Designation: ~~B527 – 06~~ B527 – 14

Standard Test Method for Determination of Tap Density of ~~Metallic~~Metal Powders and Compounds[1]

This standard is issued under the fixed designation B527; 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 specifies a method for the determination of tap density (packed density) of ~~metallic~~metal powders and compounds, that is, the density of a powder that has been tapped, to settle contents, in a container under specified conditions.

1.2 With the exception of the values for density and the mass used to determine density, for which the use of the gram per cubic centimetre (g/cm^3) and gram (g) units is the long-standing industry practice, the values in SI units are to be regarded as 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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

B215 Practices for Sampling Metal Powders
B243 Terminology of Powder Metallurgy
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

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:* Terms used in this test method are defined in B243.

4. Significance and Use

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

5. Apparatus

5.1 *Balance,* of appropriate capacity ~~and accuracy~~ to satisfy the requirements shown in Table 1~~.~~ and accuracy of ± 0.05 g.

5.2 *Graduated Glass Cylinder,* calibrated to contain 100 cm^3 at ~~20°C,~~20 °C, the height of the graduated portion being approximately 175 mm. The graduations shall be at 1 cm^3 intervals, thus allowing a measuring accuracy of ±0.5 cm^3. For apparent densities over 4 g/cm^3, do not use the 100 cm^3 ~~cylinder.~~cylinder, see section 5.2.1.1.

5.2.1 Alternatively, the following may be used:

5.2.1.1 *Graduated Glass Cylinder,* calibrated to contain 25 cm^3 at ~~20°C,~~20 °C, the height of the graduated portion being approximately 135 mm. The graduations shall be at 0.2 cm^3 ~~intervals.~~intervals, thus allowing a measuring accuracy of ±0.1 cm^3.

5.2.1.2 A ~~25-cm~~25 cm^3 cylinder shall be used for powders of apparent density higher than 4 g/cm^3, in particular for refractory metal ~~powders, but may also be used for powder of lower apparent density.~~powders.

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[1] This specification is under the jurisdiction of ASTM Committee B09 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] 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.

***A Summary of Changes section appears at the end of this standard**

~~TABLE 1 Accuracy and Capacity of Balance~~

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~~Cylinder Capacity, cm^3~~	~~Apparent Density, g/cm^3~~	~~Mass of Test Portion, g~~
~~100~~	~~>1~~	~~100 ± 0.5~~
~~100~~	~~≤1~~	~~50 ± 0.2~~
~~25~~	~~>7~~	~~100 ± 0.5~~
~~25~~	~~2 to 7~~	~~50 ± 0.2~~
~~25~~	~~<2~~	~~20 ± 0.1~~

TABLE 1 Capacity and Accuracy of the Test Portion Mass and Graduated Cylinder

Apparent Density g/cm^3	Mass of Test Portion g	Cylinder Capacity cm^3	Cylinder Accuracy cm^3
<1	50 ± 0.2	100	0.5
1-4	100 ± 0.5	100	0.5
>4	100 ± 0.5	25	0.2

5.3 *Tapping Apparatus,* which permits the tapping of the graduated cylinder against a firm base. The tapping shall be such that a densification of the powder can take place without any loosening of its surface layers. The stroke shall be 3 mm ~~(0.118 in.)~~ and the tapping frequency shall be between 100 and 300 taps/min. An example of a tapping apparatus is shown in Fig. 1.

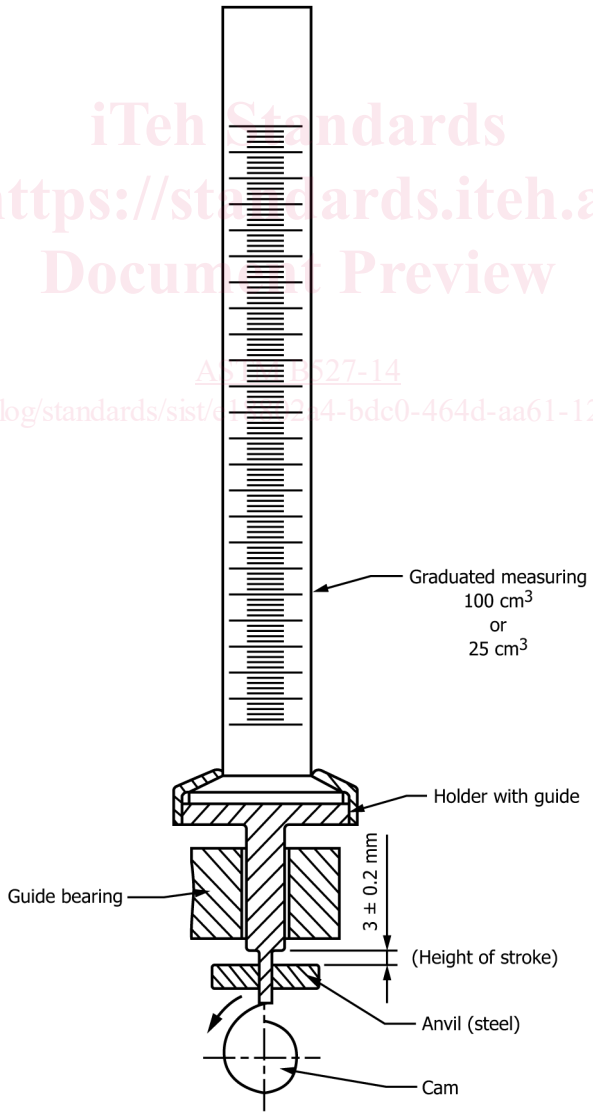

FIG. 1 Example of Tapping Apparatus