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**Standard Practice for**

# **Making and Curing Concrete Test Specimens in the Field**

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**AASHTO Designation: R 100-21<sup>1,2</sup>**

Reclassified with Revisions: 2021

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

**ASTM Designation: C31-15a**



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## 1. SCOPE

- 1.1. This practice covers procedures for making and curing cylinder and beam specimens from representative samples of fresh concrete for a construction project.
- 1.2. The concrete used to make the molded specimens shall be sampled after all on-site adjustments have been made to the mixture proportions, including the addition of mix water and admixtures. This practice is not satisfactory for making specimens from concrete not having measurable slump or requiring other sizes or shapes of specimens.
- 1.3. The values stated in SI units or inch-pound 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.
- 1.4. *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.*  
**Warning**—Fresh hydraulic cementitious mixtures are caustic and may cause chemical burns to exposed skin and tissue upon prolonged exposure.
- 1.5. The text of this standard references notes that provide explanatory material. These notes shall not be considered as requirements of the standard.
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## 2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards:*
- M 195, Lightweight Aggregates for Structural 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 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 309, Temperature of Freshly Mixed Portland Cement Concrete

2.2. *ASTM Standard:*

- C125, Standard Terminology Relating to Concrete and Concrete Aggregates

2.3. *ACI Standard:*

- ACI 309R, *Guide for Consolidation of Concrete*

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### 3. TERMINOLOGY

3.1. For definitions of terms used in this practice, refer to ASTM C125.

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### 4. SIGNIFICANCE AND USE

4.1. This practice provides standardized requirements for making, curing, protecting, and transporting concrete test specimens under field conditions.

4.2. *If the specimens are made and standard cured, as stipulated herein, the resulting strength test data where the specimens are tested are able to be used for the following purposes:*

4.2.1. Acceptance testing for specified strength;

4.2.2. Checking the adequacy of mixture proportions for strength;

4.2.3. Quality control.

4.3. *If the specimens are made and field cured, as stipulated herein, the resulting strength test data when the specimens are tested are able to be used for the following purposes:*

4.3.1. Determination of whether a structure is capable of being put in service;

4.3.2. Comparison with test results of standard cured specimens or with test results from various in-place test methods;

4.3.3. Adequacy of curing and protection of concrete in the structure; or

4.3.4. Form or shoring removal time requirements.

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### 5. APPARATUS

5.1. *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 hold their dimensions and shape under conditions of use. Molds shall be watertight during use as judged by their ability to hold water poured into them. Provisions for tests of watertightness are given in M 205M/M 205. A suitable sealant, such as heavy grease, modeling clay, or microcrystalline wax shall be used where necessary to prevent leakage through the joints. Positive means shall be provided to hold base plates firmly to the