



Designation: D8121/D8121M – 19

Standard Test Method for Approximating the Shear Strength of Cohesive Soils by the Handheld Vane Shear Device¹

This standard is issued under the fixed designation D8121/D8121M; 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 describes approximating the shear strength of cohesive soils using a handheld (pocket) vane shear device.

1.2 The device allows for a simple and portable method for measuring the approximate undrained shear strength of saturated, fine-grained, cohesive soils. The test method can be used in the field or in the laboratory, on the ends of sample tubes, on the surface of block samples or excavations, or on the surface of other test specimens with rigid confinement.

1.3 *Units*—The values stated in either inch-pound units or SI units [given in brackets] are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard. Tables of critical dimensions and tolerances of the described vanes are provided in separate units of inches and mm.

NOTE 1—The original shear vane device was developed when shear strength was often reported in tons per square foot (TSF) or kilograms per square centimeter (kg/cm^2) which are approximately equivalent. These units have prevailed within the industry and are adopted herein.

1.4 All observed and calculated values shall conform to the guidelines for significant digits and rounding established in Practice D6026, unless superseded by this test method.

1.4.1 The procedures used to specify how data are collected, recorded, and 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 test method to consider significant digits used in analysis methods for engineering design.

1.5 *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.*

1.6 *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

D4648 Test Methods for Laboratory Miniature Vane Shear Test for Saturated Fine-Grained Clayey Soil

D6026 Practice for Using Significant Digits in Geotechnical Data

3. Terminology

3.1 *Definitions*:

3.1.1 For common definitions of technical terms used in this test method, refer to Terminology D653.

3.2 *Definitions of Terms Specific to This Standard*:

3.2.1 *vane multiplier (VM), n* —a multiplier to correct the vane's dial reading based on the standard (mid-size) vane to the larger or smaller vane (4.2).

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.