



Designation: D4751 – 21a

Standard Test Methods for Determining Apparent Opening Size of a Geotextile¹

This standard is issued under the fixed designation D4751; 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 the determination of the apparent opening size (AOS) of a geotextile either by dry-sieving glass beads through a geotextile (Methods A1 and A2) or by using a capillary porometer (Method B).

1.2 Method B will not be used in lieu of Method A unless the pre-qualification procedure specified in this standard is followed.

1.3 These test methods show the values in both SI units and inch-pound units. SI units is the technically correct name for the system of metric units known as the International System of Units. Inch-pound units is the technically correct name for the customary units used in the United States. The values in inch-pound units are provided for information only.

1.4 *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.*

1.5 *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

D1331 Test Methods for Surface and Interfacial Tension of Solutions of Paints, Solvents, Solutions of Surface-Active Agents, and Related Materials

¹ These test methods are under the jurisdiction of ASTM Committee D35 on Geosynthetics and are the direct responsibility of Subcommittee D35.03 on Permeability and Filtration.

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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.

D1776/D1776M Practice for Conditioning and Testing Textiles

D4354 Practice for Sampling of Geosynthetics and Rolled Erosion Control Products (RECPs) for Testing

D4439 Terminology for Geosynthetics

D6767 Test Method for Pore Size Characteristics of Geotextiles by Capillary Flow Test

E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

3. Terminology

3.1 *Definitions*—For general geosynthetics terms used in this standard, refer to Terminology **D4439**.

3.2 Definitions:

3.2.1 *apparent opening size (AOS), O_{95} , n* —for a geotextile, a property that indicates the approximate largest particle that would effectively pass through the geotextile.

3.2.1.1 *Discussion*—While the same “O95” symbol is used in Test Methods A1 and B for defining the AOS of a geotextile as well as in Test Method **D6767** for determining the pore size of geotextiles by capillary flow, they are not necessarily equivalent. The O95 values are defined in terms of their respective test methods. Therefore, the AOS version of the O95 value that is determined with Method B may not be identical to the O95 value determined per Test Method **D6767**.

4. Summary of Test Methods

4.1 *Glass Bead Dry-Sieving, Method A1*—A geotextile specimen is placed in a sieve frame, and sized glass beads are placed on the geotextile surface. The geotextile and frame are shaken laterally so that the jarring motion will induce the beads to pass through the test specimen. The procedure is repeated on the same specimen with various size glass beads until a bead size with more than 5 % passing and a bead size with less than 5 % passing are tested and its apparent opening size has been determined. This method is considered the referee method in the case of inter-laboratory disputes involving both Methods A2 and B.

4.2 *Method A2*—This procedure is strictly intended as a “Pass/Fail” test for manufacturing QC testing. The test is