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StandardGuide for
for Acceptance Testing Requirements for Geonets and Geonet Drainage Geocomposites[1]

This standard is issued under the fixed designation D7273; 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 guide covers guidelines for the acceptance testing frequency requirements for geonet and geonet drainage geocomposite materials describing types of tests, test methods, and recommended verifications.

1.2 This guide is intended to aid purchasers, installers, contractors, owners, operators, designers, and agencies in establishing a minimum level of effort for product acceptance testing and verification. This is intended to assure that the supplied geonet and/or geonet drainage geocomposite roll(s) meet accepted material specifications.

1.3 The values stated in SI units are to be regarded as the standard.

1.4 This guide offers an organized collection of information or a series of options and does not recommend a specific course of action. This guide cannot replace education or experience and should be used in conjunction with professional judgment. Not all aspects of this guide may be applicable in all circumstances. This guide is not intended to represent or replace the standard of care by which the adequacy of a given professional service must be judged, nor should this guide be applied without consideration of a project's many unique aspects. The word "Standard" in the title of this guide means only that the guide has been approved through the ASTM International consensus process.

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. Referenced Documents

2.1 *ASTM Standards:*[2]

D792 Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
D1505 Test Method for Density of Plastics by the Density-Gradient Technique
D1603 Test Method for Carbon Black Content in Olefin Plastics
D4218 Test Method for Determination of Carbon Black Content in Polyethylene Compounds By the Muffle-Furnace Technique
D4354 Practice for Sampling of Geosynthetics for Testing
D4355 Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus
D4439 Terminology for Geosynthetics
D4491 Test Methods for Water Permeability of Geotextiles by Permittivity
D4533 Test Method for Trapezoid Tearing Strength of Geotextiles
D4632 Test Method for Grab Breaking Load and Elongation of Geotextiles
D4716 Test Method for Determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
D4751 Test Method for Determining Apparent Opening Size of a Geotextile
D4759 Practice for Determining the Specification Conformance of Geosynthetics
D4873 Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples
D5199 Test Method for Measuring the Nominal Thickness of Geosynthetics
D5321 Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method
D6241 Test Method for the Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe
D7005 Test Method for Determining the Bond Strength (Ply Adhesion) of Geocomposites
D7179 Test Method for Determining Geonet Breaking Force

[1] This guide is under the jurisdiction of ASTM Committee D35 on Geosynthetics and is the direct responsibility of Subcommittee D35.01 on Mechanical 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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3. Terminology

3.1 *Definitions*—For definitions of terms related to geosynthetics, refer to Terminology D4439.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *acceptance testing, n*—testing performed on a product to determine whether or not an individual lot of the product conforms to specified requirements.

3.2.2 *agency, n—in geosynthetics*, the organization that reviews the permit application for compliance with the agency's regulation and all quality assurance documentation before and after construction.

3.2.3 *contractor, n—in geosynthetics* , the party or organization that has the responsibility for the construction of the manmade project, structure, or system.

3.2.4 *designer, n—in geosynthetics*, the person or organization that designs a manmade project, structure, or system that fulfills the owner's/operator's requirements and meets or exceeds the minimum requirements of the agency.

3.2.5 *geonet geocomposite, n*—product composed of two or more materials, at least one of which is a geonet.

3.2.6 *installer, n—in geosynthetics*, the party that installs, or facilitates installation of, any materials purchased from manufacturers or suppliers.

3.2.7 *manufacturer, n—in geosynthetics* , the group, corporation, partnership, or individual that manufactures a product.

3.2.8 *quality assurance (QA), n*—all those planned or systematic actions necessary to provide adequate confidence that a material, product, system, or service will satisfy given needs.

3.2.9 *manufacturing quality control (MQC), n*—planned system of activities by the manufacturer whose purpose is to provide a level of quality that meets the needs of product requirements; also, the use of such a system.

3.2.10 *operator, n—in geosynthetics*, the person or organization that operates the manmade project, structure, or system.

3.2.11 *owner, n—in geosynthetics*, the person or organization that owns the manmade project, structure, or system.

3.2.12 *purchaser, n—in geosynthetics*, the person, company, or organization that purchases any materials or work to be performed.

3.3 *Abbreviations:*

3.3.1 *MD*—Machine direction.

3.3.2 *MQC, n*— Manufacturing quality control.

4. Summary of Guide

4.1 This guide suggests the types of tests, the methods of the testing, and verification requirements for acceptance testing of geonet and geonet geocomposite materials.

4.2 It should be recognized that parties, organizations, or representatives may perform additional tests at other frequencies than required in this guide. In this case, the project-specific acceptance plan will then take precedence over this guide.

5. Procedure

5.1 The geocomposite components are typically tested during MQC (Practice D4354) and typically documented by means of a letter of certification or summarized MQC test data or both. These actual tested values (MQC test data) should be verified to be in conformance with the accepted material specifications. This can be done by reviewing the MQC test data, or by additional quality assurance testing, or both, and purchaser's specification conformance testing. Purchaser's specification acceptance/conformance testing should be done directly after arrival of the product on site, and definitely before product installation. Properties of the individual geocomposite components (geonet and geotextile) are likely to

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TABLE 1 Types of Acceptance Test and Methods for Geonets (SI Units)[A,B]

Test Designation, Reporting Units	Test Method (ASTM)	Frequency of Acceptance Testing	Reported Average Test Values Compared to:[C]
Geonet			
Density, kg/m^3 [D]	D1505 or D792	project specified	Specified Value
Carbon black content, %[D]	D4218 or D1603	project specified	Specified Value
Peak tensile strength (MD), N/mm	D7179	project specified	Specified Value
Thickness, mm	D5199	project specified	Specified Value
Transmissivity (MD), m^2/s	D4716	project specified	Specified Value

[A] Frequencies may change on the size or sensitivity of the project. On small projects tests may be replaced by a letter of certification. Example for project (size 50 000 m^2 (500 000 ft^2)) specific acceptance testing:

Density of the geonet	=	Every 10 000 m^2 (100 000 ft^2)
Carbon black content of the geonet	=	Every 10 000 m^2 (100 000 ft^2)
Peak tensile strength of the geonet in MD	=	Every 10 000 m^2 (100 000 ft^2)
Thickness of the geonet	=	Every 10 000 m^2 (100 000 ft^2)
Transmissivity of the geonet	=	Every 50 000 m^2 (500 000 ft^2)

[B] Additional acceptance tests may be required depending on the application. For example, in applications in which shear strength is critical, direct shear tests (Test Method D5321) may be needed.

[C] This column proposes a pass/fail criterion for the measured average roll value. All measured average roll values (not the value for a single specimen tested) should be reported in accordance of the ASTM procedure listed above, measured at a frequency greater than or equal as what is listed above, and ultimately compared to the specified value (manufacturing and or project specification) to be acceptable or conforming. If the measured average roll value is below the specified value, that particular roll will be catalogued as "failed", or non-conforming. Note that most individual ASTM standards describe within the standard procedure as of how to address "failed" or non-conforming measured values. Typically checking all setup and boundary conditions would be done first in a retest of the initially "failed" sample. If the average of both tests confirm that the geonet is non-conforming, then the geonet rolls failing the accepted material specification value need to be rejected. The sequence of non-conforming rolls in the lot shall be bounded/delineated by passing rolls ("blocking tests"). The pass/fail criterion is thus a threshold methodology, a measured average roll value greater or equal as the "specified value" means a passing or conforming result for that particular test method.

[D] The correct test method should be agreed on prior testing.