



Designation: C387/C387M – 09

# Standard Specification for Packaged, Dry, Combined Materials for Mortar and Concrete<sup>1</sup>

This standard is issued under the fixed designation C387/C387M; 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 reappraisal. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reappraisal.

## 1. Scope\*

1.1 This specification covers the production, properties, packaging, and testing of packaged, dry, combined materials for concrete and mortars. The classifications of concrete and mortar covered are defined in Section 3.

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 following safety hazards caveat pertains only to the test method portion 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*:<sup>2</sup>

C33 Specification for Concrete Aggregates

C39/C39M Test Method for Compressive Strength of Cylindrical Concrete Specimens

C91 Specification for Masonry Cement

C109/C109M Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)

C125 Terminology Relating to Concrete and Concrete Aggregates

C138/C138M Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete

C143/C143M Test Method for Slump of Hydraulic-Cement Concrete

C144 Specification for Aggregate for Masonry Mortar

C150 Specification for Portland Cement

C173/C173M Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method

C185 Test Method for Air Content of Hydraulic Cement Mortar

C192/C192M Practice for Making and Curing Concrete Test Specimens in the Laboratory

C207 Specification for Hydrated Lime for Masonry Purposes

C231 Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

C260 Specification for Air-Entraining Admixtures for Concrete

C270 Specification for Mortar for Unit Masonry

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

C330 Specification for Lightweight Aggregates for Structural Concrete

C494/C494M Specification for Chemical Admixtures for Concrete

C566 Test Method for Total Evaporable Moisture Content of Aggregate by Drying

C595 Specification for Blended Hydraulic Cements

C618 Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

C702 Practice for Reducing Samples of Aggregate to Testing Size

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.43 on Packaged Dry Combined Materials.

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<sup>2</sup> 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.

- C989** Specification for Slag Cement for Use in Concrete and Mortars
- C1157** Performance Specification for Hydraulic Cement
- C1240** Specification for Silica Fume Used in Cementitious Mixtures
- C1329** Specification for Mortar Cement
- C1437** Test Method for Flow of Hydraulic Cement Mortar
- C1438** Specification for Latex and Powder Polymer Modifiers for Hydraulic Cement Concrete and Mortar
- C1506** Test Method for Water Retention of Hydraulic Cement-Based Mortars and Plasters
- E96/E96M** Test Methods for Water Vapor Transmission of Materials

3.2.5 *mortar for unit masonry, n*—in packaged, dry, combined materials, a packaged mortar for laying brick, block, and stone, and for masonry repairs.

3.2.5.1 *Discussion*—These products are packaged versions of the masonry mortars that are specified in Specification **C270**.

3.2.6 *mortar, high-strength, n*—in packaged, dry, combined materials, a product for building or repair requiring a thickness of less than 50 mm [2 in.], or where a high strength mortar mixture is required.

3.2.6.1 *Discussion*—Typical uses include topping and patching existing concrete structures. Often referred to as “sand mix.”

### 3. Terminology

3.1 *Definitions*—For definitions of terms used in this specification, refer to Terminology **C125**.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *concrete, high-early strength, n*—in packaged, dry, combined materials, a product for building and repair requiring a more rapid than normal strength development such as required for the earlier removal of forms.

3.2.2 *concrete, normal strength, n*—in packaged, dry, combined materials, a product for general building and repair where thickness exceeds 50 mm [2 in.].

3.2.2.1 *Discussion*—Typical uses include building or repairing sidewalks, patios, steps, footings, and for setting posts.

3.2.3 *concrete, normal strength, lightweight, n*—in packaged, dry, combined materials, a concrete product for building and repair where the lightest concrete density is desirable.

3.2.3.1 *Discussion*—These mixtures will produce concrete that is about 25 to 35 % lower in density than normal weight concrete.

3.2.4 *concrete, normal strength, lightweight using normal weight sand, n*—in packaged, dry, combined materials, a concrete product for building and repair where a lower density is desirable.

3.2.4.1 *Discussion*—These mixtures will produce concrete that is about 15 to 25 % lower in density than normal weight concrete.

### 4. Ordering Information

4.1 The purchaser shall specify the material desired as concrete, high strength mortar, or mortar for use with unit masonry, and the respective physical requirements as specified in **Table 1** shall govern.

### 5. Materials

5.1 Materials used as ingredients in packaged, dry, combined materials for mortar and concrete shall conform to at least one of the following requirements:

5.1.1 *Aggregates*, shall conform to Specification **C33**, Specification **C144**, or Specification **C330**.

5.1.2 *Air-Entraining Admixtures*, shall conform to Specification **C260**.

5.1.3 *Blended Cement*, shall conform to Specification **C595** or Performance Specification **C1157**.

5.1.4 *Chemical Admixtures*, shall conform to Specification **C494/C494M**.

5.1.5 *Flyash*, shall conform to Specification **C618**.

5.1.6 *Ground Granulated Blast-Furnace Slag*, shall conform to Specification **C989**.

5.1.7 *Hydrated Lime*, shall conform to Type S or Type SA of Specification **C207**.

5.1.8 *Latex and Powder Polymer Modifiers*, shall conform to Specification **C1438**.

NOTE 1—Type II latex polymers should not be used in applications that

**TABLE 1 Physical Requirements**

Kind of Material	Compressive Strength, MPa [psi] min		
	3 days	7 days	28 days
<i>Concrete:</i>			
High-early strength	17.0 [2500]	24.0 [3500]	...
Normal strength:			
Normal weight	...	17.0 [2500]	24.0 [3500]
Lightweight using normal weight sand <sup>A</sup>	...	17.0 [2500]	24.0 [3500]
Lightweight	...	17.0 [2500]	24.0 [3500]
<i>Mortar:</i>			
High-strength mortar		20.0 [3000]	35.0 [5000]
Mortar for unit masonry:			
Type M	Shall comply with property requirements of Specification <b>C270</b> <sup>B</sup>		
Type S			
Type N			

<sup>A</sup> Lightweight concrete using normal weight sand may contain some portion of lightweight fines.

<sup>B</sup> The performance requirements for 28-day compressive strength, water retention, and air content are those for mortars made from masonry cement unless otherwise specified. Manufacturers wishing to comply with the air content requirements for mortar-cement mortar or cement-lime mortar must specify the ingredients used and comply with the applicable portions of Specification **C270**.