



## Standard Test Method for Biological Clogging of Geotextile or Soil/Geotextile Filters<sup>1</sup>

This standard is issued under the fixed designation D 1987; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This test method is used to determine the potential for, and relative degree of, biological growth which can accumulate on geotextile or geotextile/soil filters.

1.2 This test method uses the measurement of flow rates over an extended period of time to determine the amount of clogging.

1.3 This test method can be adapted for nonsaturated as well as saturated conditions.

1.4 This test method can use constant head or falling head measurement techniques.

1.5 This test method can also be used to give an indication as to the possibility of backflushing and/or biocide treatment for remediation purposes if biological clogging does occur.

1.6 The values in SI units are to be regarded as the standard. The values provided in inch-pound units are for information only.

1.7 *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:

D 123 Terminology Relating to Textiles<sup>2</sup>

D 1776 Practice for Conditioning Textiles for Testing<sup>2</sup>

D 4439 Terminology for Geotextiles<sup>3</sup>

D 4354 Practice for Sampling of Geotextile for Testing<sup>3</sup>

D 4491 Test Method for Water Permeability of Geotextiles by Permittivity<sup>3</sup>

D 5101 Test Method for Measuring the Soil-Geotextile System Clogging Potential By the Gradient Ratio

G 22 Practice for Determining Resistance of Plastics to Bacteria<sup>4</sup>

### 3. Terminology

#### 3.1 Definitions:

3.1.1 *geotextile, n*—a permeable geosynthetic comprised solely of textiles.

3.1.2 *permeability, n*—the rate of flow of a liquid under a differential pressure through a material.

3.1.2.1 *Discussion*—In *geotextiles*, permeability refers to hydraulic conductivity.

3.1.3 *permittivity,  $(\Psi)(t^{-1})$ , n*—of *geotextiles*, the volumetric flow rate of water per unit, in a cross sectional area head under laminar flow conditions.

3.1.4 *aerobic, n*—a condition in which a measurable volume of air is present in the incubation chamber or system.

3.1.4.1 *Discussion*—In *geotextiles*, this condition can potentially contribute to the growth of micro-organisms.

3.1.5 *anaerobic, n*—a condition in which no measurable volume of air is present in the incubation chamber or system.

3.1.5.1 *Discussion*—In *geotextiles*, this condition cannot contribute to the growth of microorganisms.

3.1.6 *back flushing, n*—a process by which liquid is forced in the reverse direction to the flow direction.

3.1.6.1 *Discussion*—In *other drainage application areas*, this process is commonly used to free clogged drainage systems of materials that impede the intended direction of flow.

3.1.7 *biocide, n*—a chemical used to kill bacteria and other microorganisms.

3.2 For definitions of other terms used in this test method, refer to Terminology D 123 and D 4439.

### 4. Summary of Test Method

4.1 A geotextile filter specimen or geotextile/soil filter composite specimen is positioned in a flow column so that a designated liquid flows through it under either constant or falling head conditions.

4.1.1 The designated liquid might contain micro-organisms from which biological growth can occur.

4.2 Flow rate is measured over time, converted to either permittivity or permeability, and reported according.

4.2.1 Between readings, the test specimen can be allowed to be in either nonsaturated or saturated conditions.

4.2.2 Back flushing can be introduced from the direction opposite to the intended flow direction and evaluated accordingly.

4.2.3 Biocide can be introduced with the back flushing

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D-35 on Geosynthetics and is the direct responsibility of Subcommittee D35.02 on Endurance Properties.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 07.01.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 04.09.

<sup>4</sup> *Annual Book of ASTM Standards*, Vol 14.02.