



Standard Test Method for Bond Strength of Latex Systems Used With Concrete By Slant Shear¹

This standard is issued under the fixed designation C 1042; 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 test method covers the determination of the bond strength of latex bonding systems for use with portland-cement concrete. This test method covers bonding hardened mortar specimens to freshly mixed mortar specimens.

1.2 The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents, therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with this test method.

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 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:

- C 39 Test Method for Compressive Strength of Cylindrical Concrete Specimens²
- C 109/C 109M Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-mm Cube Specimens)³
- C 150 Specification for Portland Cement³
- C 192 Practice for Making and Curing Concrete Test Specimens in the Laboratory²
- C 305 Practice for Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency³
- C 617 Practice for Capping Cylindrical Concrete Specimens²
- C 1059 Specification for Latex Agents for Bonding Fresh to Hardened Concrete²

3. Summary of Test Method

3.1 The bond strength is determined by using the latex

system to bond a fresh mortar section of a 3 by 6 in. [75 by 150 mm] portland-cement mortar cylinder to a hardened half cylinder, that has a diagonally cast bonding area at an angle 30° from vertical. After suitable curing of the composite specimen, the bond stress is determined by testing the specimen in compression and computing the bond strength at the diagonal face.

4. Significance and Use

4.1 This test method can be used in measuring the effectiveness of latex systems in bonding fresh concrete to hardened concrete.

5. Apparatus

5.1 *Apparatus to Mix Portland-Cement Mortar*—This apparatus shall be as described in Practice C 305.

5.2 *Specimen Molds*—The molds shall be constructed in the form of right cylinders, $3 \pm \frac{1}{16}$ in. [75 ± 2 mm] in inside diameter and $6 \pm \frac{1}{16}$ in. [150 ± 2 mm] high. All molds shall be either selected or machined so that the maximum range of the differences in each of the dimensions of the group of molds is less than $\frac{1}{64}$ in. [0.4 mm]. The molds shall be made of metal not attacked by portland-cement mortar. The side of the mold shall be sufficiently rigid to prevent spreading or warping. The molds shall be made watertight before use. A satisfactory material for this purpose is the paraffin-resin mixture described in Test Method C 109/C 109M.

5.3 *Dummy Section*—A dummy section (Fig. 1) shall be machined of a hard material that is not attacked by portland-cement mortar. It shall fit the mold and be equal to half the volume of the cylinder, but at an angle 30° from vertical. Additional dummy sections can be made by casting an epoxy resin mortar against the machined dummy section contained in a specimen mold. Due precautions, such as waxing, shall be taken to prevent the bonding of the epoxy resin mortar to the machined dummy section or the mold.

5.4 *Tamping Rod*—The tamping rod shall be a round rod of brass or plastic, $\frac{3}{8}$ in. [10 mm] in diameter and approximately 12 in. [300 mm] long, having both ends rounded to hemispherical tips.

6. Half Cylinder Preparation

6.1 Laboratory conditions, materials, proportions, and procedures for mixing the portland-cement mortar shall be in

¹ This test method is under the jurisdiction of ASTM Committee C-9 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.25 on Organic Materials for Bonding.

Current edition approved Feb. 10, 1999. Published May 1999. Originally published as C 1042 – 85. Last previous edition C 1042 – 91.

² *Annual Book of ASTM Standards*, Vol 04.02.

³ *Annual Book of ASTM Standards*, Vol 04.01.