



Designation: C 90 – 02a

Standard Specification for Loadbearing Concrete Masonry Units¹

This standard is issued under the fixed designation C 90; 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 Department of Defense.

1. Scope *

1.1 This specification covers hollow and solid (see 5.3 and 5.4) concrete masonry units made from portland cement, water, and mineral aggregates with or without the inclusion of other materials. There are three classes of concrete masonry units: (1) normal weight, (2) medium weight, and (3) lightweight. These units are suitable for both loadbearing and nonloadbearing applications.

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

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

1.4 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

NOTE 1—When particular features are desired such as surface textures for appearance or bond, finish, color, or particular properties such as weight classification, higher compressive strength, fire resistance, thermal performance or acoustical performance, these features should be specified separately by the purchaser. Local suppliers should be consulted as to the availability of units having the desired features.

2. Referenced Documents

2.1 ASTM Standards:

- C 33 Specification for Concrete Aggregates²
- C 140 Test Methods for Sampling and Testing Concrete Masonry Units and Related Units³
- C 150 Specification for Portland Cement⁴
- C 331 Specification for Lightweight Aggregates for Concrete Masonry Units²
- C 426 Test Method for Drying Shrinkage of Concrete Masonry Units³
- C 595 Specification for Blended Hydraulic Cements⁴

- C 618 Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete²
- C 989 Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars²
- C 1157 Performance Specification for Hydraulic Cement⁴
- C 1209 Terminology of Concrete Masonry Units and Related Units³
- C 1232 Terminology of Masonry³
- C 1314 Test Method for Constructing and Testing Masonry Prisms Used to Determine Compliance with Specified Compressive Strength of Masonry³
- E 519 Test Method for Diagonal Tension (Shear) in Masonry Assemblages³
- E 72 Methods for Conducting Strength Tests of Panels for Building Construction⁵

3. Terminology

3.1 Terminology defined in Terminology C 1209 and Terminology C 1232 shall apply for this specification.

4. Materials

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

- 4.1.1 *Portland Cement*—Specification C 150.
- 4.1.2 *Modified Portland Cement*—Portland cement conforming to Specification C 150, modified as follows:
 - (1) *Limestone*—If calcium carbonate is added to the cement, the CaCO₃ 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 %.
- 4.1.3 *Blended Hydraulic Cements*—Specification C 595.
- 4.1.4 *Hydraulic Cement*—Specification C 1157.
- 4.1.5 *Pozzolans*—Specification C 618.
- 4.1.6 *Blast Furnace Slag Cement*—Specification C 989.

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

- 4.2.1 *Normal Weight Aggregates*—Specification C 33.

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 *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.

⁵ *Annual Book of ASTM Standards*, Vol 04.07.

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