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Standard Specification for Solid Concrete Interlocking Paving Units[1]

This standard is issued under the fixed designation C 936; 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 SI units are to be regarded as the standard. The values given in parentheses are for information only.

2. Referenced Documents

2.1 *ASTM Standards:* [2]

C 33 Specification for Concrete Aggregates ~~C67Test Methods for Sampling and Testing Brick and Structural Clay Tile~~
C 140 Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
C 150 Specification for Portland Cement
C 207 Specification for Hydrated Lime for Masonry Purposes
C 260 Specification for Air-Entraining Admixtures for Concrete
C 331 Specification for Lightweight Aggregates for Concrete Masonry Units
C 418 Test Method for Abrasion Resistance of Concrete by Sandblasting
C 494/C 494M Specification for Chemical Admixtures for Concrete
C 595 Specification for Blended Hydraulic Cements
C 618 Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
C 979 Specification for Pigments for Integrally Colored Concrete
C 989 Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars
C 1157 Performance Specification for Hydraulic Cement
C 1240~~Specification for Silica Fume Used in Cementitious Mixtures~~ Specification for Silica Fume Used in Cementitious Mixtures
C 1645 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.

4. Materials

4.1 *Cementitious 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, Types IS or IP.

4.1.3 *Hydraulic Cement*—Specification C 1157.

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

4.1.5 *Fly Ash*—Specification C 618.

4.1.6 *Ground Slag*— Specification C 989.

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[1] This specification is under the jurisdiction of ASTM Committee C27 on Precast Concrete Products and is the direct responsibility of Subcommittee C27.20 on Architectural and Structural Products.

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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.

4.1.7 *Silica Fume*— Specification C 1240.

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 *Chemical Admixtures* shall conform to the following applicable ASTM specifications:

4.3.1 *Air-entraining Admixtures*—Specification C 260.

4.3.2 *Water-reducing, Retarding, and Accelerating Admixtures*—Specification C 494/C 494M.

4.3.3 *Pigments for Integrally Colored Concrete*—Specification C 979.

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 ≤0.065 m^2 (101 $in.^2$), and their overall length divided by thickness shall be ≤4. The minimum specified thickness shall be 60 mm (2.36 in.). 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 55 MPa (8000 psi) with no individual unit less than 50 MPa (7200 psi) 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*—~~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, when tested in accordance with Test Methods C67, specimens shall have no breakage and not greater than 1.0% loss in dry mass of any individual unit when subjected to 50 cycles of freezing and thawing. This test method shall be conducted not more than 12 months prior to delivery of units.~~ —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, test in accordance with Test Method C 1645. 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. Specimens shall comply with either of the following: (*a*) no greater mass loss than 200 g/m^2 when subject to 25 freeze-thaw cycles, or (*b*) no greater mass loss than 500 g/m^2 when subject to 50 freeze-thaw cycles. This test method shall be conducted not more than 12 months prior to delivery of units.

5.6 *Abrasion Resistance*—When tested in accordance with Test Method C 418, specimens shall not have ~~a greater~~an average volume loss greater than 15 $cm^3/50\ cm^2$ (0.92 $in.^3/7.75\ in.^2$). The average thickness loss shall not exceed 3 mm (0.118 in.).

5.7 *Dimensional Tolerance*—~~Length~~ —Measured length or width of ~~units~~ test specimens shall not differ by more than ±1.6 mm (±0.063 in.) from ~~approved samples. Heights~~ specified dimensions. Measured height of ~~units~~ test specimens shall not differ by more than ±3.2 mm (±0.125 in.) from the specified ~~standard~~ dimension. All tests shall be performed as required in 6.2. Units shall meet dimensional tolerances prior to the application of architectural finishes.

6. ~~Sampling and Testing~~

~~6.1The 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.~~ Sampling and Testing

6.1 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. Prior to delivery of units, the supplier and purchaser shall decide on the lot size from which to sample test specimens for resistance to freezing and thawing, abrasion resistance, absorption, compressive strength, and dimensional tolerances.

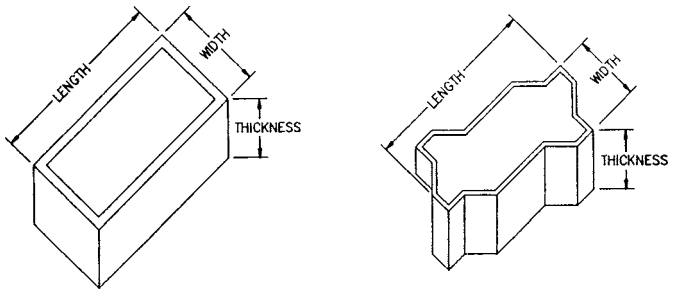

FIG. 1 Length, Width, and Thickness of Concrete Paving Units