Designation: B 329 – 98

Standard Test Method for Apparent Density of Metal Powders and Compounds Using the Scott Volumeter[1]

This standard is issued under the fixed designation B 329; 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 Department of Defense.

1. Scope

1.1 This test method covers determination of the apparent density of metal powders and related compounds using the Scott Volumeter, also known as the Paint Pigment Volumeter.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

B 215 Practices for Sampling Finished Lots of Metal Powders[2]

B 243 Terminology of Powder Metallurgy[2]

B 873 Measuring Volume of Apparent Density Cup Used in Test Methods B 212, B 329 and B 417[2]

3. Terminology

3.1 Definitions—For definitions of terms used in this test method see Terminology B 243.

4. Significance and Use

4.1 This test method covers the evaluation of the apparent density physical characteristic of powders. The degree of correlation between the results of this test and the quality of powders in use will vary with each particular application and has not been fully determined.

4.2 The apparent density measured via this test method is often referred to as the "Scott Density."

5. Apparatus

5.1 Fig. 1 shows the Scott Volumeter[3] consisting of the following parts:

5.1.1 *Top Brass Funnels*—A large funnel with a 16-mesh brass screen and a small conical funnel for directing the powder into the baffle box (Note 2).

5.1.2 *Baffle Box*—A box with two glass sides and two wooden sides containing a series of four glass baffle plates.

NOTE 1—The wooden baffle box may be substituted by a water-resistant material if washing is more desirable than air cleaning.

5.1.3 *Bottom Brass Funnel*—A small brass funnel directly beneath lower baffle box opening for directing the powder into the density cup (Note 2).

5.1.4 *Brass Density Cups*—A cylindrical cup having a capacity of 25.00 ± 0.03 cm^3, with an inside diameter of 28.00 ± 0.50 mm; or a square cup with a capacity of 16.39 ± 0.05 cm^3(1.000 ± 0.003 $in.^3$).[4]

NOTE 2—Replacement parts for 5.1.1, 5.1.3, and 5.1.4 may be of stainless steel.

5.1.5 *Stand*—A 90° pivoting wooden stand to support the funnels and the baffle box concentric with the density cup so that the bottom funnel lower opening is 19 mm (¾ in.) above the top of the density cup as shown in Fig. 1 when using the cubic inch cup. Fig. 2 shows some suggested modifications for use of the metric cup. Modifications A and C of Fig. 2 are suggested when the metric cup is to be used exclusively. Modification B of Fig. 2 is suggested when both cups are to be used interchangeably.

5.2 *Instrument Support*—A stand or bench surface, level and vibration free.

5.3 *Balance*—A balance having a capacity of at least 200 g and an accuracy of ±0.05 g with full-range taring capability.

5.4 *Brush*—A good quality, 25.4-mm (1-in.) wide brush, preferably nylon.

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[1] This test method is under the jurisdiction of ASTM Committee B-9 on Metal Powders and Metal Powder Products and is the direct responsibility of Subcommittee B09.03 on Refractory Metal Powders.

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[2] *Annual Book of ASTM Standards,* Vol 02.05.

[3] Apparatus may be purchased as the "Metal Powder Volumeter" (Catalog No. 66062-620) from VWR Scientific Co., 1310 Goshen Parkway, West Chester, PA 19380. The apparatus was formerly known as the "Scott, Schaeffer and White Paint Pigment Volumeter."

[4] Metric cup may be constructed or purchased from Alcan Powders and Pigments, Division of Alcan Aluminum Corp., 901 Lehigh Ave., Union, NJ 07083-7632.