



Designation: D6528 – 17

Standard Test Method for Consolidated Undrained Direct Simple Shear Testing of Fine Grain Soils¹

This standard is issued under the fixed designation D6528; 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 defines equipment specifications and testing procedures for the measurement of constant volume strength and stress-strain characteristics of cohesive soils after one-dimensional consolidation using a constant rate of simple shear deformation mode of loading. The constant volume condition is equivalent to the undrained condition for saturated specimens.

1.2 This test method is written specifically for devices that test rectangular parallelepiped or cylindrical specimens. Other more general devices, such as the torsional shear hollow cylinder, may be used to perform consolidated constant volume simple shear tests but are beyond the scope of this test method.

1.3 This test method is applicable to testing intact, laboratory reconstituted, and compacted soils, however, it does not include specific guidance for reconstituting or compacting test specimens.

1.4 It shall be the responsibility of the agency requesting this test to specify the magnitude of the vertical consolidation stress prior to constant volume shear and, when appropriate, the maximum vertical consolidation stress, which will result in an overconsolidated specimen.

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

1.5.1 In the engineering profession it is customary practice to use, interchangeably, units representing both mass and force, unless dynamic calculations ($F=Ma$) are involved. This implicitly combines two separate systems of units, that is, the absolute system and the gravimetric system. It is scientifically undesirable to combine two separate systems within a single standard. This test method has been written using SI units; however, inch-pound conversions are given in the gravimetric

system, where the pound (lbf) represents a unit of force (weight). The use of balances or scales recording pounds of mass (lbm), or the recording of density in lb/ft^3 should not be regarded as nonconformance with this test method.

1.6 All observed and calculated values shall conform to the guidelines for significant digits and rounding established in Practice D6026.

1.6.1 The procedures used to specify how data are collected/recorded or calculated in this test standard are regarded as the industry standard. In addition, they are representative of the significant digits that should generally 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; 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 test standard to consider significant digits used in analysis methods for engineering design.

1.6.2 Measurements made to more significant digits or better sensitivity than specified in this standard shall not be regarded as nonconformance with this standard.

1.7 *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.*

1.8 *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

¹ This test method is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.05 on Strength and Compressibility of Soils.

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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