

MATERIAL SPECIFICATION

592. GEOTEXTILE

1. SCOPE

This specification covers the 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 85 percent by weight polypropylenes, polyesters, polyamides, polyethylene, polyolefins, or polyvinylidene-chlorides. They shall be formed into a stable network of filaments or yarns retaining dimensional stability relative to each other. The geotextile shall be free of defects and 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 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 selvaged or otherwise finished to prevent the outer yarn from unraveling.

- b. Non-woven. Fabrics formed by a random placement of threads in a mat and bonded by heat-bonding, resin-bonding, or needle punching.

Non-woven 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 non-wovens, other than the needle-punched geotextiles, is somewhat restricted (see Note 3 of Table 2).

4. SAMPLING AND TESTING

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 latest edition of the "Specifiers Guide", Geotechnical Fabrics Report, ADDRESS: Industrial Fabrics

Association International, 1801 County Road BW, Roseville, MN 55113-4061; 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.

5. SHIPPING AND STORAGE

The geotextile shall be shipped/transported in rolls wrapped with a cover for protection from moisture, dust, dirt, debris, and ultraviolet light. The cover shall be maintained undisturbed to the maximum extent possible prior to placement.

Each roll of geotextile shall be labeled or tagged to clearly identify the brand, Class and the individual production run in accordance with ASTM D 4873.

TABLE 1
REQUIREMENTS FOR WOVEN GEOTEXTILES

Property	Test Method	Class I	Class II & III	Class IV
Tensile Strength (pounds) <u>1/</u>	ASTM D 4632 Grab Test	200 minimum in any principal direction	120 minimum in any principal direction	180 minimum in any principal direction
Bursting Strength (psi) <u>1/</u>	ASTM D 3786 Diaphragm Tester	400 minimum	300 minimum	NA
Elongation at Failure (percent) <u>1/</u>	ASTM D 4632 Grab Test	<50	<50	<50
Puncture (pounds) <u>1/</u>	ASTM D 4833	90 minimum	60 minimum	60 minimum
Ultraviolet Light (percent residual tensile strength)	ASTM D 4355 150-hours exposure	70 minimum	70 minimum	70 minimum
Apparent Opening Size (AOS)	ASTM D 4751	As specified or a minimum # 100 <u>2/</u>	As specified or a minimum # 100 <u>2/</u>	As specified or a minimum # 100 <u>2/</u>
Percent Open Area (percent)	CWO-02215-86	4.0 minimum	4.0 minimum	1.0 minimum
Permittivity sec ⁻¹	ASTM D 4491	0.10 minimum	0.10 minimum	0.10 minimum

1/ Minimum average roll value (weakest principal direction).

2/ U.S. Standard Sieve Size.

NOTE: CWO is a USACE reference.

TABLE 2
REQUIREMENTS FOR NON-WOVEN GEOTEXTILES

Property	Test Method	Class I	Class II	Class III	Class IV <u>3/</u>
Tensile Strength (pounds) <u>1/</u>	ASTM D 4632 Grab Test	180 minimum	120 minimum	90 minimum	115 minimum
Bursting Strength (psi) <u>1/</u>	ASTM D 3786 Diaphragm Tester	320 minimum	210 minimum	180 minimum	NA
Elongation at Failure (percent) <u>1/</u>	ASTM D 4632	≥50	≥50	≥50	≥50
Puncture (pounds) <u>1/</u>	ASTM D 4833	80 minimum	60 minimum	40 minimum	40 minimum
Ultraviolet Light (percent residual tensile strength)	ASTM D 4355 150-hours exposure	70 minimum	70 minimum	70 minimum	70 minimum
Apparent Opening Size (AOS)	ASTM D 4751	As specified or a maximum #40 <u>2/</u>	As specified or a maximum # 40 <u>2/</u>	As specified or a maximum # 40 <u>2/</u>	As specified or a maximum # 40 <u>2/</u>
Permittivity sec ⁻¹	ASTM D 4491	0.70 minimum	0.70 minimum	0.70 minimum	0.10 minimum

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 III and IV. They are particularly well suited for Class IV. Needle-punched geotextiles are required for all other classes.