



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

This standard is issued under the fixed designation D 6528; 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 both undisturbed and compacted soils, however, it does not include specific guidance for compacting test specimens.

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

1.5 The values stated in SI units are to be regarded as the standard. Reporting test results in units other than SI shall be regarded as conformance 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 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 and health practices and determine the applicability of regulatory limitations prior to use.

2. Referenced Documents

2.1 ASTM Standards:

- D 422 Test Method for Particle-Size Analysis of Soils²
- D 653 Terminology Relating to Soil, Rock and Contained Fluids²
- D 854 Test Method for Specific Gravity of Soils²
- D 1587 Practice for Thin-Walled Tube Geotechnical Sampling of Soils²
- D 2216 Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock²
- D 2435 Test Method for One-Dimensional Consolidation Properties of Soils²
- D 2487 Classification of Soils for Engineering Purposes (Unified Soil Classification System)²
- D 2488 Practice for Description and Identification of Soils (Visual-Manual Procedure)²
- D 3550 Practice for Ring-Lined Barrel Sampling of Soils²
- D 3740 Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction²
- D 4220 Practices for Preserving and Transporting Soil Samples²
- D 4318 Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils²
- D 4452 Methods for X-Ray Radiography of Soil Samples²

3. Terminology

3.1 *Definitions*—The terms used in this test method are in accordance with Terminology D 653.

3.1.1 *shear modulus, n* —a measure of a material's resistance to shear stress, equal to the ratio of the increment in the shear stress to the resultant increment in angle of deformation expressed in radians. Also known as the modulus of rigidity.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *active height control, n* —a method of keeping the height of the specimen constant during the shearing process in

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 Structural Properties of Soils.

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² *Annual Book of ASTM Standards*, Vol 04.08.