



Standard Specification for Latex and Powder Polymer Modifiers for use in Hydraulic Cement Concrete and Mortar¹

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1. Scope*

1.1 This specification covers performance criteria for latex and powder polymers when used as modifiers in hydraulic cement concrete and mortar to improve adhesion and reduce permeability (see [Note 1](#)).

NOTE 1—For further information concerning theory, benefits, limitations, and applications of polymer-modified hydraulic cementitious mixtures, refer to ACI 548.3R-09.²

1.2 The performance criteria are based on certain property changes that are achieved by use of the polymer modifier when compared to reference concrete or mortar (Test Methods [C1439](#)).

1.3 Prepackaged, proprietary mortar products are not included in this specification. Also, this specification covers only those materials contained in the reference or test mixtures listed in Test Methods [C1439](#).

1.4 The values stated in SI units are to be regarded as standard.

1.5 The following precautionary statement pertains only to the test method portion, Section [10](#), of this specification: *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.*

2. Referenced Documents

2.1 ASTM Standards:³

[C125 Terminology Relating to Concrete and Concrete Aggregates](#)

¹ This specification is under the jurisdiction of ASTM Committee [C09](#) on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee [C09.44](#) on Polymer-Modified Concrete and Mortars.

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² ACI 548.3R-09 Report on Polymer-Modified Concrete. Available from American Concrete Institute (ACI), P.O. Box 9094, Farmington Hills, MI 48333-9094, <http://www.concrete.org>.

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.

[C494/C494M Specification for Chemical Admixtures for Concrete](#)

[C1439 Test Methods for Evaluating Latex and Powder Polymer Modifiers for use in Hydraulic Cement Concrete and Mortar](#)

3. Terminology

3.1 *Definitions of Terms Specific to This Standard*—Terms used in this specification are defined in Terminology [C125](#) or in this section.

3.1.1 *latex, n*—a dispersion of organic polymer particles in water.

3.1.2 *polymer-modified concrete or mortar, n*—a hydraulic cement concrete or mortar containing a polymer modifier.

3.1.3 *polymer modifier, n*—latex or redispersible powder formulated for use with hydraulic cements.

3.1.4 *redispersible powder, n*—powder that redisperses in water to form a latex.

3.1.5 *reference concrete or mortar, n*—concrete or mortar having the amounts of cement and aggregates given in Test Methods [C1439](#) and having an amount of water to achieve the specified slump or flow.

3.1.6 *test concrete or mortar, n*—concrete or mortar containing a polymer modifier and having the same composition (except for water content) and slump or flow as the reference concrete or mortar.

4. Classification

4.1 Polymer modifiers are classified into two product types:

4.1.1 *Type I*—For use in areas not exposed to moisture.

4.1.2 *Type II*—For general use.

5. Ordering Information

5.1 The purchaser shall specify the type of polymer modifier desired and the size and type of containers in which the material is to be supplied.

6. Physical and Mechanical Properties

6.1 The polymer modifier shall produce test mortar or test concrete which conforms to the requirements listed in [Table 1](#) for the type specified.

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

TABLE 1 Requirements for Test Mortar and Concrete Made With Polymer Modifier

	MORTAR		CONCRETE
	Type I	Type II	Type II
Air Content, % maximum	12.0	12.0	7.0
Time of Setting, allowable deviation from reference mixture, h:min:			
Initial:			
not more than, earlier	1:00	1:00	1:00
nor, later	3:30	3:30	3:30
Final:			
not more than, earlier	1:00	1:00	1:00
nor, later	3:30	3:30	3:30
Compressive Strength, minimum % of reference mixture			
at each age	70	70	80
Bond Strength, minimum % of reference mixture			
at each age	140	140	140
Indication of Chloride Ion penetration, maximum % of reference mixture			
at each age	na ^A	25	25

^A na = not applicable.

7. Lot Uniformity and Equivalence

7.1 When specified by the purchaser, the uniformity of a lot, or the equivalence of different lots from the same source shall be established by evaluation following Specification **C494/C494M**, with the following exception:

7.1.1 *Residue by Oven Drying*—Within a range not greater than 2 percentage points of the initial sample.

8. Storage

8.1 The supplier shall store the polymer modifier in such a manner as to permit easy access for proper inspection and identification of each shipment, in a suitable building that will

protect the polymer modifier from dampness and freezing, and in accordance with manufacturer's recommendations.

9. Sampling and Inspection

9.1 The supplier shall provide facilities for proper sampling of the product as specified by the purchaser.

9.2 Sampling shall conform to the requirements of Specification **C494/C494M**.

10. Test Methods

10.1 Test the polymer modifier in accordance with the requirements of Test Methods **C1439**.

11. Rejection

11.1 The purchaser has the right to reject the polymer modifier if it fails to meet any of the applicable requirements of this specification.

11.2 It is permitted to reject packages that are more than 2 % below the mass or volume marked on them, and it is permitted to reject the entire shipment if the average mass of packages in any shipment, as shown by weighing 50 packages taken at random, is less than that marked on the packages.

12. Packaging and Package Marking

12.1 When the polymer modifier is delivered in packages and containers, the proprietary name of the polymer modifier, the type under this specification, and the net mass or volume shall be plainly marked thereon. Similar information shall be provided in the shipping papers accompanying bulk shipments of the polymer modifier.

13. Keywords

13.1 latex; polymer modifier; polymer-modified concrete or mortar

SUMMARY OF CHANGES

Committee C09 has identified the location of selected changes to this specification since the last issue, C1438–11a, that may impact the use of this specification. (Approved November 15, 2013)

(1) In the title, the words “for use” were inserted after “Modifiers.”

(2) In the scope, the term “redispersible” was removed. “Latex,” “powder,” “concrete,” and “mortar” are now singular. “Polymers” was added.

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