



# Standard Specification for Solid Concrete Interlocking Paving Units<sup>1</sup>

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## 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:

- C 33 Specification for Concrete Aggregates<sup>2</sup>
- C 67 Test Methods for Sampling and Testing Brick and Structural Clay Tile<sup>3</sup>
- C 140 Test Methods for Sampling and Testing Concrete Masonry Units and Related Units<sup>3</sup>
- C 150 Specification for Portland Cement<sup>4</sup>
- C 207 Specification for Hydrated Lime for Masonry Purposes<sup>4</sup>
- C 260 Specification for Air-Entraining Admixtures for Concrete<sup>2</sup>
- C 331 Specification for Lightweight Aggregates for Concrete Masonry Units<sup>2</sup>
- C 418 Test Method for Abrasion Resistance of Concrete by Sandblasting<sup>2</sup>
- C 494/C 494M Specification for Chemical Admixtures for Concrete<sup>2</sup>
- C 595 Specification for Blended Hydraulic Cements<sup>4</sup>
- C 618 Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete<sup>2</sup>
- C 979 Specification for Pigments of Integrally Colored Concrete<sup>2</sup>

C 989 Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars<sup>2</sup>

C 1240 Specification for Use of Silica Fume as a Mineral Admixture in Hydraulic-Cement Concrete, Mortar, and Grout<sup>2</sup>

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

4.1.4 *Fly Ash*—Specification C 618.

4.1.5 *Ground Slag*—Specification C 989.

4.1.6 *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  $\leq 0.065 \text{ m}^2$  (101 in.<sup>2</sup>), and their overall length divided by thickness shall be  $\leq 4$ . The minimum thickness shall be 60 mm (2.36 in.). See Fig. 1.

5.2 Concrete units covered by this specification may be

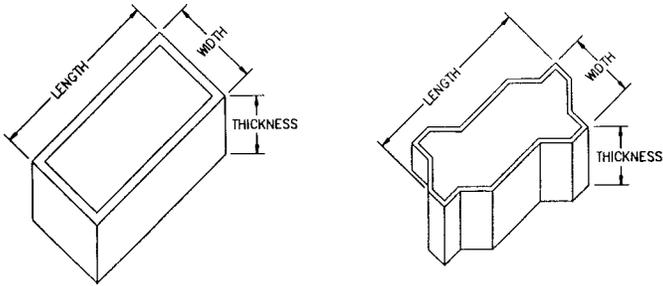
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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 04.02.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 04.05.

<sup>4</sup> *Annual Book of ASTM Standards*, Vol 04.01.



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

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 C 67, 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.

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

**5.7 Dimensional Tolerance**—Length or width of units shall not differ by more than ±1.6 mm (±0.063 in.) from approved samples. Heights of units shall not differ more than ±3.2 mm (±0.125 in.) 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

6.1 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.

6.2 Sample and test units in accordance with Test Methods C 140, except as required in 5.5. Units tested in compression shall be whole. If the testing machine does not have sufficient force to break a whole unit, then the unit shall be cut in half along the shortest axis and one half tested. Units with protruding, smaller ends shall have the ends saw cut and the remaining larger pieces tested. This specimen shall be symmetrical about two axes.

## 7. Visual Inspection

7.1 All units shall be sound and free of defects that would interfere with the proper placing of the units or impair the strength or performance of the construction. Minor cracks incidental to the usual methods of manufacture or minor chipping resulting from customary methods of handling in shipment and delivery shall not be deemed grounds for rejection.

## 8. Rejection

8.1 In case 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. In case the second set of specimens fails to conform to the test requirements, the entire lot shall be rejected.

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