
Standard Method of Test for Mechanical Analysis of Extracted Aggregate

AASHTO Designation: T 30-24

Technically Revised: 2024

Editorially Revised: 2024

Technical Subcommittee: 2c, Asphalt–Aggregate Mixtures



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1. SCOPE

- 1.1. This method covers a procedure for the determination of the particle-size distribution of fine and coarse aggregates extracted from asphalt mixtures using sieves with square openings.
- 1.2. The values stated in SI units are to be regarded as the standard. The values in parentheses are provided for information purposes only.
- 1.3. *The quality of the results produced by this standard is dependent on the competence of the personnel performing the procedure and the capability, calibration, and maintenance of the equipment used. Agencies that meet the criteria of R 18 are generally considered capable of competent and objective testing/sampling/inspection/etc. Users of this standard are cautioned that compliance with R 18 alone does not completely assure reliable results. Reliable results depend on many factors; following the suggestions of R 18 or some similar acceptable guideline provides a means of evaluating and controlling some of those factors.*

2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards:*
 - M 231, Weighing Devices Used in the Testing of Materials
 - R 18, Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
 - R 35, Superpave Volumetric Design for Asphalt Mixtures
 - R 61, Establishing Requirements for Equipment Calibrations, Standardizations, and Checks
 - R 76, Reducing Sample of Aggregate to Testing Size
 - T 164, Quantitative Extraction of Asphalt Binder from Asphalt Mixtures
 - T 255, Total Evaporable Moisture Content of Aggregate by Drying
 - T 308, Determining the Asphalt Binder Content of Asphalt Mixtures by the Ignition Method
 - T 319, Quantitative Extraction and Recovery of Asphalt Binder from Asphalt Mixtures
- 2.2. *ASTM Standards:*
 - C670, Standard Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials
 - E11, Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves
- 2.3. *Other Document:*
 - National Academies of Sciences, Engineering, and Medicine. 2014. *Precision Estimates of AASHTO T 304, AASHTO T 96, and AASHTO T 11 and Investigation of the Effect of Manual*

and Mechanical Methods of Washing on Sieve Analysis of Aggregates. National Academies Press, Washington, DC. Available from <https://doi.org/10.17226/22374>

- NCHRP. *NCHRP Research Results Digest 389*. National Cooperative Highway Research Program, Transportation Research Board, National Research Council, Washington, DC, June 2014.

3. SUMMARY OF METHOD

- 3.1. A sample of aggregate extracted from an asphalt mixture is washed with water containing a wetting agent. The decanted wash water, containing suspended and dissolved material, is passed through a 75- μ m (No. 200) sieve. The material is dried, and the loss in mass resulting from the wash treatment is calculated. The dried material is then separated through a series of sieves of progressively smaller openings for determination of particle size distribution.

4. SIGNIFICANCE AND USE

- 4.1. This method is used to determine the grading of aggregates extracted from asphalt mixtures. The results are used to determine compliance of the particle-size distribution with applicable requirements and to provide necessary data for control of the production of various aggregates to be used in asphalt mixtures.

5. APPARATUS

- 5.1. *Balance*—The balance shall have sufficient capacity, be readable to 0.1 g or better, and conform to the requirements of M 231.

- 5.2. *Sieves*—For the washing portion of the test procedure (Sections 8.2, 8.3, and 8.4) a nest of two sieves is required. The lower sieve shall be a 75- μ m (No. 200) sieve and the upper sieve shall be a sieve that is in the range of 2.36 mm (No. 8) to 1.18 mm (No. 16) in opening size. All sieves shall conform to the requirements of ASTM E11.

- 5.3. *Mechanical Sieve Shaker*—A mechanical sieving device, if used, shall create motion of the sieves to cause the particles to bounce, tumble, or otherwise turn so as to present different orientations to the sieving surface. The sieving action shall meet the requirements for sieving adequacy described in Section 7 in a reasonable time period (Note 1).

Note 1—Use of a mechanical sieve shaker is recommended when the size of the sample is 20 kg (44 lb) or greater, and may be used for smaller samples, including fine aggregate. Excessive time (more than ten minutes) to achieve adequate sieving may result in degradation of the sample. The same mechanical sieve shaker may not be practical for all sizes of samples, because a large sieving area is needed for practical sieving of a large nominal size coarse aggregate. Use of the same device for a smaller size of coarse aggregate or fine aggregate will likely result in loss of a portion of the sample.

- 5.4. *Oven*—An oven of sufficient size, capable of maintaining the set temperature within $\pm 5^{\circ}\text{C}$ (9°F).

- 5.5. *Wetting Agent*—Any dispersing agent that will promote separation of fine materials without degrading the extracted aggregate. Any detergent used shall not leave a residue on the sample during the washing procedure.

- 5.6. *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.