



Standard Practice for Preparation of Field Removed Manufactured Masonry Units and Masonry Specimens for Compressive Strength Testing¹

This standard is issued under the fixed designation C 1587; 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 The purpose of this practice is to standardize the preparation of manufactured masonry units and masonry specimens extracted from the field for compressive strength testing in a laboratory environment.

1.2 *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 to determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*²

C 43 Terminology of Structural Clay Products

C 67 Test Methods for Sampling and Testing Brick and Structural Clay Tile

C 140 Test Methods for Sampling and Testing Concrete Masonry Units and Related Units

C 1180 Terminology of Mortar and Grout for Unit Masonry

C 1209 Terminology of Concrete Masonry Units and Related Units

C 1232 Terminology of Masonry

C 1314 Test Method for Compressive Strength of Masonry Prisms

C 1532 Practice for Selection, Removal, and Shipment of Masonry Specimens from Existing Construction

3. Terminology

3.1 *Definitions:* For definitions of terms used in this practice, refer to Terminologies **C 43**, **C 1180**, **C 1209**, and **C 1232**.

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.

Current edition approved June 1, 2006. Published June 2006. Originally approved in 2004. Last previous edition approved in 2005 as C 1587 – 05a.

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 Masonry units and masonry specimens are sometimes removed as part of an assessment of the condition of masonry construction. This document is intended to standardize the preparation of such units and masonry specimens for compressive strength testing.

NOTE 1—Masonry specimens removed from existing masonry construction (single wythe, multi-wythe or portions thereof) will sometimes contain mortar, grout, reinforcement, or accessory materials.

4.2 This practice provides information pertaining to the removal of hardened mortar, cleaning, and other special preparation required prior to compressive strength testing of a manufactured masonry unit or masonry specimen that has been removed from usage.

4.3 This practice does not address test procedures or the use of test results conducted on removed specimens. This practice does not determine whether removed masonry materials met original specification requirements.

NOTE 2—Compressive strength test results of masonry units and masonry specimens extracted from the field are expected to vary from and will likely be less than compressive strength test results of masonry units that have not been placed in service or masonry prisms that have been constructed within a controlled environment. Comparison of results of tests conducted on specimens removed from service to those of masonry units prior to use or of constructed prisms is difficult. Considerable judgment is typically required for the selection and preparation of specimens removed from service.

5. Inspection of Specimens

5.1 Specimens shall be selected, removed from service, and shipped in accordance to Practice C 1532.

5.2 Carefully remove specimens from transportation packaging. Visually inspect specimens. Compare received specimens with visual assessment as reported under Practice **C 1532**. Note additional damage, if any, contained within each specimen.

5.2.1 If specimen shipment does not include a visual assessment report, note the report as missing as part of the subsequent test report and document condition of each specimen as received.

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

5.3 Take photographs of specimens as received to document condition prior to any preparation for testing.

6. Preparation of Units and Prisms

6.1 Unless required by the testing procedure that will be subsequently used to evaluate the specimen, do not oven dry the test specimens.

6.2 Remove all unsound material and smooth irregularities of the unit's or masonry specimen's bearing surfaces using a method that will not reduce the integrity of the unit or masonry specimen to produce a test specimen, either a unit or a prism, that is no more than $\frac{1}{8}$ in. (3 mm) out of level over 12 in. (305 mm) and no more than $\frac{1}{8}$ in. (3 mm) out of plumb over 12 in. (305 mm).

6.3 Test specimens are subsequently capped to provide a level-bearing surface for compressive strength testing. Therefore, it is not necessary to remove portions of hardened mortar in recesses of masonry.

6.4 UngROUTED masonry specimens are particularly susceptible to damage during handling and preparation for testing. Use care to limit the potential damage to the bond between mortar and manufactured masonry units in the masonry specimen.

6.5 If necessary, remove sound material to produce a more suitable test specimen.

6.6 If possible, avoid producing test specimens containing unsupported protrusions (from face shells or webs of hollow units) whose lengths are more than twice their thickness.

6.7 If possible, avoid saw-cuts that reduce the thickness of the webs and face shells of hollow units or prisms.

6.8 If possible, prepare test specimens to minimize variations in length and width provided such preparation does not damage the test specimen.

