



**Designation: C 684 – 99**

## **Standard Test Method for Making, Accelerated Curing, and Testing Concrete Compression Test Specimens<sup>1</sup>**

This standard is issued under the fixed designation C 684; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### **1. Scope**

1.1 This test method covers four procedures for making, curing, and testing specimens of concrete stored under conditions intended to accelerate the development of strength. The four procedures are: Procedure A—Warm Water Method, Procedure B—Boiling Water Method, Procedure C—Autogenous Curing Method, and Procedure D—High Temperature and Pressure Method.

1.2 The values stated in SI units are to be regarded as standard. The values given in parentheses are provided for information purposes only.

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.* See Section 9 and Note 9 and Note 14 for specific warnings and precautions.

### **2. Referenced Documents**

#### **2.1 ASTM Standards:**

- C 31/C 31M Practice for Making and Curing Concrete Test Specimens in the Field<sup>2</sup>
- C 39 Test Method for Compressive Strength of Cylindrical Concrete Specimens<sup>2</sup>
- C 172 Practice for Sampling Freshly Mixed Concrete<sup>2</sup>
- C 177 Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus<sup>3</sup>
- C 192/C 192M Practice for Making and Curing Concrete Test Specimens in the Laboratory<sup>2</sup>
- C 470 Specification for Molds for Forming Concrete Test Cylinders Vertically<sup>2</sup>

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee C-9 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.61 on Testing for Strength.

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<sup>2</sup> Annual Book of ASTM Standards, Vol 04.02.

<sup>3</sup> Annual Book of ASTM Standards, Vol 04.06.

C 617 Practice for Capping Cylindrical Concrete Specimens<sup>2</sup>

C 1231 Practice for Use of Unbonded Caps in Determination of Compressive Strength of Hardened Concrete Cylinders<sup>2</sup>

D 3665 Practice for Random Sampling of Construction Materials<sup>4</sup>

E 105 Practice for Probability Sampling of Materials<sup>5</sup>

E 122 Practice for Choice of Sample Size to Estimate a Measure of Quality for a Lot or Process<sup>5</sup>

E 141 Practice for Acceptance of Evidence Based on the Results of Probability Sampling<sup>5</sup>

### **3. Terminology**

3.1 There are no terms in this standard that require new or other than dictionary definitions.

### **4. Summary of Test Method**

4.1 Concrete specimens are exposed to accelerated curing conditions that permit the specimens to develop a significant portion of their ultimate strength within a time period ranging from 5 to 49 h, depending upon the procedure that is used. Procedures A and B utilize storage of specimens in heated water at elevated curing temperatures without moisture loss. The primary function of the moderately heated water used in Procedure A is to serve as insulation to conserve the heat generated by hydration. The temperature level employed in Procedure B provides thermal acceleration. Procedure C involves storage of specimens in insulated curing containers in which the elevated curing temperature is obtained from heat of hydration of the cement. The sealed containers also prevent moisture loss. Procedure D involves simultaneous application of elevated temperature and pressure to the concrete using special containers. Sampling and testing procedures are the same as for normally cured specimens (see Practice C 172 and Test Method C 39, respectively).

<sup>4</sup> Annual Book of ASTM Standards, Vol 04.03.

<sup>5</sup> Annual Book of ASTM Standards, Vol 14.02.