

Part 642 – Specifications

Chapter 3 – National Standard Material Specifications

Material Specification 592—Geotextile

A. Scope

This specification covers the quality of geotextile, including geotextile for temporary silt fence.

B. General Requirements

- (1) Fibers (threads and yarns) used in the manufacture of geotextile must consist of synthetic polymers composed of a minimum of 85 percent by weight polypropylene, polyester, polyamide, polyethylene, polyolefin, or polyvinylidene-chloride. The fiber must be formed into a stable network of filaments retaining dimensional stability relative to each other. The geotextile must be free of defects, such as holes, tears, and abrasions. The geotextile must be free of any chemical treatment or coating that significantly reduces its porosity. Fibers must contain stabilizers, inhibitors, or both to enhance resistance to ultraviolet light. Geotextile other than for temporary silt fence must conform to the requirements in Figure 592-1 or 592-2, as applicable. Geotextile for temporary silt fence must conform to ASTM D6461.
- (2) Thread used for factory or field sewing must be of a color contrasting to the color of the fabric and made of high-strength polypropylene, polyester, or polyamide material. It must be as resistant to ultraviolet light as the geotextile being sewn.

C. Classification

- (1) There are two geotextile classifications, woven and nonwoven. Geotextile for temporary silt fence may be either woven or nonwoven. Silt film woven geotextile may not be used except for temporary silt fence.
- (2) Woven geotextiles are made from fabric that is formed by the uniform and regular interweaving of the threads or yarns in two directions. Woven fabrics must be manufactured from monofilament yarn formed into a uniform pattern with distinct and measurable openings, retaining their position relative to each other. The fabric must have a selvage edge or otherwise be finished to prevent unraveling.
- (3) Nonwoven geotextiles are made from fabric that is formed by a random placement of threads in a mat and bonded by needle punching, heat bonding, or resin bonding. Nonwoven geotextiles must have distinct but variable small openings, retaining their position relative to each other when bonded. The use of heat- or resin-bonded nonwovens is restricted as specified in note 2 of Figure 592-2.

D. Sampling and Testing

The geotextile must conform to Figure 592-1 or 592-2 or ASTM D6461, as applicable, for the product type shown on the label. Documentation described in either (i) or (ii) below is required to verify the product meets the specified requirements:

- (i) Product properties as listed in the latest edition of the "Specifiers Guide," Geosynthetics (Industrial Fabrics Association International, 1801 County Road B, West Roseville, MN 55113-4061 or at <http://www.geosindex.com>), and that represent average roll values, are acceptable.

- (ii) Test data from the geotextile production run for each of the specified tests listed in Figure 592-1 or 592-2 or ASTM D6461, as applicable.

E. Shipping and Storage

Each roll of geotextile must be labeled or tagged to clearly identify the brand, class, and individual production run in accordance with ASTM D4873. The geotextile must be shipped and transported in rolls wrapped with a cover for protection from moisture, dust, dirt, debris, and ultraviolet light. The cover must be maintained undisturbed to the maximum extent possible before placement.

Figure 592-1 Requirements for Woven Geotextiles ^{1/}

Property	Test method	Class I	Class II	Class III	Class IV
Grab tensile strength (lb)	ASTM D4632	247 minimum	180 minimum	180 minimum	315
Elongation at failure (%)	ASTM D4632	<50	<50	<50	<50
Trapezoidal tear strength (lb)	ASTM D4533	90 minimum	67 minimum	67 minimum	112 minimum
Puncture strength (lb)	ASTM D6241	495 minimum	371 minimum	371 minimum	618 minimum
Ultraviolet stability (% retained strength)	ASTM D4355	50 minimum	50 minimum	50 minimum	70 minimum
Permittivity (sec ⁻¹)	ASTM D4491	as specified			
Apparent opening size (AOS) ^{2/}	ASTM D4751	as specified			
Percent open area (POA) (%)	USACE ^{3/} CWO-02215-86	as specified			

^{1/} All values are minimum average roll values (MARV) in the weakest principal direction, unless otherwise noted.

^{2/} Maximum average roll value.

^{3/} Note: CWO is a USACE reference.

Figure 592-2 Requirements for Non-Woven Geotextiles ^{1/}

Property	Test method	Class I ^{2/}	Class II ^{2/}	Class III ^{2/}	Class IV ^{2/}
Grab tensile strength (lb)	ASTM D4632 grab test	202 minimum	157 minimum	112 minimum	202 minimum
Elongation at failure (%)	ASTM D4632	50 minimum	50 minimum	50 minimum	50 minimum
Trapezoidal tear strength (lb)	ASTM D4533	79 minimum	56 minimum	40 minimum	79 minimum
Puncture strength (lb)	ASTM D6241	433 minimum	309 minimum	223 minimum	433 minimum
Ultraviolet light (% retained strength)	ASTM D4355	50 minimum	50 minimum	50 minimum	50 minimum
Permittivity sec ⁻¹	ASTM D4491	0.70 minimum or as specified			
Apparent opening size (AOS) (mm) ^{3/}	ASTM D4751	0.22 maximum or as specified			

^{1/} All values are minimum average roll values (MARV) in the weakest principal direction, unless otherwise noted.

^{2/} Needle punched geotextiles may be used for all classes. Heat-bonded or resin-bonded geotextiles may be used for class IV only.

^{3/} Maximum average roll value.