Designation: C 1384 – 06

Standard Specification for Admixtures for Masonry Mortars[1]

This standard is issued under the fixed designation C 1384; 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 specification pertains to admixtures for masonry mortars. Admixtures are substances other than Specification C 270 prescribed materials of water, aggregate, and cementitious materials that are used to improve one or more of the recognized desirable properties of conventional masonry mortar.

1.2 This specification does not cover coloring pigments.

NOTE 1—Information on coloring pigments can be found in Specification C 979.

1.3 This specification does not cover additives that are added to the cementitious materials during the manufacture of the cementitious materials.

1.4 Acceptance of an admixture is based on its performance in an admixed mortar. Acceptance of the admixed masonry mortar is based on attainment of performance either equivalent to that required for conventional mortar or improved performance of one or more indicated properties, while maintaining required performance levels for other properties.

1.5 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

NOTE 2—The testing laboratory performing the test methods referenced in this specification should be evaluated in accordance with Practice C 1093.

2. Referenced Documents

2.1 *ASTM Standards:* [2]

C 91 Specification for Masonry Cement
C 144 Specification for Aggregate for Masonry Mortar
C 150 Specification for Portland Cement
C 207 Specification for Hydrated Lime for Masonry Purposes
C 270 Specification for Mortar for Unit Masonry
C 305 Practice for Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency
C 403/C 403M Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance
C 595 Specification for Blended Hydraulic Cements
C 723 Practice for Chemical-Resistant Resin Grouts for Brick or Tile
C 778 Specification for Sand
C 780 Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
C 979 Specification for Pigments for Integrally Colored Concrete
C 1093 Practice for Accreditation of Testing Agencies for Unit Masonry
C 1152/C 1152M Test Method for Acid-Soluble Chloride in Mortar and Concrete
C 1157 Performance Specification for Hydraulic Cement
C 1218/C 1218M Test Method for Water-Soluble Chloride in Mortar and Concrete
C 1329 Specification for Mortar Cement
C 1357 Test Methods for Evaluating Masonry Bond Strength
C 1403 Test Method for Rate of Water Absorption of Masonry Mortars
C 1437 Test Method for Flow of Hydraulic Cement Mortar

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *admixed mortar*, *n*—masonry mortar that deviates from those combinations of materials recognized by Specification C 270 in that it also contains an admixture.

3.1.2 *admixture*, *n*—substance other than the Specification C 270 prescribed materials of water, aggregate, and cementitious materials that is added to a masonry mortar to modify one or more properties of the conventional masonry mortar.

[1] This specification is under the jurisdiction of ASTM Committee C12 on Mortars and Grouts for Unit Masonry and is the direct responsibility of Subcommittee C12.09 on Modified Mortars.

Current edition approved Feb. 15, 2006. Published February 2006. Originally approved in 1998. Last previous approved in 2005 as edition C 1384 – 05.

[2] 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.**

3.1.3 *bond enhancer*, *n*—admixture used to increase the bond strength between the masonry mortar and the masonry unit.

3.1.4 *reference mortar*, *n*—mortar of the same composition as an admixed mortar except that the reference mortar does not include the admixture and may contain a different amount of water to obtain an equivalent flow or penetration as the admixed mortar.

3.1.5 *set accelerator*, *n*—admixture used to shorten the time of setting of a masonry mortar.

3.1.6 *set retarder*, *n*—admixture used to lengthen the time of setting of a masonry mortar.

3.1.7 *water repellent*, *n*—admixture used to decrease the rate of water absorption of the hardened masonry mortar.

3.1.8 *workability enhancer*, *n*—admixture used in a masonry mortar to increase the ease of being worked and used.

3.1.8.1 *Discussion*—Workability is a combination of several properties, including: plasticity, consistency, cohesion, adhesion, water retentivity, setting characteristics, and its capacity to remain satisfactory under the influence of masonry unit suction. Many of these properties have defied exact laboratory measurement. The mason can best assess workability by observing the response of the mortar to the trowel and the masonry unit. For further discussion on workability, see the Appendix of Specification C 270.