6.9 Remove excess mortar if present on the top or bottom of bearing surfaces of the unit or prism. However, if such removal is expected to do more harm to the test specimen than good, leave mortar in place. Remove mortar on top or bottom of the bearing surfaces of the final test specimen if the thickness of that mortar is more than $\frac{1}{8}$ in. (3 mm) provided the mortar can be removed without damaging the test specimen.

6.10 Discard all test specimens that are damaged as a result of removing unsound material. Resulting damage is assessed by comparing visible cracking, or chipping on the unit or prism after removal to that documented under 5.2 and 5.3. Do not discard test specimens if resulting damage occurs in portions of the test specimen that will be subsequently cut or otherwise modified so that the damaged portion of the masonry unit or masonry specimen will not be tested.

6.11 Document methods used in removal of unsound materials and smoothing irregularities of unit or prism surfaces.

6.12 Take photographs of test specimens after preparation has been completed to document condition prior to capping.

7. Masonry Units

7.1 Refer to Test Methods C 67 for additional information relative to the preparation of brick and structural clay tile test specimens prior to testing.

7.2 Refer to Test Methods C 140 for additional information relative to the preparation of concrete masonry unit test specimens prior to testing.

NOTE 3—Individual masonry units filled or partially filled with grout or mortar should not be used to determine the compressive strength of the masonry units or of the masonry assembly. If evaluation of grouted masonry is desired, it should be performed on masonry assemblies meeting the requirements of Section 8.

8. Masonry Prisms

8.1 The masonry prisms shall:

8.1.1 Include at least one bed joint,

8.1.2 Have an aspect ratio (height divided by least lateral dimension) between 1.3 and 5,

8.1.3 Have a height defined by at least two units, each of which are no less than one-half the full height of a typical unit,

8.1.4 Have a minimum length of $\frac{1}{2}$ unit and a maximum length of 2 units, and

8.1.5 Not contain vertical reinforcement.

8.2 For prisms containing units of varying sizes and/or shapes, unit height and length shall be considered that of the largest unit height or the largest unit length within the prism, respectively.

8.3 Refer to Test Method C 1314 for additional information relative to the preparation of masonry prisms prior to testing.

9. Report

9.1 Prepare a written report with the following information:

9.1.1 Identification of structure from which specimens were obtained.

9.1.2 General description of specimens.

9.1.3 Name of parties that sampled and transported the specimens.

9.1.4 Documented condition of specimens as received, including photographs.

9.1.5 Description of procedures used to prepare the specimens.

9.1.6 Documented condition of specimens after preparation for testing, including photographs.

9.1.7 Noted presence of unsupported projections, if any, with accompanying note that such projections may adversely affect test results.

9.1.8 Noted reductions in face shell or web thickness, if any, with accompanying note that such reductions may adversely affect test results.

9.1.9 Noted presence of mortar greater than $\frac{1}{8}$ in. thickness on top or bottom bearing surface, if any, with accompanying note that such mortar may adversely affect test results.

9.1.10 Noted variations in length, width, and cross sectional area, if any, with accompanying note that such variations may adversely affect test results.

9.2 If specimen shipment does not include a visual assessment report, note report as missing as part of this test report.

10. Keywords

10.1 brick; compressive strength testing; concrete masonry unit; grout; hardened mortar; manufactured masonry units; masonry prisms; masonry specimens; mortar; preparation of masonry for testing; structural clay tile

SUMMARY OF CHANGES

Committee C15 has identified the location of selected changes to this standard since the last issue (C 1587 – 05a) that may impact the use of this standard. (Approved June 1, 2006.)

- (1) Sections 2.1, 5.1, and 5.2 were modified to remove references to Practice C 1420. (2) Section 6.1 was added to prohibit oven-drying of specimens under some circumstances.

Committee C15 has identified the location of selected changes to this standard since the last issue (C 1587 – 05) that may impact the use of this standard. (Approved May 15, 2005.)

- (1) Note 3 was added to clarify how to test grouted masonry.

Committee C15 has identified the location of selected changes to this standard since the last issue (C 1587 – 04) that may impact the use of this standard. (Approved May 15, 2005.)

- (1) Sections 1.1 and 4.2 were modified to refer to “manufactured masonry units” and “assemblies” to make them consistent with the title. (2) The term “manufactured masonry units” was added to the Keywords.

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