MATERIAL SPECIFICATION

592. Geotextile

1. Scope

This specification covers the performance requirements and quality of geotextiles.

2. General Requirements

Fibers (threads and yarns) used in the manufacture of geotextile shall consist of synthetic polymers composed of a minimum of 95 percent by weight polypropylenes, polyesters, polyethylene, or polyvinylidene-chlorides. They shall be formed into a stable network of filaments or yarns retaining dimensional stability relative to each other. The filaments shall be resistant to delamination. The geotextile shall be uniform in texture, thickness, and appearance, and be free of defects, flaws or tears. The geotextile shall conform to the physical requirements contained in Tables 1 and 2. The geotextile shall be free of any chemical treatment or coating that significantly reduces its porosity. Fibers shall contain stabilizers and/or inhibitors to enhance resistance to ultraviolet light.

Thread used for factory or field sewing shall be of contrasting color to the fabric and made of high strength polypropylene, polyester, or polyamide thread. Thread shall be as resistant to ultraviolet light as the geotextile being sewn.

3. Classification

Geotextiles shall be classified based on the method used to place the threads or yarns forming the fabric. The geotextiles will be grouped into the types described

below.

a. *Woven*: Fabrics formed by the uniform and regular interweaving of the threads or yarns in two directions.

   Woven fabrics shall be manufactured from slit-tape or monofilament yarn formed into a uniform pattern with distinct and measurable openings, retaining their position relative to each other.

   The edges of fabric shall be selvedged or otherwise finished to prevent the outer yarn from unraveling.

b. *Nonwoven*: Fabrics formed by a random placement of threads in a mat and bonded by heat-bonding, resin-bonding, needle punching, or a combination thereof.

   Nonwoven fabrics shall be manufactured from individual fibers formed into a random pattern with distinct but variable small openings, retaining their position relative to each other when bonded by needle punching, heat, or resin bonding. The use of nonwovens, other than the needle punched geotextiles, is somewhat restricted (see Note 3 on Table 2).

4. Certification, Sampling, and Testing

Along with each shipment of geotextile, a Certificate of Compliance shall be furnished by the supplier, along with a document stating the manufacturer's minimum average roll values (MARV) for the geotextile. The geotextile shall meet the specified requirements (Table 1 or 2) for the product style shown on the label. Product properties as listed in the "Specifier's Guide" (current version), Geotechnical Fabrics Report, Industrial Fabrics Association International, 1801

County Road BW Roseville, Minnesota 55113; and that *represents minimum average roll values*, will be acceptable documentation that the product style meets the requirements of these specifications.

For products that do not appear in the above directory, or do not have minimum average roll values listed, typical test data from the identified production run of the geotextile will be required for each of the specified tests (Table 1 or 2) as covered under clause AGAR 452.236-76. These tests must be conducted by third party research institutions.

5. Shipping and Storage

The geotextile shall be shipped in rolls wrapped with a cover for protection against moisture, dust, dirt, debris, and ultraviolet light. The cover shall be kept in place to the maximum extent possible prior to placement.

Each roll of geotextile shall be labeled or tagged to clearly identify the manufacturer, class and the individual production run in accordance with ASTM D4873.

Table 1
Requirements for Woven Geotextiles

Property	Test Method	Class I	Class III	Class III	Class IV
Tensile Strength (lbs.)[1]	ASTM D 4632 Grab Test	250 min. in any principal direction	120 min. in any principal direction	180 min. in any principal direction	200 min. in any principal direction
Elongation at (%)	ASTM D 4632 Grab Test	20 max.	35 max.	35 max.	24 max.
Trapezoidal Tear Strength	ASTM D 4533	115 min.	50 min.	70 min.	115 min.

(lbs.)					
Puncture (CBR)	ASTM D 6241	900 min.	250 min.	550 min.	675 min.
Ultraviolet Light (% residual tensile strength)	ASTM D 4355 150 hours exposure	70 min.	70 min.	70 min.	70 min.
Apparent Opening Size – AOS	ASTM D 4751	As specified or #40/2	As specified or #30/2	As specified or #40/2	As specified or #40/2
Precent Open Area (%)	CWO-02215-86	1.0 min.	1.0 min	1.0 min.	1.0 min.
Permitivity (sec^{-1}) ($gal/min/ft^2$)	ASTM D 4491	0.050 min. 4 min.	0.150 min. 10 min.	0.080 min. 6 min.	2.14 min. 145 min.

[1]Minimum average roll value (weakest principal direction).
[2]U.S. standard sieve size.

Table 2
Requirements for Nonwoven Geotextiles

Property	Test Method	Class I	Class II	Class III	Class IV3
Tensile Strength (lbs.)[1]	ASTM D 4632 Grab Test	180 min.	120 min.	90	180
Elongation at (%)[1]	ASTM D 4632 Grab Test	> 50	> 50	> 50	> 50
Puncture (CBR)	ASTM D 6241	475 min.	340 min.	265 min.	310 min.
Ultraviolet Light (% residual tensile strength)	ASTM D 4355 150 hours exposure	70 min.	70 min.	70 min.	70 min.
Apparent Opening Size – AOS	ASTM D 4751	As specified or max. of #100/2	As specified or max. of #70/2	As specified or max. of #70/2	As specified or max. of #100/2
Permitivity (sec^{-1}) ($gal/min/ft^2$)	ASTM D 4491	1.5 min. 110 min.	1.8 min. 135 min.	2.1 min. 155 min.	0.30 min. 29 min.

[1]Minimum average roll value (weakest principal direction).
[2]U.S. standard sieve size.
[3]Heat-bonded or resin bonded geotextile may be used for Class IV only, and are

particularly well-suited for this use. Needle punched geotextiles are required for all other classes.

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