



Designation: D8176 – 18 (Reapproved 2023)

Standard Test Method for Mechanically Tapped Density of Activated Carbon (Powdered and Fine Mesh)¹

This standard is issued under the fixed designation D8176; 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 the mechanically tapped density of powdered and fine mesh activated carbon. For the purpose of this test method, “powdered carbon” is defined as having a mean particle diameter less than 45 μm , and “fine mesh carbon” is defined as having a particle size predominately between 80 and 325 U.S. Standard mesh.

1.2 The values in SI units are to be regarded as standard. No other units of measure are included in this standard.

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

D2652 Terminology Relating to Activated Carbon

D2867 Test Methods for Moisture in Activated Carbon

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

3. Terminology

3.1 *Definitions*—See Terminology D2652.

¹ This test method is under the jurisdiction of ASTM Committee D28 on Activated Carbon and is the direct responsibility of Subcommittee D28.02 on Liquid Phase Evaluation.

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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.

4. Summary of Test Method

4.1 The sample of powdered or fine mesh carbon is tapped in a graduated cylinder using a tapping device. The mechanically tapped density is determined from the known mass of powdered or fine mesh carbon and the tapped volume.

5. Significance and Use

5.1 This test method is used to determine the density expressed in g/mL for powdered or fine mesh carbon. Due to the nature of the small particles, the density of these carbon types cannot be measured using the same procedure as granular carbon.

6. Apparatus

6.1 *Cylinder*—Graduated 100-mL serialized Class A, calibrated “to contain” (TC), with a base designed to accommodate the cylinder holder in the tapping device.

6.2 *Automated Tapping Device*³—Stroke height 3.0 mm $\pm$ 0.3 mm, 250 strokes/min $\pm$ 15 strokes/min, with built-in adjustable counter capable of delivering 5000 taps.

6.3 *Analytical Balance*, having a sensitivity of 0.1 g or better.

6.4 *Drying Oven*, forced-air circulation.

7. Procedure

7.1 Dry an adequate sample(s) using the procedure described in Test Methods D2867.

7.2 Tare the empty graduated cylinder on the balance.

7.3 Fill the graduated cylinder to 100 mL and weigh to the nearest 0.1 g. Record the mass of the carbon, *W*.

7.4 Place the graduated cylinder into the holder of the tapping device.

³ ERWEKA GmbH (Ottostr. 20-22 63150 Heusenstamm, Germany). The ERWEKA SVM-121/221 tapped density tester has been found suitable for this purpose.

Agilent Technologies, Inc. (5301 Stevens Creek Blvd. Santa Clara, CA 95051). The Agilent 350 tapped density tester has been found suitable for this purpose.

Pharma Alliance Group, Inc. (28518 Constellation Road Valencia, CA 91333). The Pharma Alliance TD-1-2 has been found suitable for this purpose.

Quantachrome Instruments (1900 Corporate Drive Boynton Beach, FL 33426). The Autotap™ and Dualtap™ tapped density analyzers have been found suitable for this purpose.