



Designation: C 1645 – 06

Standard Test Method for Freeze-thaw and De-icing Salt Durability of Solid Concrete Interlocking Paving Units¹

This standard is issued under the fixed designation C 1645; 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 test method covers the resistance to freezing and thawing of solid interlocking concrete paving units conforming to the dimensional requirements of Specification C 936. Units are tested in a test solution that is either water or 3 % saline solution, depending on the intended use of the units in actual service.

1.2 The values stated in SI units are to be regarded as the standard.

1.3 *This standard does not purport to address all of the safety concerns, in any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitation prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*²

C 936 Specification for Solid Concrete Interlocking Paving Units

3. Significance and Use

3.1 This test method is intended to determine the effects of freezing and thawing on units conforming to the dimensional requirements of Specification C 936 while immersed in a test solution. Other types of segmental concrete paving units that do not conform to the dimensional requirements of Specification C 936 may be tested using this method.

3.2 The results from this test method are not intended to provide a quantitative measure of the length of service from paving units conforming to the dimensional requirements of Specification C 936.

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. Apparatus

4.1 *Freezing-and-Thawing Apparatus*—The freezing apparatus shall consist of suitable cabinet or cold room with controls to reach and maintain an air temperature of $-5 \pm 3^\circ\text{C}$ ($23 \pm 5^\circ\text{F}$) within 1 h of introduction of specimens. The thawing chamber shall maintain a controlled air temperature. This temperature shall never be greater than $+30^\circ\text{C}$ (86°F).

4.2 *Balance*—A balance capable of weighing 500 g with an accuracy of ± 0.1 g shall be used for measuring the mass of the fine spalled material.

4.3 *Oven*—The oven shall be vented and capable of being maintained at $60 \pm 2^\circ\text{C}$ ($140 \pm 4^\circ\text{F}$).

4.4 *Specimen Container*—The specimen container shall be made of non-corroding flexible material and have dimensions that allow complete submersion of the specimen in the test solution. The size of the container shall be less than or equal to three times the volume of the unit that is being tested. The container shall prevent evaporation of the test solution.

5. Sampling

5.1 *Selection of Test Specimens*—Select whole units representative of the lot from which they are selected. The units shall be free from visible cracks, chipped edges, and structural defects.

5.2 *Number of Test Specimens*—Sample according to the requirements of Specification C 936.

5.3 *Identification*—Mark each test specimen so that it is identifiable at any time.

6. Preparation of Test Specimens

6.1 *Curing and Conditioning*—Test specimens shall consist of full size units, a minimum of 28 days old. After sampling, all test specimens shall be cured for 14 days in a moist chamber (cabinet or room) at an air temperature of $23 \pm 2^\circ\text{C}$ ($73 \pm 4^\circ\text{F}$) and a relative humidity of at least 90 %. Moist curing shall be followed by air curing for a minimum of 14 days at $23 \pm 5^\circ\text{C}$ ($73 \pm 9^\circ\text{F}$) at a minimum 40 % relative humidity.

6.1.1 After air curing, specimens then shall be oven conditioned for $48 \text{ h} \pm 2 \text{ h}$ at $60^\circ \pm 2^\circ\text{C}$ ($140 \pm 4^\circ\text{F}$).