



Designation: C1754/C1754M – 12

Standard Test Method for Density and Void Content of Hardened Pervious Concrete¹

This standard is issued under the fixed designation C1754/C1754M; 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 provides a procedure for determining the density and void content of hardened pervious concrete specimens.

1.2 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system are not exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the standard.

1.3 *This standard does not purport to address all of the safety concerns, if 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 limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*²

C29/C29M Test Method for Bulk Density (“Unit Weight”) and Voids in Aggregate

C125 Terminology Relating to Concrete and Concrete Aggregates

C1542/C1542M Test Method for Measuring Length of Concrete Cores

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this test method, refer to Terminology C125.

4. Summary of Test Method

4.1 The dimensions of a specimen of hardened pervious concrete are measured to determine its volume. The specimen is subsequently dried to constant mass and immersed in water

to determine the volume of solids in the specimen. Void content is calculated using the difference between the total volume and the displaced volume when submerged.

5. Significance and Use

5.1 This test method is applicable to pervious concrete mixtures containing coarse aggregate with a nominal maximum size of 25 mm [1 in.] or smaller.

5.2 This test method applies to either core specimens or molded cylinders.

5.3 Density and void content determined by other test methods may produce different numerical results, which may not be comparable.

5.4 This test method allows one to choose one of two different drying methods. The following should be considered in selecting Drying Method A or B.

5.4.1 Drying Method A uses a lower temperature to determine the constant dry mass of the pervious specimen. Depending on the initial condition of the pervious specimen, obtaining the constant dry mass may take as long as one week or more. Drying Method B uses a much higher temperature and therefore the constant dry mass is attained much more quickly.

5.4.2 Specimens tested using Drying Method B shall not be used to determine other properties of the pervious concrete. If other physical properties such as strength or infiltration will be determined from the specimen, Drying Method A should be used for testing.

5.4.3 Drying Method B may produce lower densities and correspondingly higher void contents than Drying Method A. Results from the two methods should be treated separately and not combined.

5.4.4 Repeat testing of the same specimen using Drying Method A has been shown to produce dissimilar results. Only the first set of results should be considered.

NOTE 1—It is believed that exposure to high temperatures, as used in Drying Method B, may alter the void structure of the pervious concrete matrix by causing shrinkage cracks in the cement paste at the aggregate interface.

6. Apparatus

6.1 *Balance*—A balance or scale accurate to 0.5 g [0.001 lb]. The balance shall be equipped with suitable apparatus for determining the submerged mass of the test specimen.

¹ This test method is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.49 on Pervious Concrete.

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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.