



Standard Test Methods for Time of Setting of Hydraulic Cement by Vicat Needle¹

This standard is issued under the fixed designation C191; 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 (ε) indicates an editorial change since the last revision or reapproval.

1. Scope*

1.1 These test methods determine the time of setting of hydraulic cement by means of the Vicat needle. Two test methods are given; Method A is the Reference Test Method using the manually operated standard Vicat apparatus, while Method B permits the use of an automatic Vicat machine that has, in accordance with the qualification requirements of this method, demonstrated acceptable performance.

1.2 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.*

Warning: Fresh hydraulic cementitious mixtures are caustic and may cause chemical burns to skin and tissue upon prolonged exposure.²

1.4 The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

NOTE 1—For the method for determining the time of setting by Gillmore needles, see Test Method C266.

2. Referenced Documents

2.1 ASTM Standards:³

C150 Specification for Portland Cement

C151 Test Method for Autoclave Expansion of Hydraulic Cement

C183 Practice for Sampling and the Amount of Testing of Hydraulic Cement

C187 Test Method for Amount of Water Required for Normal Consistency of Hydraulic Cement Paste

C219 Terminology Relating to Hydraulic Cement

C266 Test Method for Time of Setting of Hydraulic-Cement Paste by Gillmore Needles

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

C595 Specification for Blended Hydraulic Cements

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

C1157 Performance Specification for Hydraulic Cement

D1193 Specification for Reagent Water

3. Terminology

3.1 *Definitions*—The terms used in this test method are defined in accordance with Terminology C219.

4. Summary of Test Method

4.1 A paste that is proportioned and mixed to normal consistency, as described in the Test Method C187, is molded and placed in a moist cabinet and allowed to start setting. Periodic penetration tests are performed on this paste by allowing a 1-mm Vicat needle to settle into this paste. The Vicat initial time of setting is the time elapsed between the initial contact of cement and water and the time when the penetration is measured or calculated to be 25 mm. The Vicat final time of setting is the time elapsed between initial contact of cement and water and the time when the needle does not leave a complete circular impression in the paste surface.

5. Significance and Use

5.1 This test method provides a means of determining compliance with a specification limit for Vicat time of setting. Refer to the appropriate specification for the cement to determine if this test method is used for specification compliance.

¹ These test methods are under the jurisdiction of ASTM Committee C01 on Cement and is the direct responsibility of Subcommittee C01.30 on Time of Set.

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

³ 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.