Designation: C1552 – 12

StandardPractice for Capping Concrete Masonry Units, Related Units and Masonry Prisms for Compression Testing[1]

This standard is issued under the fixed designation C1552; 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 practice covers apparatus, materials, and procedures for capping concrete masonry units, related units, including coupons or other specimens obtained from such units, and masonry prisms for compression testing.

NOTE 1—The testing laboratory performing these test methods should be evaluated in accordance with Practice C1093.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI 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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C140 Test Methods for Sampling and Testing Concrete Masonry Units and Related Units

C617 Practice for Capping Cylindrical Concrete Specimens

C1093 Practice for Accreditation of Testing Agencies for Masonry

C1232 Terminology of Masonry

C1314 Test Method for Compressive Strength of Masonry Prisms

3. Terminology

3.1 Terminology defined in Terminology C1232 shall apply for this practice.

4. Significance and Use

4.1 This practice describes procedures for providing plane surfaces on the two bearing surfaces of units and prisms. The purpose of this standard is to provide consistent and standardized procedures for capping units and prisms for compression testing. The procedures are based on those contained (or previously contained) in Test Methods C140, Practice C617, and Test Method C1314.

NOTE 2—Specimens capped using this practice will vary significantly in size and weight. Appropriate care and handling may differ based on specimen size and weight. Provide care and handling as needed to provide for proper capping based on the physical characteristics of the specimen being capped.

5. Apparatus

5.1 *Capping Plate*—If used, the capping plate shall be made of steel having a thickness of not less than 1 in. (25.4 mm), or a polished plate of granite or diabase at least 3 in. (76 mm) thick. The capping surface shall be plane within 0.002 in. in 12 in. (0.05 mm in 300 mm) and shall be free of gouges, grooves, and indentations greater than 0.010 in. (0.25 mm) deep or greater than 0.05 in.^{2} (32 mm^2) in surface area. At the time of capping, the capping surface shall be level within 1⁄16 in. (1.6 mm) over the length of the plate.

5.1.1 *Capping Wear Plate*—If used, the capping wear plate shall be placed directly on top of the capping plate and shall meet the requirements of 5.2. At the time of capping, the wear plate surface shall be level within 1⁄16 in. (1.6 mm) over the length of the plate. Do not use a capping wear plate with sulfur capping materials.

NOTE 3—A capping wear plate has been found to reduce the potential of damage to the capping plate. The capping wear plate is typically more resistant to scratches and can be replaced at less cost than that required to resurface the capping plate. See Fig. 1 for a schematic of capping setup when using gypsum cement materials.

5.2 *Casting Plate*—If used, the casting plate shall be of transparent glass with a thickness of not less than ½ in. (13 mm). The casting plate shall be plane within 0.002 in. in 12 in. (0.05 mm in 300 mm).

6. Materials

6.1 *Capping Materials:*

6.1.1 *High Strength Gypsum Cement Capping Materials:*

[1] This practice is under the jurisdiction of ASTM Committee C15 on Manufactured Masonry Units and is the direct responsibility of Subcommittee C15.04 on Research.

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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.

