



Designation: **C1364 – 16^{ε1}** **C1364 – 17**

Standard Specification for Architectural Cast Stone¹

This standard is issued under the fixed designation C1364; 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 (ϵ) indicates an editorial change since the last revision or reappraisal.

~~^{ε1} NOTE—Editorially added decimal places to percentages in 5.2 and 5.5.3 in September 2016.~~

1. Scope

1.1 This specification includes the physical properties, sampling, testing, tolerance, and appearance requirements for architectural cast stone.

1.2 Cast stone units covered under this specification include both wet cast and vibratory dry tamp products. Production methods of cast stone can vary among manufacturers; many production methods are acceptable provided the delivered cast stone meets the requirements of this specification.

1.3 Surface textures, finish, color, special applications, or other features shall be specified by the purchaser. Slump, manufacturing method, and apparatus shall be selected by the manufacturer and not specified by the purchaser.

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.5 *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, health and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

[A615/A615M](#) Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

[C33/C33M](#) Specification for Concrete Aggregates

[C150/C150M](#) Specification for Portland Cement

[C173/C173M](#) Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method

[C231/C231M](#) Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

[C260/C260M](#) Specification for Air-Entraining Admixtures for Concrete

[C426](#) Test Method for Linear Drying Shrinkage of Concrete Masonry Units

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

[C595/C595M](#) Specification for Blended Hydraulic Cements

[C618](#) Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

[C666/C666M](#) Test Method for Resistance of Concrete to Rapid Freezing and Thawing

[C979/C979M](#) Specification for Pigments for Integrally Colored Concrete

[C989/C989M](#) Specification for Slag Cement for Use in Concrete and Mortars

[C1157/C1157M](#) Performance Specification for Hydraulic Cement

[C1194](#) Test Method for Compressive Strength of Architectural Cast Stone

[C1195](#) Test Method for Absorption of Architectural Cast Stone

¹ This specification is under the jurisdiction of ASTM Committee C27 on Precast Concrete Products and is the direct responsibility of Subcommittee C27.20 on Architectural and Structural Products.

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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.

D1729 Practice for Visual Appraisal of Colors and Color Differences of Diffusely-Illuminated Opaque Materials

D2244 Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates

2.2 *ACI Standards:*

318 Building Code Requirements for Reinforced Concrete³

3. Terminology

3.1 *Definitions:*

3.1.1 *cast stone, n*—an architectural precast concrete building unit intended to simulate natural cut stone.

3.1.2 *vibrant dry tamp (dry cast) products, n*—cast stone manufactured from zero slump concrete densely compacted by apparatus. (See **Note 1**.)

3.1.3 *wet cast products, n*—cast stone manufactured from measurable slump concrete consolidated by apparatus. (See **Note 1**.)

NOTE 1—Apparatus used in the production of cast stone may include automatic, semi-automatic, or manual devices that deploy internal or external vibration, vibrant tamping, vibration under pressure, centrifugal casting, or combinations of these techniques to achieve the specified physical properties.

4. Materials and Design

4.1 *Raw Materials*—Materials shall conform to the following specifications:

4.1.1 *Cement:*

4.1.1.1 *Portland Cement*—Specification ~~E150~~**C150/C150M**.

4.1.1.2 *Blended Cement*—Specification ~~E595~~**C595/C595M**.

4.1.1.3 *Hydraulic Cement*—Specification ~~E1157~~**C1157/C1157M**.

4.1.2 *Aggregates*—Specification ~~E33~~**C33/C33M**, except for grading requirements.

4.1.3 *Coloring Pigment*—Specification ~~E979~~**C979/C979M**, except that carbon black pigment shall not be used.

4.1.4 *Reinforcement*—Specification **A615/A615M**.

4.1.5 *Chemical Admixtures*—Chemical admixtures shall conform to the following applicable specifications:

4.1.5.1 *Air Entraining Admixtures*—Specification ~~E260~~**C260/C260M**, except for vibrant dry tamp products.

4.1.5.2 *Water Reducing and Accelerating Admixtures*—Specification **C494/C494M**.

4.1.5.3 *Other Constituents*—Integral water repellents and other chemicals for which no ASTM standard exists shall be previously established as suitable for use in concrete by proven field performance or through laboratory testing.

4.1.6 *Ground Slag*—Specification ~~E989~~**C989/C989M**.

4.1.7 *Fly Ash or Natural Pozzolan*—Specification **C618**.

4.2 *Design*—Samples shall be submitted for approval of color and texture. The manufacturer shall prepare drawings for approval showing shapes, sizes, reinforcement, exposed faces, and anchorage provisions. The purchaser or his authorized representative shall approve the samples and drawings before manufacture.

4.3 *Reinforcement:*

4.3.1 Reinforcement shall be new billet steel reinforcing bars meeting the requirements of Specification **A615/A615M** unless specified otherwise by the purchaser.

4.3.2 Reinforce units when necessary for safe handling and structural stress.

4.3.3 Reinforcement shall be noncorrosive where faces exposed to weather are covered with less than 1.5 in. (38 mm) of concrete material. All reinforcement shall have minimum coverage of twice the diameter of the bars.

4.3.4 Area of reinforcement in panels greater than 24 in. (600 mm) in more than one direction shall be not less than 0.25 % of the cross section area [in that direction]. Units less than 24 in. (600 mm) in both their length and width dimension shall be non-reinforced unless otherwise specified.

5. Physical Requirements

5.1 *Compressive Strength*—At 28 days after manufacture, not less than 6500 psi (45 MPa), when tested in accordance with Test Method **C1194**.

5.2 *Absorption, Cold Water*—At 28 days after manufacture, not greater than 6.0 %, when tested in accordance with Method A, Cold Water of Test Method **C1195**.

5.3 *Air Content*—Provide sufficient air content to meet the freeze-thaw requirements for wet cast products, when the air content is tested in accordance with Test Method **C173/C173M** or Test Method ~~E231~~**C231/C231M**.

5.4 *Field Testing* of cast stone shall be in accordance with Test Methods **C1194** and **C1195**. Field tested specimens shall have a minimum compressive strength of 85 % with no single specimen testing less than 75 % of the design requirement as allowed by ACI 318.

³ Available from American Concrete Institute (ACI), 38800 Country Club Dr., Farmington Hills, MI 48331-3439, <http://www.concrete.org>.