pm 0.3\%$ accuracy.

5.2 Mixing Equipment:

5.2.1 **Porcelain Enameled Pan**—Measuring approximately 250 mm long by 400 mm wide by 50 mm deep (10 in. by 16 in. by 2 in.).

5.2.2 **Bricklayer's Triangular Trowel**—Approximately 100 mm (4 in.) in length.

5.3 **Bricks**—As per Specification C279, Type III.

5.4 **Vicat Apparatus**—The Vicat apparatus shall consist of a frame, A (see Fig. 1), bearing a movable rod, B, weighing 300 g, one end, C, the plunger end, being 10 mm in diameter for a distance of at least 50 mm and the other end having a removable steel needle, D, for initial setting time determination, 1 mm in diameter and 50 mm in length. The rod, B, is reversible, and can be held in any desired position by a set screw, E, and has an adjustable indicator, F, which moves over a scale (graduated in millimetres) attached to the frame, A. In addition to the above, the Vicat apparatus shall conform to the following requirements:

5.4.1 **Weight of Plunger**—300 g \pm 0.5 g.

5.4.2 **Diameter of Larger End of Plunger**—10 mm \pm 0.05 mm.

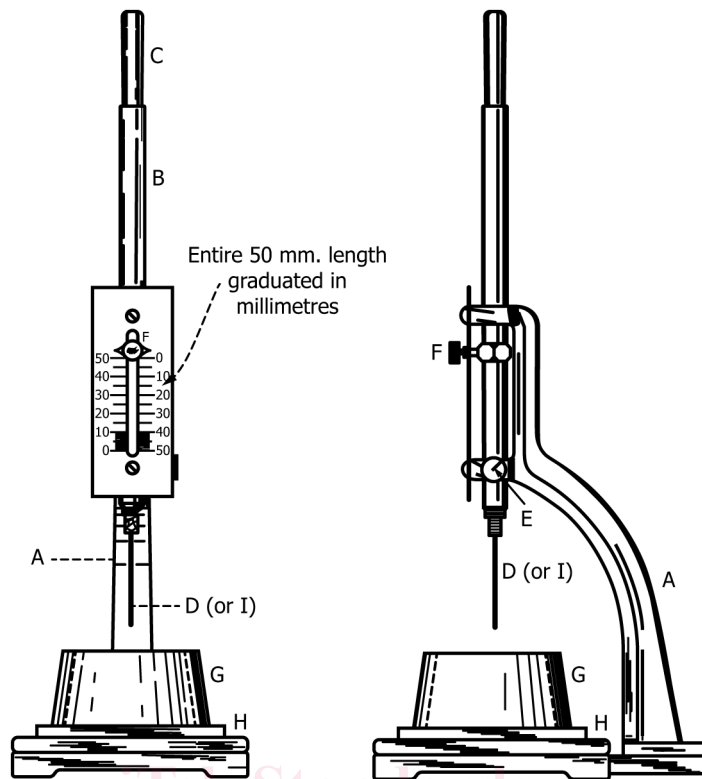
5.4.3 **Diameter of Needle**—1 mm \pm 0.05 mm.

5.4.4 **Graduated Scale**—The graduated scale, when compared with a standard scale accurate to within 0.1 mm at all points, shall not show a deviation at any point greater than 0.25 mm.

6. Procedure

6.1 Temperature:

6.1.1 All materials used in this method shall be stored for at least 16 h prior to use at the standard test temperature of 23 °C



NOTE 1—Ring, G, and plate, H, are not required for this test.

FIG. 1 Vicat Apparatus

$\pm 2\text{ }^{\circ}\text{C}$ ($73\text{ }^{\circ}\text{F} \pm 4\text{ }^{\circ}\text{F}$). The standard temperature for the working and initial setting time tests shall be $23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ ($73\text{ }^{\circ}\text{F} \pm 4\text{ }^{\circ}\text{F}$). Other test temperatures are acceptable upon agreement between the manufacturer and user provided that they are reported with the test data.

6.2 Preparation of Mortar:

6.2.1 Prepare a 1000 g sample of mortar, using proportionate amounts of filler and liquid as recommended by the manufacturer. If the proportions specified are by volume, weigh the materials and report the corresponding proportions by weight. Pour an appropriate amount of liquid into the pan, gradually add the powder to the liquid resin, and mix thoroughly with the trowel until a uniform mixture is obtained (this shall be complete within 3 min). Continue the mixing operation for 1 min after an apparently uniform mixture is obtained. Spread out the mortar in a layer of uniform thickness covering the entire surface of the mixing pan.

6.2.2 For a multicomponent resin mortar, the procedure described in 6.2.1 may be modified slightly to permit the addition of the catalyst to the mortar within the specified time limit.

6.3 Working Time:

6.3.1 Remove approximately 25 g portions of the resin mortar at specific intervals and trowel on the horizontal surface of clean, dry freezer paper. In order that sufficient data will be obtained with the minimum quantity of material, it is recommended that the testing be done every 5 min until the material begins to curl behind the trowel. The sample shall be removed from a portion of the mortar located at least 50 mm (2 in.) from

the side of the pan. The material used for tests shall not be returned to the mixing pan. The working time shall be recorded as the longest time (in minutes) at which the mortar does not curl behind the trowel.

6.4 Initial Setting Time:

6.4.1 Immediately after mixing is complete, remove and butter a sufficient amount of the mortar on the sides of two clean, dry bricks to provide a 6 mm ($\frac{1}{4}$ in.) joint. The bricks should be laid on freezer paper and the buttered sides pushed together to form a joint approximately 6 mm ($\frac{1}{4}$ in.) wide. Care should be taken to eliminate voids when pushing the bricks together. It is advantageous to establish the joint thickness by inserting a dowel rod near each end of the joint. Strike off any excess material above the joint by use of the trowel.

6.4.2 Examine the joint qualitatively, at 1 h intervals, with the point of the trowel until indentation becomes difficult. Continue the test with the Vicat needle (at 20 min to 30 min intervals) until the indentation of the needle during a 10 min period is less than 1 mm. Record the initial setting time as the time interval in hours at which the indentation of the Vicat needle is less than 1 mm.

6.5 Service Strength Setting Time:

6.5.1 Make a minimum of three tension test specimens for testing at each time interval. This normally requires 12 or more specimens. Prepare tension specimens in accordance with Test Method C307. Make the first test 24 h after the initial mixing time and continue every 48 h until 90 % of the manufacturer's published value for tensile strength is reached.