## Standard Practice for

# Making and Curing Concrete Test Specimens in the Laboratory

**AASHTO Designation: R 39-19**

**Technical Subcommittee: 3b, Fresh Concrete**

**Release: Group 1 (April)**

**ASTM Designation: C192/C192M-16a**

AASHTO

American Association of State Highway and Transportation Officials
444 North Capitol Street N.W., Suite 249
Washington, D.C. 20001

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## 1. SCOPE

1.1. This standard practice covers procedures for making and curing test specimens of concrete in the laboratory under accurate control of materials and test conditions.

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

1.3. *This standard practice does not purport to address the safety concerns associated with its use. It is the responsibility of the user of this standard practice to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

**Warning**—Fresh hydraulic cementitious mixtures are caustic and may cause chemical burns to exposed skin and tissue upon prolonged exposure.

## 2. REFERENCED DOCUMENTS

2.1. *AASHTO Standards*:

- M 194M/M 194, Chemical Admixtures for Concrete
- M 201, Mixing Rooms, Moist Cabinets, Moist Rooms, and Water Storage Tanks Used in the Testing of Hydraulic Cements and Concretes
- M 205M/M 205, Molds for Forming Concrete Test Cylinders Vertically
- R 60, Sampling Freshly Mixed Concrete
- T 23, Making and Curing Concrete Test Specimens in the Field
- T 27, Sieve Analysis of Fine and Coarse Aggregates
- T 84, Specific Gravity and Absorption of Fine Aggregate
- T 85, Specific Gravity and Absorption of Coarse Aggregate
- T 119M/T 119, Slump of Hydraulic Cement Concrete
- T 121M/T 121, Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
- T 152, Air Content of Freshly Mixed Concrete by the Pressure Method
- T 196M/T 196, Air Content of Freshly Mixed Concrete by the Volumetric Method
- T 197M/T 197, Time of Setting of Concrete Mixtures by Penetration Resistance

- T 231, Capping Cylindrical Concrete Specimens
- T 255, Total Evaporable Moisture Content of Aggregate by Drying
- T 309, Temperature of Freshly Mixed Portland Cement Concrete
- T 345, Passing Ability of Self-Consolidating Concrete (SCC) by J-Ring
- T 347, Slump Flow of Self-Consolidating Concrete (SCC)
- T 351, Visual Stability Index (VSI) of Self-Consolidating Concrete (SCC)
- TP 118, Characterization of the Air-Void System of Freshly Mixed Concrete by the Sequential Pressure Method

2.2. *ASTM Standards*:

- C125, Standard Terminology Relating to Concrete and Concrete Aggregates
- C330/C330M, Standard Specification for Lightweight Aggregates for Structural Concrete
- C470/C470M, Standard Specification for Molds for Forming Concrete Test Cylinders Vertically
- C512/C512M, Standard Test Method for Creep of Concrete in Compression

2.3. *American Concrete Institute (ACI) Publications*:

- 211.3 Practice for Selecting Proportions for No Slump Concrete[1]
- 309R Guide for Concrete Consolidation[1]

## 3. SIGNIFICANCE AND USE

3.1. This standard practice provides standardized requirements for preparation of materials, mixing concrete, and making and curing concrete test specimens under laboratory conditions.

3.2. If specimen preparation is controlled as stipulated herein, the specimens may be used to develop information for the following purposes:

3.2.1. Mixture proportioning for project concrete;

3.2.2. Evaluation of different mixtures and materials;

3.2.3. Correlation with nondestructive tests; and

3.2.4. Providing specimens for research purposes.

**Note 1**—The concrete test results for concrete specimens made and cured using this standard practice are widely used. They may be the basis for acceptance testing for project concrete, research evaluation, and other studies. Careful and knowledgeable handling of materials, mixing concrete, molding test specimens, and curing test specimens is necessary. Many laboratories performing this important work are independently inspected or accredited, and qualify technicians by participating in certification programs. AASHTO, ASTM, WAQTC, NETTCP, and ACI are examples of entities that can provide guidance on laboratory inspections and accreditation programs as well as technician qualifications and certifications.

## 4. APPARATUS

4.1. *Molds, General*—Molds for specimens or fastenings thereto in contact with the concrete shall be made of steel, cast iron, or other nonabsorbent material, nonreactive with concrete containing portland or other hydraulic cements. Molds shall conform to the dimensions and tolerances specified in the method for which the specimens are required. Molds shall hold their dimensions