



Designation: D5891/D5891M – 19

Standard Test Method for Fluid Loss of Clay Component of Geosynthetic Clay Liners¹

This standard is issued under the fixed designation D5891/D5891M; 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 test method covers an index method that enables the evaluation of fluid loss properties of a clay mineral film deposited on a filter paper from a 6 % solids slurry of clay mineral at 100-psi (kPa) pressure as a measure of its usefulness for permeability or hydraulic conductivity reduction in geosynthetic clay liners (GCL). This test method is not applicable for clays with polymers.

1.2 This test method is adapted from American Petroleum Institute drilling fluid specifications for bentonite.

1.3 Powdered clay mineral is tested as produced; granular clay mineral should be ground to 100 % passing a 100 mesh U.S. Standard Sieve with a minimum of 65 % passing a 200 mesh U.S. Standard Sieve with the whole ground product used for testing.

1.4 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.5 *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.*²

1.6 *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.*

¹ This test method is under the jurisdiction of ASTM Committee D35 on Geosynthetics and is the direct responsibility of Subcommittee D35.04 on Geosynthetic Clay Liners.

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² When bentonite is removed from a GCL product for testing, it may include adhesives that can influence test results.

2. Referenced Documents

2.1 ASTM Standards:³

D1193 Specification for Reagent Water

E1 Specification for ASTM Liquid-in-Glass Thermometers

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

E725 Test Method for Sampling Granular Carriers and Granular Pesticides

2.2 API Standard:⁴

API RP 131 Recommended Practice for Laboratory Testing of Drilling Fluids

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, refer to API Standards and ASTM definitions for GCL products.

4. Significance and Use

4.1 Clay mineral is the functional component of GCL that reduces the hydraulic conductivity of industrial waste or ground water through the liner.

4.2 Clay mineral quality can vary significantly and affect the hydraulic conductivity of the GCL composite. This test method evaluates a significant property of clay mineral that relates to performance.

5. Atmosphere Conditions

5.1 *Atmospheric Conditions*—The atmospheric conditions of the laboratory performing fluid loss of clay mineral component of geosynthetic clay liners shall be: relative humidity between 50 to 70 % and a temperature of 21 ± 2 °C [70 ± 4 °F].

6. Apparatus

6.1 *Laboratory Balance*, 100-g capacity, ± 0.01 -g accuracy and precision.

³ 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.

⁴ Available from American Petroleum Institute (API), 1220 L. St., NW, Washington, DC 20005-4070, <http://www.api.org>.