Designation: ~~C936/C936M – 16~~ C936/C936M – 18

Standard Specification for Solid Concrete Interlocking Paving Units[1]

This standard is issued under the fixed designation C936/C936M; 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.

1. Scope*

1.1 This specification covers the requirements for interlocking concrete pavers manufactured for the construction of paved surfaces.

1.2 When particular features are desired, such as weight classification, higher compressive strength, surface textures, finish, color, or other special features, such properties should be specified by the purchaser. Local sellers, however, should be consulted as to availability of units having the desired features.

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the 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
C260/C260M Specification for Air-Entraining Admixtures for Concrete
C331/C331M Specification for Lightweight Aggregates for Concrete Masonry Units
C418 Test Method for Abrasion Resistance of Concrete by Sandblasting
C494/C494M Specification for Chemical Admixtures for Concrete
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
C1157/C1157M Performance Specification for Hydraulic Cement
C1240 Specification for Silica Fume Used in Cementitious Mixtures
C1645/C1645M Test Method for Freeze-thaw and De-icing Salt Durability of Solid Concrete Interlocking Paving Units

3. Terminology

3.1 *Definitions:*

3.1.1 *architectural finishes*—surface modified by mechanical means such as blasting, hammering, polishing, tumbling, washing, or other methods.

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[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.

Current edition approved ~~June 1, 2016~~Sept. 1, 2018. Published ~~July 2016~~September 2018. Originally approved in 1982. Last previous edition approved in ~~2015~~2016 as ~~C936/C936M – 15.~~C936/C936M – 16. DOI: ~~10.1520/C0936_C0936M-16.~~10.1520/C0936_C0936M-18.

[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**

4. Materials

4.1 *Cementitious Materials* shall conform to the following applicable ASTM specifications:
4.1.1 *Portland Cements*—Specification C150/C150M.
4.1.2 *Blended Hydraulic Cements*—Specification C595/C595M.
4.1.3 *Hydraulic Cement*—Specification C1157/C1157M.
4.1.4 *Hydrated Lime, Type S*—Specification C207.
4.1.5 *Fly Ash*—Specification C618.
4.1.6 *Ground Slag*—Specification C989/C989M.
4.1.7 *Silica Fume*—Specification C1240.

4.2 *Aggregates* shall conform to the following ASTM specifications, except that grading requirements shall not necessarily apply:
4.2.1 *Normal Weight*—Specification C33/C33M.
4.2.2 *Lightweight*—Specification C331/C331M.

4.3 *Chemical Admixtures* shall conform to the following applicable ASTM specifications:
4.3.1 *Air-entraining Admixtures*—Specification C260/C260M.
4.3.2 *Water-reducing, Retarding, and Accelerating Admixtures*—Specification C494/C494M.
4.3.3 *Pigments for Integrally Colored Concrete*—Specification C979/C979M.

4.4 *Other Constituents*—Integral water repellents, and other materials for which no ASTM standards exist, shall be previously established as suitable for use in concrete or shall be shown by test or experience not to be detrimental to the concrete.

5. Physical Requirements

5.1 Units shall have an exposed face area ≤101 in.^{2} [0.065 m^2], and their overall length divided by thickness shall be ≤4. The minimum specified thickness shall be 2.36 in. [60 mm]. See Fig. 1.

5.2 Concrete units covered by this specification may be made from lightweight or normal weight aggregates or mixed lightweight and normal weight aggregates.

5.3 *Compressive Strength*—At the time of delivery to the work site, the average compressive strength of the test samples shall be not less than 8000 psi [55 MPa] with no individual unit less than 7200 psi [50 MPa] as required in 6.2.

5.4 *Absorption*—The average absorption of the test samples shall not be greater than 5 % with no individual unit greater than 7 % as required in 6.2.

5.5 *Resistance to Freezing and Thawing*—If the units are exposed to freezing and deicing materials during service, the manufacturer shall satisfy the purchaser either by proven field performance or a laboratory freezing-and-thawing test that the paving units have adequate resistance to freezing and thawing. If a laboratory test is used, sample and test in accordance with 6.2 using Test Method C1645/C1645M. Specimens sampled from units that will not be exposed to deicing salts in service shall be tested in tap water. Specimens sampled from units that will be exposed to deicing materials in service shall be tested in 3 % saline solution. The average mass loss of all the specimens tested shall not be greater than: (*a*) 225 g/m^2 when subject to 28 freeze-thaw cycles, or (*b*) 500 g/m^2 when subject to 49 freeze-thaw cycles. ~~This test method shall be conducted not more than 12 months prior to delivery of units.~~

NOTE 1—For some pavement applications subject to severe winter temperatures and deicing materials, a lower freezing temperature should be considered when conducting Test C1645/C1645M using a 3 % saline solution. See the non-mandatory Appendix X1 for this temperature option.

5.6 *Abrasion Resistance*—When requested by the specifier or purchaser, ~~units shall be tested~~ sample and test in accordance with 6.4 using Test Method C418 or the manufacturer shall provide adequate record of field performance from a similar application. Specimens shall not have an average volume loss greater than 0.92 in.^{3}/7.75 in.^{2} [15 cm^3/50 cm^2]. The average thickness loss shall not exceed 0.118 in. [3 mm].

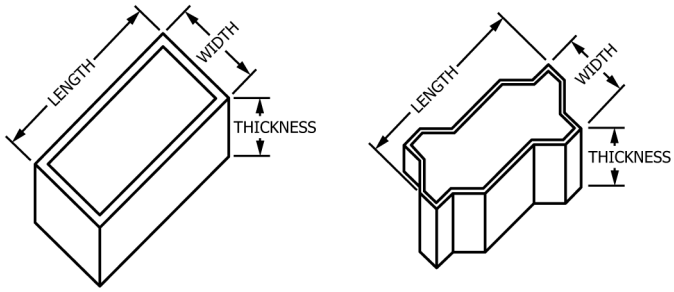

FIG. 1 Length, Width, and Thickness of Concrete Paving Units