



Designation: C535 – 09

Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine¹

This standard is issued under the fixed designation C535; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope*

1.1 This test method covers testing sizes of coarse aggregate larger than 19 mm ($\frac{3}{4}$ in.) for resistance to degradation using the Los Angeles testing machine (Note 1).

NOTE 1—A procedure for testing coarse aggregate smaller than 37.5 mm ($1\frac{1}{2}$ in.) is covered in Test Method C131.

1.2 *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.*

1.3 The values stated in SI units are to be regarded as the standard. The inch-pound values given in parentheses are for information only.

2. Referenced Documents

2.1 *ASTM Standards:*²

C125 Terminology Relating to Concrete and Concrete Aggregates

C131 Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

C136 Test Method for Sieve Analysis of Fine and Coarse Aggregates

C702 Practice for Reducing Samples of Aggregate to Testing Size

D75 Practice for Sampling Aggregates

E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves

¹ This test method is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.20 on Normal Weight Aggregates.

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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.

3. Terminology

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

4. Summary of Test Method

4.1 This test is a measure of degradation of mineral aggregates of standard gradings resulting from a combination of actions including abrasion or attrition, impact, and grinding in a rotating steel drum containing 12 steel spheres. As the drum rotates, a shelf plate picks up the sample and the steel spheres, carrying them around until they are dropped to the opposite side of the drum, creating an impact-crushing effect. The contents then roll within the drum with an abrading and grinding action until the shelf plate picks up the sample and the steel spheres, and the cycle is repeated. After the prescribed number of revolutions, the contents are removed from the drum and the aggregate portion is sieved to measure the degradation as percent loss.

5. Significance and Use

5.1 The test has been widely used as an indicator of the relative quality or competence of various sources of aggregate having similar mineral compositions. The results do not automatically permit valid comparisons to be made between sources distinctly different in origin, composition, or structure. Assign specification limits with extreme care in consideration of available aggregate types and their performance history in specific end uses.

6. Apparatus

6.1 *The Los Angeles Machine* shall conform to the requirements of Test Method C131.

6.1.1 The operation and maintenance of the machine shall be as prescribed in Test Method C131.

6.2 *Sieves*, conforming to Specification E11.

6.3 *Balance*—A balance or scale accurate within 0.1 % of test load over the range required for this test

6.4 *Charge*—The charge (Note 2) shall consist of 12 steel spheres averaging approximately 47 mm ($1\frac{7}{32}$ in.) in

*A Summary of Changes section appears at the end of this standard