



Designation: C 1384 – 00

Standard Specification for Modifiers for Masonry Mortars¹

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 modifiers for masonry mortars. Modifiers are used to improve one or more of the recognized desirable properties of conventional masonry mortar.

1.2 Acceptance of a modifier is based on its performance in a modified mortar. Acceptance of the modified 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.

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

NOTE 1—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:

- C 91 Specification for Masonry Cement²
- C 144 Specification for Aggregate for Masonry Mortar³
- C 150 Specification for Portland Cement²
- C 207 Specification for Hydrated Lime for Masonry Purposes²
- C 270 Specification for Mortar for Unit Masonry³
- C 305 Practice for Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency²
- C 403 Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance⁴
- C 595 Specification for Blended Hydraulic Cements²
- C 723 Practice for Chemical-Resistant Resin Grouts for Brick or Tile³
- C 778 Specification for Standard Sand²

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 Aug. 10, 2000. Published September 2000. Originally published as C 1384–98. Last previous edition C 1384–99.

² Annual Book of ASTM Standards, Vol 04.01.

³ Annual Book of ASTM Standards, Vol 04.05.

⁴ Annual Book of ASTM Standards, Vol 04.02.

C 780 Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry³

C 1093 Practice for Accreditation of Testing Agencies for Unit Masonry³

C 1152 Test Method for Acid-Soluble Chloride in Mortar and Concrete⁴

C 1218 Test Method for Water-Soluble Chloride in Mortar and Concrete⁴

C 1329 Specification for Mortar Cement²

C 1357 Test Method for Evaluating Masonry Bond Strength³

C 1403 Test Method for Rate of Water Absorption of Masonry Mortars³

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *bond enhancer, n*—substance incorporated into a masonry mortar to increase the bond strength between the mortar and the masonry unit.

3.1.2 *modified mortar, n*—masonry mortar that deviates from those combinations of materials recognized by Specification C 270 in that it also contains a modifier.

3.1.3 *modifier, n*—substance added to a masonry mortar as an ingredient that improves one or more chemical or physical properties of the conventional masonry mortar.

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

3.1.5 *set accelerator, n*—substance incorporated into a masonry mortar to shorten the time of setting of a mortar.

3.1.6 *set retarder, n*—substance incorporated into a masonry mortar to lengthen the time of setting of a mortar.

3.1.7 *water repellent, n*—substance incorporated into a masonry mortar to decrease the rate of water absorption of the hardened mortar.

3.1.8 *workability enhancer, n*—substance incorporated into a masonry mortar to increase the ease of being worked and used. A workability enhancer will increase the board life and maintain the water retention of a mortar.

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

4. Classification

4.1 Modifiers are classified by their effect on the performance characteristics of conventional masonry mortars. Modified 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 modifier shall conform to applicable requirements specified in 5.1.1–5.1.4.

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

5.1.4 *Cement, Mortar*—When the modifier 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 modifier 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 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 soluble chloride, 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 modifier shall not react adversely with embedded or attached materials common to masonry.

NOTE 2—Currently, there is no standard test method for determining the corrosion potential of masonry mortars toward embedded and attached materials. Nonetheless, the modifier shall not be offered for sale if the manufacturer has evidence that the modifier does react adversely with embedded or attached materials common to masonry.

6.2 At the maximum recommended dosage, the mortar modifier shall add not more than 0.15 kg/m³ (0.0094 lb/ft³) water-soluble chloride, or 0.20 kg/m³ (0.0125 lb/ft³) acid-soluble chloride to the mortar's overall chloride content as determined by testing of the reference and modified 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

TABLE 1 Physical Requirements^A

	Bond Enhancer	Workability Enhancer	Set Accelerator	Set Retarder	Water Repellent
Compressive strength, min % of reference:					
7 day	80	80	80	70	80
28 day	80	80	80	80	80
Water retention, min % of reference:	report	100	report	report	report
Air content of plastic mortar, %	report	report	report	report	report
Board life, min % of reference	report	120	report	120	report
Time of setting ^B , allowable deviation from reference, h: min:					
Initial: at least	...	...	1:00 earlier	1:00 ^C later	...
not more than	1:00 earlier nor 1:30 later	1:00 earlier nor 3:30 later	3:30 earlier	8:00 ^C later	1:00 earlier nor 1:30 later
Final: at least	...	...	1:00 earlier	...	...
not more than	1:00 earlier nor 1:30 later	1:00 earlier nor 3:30 later	...	8:00 ^C later	1:00 earlier nor 1:30 later
Flexural bond strength, min % of reference	110	...	...	...	...
Rate of water absorption max % of reference 24 h	...	...	...	...	50

^A The values in the table include allowance for normal variation in test results. In addition to meeting the requirements in this table, all modified mortars must meet the property requirements of Specification C 270.

^B All time of setting tests shall be performed at 23 ± 3°C (73.4 ± 5.4°F), except those for set accelerators, which shall be performed at 5 ± 2°C (41 ± 3.6°F) as specified in 9.1.5.

^C The manufacturer's maximum recommended dosage rate shall be used when testing the initial and final set times for a set retarder.