



Designation: D2434 – 22

Standard Test Methods for Measurement of Hydraulic Conductivity of Coarse-Grained Soils¹

This standard is issued under the fixed designation D2434; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 These test methods cover laboratory measurement of the hydraulic conductivity (also referred to as *coefficient of permeability*) of water-saturated coarse-grained soils (for example, sands and gravels) with $k > 10^{-7}$ m/s. The test methods utilize low hydraulic gradient conditions.

1.2 This standard describes two methods (A and B) for determining hydraulic conductivity of coarse-grained soils. Method A incorporates use of a rigid wall permeameter and Method B incorporates the use of a flexible wall permeameter. A single- or dual-ring rigid wall permeameter may be used in Method A. A dual-ring permeameter may be preferred over a single-ring permeameter when adverse effects from short-circuiting of permeant water along the sidewalls of the permeameter (that is, prevent sidewall leakage) are suspected by the user of this standard.

1.3 The test methods are used under constant head conditions.

1.4 The test methods are used under saturated soil conditions.

1.5 Water is used to permeate the test specimen with these test methods.

1.6 *Units*—The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

NOTE 1—Hydraulic conductivity has traditionally been reported in cm/s in the US, even though the official SI unit for hydraulic conductivity is m/s.

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

1.8 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the*

¹ This test method is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.04 on Hydrologic Properties and Hydraulic Barriers.

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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.

1.9 *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

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

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

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

D5101 Test Method for Measuring the Filtration Compatibility of Soil-Geotextile Systems

D5716/D5716M Test Method for Measuring the Rate of Well Discharge by Circular Orifice Weir

D6026 Practice for Using Significant Digits and Data Records in Geotechnical Data

D6913/D6913M Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

3. Terminology

3.1 *Definitions*:

3.1.1 For definitions of common technical terms in this standard, refer to Terminology D653.

3.1.2 *hydraulic conductivity, k , n* —(also referred to as coefficient of permeability or permeability) the rate of discharge of

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