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Standard Test Method for Determining the Flexural Strength of a Geosynthetic Cementitious Composite Mat (GCCM) Using the Three-Point Bending Test¹

This standard is issued under the fixed designation D8058; 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 provides guidelines for testing the flexural strength of cured geosynthetic cementitious composite mat (GCCM) products in a three (3)-point bend apparatus.

1.2 The values in SI units are to be regarded as the standard. Values in inch-pound units are in parentheses for information.

1.3 This standard may involve hazardous operations, equipment, and climates. *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.*

1.4 *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

[C125 Terminology Relating to Concrete and Concrete Aggregates](#)

[D76/D76M Specification for Tensile Testing Machines for Textiles](#)

[D4354 Practice for Sampling of Geosynthetics and Rolled Erosion Control Products \(RECPs\) for Testing](#)

[D4439 Terminology for Geosynthetics](#)

[D5994/D5994M Test Method for Measuring Core Thickness of Textured Geomembranes](#)

¹ This test method is under the jurisdiction of ASTM Committee [D35](#) on Geosynthetics and is the direct responsibility of Subcommittee [D35.05](#) on Geosynthetic Erosion Control.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[D8030/D8030M Practice for Sample Preparation for GCCM](#)

3. Terminology

3.1 *Definitions*—For definitions of common technical terms used in this standard, refer to Terminologies [C125](#) and [D4439](#).

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *cured, adj*—a description of the state of a GCCM after initial hydration of the cementitious material and after setting has begun.

3.2.1.1 *Discussion*—The terms *cementitious material* and *setting* are defined in Terminology [C125](#).

3.2.2 *curing time, n*—the time elapsed from the start of hydration of the GCCM to immediately prior to the testing of the material.

3.2.3 *final breaking load, n*—the maximum load achieved prior to rupture of materials, measured between 0 and 30 mm (1.2 in.) of displacement from the start of the test.

3.2.4 *final deflection*—the deflection of the specimen from its initial position (before testing begins) measured at mid span at the final breaking load.

3.2.5 *final flexural strength, n*—the final flexural strength, expressed in megapascals (pound-force per square inch), is calculated from the final breaking load of a hydrated and cured GCCM specimen, oriented in either the machine or cross-machine direction, loaded as simple beams, when breaks occur perpendicular to the specimen length, with the load applied at the center, in a three-point loading fixture.

3.2.6 *geosynthetic cementitious composite barrier (GCCB), n*—a composite material consisting of a geosynthetic barrier bonded to an integral GCCM protective cover layer. The geosynthetic barrier component of adjacent material must be seamed to reduce or prevent the flow of fluid through the construction.

3.2.6.1 *Discussion*—The terms *geosynthetic barrier*, *GCCM*, and *seam* are defined in Terminology [D4439](#).

3.2.7 *hydration, n*—exposure of the GCCM, in this case, to water in prescribed conditions for a prescribed time.

3.2.8 *initial breaking load, n*—the maximum load at which the first crack in the cementitious matrix of the GCCM forms