

**Designation: C 145 - 85**

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1916 Race St., Philadelphia, Pa. 19103Reprinted from the Annual Book of ASTM Standards, Copyright ASTM
If not listed in the current combined index, will appear in the next edition.**Standard Specification for
SOLID LOAD-BEARING CONCRETE MASONRY UNITS¹**

This standard is issued under the fixed designation C 145; 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 specification has been approved for use by agencies of the Department of Defense and for listing in the DoD Index of Specifications and Standards.

1. Scope

1.1 This specification covers solid load-bearing concrete masonry wall units (units with 75 % or more net area) made from portland cement, water, and suitable mineral aggregates, with or without the inclusion of other materials. The three weight classifications for concrete masonry units are normal weight, medium weight, and lightweight.

1.2 The values stated in inch-pound units are to be regarded as the 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 weight classification, high compressive strength, 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, local sellers should be consulted as to the availability of units having the desired features.

2. Applicable Documents**2.1 ASTM Standards:**

- C 33 Specification for Concrete Aggregates²
- C 140 Method of Sampling and Testing Concrete Masonry Units³
- C 150 Specification for Portland Cement²
- C 207 Specification for Hydrated Lime for Masonry Purposes⁴
- C 331 Specification for Lightweight Aggregates for Concrete Masonry Units²
- C 426 Test Method for Drying Shrinkage of Concrete Block³
- C 595 Specification for Blended Hydraulic Cements⁴
- C 618 Specification for Fly Ash and Raw or

Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete²

3. Classification

3.1 *Types*—Two types of concrete masonry units in each of two grades are covered as follows:

3.1.1 *Type I, Moisture-Controlled Units*—Units designated as Type I (Grades N-I and S-I) shall conform to all requirements of this specification including the moisture content requirements of Table 1.

3.1.2 *Type II, Nonmoisture-Controlled Units*—Units designated as Type II (Grades N-II and S-II) shall conform to all requirements of this specification except the moisture content requirements of Table 1.

3.2 *Grades*—Concrete masonry units manufactured in accordance with this specification shall conform to two grades as follows:

3.2.1 *Grade N*—For general use as in exterior walls below and above grade that may or may not be exposed to moisture penetration or the weather and for interior walls and back-up.

3.2.2 *Grade S*—Limited to use above grade in exterior walls with weather-protective coatings and in walls not exposed to the weather.

¹ This specification is under the jurisdiction of ASTM Committee C-15 on Manufactured Masonry Units and is the direct responsibility of Subcommittee C15.03 on Concrete and Sand Lime Units.

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² Annual Book of ASTM Standards, Vol 04.02.

³ Annual Book of ASTM Standards, Vol 04.05.

⁴ Annual Book of ASTM Standards, Vol 04.01.



4. Materials and Manufacture

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

4.1.1 *Portland Cements*—Specification C 150.

4.1.2 *Blended Cements*—Specification C 595.

4.1.3 *Hydrated Lime, Type S*—Specification C 207.

4.1.4 *Pozzolans*—Specification C 618.

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

4.2.1 *Normal Weight*—Specification C 33.

4.2.2 *Lightweight*—Specification C 331.

4.3 *Other Constituents*—Air-entraining agents, coloring pigments, integral water repellents, finely ground silica, etc., shall be previously established as suitable for use in concrete and either shall conform to ASTM standards where applicable, or shall be shown by test or experience not to be detrimental to the durability of the concrete.

5. Physical Requirements

5.1 At the time of delivery to the work site the units shall conform to the physical requirements prescribed in Table 2.

5.2 The moisture content of Type I concrete masonry units at the time of delivery shall conform to the requirements prescribed in Table 1.

6. Dimensions and Permissible Variations

6.1 The net cross-sectional area of the unit 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.

6.2 No overall dimension (width, height, or length) shall differ by more than $\frac{1}{8}$ in. (3.2 mm) from the specified standard dimensions.

NOTE 3—Standard dimensions of units are the manufacturer's designated dimensions. Nominal dimensions of modular size units are equal to the standard dimensions plus $\frac{3}{8}$ in. (9.5 mm), the thickness of one standard mortar joint. Nominal dimensions of non-modular size units usually exceed the standard dimensions by $\frac{1}{8}$ to $\frac{1}{4}$ in. (3.2 to 6.4 mm).

7. Visual Inspection

7.1 All units shall be sound and free of cracks or other defects that would interfere with the proper placing of the unit or 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, shall not be deemed grounds for rejection.

7.2 Where units are to be used in exposed wall construction, the face or faces that are to be exposed shall be free of chips, cracks, or other imperfections, except that if not more than 5 % of a shipment contains slight cracks or small chips not larger than 1 in. (25 mm), this shall not be deemed grounds for rejection.

8. Sampling and Testing

8.1 The purchaser or his authorized representative shall be accorded proper facilities to inspect and sample the units at the place of manufacture from the lots ready for delivery. At least 10 days should be allowed for completion of the test.

8.2 Sample and test units in accordance with Methods C 140.

8.3 When Type I moisture-controlled units are specified, base the moisture-content requirements (Table 1) upon Test Method C 426, conducted not more than 12 months prior to delivery of units.

9. Rejection

9.1 If the shipment fails to conform to the specified requirements, the manufacturer may sort it, and new specimens shall be selected by the purchaser from the retained lot and tested at the expense of the manufacturer. If the second set of specimens fails to conform to the test requirements, the entire lot shall be rejected.

10. Expense of Tests

10.1 Except as specified in Section 9, and unless otherwise agreed, the expense of inspection and testing shall be borne by the purchaser.