



Designation: C129 – 22

Standard Specification for Nonloadbearing Concrete Masonry Units¹

This standard is issued under the fixed designation C129; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This specification covers hollow and solid nonloadbearing concrete masonry units made from portland cement, water, and mineral aggregates with or without the inclusion of other materials. These units are intended for use in nonloadbearing partitions, but under certain conditions they may be suitable for use in nonloadbearing exterior walls above grade where effectively protected from the weather.

1.2 The text of this standard references notes and footnotes that provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

1.3 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.

NOTE 1—Concrete masonry units covered by this specification are made from lightweight or normal weight aggregates, or both.

NOTE 2—When particular features are desired, such as density classification, surface texture for appearance or bond, finish, color, fire resistance, insulation, acoustical properties, or other special features, such properties should be specified separately by the purchaser. However, suppliers should be consulted as to the availability of units having the desired features.

1.4 *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

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

¹ This specification is under the jurisdiction of ASTM Committee C15 on Manufactured Masonry Units and is the direct responsibility of Subcommittee C15.03 on Concrete Masonry Units and Related Units.

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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.

- [C90 Specification for Loadbearing Concrete Masonry Units](#)
- [C140/C140M Test Methods for Sampling and Testing Concrete Masonry Units and Related Units](#)
- [C150/C150M Specification for Portland Cement](#)
- [C331/C331M Specification for Lightweight Aggregates for Concrete Masonry Units](#)
- [C426 Test Method for Linear Drying Shrinkage of Concrete Masonry Units](#)
- [C595/C595M Specification for Blended Hydraulic Cements](#)
- [C618 Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete](#)
- [C979/C979M Specification for Pigments for Integrally Colored Concrete](#)
- [C989/C989M Specification for Slag Cement for Use in Concrete and Mortars](#)
- [C1240 Specification for Silica Fume Used in Cementitious Mixtures](#)
- [C1157/C1157M Performance Specification for Hydraulic Cement](#)
- [C1232 Terminology for Masonry](#)

3. Terminology

3.1 Terminology defined in Terminology [C1232](#) shall apply for this specification.

4. Classification

4.1 Nonloadbearing concrete masonry units manufactured in accordance with this specification shall conform to one of three density classifications prescribed in [Table 1](#).

5. Materials and Manufacture

5.1 *Cementitious Materials*—Materials shall conform to the following applicable specifications:

5.1.1 *Portland Cement*—Specification [C150/C150M](#).

5.1.2 *Modified Portland Cement*—Portland cement conforming to Specification [C150/C150M](#), modified as follows:

(1) *Limestone*—If calcium carbonate is added to the cement, the CaCO_3 content shall not be less than 85 %.

(2) *Limitation on Insoluble Residue*—1.5 %.

(3) *Limitation on Air Content of Mortar*—Volume percent, 22 % max.

(4) *Limitation on Loss on Ignition*—7 %.

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

TABLE 1 Density Classification^A Requirements

Density Classification	Oven-Dry Density of Concrete, lb/ft ³ (kg/m ³) Average of 3 Units
Lightweight	Less than 105 (1680)
Medium Weight	105 to less than 125 (1680 to 2000)
Normal Weight	125 (2000) or more

^AConsult manufacturers for available densities

5.1.3 *Blended Hydraulic Cements*—Specification **C595/C595M**.

5.1.4 *Hydraulic Cement*—Specification **C1157/C1157M**.

5.1.5 *Pozzolans*—Specification **C618**.

5.1.6 *Blast Furnace Slag Cement*—Specification **C989/C989M**.

5.1.7 *Silica Fume*—Specification **C1240**.

5.2 *Aggregates*—Aggregates shall conform to the following specifications, except for grading requirements:

5.2.1 *Normal Weight Aggregates*—Specification **C33/C33M**.

5.2.2 *Lightweight Aggregates*—Specification **C331/C331M**.

NOTE 3—The grading requirements of Specifications **C33/C33M** and **C331/C331M** may not be suitable for concrete masonry production. Because of this, producers are allowed to modify grading to meet their needs and the requirements of this specification.

5.3 *Pigments for Integrally Colored Concrete*—Specification **C979/C979M**.

5.4 *Other Constituents*—Air-entraining agents, integral water repellents, and other constituents shall be previously established as suitable for use in concrete masonry and shall conform to applicable ASTM standards or shall be shown by test or experience not to be detrimental to the durability of the concrete masonry units or any material customarily used in masonry construction.

6. Physical Requirements

6.1 At the time of delivery to the purchaser, units shall conform to the strength requirements prescribed in **Table 2**. Units shall be free of defects that significantly impair the strength or permanence of the construction.

NOTE 4—The purchaser is the public body or authority, association, corporation, partnership, or individual entering into a contract or agreement to purchase or install, or both, concrete masonry units. The time of delivery to the purchaser is FOB plant when the purchaser or purchaser's agent transports the concrete masonry units, or at the time unloaded at the worksite if the manufacturer or manufacturer's agent transports the concrete masonry units.

6.2 At the time of delivery to the purchaser, the total linear drying shrinkage of units shall not exceed 0.065%.

TABLE 2 Strength Requirements

	Compressive Strength (average net area) min, psi (MPa)
	Average of 3 units
Individual unit	500 (3.45)

6.3 *Solid Units*—The net cross-sectional area of solid units, in every plane parallel to the bearing surface, shall be not less than 75 % of the gross cross-sectional area measured in the same plane.

7. Dimensions and Permissible Variations

7.1 Minimum face shell thickness shall be not less than ½ in. (13 mm).

7.2 No overall dimension (width, height, and length) shall differ by more than ±⅛ in. (3.2 mm) from the specified standard dimensions.

NOTE 5—Standard dimensions of units are the manufacturer's designated dimensions. Nominal dimensions of modular size units are equal to the standard dimensions plus the thickness of one mortar joint. Nominal dimensions of nonmodular size units usually exceed the standard dimensions by ⅛ to ¼ in. (3.2 to 6.4 mm).

8. Finish and Appearance

8.1 Where units are to be used in exposed wall construction, the face or faces that are to be exposed shall not show chips or cracks, except as permitted in **10.2.2** and **10.2.3**, or other imperfections when viewed from a distance of not less than 20 ft (6.1 m) under diffused lighting.

8.2 The color and texture of the units shall be specified by the purchaser. The finished surfaces that will be exposed in place shall conform to an approved sample consisting of not less than four units, representing the range of texture and color permitted.

NOTE 6—Concrete masonry units are produced using a wide variety of natural aggregates and other materials. As such, slight variations inherent from natural materials should be expected. Since specifying units and approving samples can take place several months prior to production of actual units for a project, slight variations in appearance from the approved sample are to be expected.

8.3 Nonloadbearing concrete masonry units shall be clearly marked in a manner to preclude their use as load bearing units. Labeling is not necessary if units also comply with all requirements of Specification **C90**.

9. Methods of Sampling and Testing

9.1 The purchaser or authorized representative shall be accorded proper facilities to inspect and sample the units at the place of manufacture from the lots ready for delivery.

9.2 Compressive strength, absorption, density, and dimensional tolerances shall be based on tests of concrete masonry units of any configuration or dimensions made with the same materials, concrete mix design, manufacturing process, and curing method, conducted in accordance with Test Methods **C140/C140M**, Annex A1, and not more than 12 months prior to delivery.

9.3 Total linear drying shrinkage shall be based on tests of concrete masonry units made with the same materials, concrete mix design, manufacturing process, and curing method, conducted in accordance with Test Method **C426** and not more than 24 months prior to delivery.