
Standard Method of Test for

**Water Retention by Liquid
Membrane-Forming Curing
Compounds for Concrete**

AASHTO Designation: T 155-23

Technically Revised: 2023

Technical Subcommittee: 3b, Fresh Concrete

ASTM Designation: C156-20



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1. SCOPE

- 1.1. This test method covers laboratory determination of the ability of liquid membrane-forming compounds for curing concrete to reduce moisture loss from mortar specimens during the early hardening period as a measure of their applicability for curing concrete.
- 1.2. The values stated in SI units are to be regarded as the standard. No other units of measurement are included in this standard.
- 1.3. *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety concerns 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 skin and tissue upon prolonged exposure.
- 1.4. *The quality of the results produced by this standard are dependent on the competence of the personnel performing the procedure and the capability, calibration, and maintenance of the equipment used. Agencies that meet the criteria of R 18 are generally considered capable of competent and objective testing/sampling/inspection/etc. Users of this standard are cautioned that compliance with R 18 alone does not completely assure reliable results. Reliable results depend on many factors; following the suggestions of R 18 or some similar acceptable guideline provides a means of evaluating and controlling some of those factors.*
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2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards:*
- M 85, Portland Cement
 - M 201, Mixing Rooms, Moist Cabinets, Moist Rooms, and Water Storage Tanks Used in the Testing of Hydraulic Cements and Concretes
 - M 339M/M 339, Thermometers Used in the Testing of Construction Materials
 - R 18, Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
 - T 71, Effect of Organic Impurities in Fine Aggregate on Strength of Mortar

2.2.

ASTM Standards:

- C125, Standard Terminology Relating to Concrete and Concrete Aggregates
- C305, Standard Practice for Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency
- C778, Standard Specification for Standard Sand
- D1475, Standard Test Method for Density of Liquid Coatings, Inks, and Related Products
- D1644, Standard Test Methods for Nonvolatile Content of Varnishes
- D1653, Standard Test Methods for Water Vapor Transmission of Organic Coating Films
- E1, Standard Specification for ASTM Liquid-in-Glass Thermometers
- E178, Standard Practice for Dealing with Outlying Observations
- E879, Standard Specification for Thermistor Sensors for General Purpose and Laboratory Temperature Measurements
- E1137/E1137M, Standard Specification for Industrial Platinum Resistance Thermometers

2.3.

International Electrotechnical Commission Standard:

- IEC 60751: 2008 Industrial Platinum Resistance Thermometers and Platinum Temperature Sensors

3. TERMINOLOGY

3.1. *Definitions*—For definitions of terms used in this test method, refer to ASTM C125.

4. SIGNIFICANCE AND USE

4.1. The moisture retaining ability of a product as determined by this test method is used to assess the suitability of materials for contributing to an appropriate curing environment for concrete. The laboratory test method is used both in formulating and in specifying or qualifying curing products. This test method gives the user a measure of the ability of tested curing materials to impede the escape of moisture from a hydraulic cement mortar. Since it is desirable to retain water in fresh concrete to promote the hydration process, failure of the product to minimize the escape of water may lead to loss of strength, cracking, shrinkage, or low abrasion resistance of the hardened concrete, or a combination thereof.

4.2. Many factors affect the laboratory test results. Test results obtained may be highly variable as indicated by the precision statement. Critical factors include the precision of the control of the temperature, humidity, and air circulation in the curing cabinet; preparation and sealing of the mortar specimens; the age and surface condition of the mortar specimen when the curing product is applied; and the uniformity and quantity of application of the curing membrane.

5. APPARATUS

5.1. *Mechanical Mortar Mixer*—as described in ASTM C305, or a larger size mixer operating on the same principle.

5.2. *Molds*—Molds shall be made of metal, glass, hard rubber, or plastic and shall be watertight and rigidly constructed to prevent distortion during molding of the specimens or handling the mold containing fresh mortar. They shall have a minimum surface area of 12 000 mm² and a minimum depth of 19 mm. The top surface shall be round, square, or rectangular with length not more than twice the width. The top of the mold shall have a rim to provide a firm level surface to support the