



Standard Test Method for Obtaining and Testing Drilled Cores of Shotcrete¹

This standard is issued under the fixed designation C1604/C1604M; 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 obtaining, preparing, and testing cores drilled from shotcrete for length, compressive strength, or splitting tensile strength determinations.

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

1.3 The text of this standard references notes and footnotes that provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

1.4 *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:²

C39/C39M Test Method for Compressive Strength of Cylindrical Concrete Specimens

C42/C42M Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

C125 Terminology Relating to Concrete and Concrete Aggregates

C174/C174M Test Method for Measuring Thickness of Concrete Elements Using Drilled Concrete Cores

C496/C496M Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens

C617 Practice for Capping Cylindrical Concrete Specimens

C670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials

C823 Practice for Examination and Sampling of Hardened Concrete in Constructions

C1140 Practice for Preparing and Testing Specimens from Shotcrete Test Panels

C1231/C1231M Practice for Use of Unbonded Caps in Determination of Compressive Strength of Hardened Concrete Cylinders

2.2 ACI Standards:³

318 Building Code Requirements for Structural Concrete

506.2 Specification for Shotcreting

506.4R Guide for the Evaluation of Shotcrete

3. Terminology

3.1 For definitions of terms used in this standard, refer to Terminology **C125**.

4. Significance and Use

4.1 This test method provides standardized procedures for obtaining cored specimens to determine the compressive strength and splitting tensile strength of shotcrete during pre-construction, during construction, and from older shotcrete structures.

4.2 Generally, test specimens are obtained *in situ* when doubt exists about the in-place shotcrete quality due either to low strength test results during construction or signs of distress in the structure. Other uses of this method are to provide specimens for acceptance testing, construction control and to assess the condition, quality and uniformity of the shotcrete in accordance with Practice **C823** (see **Note 1**).

4.3 Specimens obtained by this method are used to verify the thickness of shotcrete and aid in the visual assessment of the shotcrete quality, workmanship, defects, shotcrete-to-substrate bond and the condition of any reinforcement used in the shotcrete.⁴

¹ This test method is under the jurisdiction of ASTM Committee **C09** on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee **C09.46** on Shotcrete.

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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.

³ Available from American Concrete Institute (ACI), P.O. Box 9094, Farmington Hills, MI 48333-9094, <http://www.concrete.org>.

⁴ Bartlett, F. M., and MacGregor, J. G., "Effect of Core Diameter on Concrete Core Strengths," *ACI Materials Journal*, Vol 91, No. 5, September–October 1994, pp. 460–470.