



Designation: B 330 – 002

Standard Test Method for Fisher Number of Metal Powders and Related Compounds¹

This standard is issued under the fixed designation B 330; 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 This test method is under the jurisdiction of ASTM Committee B-9 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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1. Scope*

1.1 This test method uses air permeability to determine an envelope-specific surface area and its associated average equivalent spherical diameter (from 1 to 50 μm) of metal powders and related compounds. The powders may be analyzed in their “as-supplied” (shipped, received, or processed) condition or after they have been de-agglomerated or milled by a laboratory procedure (“lab milled”) such as that specified in Practice B 859. The values obtained are not intended to be absolute but are generally useful on a relative basis for control purposes.

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:

B 243 Terminology of Powder Metallurgy²

B 859 Practice for De-Agglomeration of Refractory Metal Powders and Their Compounds Prior to Particle Size Analysis²

E 456 Terminology Relating to Quality and Statistics³

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

2.2 ISO/DIS Document:

10070 Metallic Powders Determinations of Envelope-Specific Surface Area from Measurements of the Permeability to Air of a Powder Bed Under Steady-State Flow Conditions⁴

2.3 MPIF Standard:

32 Method for Determination of Average Particle Size of Metal Powders Using the Fisher Subsieve Sizer⁵

3. Terminology

3.1 *Definitions*—Many terms used in this test method are defined in Terminology B 243.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *Fisher sub-sieve sizer, n*—a commercially available permeability instrument for measuring envelope-specific surface area.

3.2.2 *envelope-specific surface area, n*—the specific surface area of a powder as determined by gas permeametry in accordance with ISO/DIS 10070.

3.2.3 *air permeability, n*—the measurement of air pressure drop across a packed bed of powder.

3.2.4 *de-agglomeration, n*—process used to break up agglomerates of particles.

3.2.5 *Fisher Number, n*—a calculated value equated to an average particle diameter, assuming all the particles are spherical and of uniform size.

3.2.6 *Fisher calibrator tube, n*—a jewel with a precision orifice mounted in a tube similar to a sample tube. The calibrator tube

² Annual Book of ASTM Standards, Vol 02.05.

³ Annual Book of ASTM Standards, Vol 14.02.

⁴ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

⁵ Available from Metal Powder Industries Federation, 105 College Rd. East, Princeton, NJ 08540-6692.

⁵ The manufacturer of the Fisher sub-sieve sizer #14-311A, is Fisher Scientific, Instrument Division, 2000 Park Lane, Pittsburgh, PA 15275. Besides supplying the basic instrument, they also supply accessories of: calibrator tube #14-313-7 and sample calibrator, #14-311-2.

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