



Standard Guide for Selecting Test Methods for Experimental Evaluation of Geosynthetic Durability¹

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1. Scope

1.1 This guide covers a designer/specifier through a systematic determination of those factors of the appropriate application environment that may affect the post-construction service life of a geosynthetic. Subsequently, test methods are recommended to facilitate an experimental evaluation of the durability of geosynthetics in a specified environment so that the durability can be considered in the design process.

1.2 This guide is not intended to address durability issues associated with the manufacturing, handling, transportation, or installation environments.

2. Referenced Documents

2.1 ASTM Standards:²

- D1204 Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature
- D1987 Test Method for Biological Clogging of Geotextile or Soil/Geotextile Filters
- D2990 Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics
- D3083 Specification for Flexible Poly(Vinyl Chloride) Plastic Sheeting for Pond, Canal, and Reservoir Lining (Withdrawn 1998)³
- D3895 Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry
- D4355 Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus
- D4594 Test Method for Effects of Temperature on Stability of Geotextiles

- D4716 Test Method for Determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
- D4886 Test Method for Abrasion Resistance of Geotextiles (Sand Paper/Sliding Block Method)
- D5101 Test Method for Measuring the Filtration Compatibility of Soil-Geotextile Systems
- D5262 Test Method for Evaluating the Unconfined Tension Creep and Creep Rupture Behavior of Geosynthetics
- D5322 Practice for Laboratory Immersion Procedures for Evaluating the Chemical Resistance of Geosynthetics to Liquids
- D5397 Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test
- D5496 Practice for In Field Immersion Testing of Geosynthetics
- D5567 Test Method for Hydraulic Conductivity Ratio (HCR) Testing of Soil/Geotextile Systems
- D5885 Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High-Pressure Differential Scanning Calorimetry
- D5970 Test Method for Deterioration of Geotextiles from Outdoor Exposure

3. Summary of Guide

3.1 The effects of a given application environment on the durability of a geosynthetic must be determined through appropriate testing. Selection of appropriate tests requires a systematic determination of the primary function(s) to be performed and the associated degradation processes that should be considered. This guide provides a suitable systematic approach.

3.2 Primary functions of geosynthetics are listed and defined in Table 1. With knowledge of the specific geosynthetic application area and end use, the corresponding primary function(s) is (are) identified. Table 2 gives degradation concerns as they relate to geosynthetic functions. Table 3 gives the environmental elements that relate to the various degradation processes and the currently available ASTM Committee D-35 test method for the experimental evaluation of specific types of

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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.

³ The last approved version of this historical standard is referenced on www.astm.org.