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Standard Terminology for Geosynthetics[1]

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1. Referenced Documents

1.1 *ASTM Standards:*[2]

C125 Terminology Relating to Concrete and Concrete Aggregates
D1987 Test Method for Biological Clogging of Geotextile or Soil/Geotextile Filters
D4354 Practice for Sampling of Geosynthetics and Rolled Erosion Control Products(RECPs) for Testing
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D4491 Test Methods for Water Permeability of Geotextiles by Permittivity
D4533 Test Method for Trapezoid Tearing Strength of Geotextiles
D4594 Test Method for Effects of Temperature on Stability of Geotextiles
D4595 Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method
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
D4833 Test Method for Index Puncture Resistance of Geomembranes and Related Products
D4873 Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples
D4884 Test Method for Strength of Sewn or Bonded Seams of Geotextiles
D4885 Test Method for Determining Performance Strength of Geomembranes by the Wide Strip Tensile Method
D5101 Test Method for Measuring the Filtration Compatibility of Soil-Geotextile Systems
D5141 Test Method for Determining Filtering Efficiency and Flow Rate of the Filtration Component of a Sediment Retention Device
D5262 Test Method for Evaluating the Unconfined Tension Creep and Creep Rupture Behavior of Geosynthetics
D5322 Practice for Laboratory Immersion Procedures for Evaluating the Chemical Resistance of Geosynthetics to Liquids
D5323 Practice for Determination of 2 % Secant Modulus for Polyethylene Geomembranes
D5397 Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test
D5494 Test Method for the Determination of Pyramid Puncture Resistance of Unprotected and Protected Geomembranes
D5496 Practice for In Field Immersion Testing of Geosynthetics
D5514 Test Method for Large Scale Hydrostatic Puncture Testing of Geosynthetics
D5567 Test Method for Hydraulic Conductivity Ratio (HCR) Testing of Soil/Geotextile Systems
D5594 Test Method for Determination of the Vinyl Acetate Content of Ethylene-Vinyl Acetate (EVA) Copolymers by Fourier Transform Infrared Spectroscopy (FT-IR)
D5617 Test Method for Multi-Axial Tension Test for Geosynthetics
D5641 Practice for Geomembrane Seam Evaluation by Vacuum Chamber
D5747 Practice for Tests to Evaluate the Chemical Resistance of Geomembranes to Liquids
D5818 Practice for Exposure and Retrieval of Samples to Evaluate Installation Damage of Geosynthetics
D5820 Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes
D5994 Test Method for Measuring Core Thickness of Textured Geomembranes

[1] This terminology is under the jurisdiction of D35 on Geosynthetics and is the direct responsibility of D35.93 on Editorial and Terminology.
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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.

1.2 *Federal Standard:*[3]
Federal Standard 751a Stitches, Seams, and Stitchings

2. Terminology

absorption, *n*—the process by which a liquid is drawn into and tends to fill permeable pores in a porous solid body, also, the increase in mass of a porous solid body resulting from penetration of a liquid into its permeable pores. **C125**

aerobic, *n*—a condition in which a measurable volume of air is present in the incubation chamber or system. **D1987**

anaerobic, *n*—a condition in which no measurable volume of air is present in the incubation chamber or system. **D1987**

apparent opening size (AOS), O_{95}**,** *n—for a geotextile*, a property which indicates the approximate largest particle that would effectively pass through the geotextile. **D4751**

atmosphere for testing geosynthetics, *n*—air maintained at a relative humidity between 50 to 70 % and a temperature of 21 ± 2°C (70° ± 4°F). **D4439, D4751, D5494**

back flushing, *n*—a process by which liquid is forced in the reverse direction to the flow direction. **D1987**

basis weight—deprecated term (do not use in the sense of mass per unit area). **D4439**

bend, *vt—in mechanics*, to force an object from its natural or manufactured shape into a curve or into increased curvature. **D4439**

biocide, *n*—a chemical used to kill bacteria and other microorganisms. **D1987**

blinding, *n—for geotextiles*, the condition where soil particles block the surface openings of the fabric, thereby reducing the hydraulic conductivity of the system. **D4439**

~~**biocide,** *n*—a chemical used to kill bacteria and other microorganisms.~~ ~~**D1987**~~

breaking force, *(F), J,n*—the force at failure. **D4885**

breaking load, *n*—the maximum force applied to a specimen in a tensile test carried to rupture. **D4632**

breaking toughness, *T, (FL*$^{-1}$*),Jm*$^{-2}$**,** *n—for geotextiles*, the actual work-to-break per unit surface area of material. **D4595, D4885**

chemical resistance, *n*—the ability to resist chemical attack. **D5322**

clogging, *n—for geotextiles*, the condition where soil particles move into and are retained in the openings of the fabric, thereby reducing the hydraulic conductivity. **D4439**

clogging potential, *n—in geotextiles*, the tendency for a given geotextile to decrease permeability due to soil particles that have either lodged in the geotextile openings or have built up a restrictive layer on the surface of the geotextile. **D5101**

compressed thickness (t, (L), mm)**,***n*—thickness under a specified stress applied normal to the material. **D4439**

