



Designation: **C117–04 C117 – 13**

Standard Test Method for Materials Finer than 75- μm (No. 200) Sieve in Mineral Aggregates by Washing¹

This standard is issued under the fixed designation C117; 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 U.S. Department of Defense.

1. Scope

1.1 This test method covers the determination of the amount of material finer than a 75- μm (No. 200) sieve in aggregate by washing. Clay particles and other aggregate particles that are dispersed by the wash water, as well as water-soluble materials, will be removed from the aggregate during the test.

1.2 Two procedures are included, one using only water for the washing operation, and the other including a wetting agent to assist the loosening of the material finer than the 75- μm (No. 200) sieve from the coarser material. Unless otherwise specified, Procedure A (water only) shall be used.

1.3 The values stated in SI units are to be regarded as the standard. No other units of measurement are included in this standard.

1.4 *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

[C136 Test Method for Sieve Analysis of Fine and Coarse Aggregates](#)

[C670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials](#)

[C702 Practice for Reducing Precision of Aggregate to Testing Size](#)

[D75 Practice for Sampling Aggregates](#)

[E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves](#)

2.2 *AASHTO Standard:*

[T11 Method of Test for Amount of Material Finer than 0.075-mm Sieve in Aggregate](#)³

3. Summary of Test Method

3.1 A sample of the aggregate is washed in a prescribed manner, using either plain water or water containing a wetting agent, as specified. The decanted wash water, containing suspended and dissolved material, is passed through a 75- μm (No. 200) sieve. The loss in mass resulting from the wash treatment is calculated as mass percent of the original sample and is reported as the percentage of material finer than a 75- μm (No. 200) sieve by washing.

4. Significance and Use

4.1 Material finer than the 75- μm (No. 200) sieve can be separated from larger particles much more efficiently and completely by wet sieving than through the use of dry sieving. Therefore, when accurate determinations of material finer than 75 μm in fine or coarse aggregate are desired, this test method is used on the sample prior to dry sieving in accordance with Test Method [C136](#). The results of this test method are included in the calculation in Test Method [C136](#), and the total amount of material finer than 75 μm by washing, plus that obtained by dry sieving the same sample, is reported with the results of Test Method [C136](#). Usually,

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 Available from American Association of State Highway and Transportation Officials (AASHTO), 444 N. Capitol St., NW, Suite 249, Washington, DC 20001.

the additional amount of material finer than 75 μm obtained in the dry sieving process is a small amount. If it is large, the efficiency of the washing operation should be checked. It could also be an indication of degradation of the aggregate.

4.2 Plain water is adequate to separate the material finer than 75 μm from the coarser material with most aggregates. In some cases, the finer material is adhering to the larger particles, such as some clay coatings and coatings on aggregates that have been extracted from bituminous mixtures. In these cases, the fine material will be separated more readily with a wetting agent in the water.

5. Apparatus and Materials

5.1 *Balance*—A balance or scale readable and accurate to 0.1 g or 0.1 % of the test load, whichever is greater, at any point within the range of use.

5.2 *Sieves*—A nest of two sieves, the lower being a 75- μm (No. 200) sieve and the upper a 1.18-mm (No. 16) sieve, both conforming to the requirements of Specification E11.

5.3 *Container*—A pan or vessel of a size sufficient to contain the sample covered with water and to permit vigorous agitation without loss of any part of the sample or water.

5.4 *Oven*—An oven of sufficient size, capable of maintaining a uniform temperature of $110 \pm 5 \text{ }^\circ\text{C}$ ($230 \pm 9 \text{ }^\circ\text{F}$).

5.5 *Wetting Agent*—Any dispersing agent, such as liquid dishwashing detergents, that will promote separation of the fine materials.

NOTE 1—The use of a mechanical apparatus to perform the washing operation is not precluded, provided the results are consistent with those obtained using manual operations. The use of some mechanical washing equipment with some samples may cause degradation of the sample.

6. Sampling

6.1 Sample the aggregate in accordance with Practice D75. If the same test sample is to be tested for sieve analysis according to Test Method C136, comply with the applicable requirements of that test method.

6.2 Thoroughly mix the sample of aggregate to be tested and reduce the quantity to an amount suitable for testing using the applicable methods described in Practice C702. If the same test sample is to be tested according to Test Method C136, the minimum mass shall be as described in the applicable sections of that method. Otherwise, the mass of the test sample, after drying, shall conform with the following:

Nominal Maximum Size ^A	Minimum Mass, g
4.75 mm (No. 4) or smaller	300
Greater than 4.75 mm (No. 4) to 9.5 mm (3/8 in.)	1000
Greater than 9.5 mm (3/8 in.) to 19.0 mm (3/4 in.)	2500
Greater than 19.0 mm (3/4 in.)	5000

^A Based on sieve sizes meeting Specification E11.

7. Selection of Procedure

7.1 Procedure A shall be used, unless otherwise specified by the Specification with which the test results are to be compared, or when directed by the agency for which the work is performed.

8. Procedure A—Washing with Plain Water

8.1 Dry the test sample in the oven to constant mass at a temperature of $110 \pm 5 \text{ }^\circ\text{C}$ ($230 \pm 9 \text{ }^\circ\text{F}$). Determine the mass to the nearest 0.1 % of the mass of the test sample.

8.2 If the applicable specification requires that the amount passing the 75- μm (No. 200) sieve shall be determined on a portion of the sample passing a sieve smaller than the nominal maximum size of the aggregate, separate the sample on the designated sieve and determine the mass of the material passing the designated sieve to 0.1 % of the mass of this portion of the test sample. Use this mass as the original dry mass of the test sample in 10.1.

NOTE 2—Some specifications for aggregates with a nominal maximum size of 50 mm or greater, for example, provide a limit for material passing the 75- μm (No. 200) sieve determined on that portion of the sample passing the 25.0-mm sieve. Such procedures are necessary since it is impractical to wash samples of the size required when the same test sample is to be used for sieve analysis by Test Method C136.

8.3 After drying and determining the mass, place the test sample in the container and add sufficient water to cover it. No detergent, dispersing agent, or other substance shall be added to the water. Agitate the sample with sufficient vigor to result in complete separation of all particles finer than the 75- μm (No. 200) sieve from the coarser particles, and to bring the fine material into suspension. Immediately pour the wash water containing the suspended and dissolved solids over the nested sieves, arranged with the coarser sieve on top. Take care to avoid, as much as feasible, the decantation of coarser particles of the sample.