Designation: C 387 – 00

Standard Specification for Packaged, Dry, Combined Materials for Mortar and Concrete[1]

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1. Scope

1.1 This specification covers the production, properties, packaging, and testing of packaged, dry, combined materials for concrete and mortars. The types of concrete and mortar covered are described in the following paragraphs in this section. Some of the mixtures covered by this specification may not be available in some areas.

1.1.1 *High-Early Strength Concrete*—For concrete building and repair jobs requiring a more rapid strength development such as required for the earlier removal of forms.

1.1.2 *Normal Strength Concrete*:

1.1.2.1 *Normal Weight Concrete*—For general concrete building and repair jobs where thicknesses exceed 50 mm (2-in.). Typical uses include building or repairing sidewalks, patios, steps, footings, and for setting posts.

1.1.2.2 *Lightweight Concrete Using Normal Weight Sand*—For concrete building and repair jobs where lower concrete weights are desirable. These mixtures will produce concrete which is about 15 to 25 % lighter in weight than normal weight concrete.

1.1.2.3 *Lightweight Concrete*—For concrete building and repair jobs where the lightest concrete weight is desirable. These mixtures will produce concrete which is about 25 to 35 % lighter in weight than normal weight concrete.

1.1.3 *High-Strength Mortar*—For general concrete work requiring thicknesses of less than 50 mm (2-in.) or where a high-strength grout mixture is required. Typical uses include topping, patching, and stuccoing. Often referred to as *sand mix*.

1.1.4 *Mortars for Unit Masonry*—For laying brick, block, and stone, and for masonry repairs. The following three types of masonry mortar are covered:

1.1.4.1 *Type N*—For general masonry work requiring normal mortar properties.

1.1.4.2 *Type S*—For use where a higher strength masonry mortar is required.

1.1.4.3 *Type M*—For use where the highest strength masonry mortar is required.

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

1.2.1 Values in SI units shall be obtained by measurement in SI units or by appropriate conversion of measurements made in other units, using the Rules for Conversion and Rounding given in IEEE/ASTM SI 10.

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:*

C 33 Specification for Concrete Aggregates[2]

C 39 Test Method for Compressive Strength of Cylindrical Concrete Specimens[2]

C 91 Specification for Masonry Cement[3]

C 109/C 109M Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-mm Cube Specimens)[3]

C 138 Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete[2]

C 143 Test Method for Slump of Hydraulic Cement Concrete[2]

C 144 Specification for Aggregate for Masonry Mortar[4]

C 150 Specification for Portland Cement[3]

C 173 Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method[2]

C 185 Test Method for Air Content of Hydraulic Cement Mortar[3]

C 192 Practice for Making and Curing Concrete Test Specimens in the Laboratory[2]

C 207 Specification for Hydrated Lime for Masonry Purposes[3]

C 231 Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method[2]

C 260 Specification for Air-Entraining Admixtures for Concrete[2]

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[2] *Annual Book of ASTM Standards*, Vol 04.02.

[3] *Annual Book of ASTM Standards*, Vol 04.01.

[4] *Annual Book of ASTM Standards*, Vol 04.05.

TABLE 1 Physical Requirements

Kind of Material	Water Retention, min, %	Compressive Strength, min		
		3 days	7 days	28 days
Concrete:				
High-early strength	...	17.0 (2470)	24.0 (3840)	...
Normal strength:				
Normal weight	...	...	17.0 (2470)	24.0 (3480)
Lightweight using normal weight sand[A]	...	...	17.0 (2470)	24.0 (3480)
Lightweight	...	...	17.0 (2470)	24.0 (3480)
High-strength mortar			20.0 (2900)	35.0 (5075)
Mortar for unit masonry:				
Type M	75	...	...	17.0 (2470)
Type S	75	...	...	12.0 (1740)
Type N	75	...	...	5.0 (725)

[A] Lightweight concrete using normal weight sand may contain some portion of lightweight fines.

C 305 Practice for Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency[3]

C 330 Specification for Lightweight Aggregates for Structural Concrete[2]

C 494/C 494M Specification for Chemical Admixtures for Concrete[2]

C 595 Specification for Blended Hydraulic Cements[3]

C 618 Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete[2]

C 702 Practice for Reducing Samples of Aggregate to Testing Size[2]

C 989 Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars[2]

C 1157 Performance Specification for Blended Hydraulic Cement[3]

C 1240 Specification for Use of Silica Fume as a Mineral Admixture in Hydraulic-Cement Concrete, Mortar, and Grout[2]

C 1329 Specification for Mortar Cement [3]

C 1438 Specification for Latex and Powder Polymer Modifiers for Hydraulic Cement Concrete and Mortar[2]

E 96 Test Methods for Water Vapor Transmission of Materials[5]

IEEE/ASTM SI 10— Standard for Use of the International System of Units (SI): The Modern Metric System[6]

3. Ordering Information

3.1 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.

4. Materials

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

4.1.1 *Aggregates*, shall conform to the requirements of Specification C 33, Specification C 144, or Specification C 330.

4.1.2 *Air-Entraining Admixtures*, shall conform to the requirements of C 260.

4.1.3 *Blended Cement*, shall comply with Specification C 595 or Specification C 1157.

4.1.4 *Chemical Admixtures*, shall conform to the requirements of Specification C 494/C 494M.

4.1.5 *Flyash*, shall conform to the requirements of Specification C 618.

4.1.6 *Ground Granulated Blast-Furnace Slag*, shall conform to the requirements of Specification C 989.

4.1.7 *Hydrated Lime*, shall conform to Type S of Specification C 207.

4.1.8 *Latex and Powder Polymer Modifiers*, shall conform to Specification C 1438.

4.1.9 *Masonry Cement*, shall conform to Specification C 91.

4.1.10 *Mortar Cement*, shall conform to Specification C 1329.

4.1.11 *Portland Cement*, shall conform to Type I, IA, II, IIA, III or IIIA of Specification C 150.

4.1.12 *Silica Fume*, shall conform to the requirements of Specification C 1240.

5. Preparation of Aggregate

5.1 All aggregates shall be dried, without disintegration, to a moisture content of less than 0.1 mass %, computed on material dried substantially to constant mass % 221 to 230°F (105 to 110°C).

6. Proportioning

6.1 The proportions of cementitious material and aggregate shall be such that the strength requirements will be met when an amount of mixing water is used that produces for concrete the slump specified in 12.2 and for mortar the flow specified in 14.2.

7. Physical Properties

7.1 Packaged, dry, combined materials for concrete, high strength mortar, and mortar for use with unit masonry shall conform to the respective physical requirements as given in Table 1 for the material specified when the prescribed amount of water is added.

8. Packaging and Package Marking

8.1 All packages shall be identified as conforming to Specification C 387, and as to kind and type of material listed in Table 1 and the net mass in each bag printed thereon.

8.2 The yield in liters (or cubic feet), and the amount of

[5] *Annual Book of ASTM Standards*, Vol 04.06.

[6] *Annual Book of ASTM Standards*, Vol 14.04.