



Designation: C 952 – 91 (Reapproved 1997)^{€1}

Standard Test Method for Bond Strength of Mortar to Masonry Units¹

This standard is issued under the fixed designation C 952; 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 (€) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

€¹ NOTE—Section 13 on Keywords was added editorially in November 1997.

1. Scope

1.1 This test method provides two procedures for measuring bond strength of mortar to masonry units: a crossed brick couplet tensile test for evaluating mortar-brick bonding and a stacked-bond, flexural test for evaluating mortar-concrete block bonding.

1.2 *This standard does not purport to address 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:

- C 67 Test Methods of Sampling and Testing Brick and Structural Clay Tile²
- C 91 Specification for Masonry Cement³
- C 109 Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-mm Cube Specimens)³
- C 190 Test Method for Tensile Strength of Hydraulic Cement Mortars³
- C 230 Specification for Flow Table for Use in Tests of Hydraulic Cement³
- C 270 Specification for Mortar for Unit Masonry²
- C 305 Practice for Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency³
- C 427 Test Method for Moisture Condition of Hardened Concrete by the Relative Humidity Method⁴

3. Significance and Use

3.1 These procedures are useful for research into bonding of masonry. They are not intended to predict the bond strength of

commercial masonry construction. The bonding in commercially built structures is determined by many factors beyond the characteristics of mortar, masonry units, and the procedures of this test method.

PREPARATION AND TESTING OF FRESH MORTAR

4. Preparation of Mortar

4.1 Apparatus:

4.1.1 *Scales, Weights, and Glass Graduates* conforming to 2.1, 2.2, and 2.4 of Test Method C 190 except that the scales and scale weights shall be of suitable capacity.

4.1.2 *Mixer, Paddle, Mixing Bowl, and Scraper* conforming to 2.1 to 2.4, of Method C 305 except that the mixer, paddle, and mixing bowl shall have a capacity of 10 qt (0.01 m³) and the first or slow speed of the mixer shall revolve the paddle at a rate of 144 ± 5 rpm, with a planetary speed of approximately 61 rpm. The second speed shall revolve the paddle at a rate of 258 ± 10 rpm, with a planetary motion of approximately 109 rpm.⁵

4.1.3 Stop Clock.

4.2 Procedure:

4.2.1 Weigh or measure the proper quantities of aggregates (Note 1), cementing materials, and water needed for the batch. The amount of water used shall provide a mortar of wet consistency, and the mortar shall preferably be as wet as can conveniently be handled with a mason's trowel.

NOTE 1—About 400 g of aggregate will provide sufficient mortar for several bond test specimens.

4.2.2 Charge the mixing bowl with the measured amounts of aggregate and cementing material. Mix manually with a spoon for 5 s. Insert the paddle into the mixture. Preset the stop clock to 10 s before zero time. Set the mixer at No. 1 (slow) speed, approximately 144 rpm.

4.2.3 Simultaneously start the stop clock and the mixer. Mix for 10 s.

¹ This test method is under the jurisdiction of ASTM Committee C15 on Manufactured Masonry Units and is the direct responsibility of Subcommittee C15.04 on Research. Committee E-6 maintains a continued interest in these practices and will make use of them in the future.

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² *Annual Book of ASTM Standards*, Vol 04.05.

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

⁴ Discontinued, see 1980 *Annual Book of ASTM Standards*, Part 16.

⁵ The Model C100 mixer manufactured by the Hobart Mfg. Co., Troy, OH has been found satisfactory for this purpose.