Designation: C1038/C1038M – 24

Standard Test Method for Expansion of Hydraulic Cementitious Material Mortar Bars Stored in Water[1]

This standard is issued under the fixed designation C1038/C1038M; 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 covers the determination of the expansion of mortar bars made using hydraulic cementitious materials, of which sulfate is an integral part.

1.2 The values stated in either 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 non-conformance with the standard.

1.3 The text of this standard refers to notes and footnotes that provide explanatory material. These notes shall not be considered as requirements of 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, health, and 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])

1.5 *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 50 mm [2 in.] Cube Specimens)

C114 Test Methods for Chemical Analysis of Hydraulic Cement

C125 Terminology Relating to Concrete and Concrete Aggregates

C219 Terminology Relating to Hydraulic and Other Inorganic Cements

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

C490 Practice for Use of Apparatus for the Determination of Length Change of Hardened Cement Paste, Mortar, and Concrete

C511 Specification for Mixing Rooms, Moist Cabinets, Moist Rooms, and Water Storage Tanks Used in the Testing of Hydraulic Cements and Concretes

C778 Specification for Standard Sand

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

C1437 Test Method for Flow of Hydraulic Cement Mortar

3. Terminology

3.1 *Definitions:*

3.1.1 See Terminology C219 and Terminology C125.

4. Significance and Use

4.1 This test method is used to determine the amount of expansion of a mortar bar when it is stored in water. The amount of mortar-bar expansion may relate to the amount of sulfate in the cementitious material; expansion may become excessive when the cementitious material contains too much sulfate.

4.2 Some cementitious material specifications limit the amount of sulfate contained in those materials by requiring that the amount of expansion in water not exceed a specified value.

5. Apparatus

5.1 *Reference Masses and Mass-Determining Devices,* conforming to the requirements of Specification C1005. Evaluate the device for precision and bias at a total load of 2 kg.

[1] This test method is under the jurisdiction of ASTM Committee C01 on Cement and is the direct responsibility of Subcommittee C01.28 on Sulfate Content.

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[2] Section on Safety, *Manual of Cement Testing, Annual Book of 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**