



Designation: **C139—22 C139 – 23**

Standard Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes¹

This standard is issued under the fixed designation C139; 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.

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

1. Scope*

1.1 This specification covers solid precast segmental concrete masonry units made from hydraulic cement, water, and suitable mineral aggregates, with or without the inclusion of other materials. The units are intended for use in the construction of catch basins and manholes.

1.2 The text of this standard referenced 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.

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
- C140/C140M Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
- C150/C150M Specification for Portland Cement
- C207 Specification for Hydrated Lime for Masonry Purposes
- C595/C595M Specification for Blended Hydraulic Cements
- C618 Specification for Coal 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
- C1157/C1157M Performance Specification for Hydraulic Cement
- C1232 Terminology for Masonry
- C1240 Specification for Silica Fume Used in Cementitious Mixtures

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.

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

3. Terminology

3.1 Terminology defined in Terminology **C1232** shall apply for this specification.

4. Materials

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

4.1.1 *Portland Cement*—Specification **C150/C150M**.

4.1.2 *Modified Portland Cement*—Portland cement conforming to Specification **C150/C150M**, modified as follows:

(1) *Limestone*—If calcium carbonate is added to the cement, the 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 **C595/C595M**.

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

4.1.5 *Pozzolans*—Specification **C618**.

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

4.1.7 *Silica Fume*—Specification **C1240**.

4.2 *Aggregates*—Aggregates shall conform to Specification **C33/C33M**, except for grading requirements.

NOTE 1—The grading requirements of Specifications **C33/C33M** 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.

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

4.4 *Other Constituents*—Air-entraining agents, integral water repellents, and other constituents shall be previously established as suitable for use in concrete masonry units 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.

5. Physical Requirements

5.1 At the time of delivery to the purchaser, the units shall conform to the requirements prescribed in **Table 1**. Units shall be free of defects that significantly impair the strength or permanence of the construction.

6. Dimensions and Permissible Variations

6.1 The thickness of any unit shall be not less than 5 in. (127 mm).

6.2 Overall dimensions shall not vary by more than ± 3 % from the specified dimensions.

TABLE 1 Strength and Absorption Requirements

Compressive Strength, min, lb/in ² (MPa) (Average Gross Area)		Water Absorption, max, lb/ft ³ (kg/m ³)	
Average of 3 Units	Individual Units	Average of 3 Units	Individual Units
2500 (17)	2000 (13)	10 (160)	12 (192)