



Designation: D3744/D3744M – 18

Standard Test Method for Aggregate Durability Index¹

This standard is issued under the fixed designation D3744/D3744M; 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 determination of a durability index of an aggregate. The calculated durability index is a value indicating the relative resistance of an aggregate to production of detrimental clay-like fines when subjected to the prescribed mechanical methods of degradation.

1.2 *Units*—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 nonconformance with the standard.

1.2.1 Measurements of volume and mass are only given in SI units because they are the only units typically used in practice when performing this test method.

1.2.2 Measurements in Section 11, Section 15, Eq 3, Eq 4, and Table 1 are only given in inch-pound units because the equipment used in these sections is only manufactured using the inch-pound system.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

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

¹ This test method is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.51 on Aggregate Tests.

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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.

C127 Test Method for Relative Density (Specific Gravity) and Absorption of Coarse Aggregate
C136/C136M Test Method for Sieve Analysis of Fine and Coarse Aggregates
C702/C702M Practice for Reducing Samples of Aggregate to Testing Size
D75/D75M Practice for Sampling Aggregates
D2419 Test Method for Sand Equivalent Value of Soils and Fine Aggregate
D3666 Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
D4753 Guide for Evaluating, Selecting, and Specifying Balances and Standard Masses for Use in Soil, Rock, and Construction Materials Testing
E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves

3. Summary of Test Method

3.1 This test method was developed to permit prequalification of aggregates proposed for use in the construction of transportation facilities. This test establishes an aggregate's resistance to generating fines when agitated in the presence of water. Separate and different test procedures are used to evaluate the coarse and the fine portions of an aggregate.

3.2 A sample of coarse aggregate is prepared to a specific grading and then washed in a washing vessel secured in a mechanical agitator for 2 min. After discarding the minus 4.75-mm (No. 4) material, dry the washed test sample.

3.3 The coarse aggregate test sample is then mechanically agitated in the washing vessel for a period of 10 min. A representative portion of the resulting wash water and minus 75- μ m (No. 200) size fines is collected and mixed with a stock calcium chloride solution and placed in a plastic cylinder. After a 20-min sedimentation time, the level of the sediment column is read. The height of the sediment value is then used to calculate the durability index of the coarse aggregate (D_c).

3.4 The fine aggregate sample is prepared by washing a specific quantity of the material in the washing vessel secured in a mechanical agitator for 2 min. All minus 75- μ m (No. 200) size material is washed from the sample through a 75- μ m (No. 200) sieve and discarded. The plus 75- μ m (No. 200) fraction is dried.