



Designation: **D4164 – 03 (Reapproved 2008) D4164 – 13**

Standard Test Method for Mechanically Tapped Packing Density of Formed Catalyst and Catalyst Carriers¹

This standard is issued under the fixed designation D4164; 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 formed catalyst and catalyst carriers. For the purpose of this test method, catalyst particles are defined as extrudates, spheres, or formed pellets of 0.8 to 4.8-mm ($1/32$ to $3/16$ -in.) nominal diameter.

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.*

2. Referenced Documents

2.1 *ASTM Standards:*²

[D3766 Terminology Relating to Catalysts and Catalysis](#)

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

[E456 Terminology Relating to Quality and Statistics](#)

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

[E1272 Specification for Laboratory Glass Graduated Cylinders](#)

3. Terminology

3.1 *Definitions*—See Terminology [D3766](#).

4. Summary of Test Method

4.1 A preconditioned sample of formed catalyst or catalyst carrier is tapped in a graduated cylinder. The mechanically tapped packing density is determined from the known mass and tapped volume.

5. Significance and Use

5.1 This test method is to be used for measuring the mechanically tapped packing density of formed particles that will not break up during sampling, filling, or tapping of the measuring cylinder under test conditions.

6. Apparatus

6.1 *Graduated Cylinder*, capacity 250 mL, conforming to Specification [E1272](#), Class A, with a base designed to accommodate the cylinder holder.

6.2 *Cylinder Holder*, weighing approximately 1 lb (454 g).

6.3 *Tapping Device*, consisting of a base-plate with worm drive, reduction ratio 15:1, nominal cam shaft speed of 250 r/min, tapping stroke travel $1/8$ in. (3.2 mm).

6.4 *Four Digit Adjustable Counter*, which can be preset to deliver any number of taps between 1 and 9999.

6.5 *Desiccator*, with a desiccant grade molecular sieve such as No. 4A.

¹ This test method is under the jurisdiction of ASTM Committee D32 on Catalysts and is the direct responsibility of Subcommittee D32.02 on Physical-Mechanical Properties.

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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.