



Designation: D5891/D5891M – 02 (Reapproved 2016)^{ε1}

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.

^{ε1} NOTE—Designation was changed to dual, units statement in 1.4 and units, where applicable, were corrected editorially in January 2016.

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).

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 and health practices and determine the applicability of regulatory limitations prior to use.*²

2. Referenced Documents

2.1 *ASTM Standards:*³

[D1193 Specification for Reagent Water](#)

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.

Current edition approved Jan. 1, 2016. Published January 2016. Originally approved in 1995. Last previous edition approved in 2009 as D5891 – 02(2009). DOI: 10.1520/D5891_D5891M-02R16E01.

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

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.

[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 Standards:*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 effect the hydraulic conductivity of the GCL composite. This test method evaluates a significant property of clay mineral that relates to performance.

5. Apparatus

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

5.2 *Weighing Paper*, or small weighing dish.

5.3 *Graduated Cylinder*, 500 \pm 5-mL graduated TD (to deliver) with 10-mL subdivisions, Class A volumetrically calibrated; 10 \pm 0.1-mL graduated cylinder, graduated TC (to contain) with 0.1-mL subdivisions.

5.4 *U.S. Standard Sieve*, 100 mesh, 200 mesh, and automated sieve shaker.

5.5 *Mortar and Pestle or Laboratory Hammer Mill*, for grinding clay mineral to required particle sizing.

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