
Standard Method of Test for

Direct Shear Test of Soils under Consolidated Drained Conditions

AASHTO Designation: T 236-22¹

Technically Revised: 2022

Technical Subcommittee: 1a, Soil and Unbound Recycled Materials

ASTM Designation: D3080-72(2003)



**American Association of State Highway and Transportation Officials
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1. SCOPE

- 1.1. This method describes procedures for determining the consolidated drained shear strength of a soil material in direct shear. The test may be conducted in either a single shear or in a double shear, as shown in Figure 1. The direct shear test is well suited to a consolidated drained test because the drainage paths through the test specimen are short, thereby allowing excess pore pressures to be dissipated fairly rapidly. The test can be made on all soil material,² and on undisturbed or remolded samples.

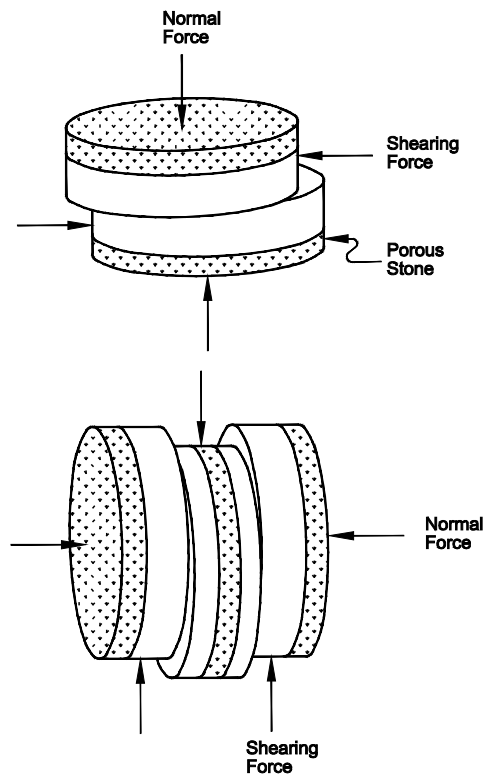


Figure 1—Test Specimens in (a) Single and (b) Double Shear

- 1.2. The test results are applicable to field situations where complete consolidation has occurred under the existing overburden and failure is reached slowly so that excess pore pressures are dissipated. The test is also useful in determining the shearing resistance along recognizable weak planes within the soil material.

Note 1—If failure is forced to occur on or near a horizontal plane at the middle of the specimen, it may not necessarily occur along the weakest plane, thereby overestimating shear strength parameters. Only when weak plane(s) are recognizable within the soil mass or interfaces between dissimilar materials are being tested, and the plane or interface at question is placed within the limits of the forced failure zone, can the shear resistance along these planes or interfaces be evaluated. The usefulness of direct shear test results was discussed in the Symposium on Direct Shear Testing of Soils; the proceedings appear in ASTM Special Technical Publication 131.

- 1.3. The test is not suited to the development of exact stress-strain relationships nor for evaluating any other associated quantities such as moduli within the test specimen because of the non-uniform distribution of shearing stresses and displacements. The slow rate of displacement provides for dissipation of excess pore pressures, but it also permits plastic flow of soft cohesive soils. Care should be taken that the testing conditions represent those being investigated.

- 1.4. The values stated in SI units are to be regarded as the standard.

- 1.5. *The quality of the results produced by this standard are dependent on the competence of the personnel performing the procedure and the capability, calibration, and maintenance of the equipment used. Agencies that meet the criteria of R 18 are generally considered capable of competent and objective testing/sampling/inspection/etc. Users of this standard are cautioned that compliance with R 18 alone does not completely assure reliable results. Reliable results depend on many factors; following the suggestions of R 18 or some similar acceptable guideline provides a means of evaluating and controlling some of those factors.*

2. REFERENCED DOCUMENT

- 2.1. *AASHTO Standards:*

- M 339M/M 339, Thermometers Used in the Testing of Construction Materials
- R 18, Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
- T 265, Laboratory Determination of Moisture Content of Soils

- 2.2. *ASTM Standards:*

- E1, Standard Specification for ASTM Liquid-in-Glass Thermometers
- E230/E230M, Standard Specification for Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples
- E2877, Standard Guide for Digital Contact Thermometers

- 2.3. *International Electrotechnical Commission Standard:*

- IEC 60584-1: 2013 Thermocouples - Part 1: EMF Specifications and Tolerances

3. SUMMARY OF METHOD

- 3.1. The method consists of (a) placing the test specimen in the direct shear device, (b) applying a predetermined normal stress, (c) providing for drainage or wetting of the test specimen, (d) consolidating the specimen under the normal stress, (e) unlocking the frames that hold the test specimen, and (f) applying a shearing force to shear the specimen (Figures 1 and 2). Generally, three or more specimens are tested, each under a different normal stress to determine the effects on