constant-rate-of-load tensile testing machine (CRL), *n*—a testing machine in which the rate of increase of the load being applied to the specimen is uniform with time after the first 3 s. **D4439**

corresponding force, *n*—synonym for force at specified elongation. **D4885**

coupon, *n*—a portion of a material or laboratory sample from which multiple specimens can be taken for testing. **D5747**

creep, *n*—the time-dependent increase in accumulative strain in a material resulting from an applied constant force. **D5262**

critical height *(ch),n*—the maximum exposed height of a cone or pyramid that will not cause a puncture failure of a geosynthetic at a specified hydrostatic pressure for a given period of time. **D5514**

cross-machine direction, *n*—the direction in the plane of the fabric perpendicular to the direction of manufacture. **D4632**

density (ρ, (ML^{-3}), kg/m^3)**,***n*—mass per unit volume. **D4439**

design load—the load at which the geosynthetic is required to operate in order to perform its intended function. **D5262**

elastic limit, *n—in mechanics*, the stress intensity at which stress and deformation of a material subjected to an increasing force cease to be proportional; the limit of stress within which a material will return to its original size and shape when the force is removed, and hence, not a permanent set. **D4885**

elongation at break, *n*—the elongation corresponding to the breaking load, that is, the maximum load. **D4632**

[3] Available from DLA Document Services, Building 4/D, 700 Robbins Ave., Philadelphia, PA 19111-5094, http://quicksearch.dla.mil.

failure, *n*—an arbitrary point beyond which a material ceases to be functionally capable of its intended use. **D4885, D5262**

failure, *n—in testing geosynthetics*, water or air pressure in the test vessel at failure of the geosynthetic. **D5514**

~~**flexible polypropylene,** *n*—a material having a 2 % secant modulus of less than 300 MPa (40,000 psi) as determined by Test Method D5323 produced by polymerization of propylene with or without other alpha olefin monomers.~~

field testing, *n*—testing performed in the field under actual conditions of temperature and exposure to the fluids for which the immersion testing is being performed. **D5496**

fill—deprecated term, see **filling**.

filling, *n*—yarn running from selvage to selvage at right angles to the warp in a woven fabric. **D4439**

flexible polypropylene, *n*—a material having a 2 % secant modulus of less than 300 MPa (40,000 psi) as determined by Practice D5323 produced by polymerization of propylene with or without other alpha olefin monomers.

force at specific elongation, FASE, *n*—the force associated with a specific elongation on the force-elongation curve. **D4439**

force-elongation curve, *n—in a tensile test*, a graphical representation of the relationship between the magnitude of an externally applied force and the change in length of the specimen in the direction of the applied force. (*Synonym* for stress-strain curve.) **D4885**

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

geofoam, *n*—block or planar rigid cellular foamed polymeric material used in geotechnical engineering applications.

geogrid, *n*—a geosynthetic formed by a regular network of integrally connected elements with apertures greater than 6.35 mm (¼ in.) to allow interlocking with surrounding soil, rock, earth, and other surrounding materials to function primarily as reinforcement. **D5262**

geomembrane, *n*—an essentially impermeable geosynthetic composed of one or more synthetic sheets. **D4439, D4873, D4885, D5994, D5820**

geonet, *n*—a geosynthetic consisting of integrally connected parallel sets of ribs overlying similar sets at various angles for planar drainage of liquids or gases. **D4439**

~~**geomembrane, geostrip—n—**an essentially impermeable geosynthetic composed of one or more synthetic sheets.~~polymeric material in the form of a strip of width not more than 200 mm (7.87 in.), used in contact with soil or other materials in geotechnical and civil engineering applications, or both. ~~**D4439, D4873, D4885, D5994, D5820**~~

geosynthetic, *n*—a planar product manufactured from polymeric material used with soil, rock, earth, or other geotechnical engineering related material as an integral part of a man-made project, structure, or system. **D4354, D4759, D4873, D5617, D5818**

geosynthetic clay liner, *n*—a manufactured hydraulic barrier consisting of clay bonded to a layer or layers of geosynthetic materials.

geotechnical engineering, *n*—the engineering application of geotechnics. **D4439, D4595**

geotechnics, *n*—the application of scientific methods and engineering principles to the acquisition, interpretation, and use of knowledge of materials of the earth's crust to the solution of engineering problems. **D4439, D4491, D4595, D4716, D4751**

geotextile, *n*—a permeable geosynthetic comprised solely of textiles.

DISCUSSION—

Geotextiles perform several functions in geotechnical engineering applications, including: separation; filtration; drainage; reinforcement; and protection. **D1987, D4439, D5594**

grab test, *n—in fabric testing*, a tension test in which only a part of the width of the specimen is gripped in the clamps. **D4632**

gradient ratio, *n—in geotextiles*, the ratio of the hydraulic gradient through a soil-geotextile system to the hydraulic gradient through the soil alone. **D5101**

gravity flow, *n*—flow in a direction parallel to the plane of a geotextile or related product driven predominately by a difference in elevation between the inlet and outflow points of a specimen. **D4716**