



Designation: D 4180 – 99

## Standard Test Method for Vibratory Packing Density of Formed Catalyst Particles and Catalyst Carriers<sup>1</sup>

This standard is issued under the fixed designation D 4180; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This test method covers the determination of the vibratory packing density of formed catalyst and catalyst carriers. For the purpose of this test, 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:*

E 177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods<sup>2</sup>

E 456 Terminology Relating to Quality and Statistics<sup>2</sup>

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method<sup>2</sup>

### 3. Summary of Test Method

3.1 A preconditioned sample of formed catalyst or catalyst carrier is vibrated in a cylinder. The vibratory packing density is determined from a known weight and vibrated volume.

### 4. Significance and Use

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

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D-32 on Catalysts and is the direct responsibility of Subcommittee D32.02 on Physical-Mechanical Properties.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 14.02.

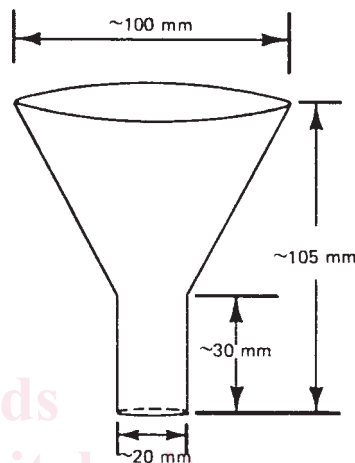


FIG. 1 Feed Funnel

### 5. Apparatus

5.1 *Glass Cylinders*, capacity 250 mL, feed<sup>3,4</sup> and measuring<sup>3,5</sup>

5.2 *Vibrator*,<sup>3,6</sup> conventional hand-held, with hard rubber or metal impactor.

5.3 *Feed Funnel*, plastic, glass, or metal as shown in Fig. 1.

5.4 *Ring Stand, Vibrator Holder and Clamps* as shown in Fig. 2 and Fig. 3.

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

5.6 *Balance* having sensitivity of 0.1 g.

5.7 *Drying Oven*.

<sup>3</sup> If you are aware of alternative suppliers, please provide this information to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend.

<sup>4</sup> A Kimble 20024 Feed-Glass Cylinder has been found satisfactory.

<sup>5</sup> A Corning 3062 or a Kimble 20026 Measuring Glass Cylinder has been found satisfactory.

<sup>6</sup> A Wahl Vibrator, Model 4180, 4 in 1, 120-V 60-Hz 11-W, available from Wahl Clipper Corp., Sterling, IL has been found satisfactory.