Designation: ~~C1506 – 16b~~ C1506 – 17

Standard Test Method for Water Retention of Hydraulic Cement-Based Mortars and Plasters[1]

This standard is issued under the fixed designation C1506; 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 This test method provides for the determination of water retention of hydraulic cement-based mortars and plasters.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard. When this test method refers to combined-unit standards, the selection of the measurement systems is at the user's discretion.

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~~ safety, health and ~~health~~environmental 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 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[3]

C109/C109M Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)
C185 Test Method for Air Content of Hydraulic Cement Mortar
C230/C230M Specification for Flow Table for Use in Tests of 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
C670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials
C1437 Test Method for Flow of Hydraulic Cement Mortar
E832 Specification for Laboratory Filter Papers

3. Summary of Test Method

3.1 After initial mixing is complete, the flow of the mortar or plaster is determined. The mortar or plaster is then subjected to a controlled vacuum suction for 60 s, after which the flow is again determined. The water retention is the final flow divided by the initial flow expressed as a percentage.

4. Significance and Use

4.1 This test method provides a means for determining the ability of mortars and plasters to retain water under suction. Test results may be used to determine compliance with specifications.

4.2 The results obtained using this test method can be used to compare the relative ability of mortars and plasters to retain water under suction.

---

[1] This test method is under the jurisdiction of ASTM Committee C01 on Cement and is the direct responsibility of Subcommittee C01.22 on Workability.

Current edition approved ~~Dec. 1, 2016~~Aug. 1, 2017. Published ~~December 2016~~February 2018. Originally approved in 2001. Last previous edition approved in 2016 as ~~C1506 – 16a.~~C1506 – 16b. DOI: ~~10.1520/C1506-16B.~~10.1520/C1506-17.

[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.

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

4.3 The results obtained using this test method for masonry mortars do not necessarily indicate the degree of water retention when used with masonry units, since the amount of water absorbed by the unit depends on the rate of absorption of the masonry unit.

4.4 The results obtained using this test method for plasters (stucco) do not necessarily indicate the degree of water retention when the plaster is applied as a second coat on the surface of a previously applied plaster base coat, since the amount of water absorbed from the second coat of plaster depends on the rate of absorption of the base coat. This is also true when a plaster is applied as a coating on masonry units.

5. Apparatus

5.1 *Tamper,* conforming to Test Method C109/C109M.

5.2 *Straightedge,* conforming to Test Method C185.

5.3 *Flow Table,* conforming to Specification C230/C230M.

5.4 *Mixing Apparatus,* conforming to the requirements prescribed in Practice C305.

5.5 *Filter Paper*—The filter paper shall be medium retentive, corresponding to Type 1, Class B, in accordance with Specification E832. It shall be 150 mm in diameter.

5.6 *Filtration Assembly,* an apparatus essentially as shown in Fig. 1 shall be used. This apparatus consists of a perforated dish resting on a funnel, which is connected by a three-way stopcock to a vacuum flask, to which a controlled vacuum is applied. The perforated dish shall be made of metal not attacked by masonry mortar or plaster (Note 1). The metal base of the dish shall have a thickness of 2.0 ± 0.3 mm and shall conform to the requirements given in Fig. 1. The stopcock bore shall have a 4.0 ± 0.5-mm diameter, and the connecting glass tubing shall have a minimum inside diameter of 4 mm. The length of the tubing projecting into the 1-L flask from the stopcock shall extend at least 25 mm below the center line of the vacuum connection. The contact surfaces of the funnel and perforated dish shall be plane and may need to be lapped to ensure intimate contact. An airtight seal shall be maintained between the funnel and the dish during the test. This shall be accomplished by either of the following procedures. (*1*) A synthetic (grease-resistant) rubber gasket ~~may be~~ permanently sealed to the top of the funnel using petrolatum or light grease to ~~ensure~~provide a seal between the gasket and dish. (2) ~~The top of the funnel may be lightly coated with petroleum or light grease to ensure~~A petroleum or light grease coating on the top of the funnel to provide a seal between the funnel and dish. ~~Care shall be taken~~ Take care to ensure that none of the holes in the perforated dish become clogged. ~~Hardened, smooth, not rapid~~ The filter paper shall be ~~used. It shall be 150 mm in diameter and be placed~~ placed into the dish so as to completely cover the perforations in the dish.

NOTE 1—Stainless steel, brass, and bronze are suitable metals for this purpose.

5.7 *Controlled Vacuum Source:*

5.7.1 A vacuum ~~gage~~gauge capable of reading at least 9-kPa pressure in 0.1-kPa increments (Note 2 and Note 3), connected to a miniature vacuum regulator having a maximum 55-kPa capacity, which is then connected to a vacuum pump or water aspirator as shown in Fig. 1. Connection is made between the vacuum flask and the vacuum ~~gage.~~gauge.

NOTE 2—Vacuum values are all given as pressure relative to atmospheric pressure.

NOTE 3—~~Gages~~Gauges reading pressure in other units are acceptable as long as their capacity and scale increments comply with the levels specified here. (For example, a vacuum ~~gage~~gauge with a minimum capacity of 70 mm of Hg in 1-mm increments is acceptable. To convert mm of Hg to kPa, multiply by 0.1333. Thus the 7.0-kPa starting pressure is equivalent to 53-mm Hg.)

5.8 ~~Water-retention~~ Water retention apparatus and related equipment shall be checked for conformance to this Test Method at least every 2½ years.

6. Temperature and Humidity

6.1 The temperature of the mixing room and the room containing the water retention apparatus shall conform to the requirements of Specification C511.

7. Materials

7.1 The composition of the mortar or plaster to be tested for water retention shall be that described in the specification of the material being considered, or that desired.

8. Mixing of Mortar and Plaster

8.1 The mortar or plaster to be tested for water retention shall be mixed as specified in the section on Procedure for Mixing Mortars of Practice C305, or as described in the specification for the material being considered.