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

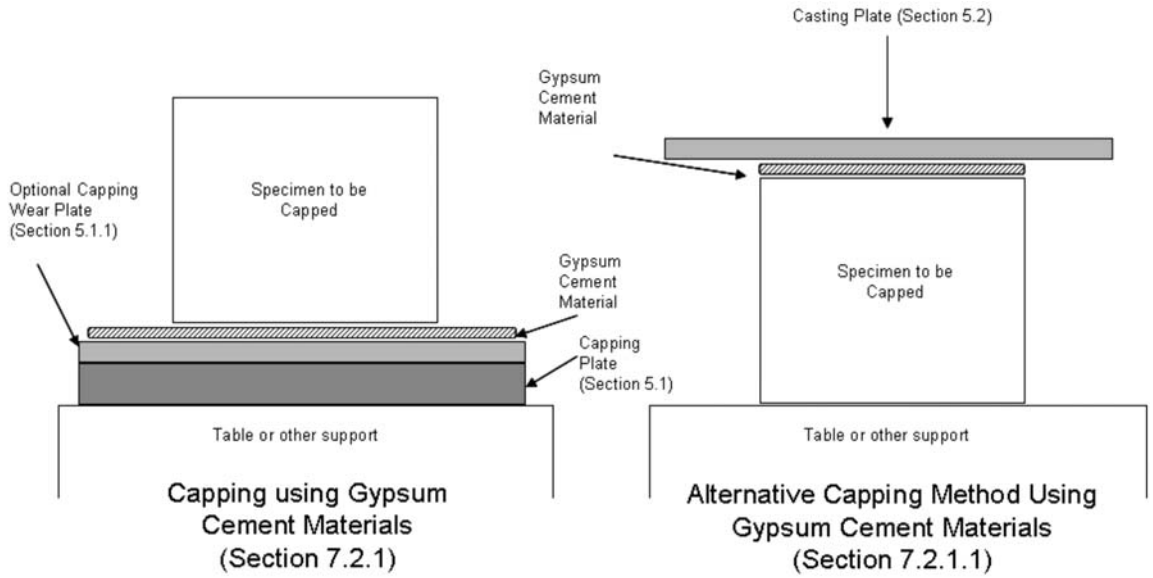

FIG. 1 Gypsum Capping Schematic

6.1.1.1 In addition to the compressive strength testing required in 6.2, qualification tests shall be made to determine the effects of water-cement ratio and age on compressive strength. Procedures used for preparing the high strength gypsum cement capping materials shall ensure that water-cement ratios used for each batch provide the required strength.

NOTE 4—The water-gypsum cement ratio should typically be between 0.26 and 0.30. Use of low water-gypsum cement ratios and vigorous mixing will usually permit development of 3500 psi (24.1 MPa) at ages of one or two hours. Higher water-gypsum cement ratios extend working time, but reduce strength.

6.1.1.2 Do not add fillers or extenders to the high strength gypsum cement.

NOTE 5—Retarders extend working time for capping materials but their effects on required water-cement ratio should be determined prior to use.

NOTE 6—See Appendix X1 for more information on high-strength gypsum capping materials and product recommendations.

6.1.2 *Sulfur Capping Materials:*

6.1.2.1 Proprietary or laboratory prepared sulfur mixtures shall contain 40 to 60 % sulfur by weight, the remainder being ground fire clay or other suitable inert material passing a No. 100 (150-µm) sieve with or without a plasticizer.

6.1.3 Use only capping materials identified in 6.1.1 and 6.1.2. Do not use other capping materials.

NOTE 7—Examples of materials that have been found to be unsuitable for capping purposes include, but are not limited to: low-strength molding plaster, plaster of paris, mixtures of plaster of paris and portland cement, and other cement-based materials.

6.2 *Compressive Strength of Capping Materials*—The compressive strength of the capping material shall be at least 3500 psi (24.1 MPa) at an age of 2 h. The cube molds and methods of preparing and testing the cubes shall be in accordance with Practice C617. The capping material shall be placed in the cube at capping consistency. Store the filled molds in laboratory air. Remove cubes of sulfur material after solidification is complete and remove cubes of gypsum cement material from the molds not more than 15 min prior to testing. Test cubes at an age of 2 h ± 10 min after completing the filling of the molds.

6.2.1 The strength of the capping material shall be determined on receipt of a new lot and at intervals not exceeding three months. If a given test of the capping material fails to conform to the strength requirements, the package from which the material was sampled shall not be used unless two additional subsequent samples are taken from the same package and both of these subsequent samples conform to the strength requirements. If the strength tests from an individual package are inadequate, randomly obtain and test three additional samples from the lot. These additional samples shall be taken from separate packages, if available. Unless these three samples conform to the strength requirements, no part of the lot shall be used.

7. Procedure

7.1 *Preparation of Specimens for Capping*—Use an abrasive stone to remove loose protrusions from the surfaces of the specimens to be capped. Refer to the appropriate compression test method (Test Methods C140 or Test Method C1314) for other specimen preparation requirements.

7.2 *Capping Test Specimens*—Cap top and bottom bearing surfaces of specimens by one of the methods in 7.2.1 or 7.2.2. Use alignment devices as needed to make sure the caps meet the requirements of 7.4.

NOTE 8—Various alignment devices have been demonstrated to be effective. For capping with sulfur materials, which sets quickly, alignment jigs make sure that the specimen is placed on the capping plate correctly in the first motion. For capping with gypsum cement materials, levels placed across the top of specimen have proven to work well. Bullseye levels work particularly well with smaller specimens.

7.2.1 *Capping Using Gypsum Cement Materials*—See Fig. 1 for capping setup. Spread the gypsum cement capping material evenly on the capping plate or capping wear plate that