



# Standard Test Method for Amount of Water Required for Normal Consistency of Hydraulic Cement Paste<sup>1</sup>

This standard is issued under the fixed designation C187; 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.

<sup>ε1</sup> NOTE—Section 8.1 was revised editorially in October 2011 to fix a typographical error.

## 1. Scope\*

1.1 This test method covers the determination of the normal consistency of hydraulic cement.

1.2 *Units*—The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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 1.4 for a specific warning statement.*

1.4 **Warning**—Fresh hydraulic cementitious mixtures are caustic and may cause chemical burns to skin and tissue upon prolonged exposure. The use of gloves, protective clothing, and eye protection is recommended. Wash contact area with copious amounts of water after contact. Wash eyes for a minimum of 15 min. Avoid exposure of the body to clothing saturated with the liquid phase of the unhardened material. Remove contaminated clothing immediately after exposure.<sup>2</sup>

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>3</sup>

C219 Terminology Relating to Hydraulic Cement

C305 Practice for Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency

C511 Specification for Mixing Rooms, Moist Cabinets, Moist Rooms, and Water Storage Tanks Used in the

Testing of Hydraulic Cements and Concretes

C1005 Specification for Reference Masses and Devices for Determining Mass and Volume for Use in the Physical Testing of Hydraulic Cements

D1193 Specification for Reagent Water

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

## 3. Terminology

3.1 Normal consistency is defined in Terminology standard C219.

## 4. Significance and Use

4.1 This test method is intended to be used to determine the amount of water required to prepare hydraulic cement pastes with normal consistency, as required for certain standard tests.

## 5. Apparatus

5.1 *Reference Masses and Devices for Determining Mass*, conforming to the requirements of Specification C1005. The devices for determining mass shall be evaluated for precision and bias at a total load of 1000 g.

5.2 *Glass Graduates*, 200 or 250-mL capacity, and conforming to the requirements of Specification C1005.

5.3 *Vicat Apparatus*—The Vicat apparatus shall consist of a frame *A* (Fig. 1) bearing a movable rod *B*, weighing 300 g, one end *C*, the plunger end, being 10 mm in diameter for a distance of at least 50 mm, and the other end having a removable needle *D*, 1 mm in diameter and 50 mm in length. The rod *B* is reversible, and can be held in any desired position by a set screw *E*, and has an adjustable indicator *F*, which moves over a scale (graduated in millimetres) attached to the frame *A*. The paste is held in a rigid conical ring *G*, resting on a plane nonabsorptive square base plate *H*, about 100 mm on each side. The rod *B* shall be made of stainless steel having a hardness of not less than 35 HRC (See Note 1), and shall be straight with the plunger end which is perpendicular to the rod axis. The ring shall be made of a noncorroding, nonabsorbent material, and shall have an inside diameter of 70 mm at the base and 60 mm

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee C01 on Cement and is the direct responsibility of Subcommittee C01.22 on Workability.

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<sup>2</sup> Section on Safety, Manual of Cement Testing, *Annual Book of ASTM Standards*, Vol 04.01.

<sup>3</sup> 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.

\*A Summary of Changes section appears at the end of this standard