



Designation: D8328 – 24

Standard Test Method for Dynamic Testing of Powders Using the Freeman Technology FT4 Powder Rheometer¹

This standard is issued under the fixed designation D8328; 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 method covers the apparatus and procedures for quantifying the dynamic flow properties of a fixed volume of powder or other bulk solid as a function of its resistance to being moved by a specially designed blade within a cylindrical test vessel, where the test specimen has an unconstrained upper surface. This allows for the resistance to motion to be assessed as ‘work done’ or energy measurement.

1.2 The parameters generated during this test are most commonly used to assist with the design and operation of powder processing and transport operations. They can also provide relative classification or comparison of the flow behavior of different powders, or different batches of the same powder, that are subjected to similar stress and flow regimes within their processing equipment.

1.3 The 50 mm apparatus described in this standard is suitable for measuring the properties of powders and other bulk solids with a maximum particle size of 6 mm. It is practicable to test powders which have a small proportion of particles between 6-10 mm, but it is recommended they represent no more than 5 % of the total mass with a normal (Gaussian) size distribution.

1.4 All observed and calculated values shall conform to the guidelines for significant digits and rounding established in Practice [D6026](#).

1.4.1 The procedures used to specify how data are collected/recorded or calculated, in this standard, are regarded as the industry standard. In addition, they are representative of the significant digits that generally should be retained. The procedures used do not consider material variation, purpose for obtaining the data, special purpose studies, or any considerations for the user’s objectives; and it is common practice to increase or decrease significant digits of reported data to be commensurate with these considerations. It is beyond the scope of this standard to consider significant digits used in analysis methods for engineering design.

¹ This test method is under the jurisdiction of ASTM Committee [D18](#) on Soil and Rock and is the direct responsibility of Subcommittee [D18.24](#) on Characterization and Handling of Powders and Bulk Solids.

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1.5 *Units*—The values stated in SI units are to be regarded as standard. No other units of measure are included in this standard. Reporting of test results in units other than SI shall not be regarded as nonconformance with this standard.

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

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

[D653](#) Terminology Relating to Soil, Rock, and Contained Fluids

[D2216](#) Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

[D3740](#) Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

[D6026](#) Practice for Using Significant Digits and Data Records in Geotechnical Data

3. Terminology

3.1 *Definitions*—For definitions of common technical terms used in this standard, refer to Terminology [D653](#).

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *Aerated Energy, AE_v , n*—in storing, handling and processing bulk solids using industrial equipment, the flow energy of a powder at a controlled superficial gas velocity of v mm/s traversing upwards through the powder bed.

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.