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.

Designation: D7361 – 07 (Reapproved 2018)

Standard Test Method for Accelerated Compressive Creep of Geosynthetic Materials Based on Time-Temperature Superposition Using the Stepped Isothermal Method[1]

This standard is issued under the fixed designation D7361; 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 accelerated testing for compressive creep properties using the stepped isothermal method (SIM).

1.2 The test method is focused on geosynthetic drainage materials such as HDPE geonet specimens.

1.3 The SIM tests are laterally unconfined tests based on time-temperature superposition procedures.

1.4 Ramp and hold (R+H) tests may be completed in conjunction with SIM tests. They are designed to provide additional estimates of the initial rapid compressive creep strain levels appropriate for the SIM results.

1.5 This method can be used to establish the sustained load compressive creep characteristics of a geosynthetic that demonstrates a relationship between time-dependent behavior and temperature. Results of this method are to be used to augment results of compressive creep tests performed at 20 ± 1 °C and may not be used as the sole basis for determination of long-term compressive creep behavior of geosynthetic material.

1.6 The values stated in SI units are to be regarded as the standard. The values given in parentheses 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.8 *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.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1621 Test Method for Compressive Properties of Rigid Cellular Plastics

D2990 Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics

D4439 Terminology for Geosynthetics

D5262 Test Method for Evaluating the Unconfined Tension Creep and Creep Rupture Behavior of Geosynthetics

D6364 Test Method for Determining Short-Term Compression Behavior of Geosynthetics

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions related to geosynthetics, see Terminology D4439.

3.1.2 For definitions related to creep, see Test Methods D2990 and D5262 and Terminology D4439.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *compressive creep*—time-dependent deformation that occurs when a specimen is subjected to a constant compressive load.

3.2.2 *compressive creep modulus*—in SIM analysis, the load divided by the percent compressive strain at any given point in time.

3.2.3 *dwell time*—time during which conditions (particular load) are held constant between temperature steps.

3.2.4 *mean test temperature*—the arithmetic average of all temperature readings of the atmosphere surrounding the test specimen for a particular temperature step, starting at a time not later than established temperature ramp time, and finishing at a time just prior to the subsequent temperature reset.

[1] This test method is under the jurisdiction of ASTM Committee D35 on Geosynthetics and is the direct responsibility of Subcommittee D35.02 on Endurance Properties.

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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.

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