



Designation: C129 – 17

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 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 Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
C150 Specification for Portland Cement
C207 Specification for Hydrated Lime for Masonry Purposes
C331 Specification for Lightweight Aggregates for Concrete Masonry Units
C426 Test Method for Linear Drying Shrinkage of Concrete Masonry Units
C595 Specification for Blended Hydraulic Cements
C618 Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
C989 Specification for Slag Cement for Use in Concrete and Mortars
C1157 Performance Specification for Hydraulic Cement
C1232 Terminology of 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.
- 5.1.2 *Blended Hydraulic Cements*—Specification C595.
- 5.1.3 *Hydraulic Cement*—Specification C1157.
- 5.1.4 *Hydrated Lime, Type S*—Specification C207.
- 5.1.5 *Ground Granulated Blast Furnace Slag*—Specification C989.
- 5.1.6 *Pozzolans*—Specification C618.

5.2 *Aggregates*—Aggregates shall conform to the following ASTM specifications, except that grading requirements shall not necessarily apply:

- 5.2.1 *Normal Weight Aggregates*—Specification C33.
- 5.2.2 *Lightweight Aggregates*—Specification C331.

*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

5.3 *Other Constituents*—Air-entraining agents, coloring pigments, integral water repellents, finely ground silica, 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**. All units shall be sound and free of cracks or other defects that interfere with the proper placement of the units or significantly impair the strength or permanence of the construction. Minor cracks incidental to the usual method of manufacture or minor chipping resulting from customary methods of handling in shipment and delivery are not grounds for rejection.

NOTE 3—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%.

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 $\pm \frac{1}{8}$ in. (3.2 mm) from the specified standard dimensions.

NOTE 4—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).

TABLE 2 Strength Requirements

| | Compressive Strength (average net area) min, psi (MPa) |
|--------------------|--|
| Average of 3 units | 600 (4.14) |
| Individual unit | 500 (3.45) |

8. Finish and Appearance

8.1 No more than 5 % of the units in the shipment shall exhibit one or more of the characteristics described in **8.1.1** through **8.1.4** and **8.2**.

8.1.1 Units with dimensions not meeting the requirements of **7.2**.

8.1.2 Units with finished face(s) containing chips larger than 1 in. (25.4 mm) in any direction.

8.1.3 Units with finished face(s) containing cracks wider than 0.02 in. (0.5 mm) and longer than 25 % of the nominal height of the unit.

8.1.4 Units that are broken.

NOTE 5—Units specified to have particular features or finishes, such as split-face and tumbled units, should not be evaluated for conformance of such features to the requirements of **8.1.2**.

8.2 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 **8.1.2** and **8.1.3**, or other imperfections when viewed from a distance of not less than 20 ft (6.1 m) under diffused lighting.

8.3 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.

8.4 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** 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.

10. Compliance

10.1 If a sample fails to conform to the specified requirements, the manufacturer shall be permitted to remove units from the shipment. A new sample shall be selected by the purchaser from remaining units from the shipment with a

similar configuration and dimension and tested at the expense of the manufacturer. If the second sample meets the specified requirements, the remaining portion of the shipment represented by the sample meets the specified requirements. If the second sample fails to meet the specified requirements, the remaining portion of the shipment represented by the sample fails to meet the specified requirements.

NOTE 7—Unless otherwise specified in the purchase order, the cost of

tests is typically borne as follows: if the results of the tests show that the units do not conform to the requirements of this specification, the cost is typically borne by the seller. If the results of the tests show that the units conform to the specification requirements, the cost is typically borne by the purchaser.

11. Keywords

11.1 concrete masonry units; face shell; flange; linear drying shrinkage; nonloadbearing

SUMMARY OF CHANGES

Committee C15 has identified the location of selected changes to this standard since the last issue (C129 – 14a) that may impact the use of this standard. (June 1, 2017)

(1) Modified 8.4 to exempt units complying with Specification C90 from C129 labeling requirements.

(2) Modified Section testing frequency in 9 to be based on time of delivery.

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