4. Classification

4.1 Admixtures are classified by their effect on the performance characteristics of conventional masonry mortars. Admixed mortars are classified by their modified properties, as compared to a reference mortar. The following classifications are recognized:

4.1.1 Bond Enhancer.

4.1.2 Workability Enhancer.

4.1.3 Set Accelerator.

4.1.4 Set Retarder.

4.1.5 Water Repellent.

5. Materials

5.1 *Cements*—The cement used in the evaluation of the admixture shall conform to applicable requirements specified in 5.1.1-5.1.5.

5.1.1 *Cement, Portland*—When the admixture is evaluated in a mortar containing portland cement, the portland cement shall conform to the requirements for Type I, IA, II, IIA, III, or IIIA of Specification C 150.

5.1.2 *Cement, Blended Hydraulic*—When the admixture is evaluated in a mortar containing blended hydraulic cement, the blended hydraulic cement shall conform to the requirements for Type IS, IS-A, IP, IP-A, I(PM) or I(PM)-A of Specification C 595.

5.1.3 *Cement, Hydraulic*—When the admixture is evaluated in a mortar containing a hydraulic cement, the hydraulic cement shall conform to the requirements for Type GU, HE, MS, HS, MH, or LH of Specification C 1157.

5.1.4 *Cement, Masonry*—When the admixture is evaluated in a mortar containing a masonry cement, the masonry cement shall conform to the requirements of Specification C 91.

5.1.5 *Cement, Mortar*—When the admixture is evaluated in a mortar containing a mortar cement, the mortar cement shall conform to the requirements of Specification C 1329.

5.2 *Lime*—When the admixture is evaluated in a cement-lime mortar, the hydrated lime shall conform to Specification C 207.

5.3 *Sand*—The fine aggregate used in the tests will vary dependent on the test procedure.

5.3.1 Sands used for soluble chloride, flexural bond strength and rate of water absorption tests shall be a blend of equal parts by weight of graded standard sand and standard 20-30 sand conforming with Specification C 778.

5.3.2 Sands used for compressive strength, water retention, determination of air content of plastic mortar, board life, and time of setting tests shall conform to the requirements of Specification C 144.

6. Chemical Composition

6.1 The admixture shall not react adversely with embedded or attached materials common to masonry.

NOTE 3—Currently, there is no standard test method for determining the corrosion potential of masonry mortars toward embedded and attached materials. Nonetheless, the admixture shall not be offered for sale if the manufacturer has evidence that the admixture does react adversely with embedded or attached materials common to masonry.

6.2 At the maximum recommended dosage, the mortar admixture shall add not more than 65 ppm (0.0065 %) water-soluble chloride, or 90 ppm (0.0090 %) acid-soluble chloride to the mortar's overall chloride content as determined by testing of the reference and admixed mortars in accordance with 9.1.1.

7. Physical Properties

7.1 All modified masonry mortars shall comply with the property specification requirements of Specification C 270. In addition, the admixed mortars shall conform to all of the specific classification requirements in Table 1 for which the admixture is obtaining qualification. Unless more specimens are required by a specific test method, a minimum of three specimens shall be tested and the results averaged. These result averages shall meet the requirements of this section.

7.2 Admixture compliance tests shall be the responsibility of the manufacturer of the admixture. These compliance tests shall be completed within the past five (5) years and prior to any admixture composition change.

8. Mortar Types and Proportions

8.1 Design the reference mortar to be a specific type of cement/lime, mortar cement, or masonry cement mortar in conformance with the proportion specification of Specification C 270 except that the aggregate ratio shall be fixed at three times the sum of the separate volumes of cementitious materials. In addition, the aggregate shall meet the requirements in 5.3.

8.2 The corresponding admixed mortars shall have the same composition as the reference mortars but also shall include the admixture, and the water content shall be adjusted to yield the flow or penetration appropriate for each test method. The