



Standard Test Method for Particle Size Distribution of Granular Activated Carbon¹

This standard is issued under the fixed designation D2862; 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 particle size distribution of granular activated carbon. For the purposes of this test, granular activated carbon is defined as a minimum of 90 % of the sample weight being retained on a 180-μm Standard sieve. A U.S. mesh 80 sieve is equivalent to a 180-μm Standard sieve.

NOTE 1—For extruded carbons, as the length/diameter ratio of the particles increases, the validity of the test results might be affected.

1.2 The data obtained may also be used to calculate mean particle diameter (MPD), effective size, and uniformity coefficient.

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3.1 *Exception*—All mass measurements are in SI units only.

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

D2652 [Terminology Relating to Activated Carbon](#)

D2854 [Test Method for Apparent Density of Activated Carbon](#)

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

E177 [Practice for Use of the Terms Precision and Bias in ASTM Test Methods](#)

E300 [Practice for Sampling Industrial Chemicals](#)

E691 [Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method](#)

3. Summary of Test Method

3.1 A known weight of granular activated carbon is placed on the top sieve of a stacked set of U.S. Standard sieves and shaken under standard conditions for a specific time period, after which the weight percent of the total retained on each sieve and bottom pan is determined.

4. Significance and Use

4.1 It is necessary to know the distribution of particle sizes of granular activated carbon in order to provide proper contact of gases or liquid in a packed bed of the material. Changes in particle size distribution can affect the pressure drop across the bed and the rate of adsorption in a bed of a given size.

4.2 Mean particle diameter is a property of activated carbons that influences pressure drop.

4.3 Effective size and uniformity coefficient are two properties of activated carbons often of interest in municipal water treatment applications where control of particle size is of interest.

5. Apparatus

5.1 *Mechanical Sieve Shaker*³—This is a mechanically operated sieve shaker that imparts a uniform rotating and tapping motion to a stack of 8-in. (203-mm or equivalent) sieves as described in 5.2. The sieve shaker should be adjusted to accommodate the desired number of sieves, receiver pan, and sieve cover. The bottom stops should be adjusted to give a clearance of approximately 1/16 in. (1.5 mm) between the upper carrying plate stops and the sieve cover plate, so that the sieves will be free to rotate. The sieve shaker shall be powered with 1/4-hp (186-W) electric motor producing 1725 to 1750 rpm. The

¹ This test method is under the jurisdiction of ASTM Committee D28 on Activated Carbon and is the direct responsibility of Subcommittee D28.04 on Gas Phase Evaluation 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.

³ The Tyler Ro-Tap Model RX-19-1 has been used in developing this test. Newer models may not produce the same separations (Model RX-19-2 is equivalent to Model RX-19-1). This model is available from Fisher Scientific, Pittsburgh, PA 15238.