Designation: D 6141 – 97

Standard Guide for Screening the Clay Portion of a Geosynthetic Clay Liner (GCL) for Chemical Compatibility to Liquids [1]

This standard is issued under the fixed designation D 6141; 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 guide suggests procedures and test methods that can be used in the evaluation of the ability of the clay portion of a geosynthetic clay liner to resist change due to exposure to liquids. These liquids may come from a site, or be generated in a laboratory from a site-specific soil.

1.2 The scope of this guide is limited to short-term screening and is not intended to replace evaluation procedures that measure a performance property such as EPA 9100, Test Method D 5887, or *other* suitable ASTM standards as they become available.

1.3 This guide applies to the clay component of a GCL. The synthetic carrier components are covered independently as described in Practice D 5322.

1.4 *This standard does not purport to address all of the safety problems, 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 653 Terminology for Soils [2]

D 4439 Terminology for Geosynthetics [3]

D 5322 Practice for Evaluating the Chemical Resistance of Geosynthetics to Liquids [3]

D 5887 Test Method for Measurement of Index Flux Through Saturated Geosynthetic Clay Liner Specimens Using Flexible Wall Permeameter [3]

D 5890 Test Method for Swell Index of the Clay Mineral Component of Geosynthetic Clay Liners[3]

D 5891 Test Method for Fluid Loss of Clay Component of Geosynthetic Clay Liners[3]

D 6072 Guide for Obtaining Samples of Geosynthetic Clay Liners[3]

2.2 *Other Document:*

EPA Test Method 9100 Saturated Hydraulic Conductivity, Saturated Leachate Conductivity, and Intrinsic Permeability[4]

3. Terminology

3.1 *Definitions:*

3.1.1 *geosynthetic clay liner (GCL), n*—a manufactured hydraulic barrier consisting of clay bonded to a layer or layers of geosynthetics.

3.1.2 *test liquid, n—within this guide*, a liquid either supplied to, or obtained by the testing laboratory, or generated by the testing laboratory through prolonged contact of a reagent with a test soil or other solid material.

3.2 Other definitions may be found in the referenced Terminologies D 4439 and D 653.

4. Significance and Use

4.1 This guide is intended as a starting place for those wishing to investigate the chemical compatibility of the clay portion of a geosynthetic clay liner to test liquids. Within the scope of this guide, the clay portion of a geosynthetic clay liner that is chemically compatible with a test liquid may be expected to maintain its swelling characteristics. Conversely, the clay portion of a geosynthetic clay liner that is incompatible with a test liquid may be expected not to maintain its swelling characteristics. In instances where the compatibility of the clay portion of a GCL is questionable, additional hydraulic testing under the expected site conditions may be warranted.

5. Apparatus

5.1 Refer to the appropriate evaluation test standards for a description of the apparatus necessary to perform those tests.

5.2 *Containers*, manufactured of a chemically resistant material, such as polyethylene or stainless steel, *may* be needed to prepare and contain test liquid generated from soils. The containers should be sealable to prevent the loss of volatile constituents. Separate containers will be needed for mixing batches and storing the test liquid for the tests.

5.3 *Mixer, motor driven*, capable of forming a slurry of the soil and the leaching fluid.

[1] This guide is under the jurisdiction of ASTM Committee D-35 on Geosynthetic and is the direct responsibility of Subcommittee D35.04 on Geosynthetic Clay Liners.

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[2] *Annual Book of ASTM Standards*, Vol 04.08.

[3] *Annual Book of ASTM Standards*, Vol 04.13.

[4] Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.