Designation: D4647/D4647M – 13

Standard Test Methods for Identification and Classification of Dispersive Clay Soils by the Pinhole Test[1]

This standard is issued under the fixed designation D4647/D4647M; 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 presents a direct, measurement of the dispersibility and consequent colloidal erodibility of clay soils by causing water to flow through a small hole punched in a specimen. The results of the tests are qualitative and provide general guidance regarding dispersibility and erodibility. This test method is complemented by Test Method D4221.

1.2 This test method and the criteria for evaluating test data are based upon results of several hundred tests on samples collected from embankments, channels, and other areas where clay soils have eroded or resisted erosion in nature (**1**).[2]

1.3 Three alternative procedures for classifying the dispersibility of clay soils are provided as follows:

1.3.1 Method A and Method C, adapted from Ref (**1**), classify soils into six categories of dispersiveness as: dispersibility (D1, D2), slight to moderately dispersive (ND4, ND3), and nondispersive (ND2, ND1).

1.3.2 Method B classifies soils into three categories of dispersiveness as: dispersibility (D), slightly dispersive (SD), and nondispersive (ND).

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

1.5 *Units*—The values stated in either SI units or inch-pound units 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 nonconformance with the 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:*[3]

D422 Test Method for Particle-Size Analysis of Soils

D653 Terminology Relating to Soil, Rock, and Contained Fluids

D698 Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft^3 (600 kN-m/m^3))

D2216 Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

D2487 Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)

D2488 Practice for Description and Identification of Soils (Visual-Manual Procedure)

D3740 Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

D4221 Test Method for Dispersive Characteristics of Clay Soil by Double Hydrometer

D4318 Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils

D4753 Guide for Evaluating, Selecting, and Specifying Balances and Standard Masses for Use in Soil, Rock, and Construction Materials Testing

D6026 Practice for Using Significant Digits in Geotechnical Data

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms in these test methods, refer to Terminology D653.

3.2 *Definitions of Terms Specific to 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 D18.06 on Physical-Chemical Interactions of Soil and Rock.

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[2] The boldface numbers in parentheses refer to the list of references at the end of these test methods.

[3] 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**

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