



Designation: E2398 – 11

# Standard Test Method for Water Capture and Media Retention of Geocomposite Drain Layers for Vegetative (Green) Roof Systems<sup>1</sup>

This standard is issued under the fixed designation E2398; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This test method covers the determination of the water and media retention of synthetic drains layers used in vegetative (green) roof systems.

1.2 This test method is applicable to geocomposite drain layers that retain water and media in cup-like receptacles on their upper surface. Examples include shaped plastic membranes and closed-cell plastic foam boards

1.3 This test method does not apply to products manufactured from water-absorptive materials.

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered 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 to determine the applicability of regulatory limitations prior to use.*

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

E631 Terminology of Building Constructions

E2114 Terminology for Sustainability Relative to the Performance of Buildings

E2397 Practice for Determination of Dead Loads and Live Loads Associated with Vegetative (Green) Roof Systems

## 3. Terminology

3.1 *Definitions:*

3.1.1 For terms related to building construction, refer to Terminology E631.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D08 on Roofing and Waterproofing and is the direct responsibility of Subcommittee D08.24 on Sustainability.

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<sup>2</sup> 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.

3.1.2 For terms related to sustainability relative to the performance of buildings, refer to Terminology E2114.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *captured water, n*—the quantity of water that is retained in the drainage layer of a vegetative (green) roof system after new water additions have ceased and that cannot escape the roof except through evaporation or plant transpiration.

3.2.2 *coupon, n*—a portion of a material or laboratory sample from which multiple specimens can be taken for testing.

3.2.3 *geocomposite drain layer, n*—a synthetic sheet, mat, or panel that is specifically designed to convey water horizontally toward the roof deck drains, gutters, or scuppers.

3.2.3.1 *Discussion*—Geocomposite drainage layers include absorptive drainage mats whose principle function is drainage, but which will also contribute to water retention (see *retained water*). Some geocomposite drainage layers may incorporate receptacles on their upper surfaces that will capture water (see *captured water*).

3.2.4 *retained water, n*—the quantity of water that will be retained for a prolonged period against gravity drainage in a vegetative (green) roof system, or in one of its components, after new additions by rainfall or artificial irrigation have ceased.

3.2.4.1 *Discussion*—Most of this water will not become runoff but will be used to the plant-mediated processes of evapo-transpiration.

3.2.5 *unit media retention volume, n*—the volume,  $\text{ft}^3/\text{ft}^2$  ( $\text{cm}^3/\text{cm}^2$ ), that is required to fill a geocomposite drain layer to the upper most asperities of the geocomposite drain layer.

3.2.6 *unit water capture volume, n*—the maximum volume of water,  $\text{ft}^3/\text{ft}^2$  ( $\text{cm}^3/\text{cm}^2$ ), that a geocomposite drain layer can hold at a specified inclination.

3.2.6.1 *Discussion*—For vegetative (green) roofs systems where the geocomposite drain layer will be filled with granular drainage medium, the actual volume is assumed to be 25 % of the measured volume. This assumption will allow a direct comparison between geocomposite sheet drains without, regard to the granular drainage media used. In computing the actual water capture of a geocomposite sheet drain employed in