



Standard Test Method for Measuring Shear Stresses of Powders Using Peschl Rotational Split Level Shear Tester¹

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1. Scope*

1.1 This test method is applied to the measurement of the mechanical properties of powders as a function of normal stress.

1.2 This apparatus is suitable measuring the properties of powders and other bulk solids, up to a particle size of 5000 micron.

1.3 This method comprises four different test procedures for the determination of powder mechanical properties:

1.3.1 *Test A*—Measurement of INTERNAL FRICTION as a function of normal stress.

1.3.2 *Test B*—Measurement of WALL FRICTION as a function of normal stress.

1.3.3 *Test C*—Measurement of BULK DENSITY as a function of normal stress and time.

1.3.4 *Test D*—Measurement of DEGRADATION as a function of normal stress.

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 reduce 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.

1.5 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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

2. Referenced Documents

2.1 ASTM Standards:²

D653 Terminology Relating to Soil, Rock, and Contained Fluids

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 in Geotechnical Data

3. Terminology

3.1 For definitions of technical terms in this standard, refer to Terminology D653.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *adhesion*—shear stress between the wall coupon and powder at a normal stress of zero.

3.2.2 *consolidation normal stress*—the maximal normal stress applied to the specimen for executing an yield locus.

3.2.3 *consolidation step*—shearing repeated under the consolidation normal stress until the shear stress reaches a maximum τ_m value followed by a steady state value τ_s . This step is performed before each shear step.

3.2.4 *degradation*—change of particle size as result of shearing.

3.2.5 *dynamic wall friction*—calculated from the measured normal stress and the steady state shear stress after certain shearing.

3.2.6 *dynamic yield locus*—line calculated from measured values of normal stress and steady values of the shear stress.

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.