Designation: D 6461 – 99

Standard Specification for Silt Fence Materials[1]

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1. Scope

1.1 This specification covers requirements and test methods for geotextile fabrics and associated components used in temporary silt fence applications. This is a material purchasing specification based on AASHTO M288.

1.2 This specification is applicable to the use of a geotextile as a vertical permeable interceptor designed to remove suspended soil from overland, nonconcentrated water flow. The function of a temporary silt fence is to trap and allow settlement of soil particles from sediment laden water. The purpose is to greatly limit the transport of eroded soil from the a construction site by water runoff.

1.3 The tests used to characterize the silt fence are intended to ensure good workmanship and quality and are not necessarily adequate for design purposes in view of the wide variety of possible sediments and performance objectives.

1.4 The values stated in SI units are to be regarded as the standard. The values in inch-pound units are provided for information only.

2. Referenced Documents

2.1 *ASTM Standards:*

D 123 Terminology Relating to Textiles[2]

D 276 Test Method for Identification of Fibers in Textiles[2]

D 4354 Practice for Sampling of Geosynthetics for Testing[3]

D 4355 Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)[3]

D 4439 Terminology for Geosynthetics[3]

D 4491 Test Methods for Water Permeability of Geotextiles by Permittivity[3]

D 4632 Test Method for Grab Breaking Load and Elongation of Geotextiles[3]

D 4751 Test Method for Determining Apparent Opening Size of a Geotextile[3]

D 4759 Practice for Determining the Specification Conformance of Geosynthetics[3]

D 4873 Guide for Identification, Storage and Handling of Geotextiles[3]

D 5141 Test Method to Determine Filtering Efficiency and Flow Rate for Silt Fence Applications Using Site Specific Soils[3]

2.2 *AASHTO Standard:*

M288-96 Standard Specification for Geotextile Specification for Highway Applications[4]

3. Materials and Manufacture

3.1 Fibers used in the manufacture of geotextiles for silt fence, and the threads used in joining geotextiles by sewing, shall consist of long-chain synthetic polymers composed of at least 95 % by weight of polyolefins or polyester. They shall be formed into a stable network such that the filaments or yarns retain their dimensional stability relative to each other, including selvages.

3.2 Geotextiles and related materials used for temporary silt fence shall conform with the physical requirements of Sections 7 and 8.

3.3 All property values, with the exception of apparent opening size (AOS), in this specification represent minimum average roll values (MARV) in the weakest principle direction (that is, average test results of any roll in a lot sampled for conformance or quality assurance testing shall meet or exceed the minimum value provided herein). Values for AOS represent maximum average roll values.

4. Sampling, Testing, and Acceptance

4.1 Silt fence shall be subject to sampling and testing to verify conformance with this specification. Sampling for testing shall be in accordance with Practice D 4354. Acceptance shall be based on testing of either conformance samples obtained using Procedure A of Practice D 4354, or based on manufacturer's certifications and testing of quality assurance samples obtained using Procedure B of Practice D 4354. A lot size for conformance or quality assurance sampling shall be considered to be the shipment quantity of the given product or a truckload of the given product, whichever is smaller.

4.2 Testing shall be performed in accordance with the test methods referenced in this specification for the indicated application. The number of specimens to test per sample is specified by each test method. Geotextile product acceptance shall be based on Practice D 4759. Product acceptance is

[1] This specification is under the jurisdiction of ASTM Committee D-18 on Soil and Rock and is the direct responsibility of Subcommittee D18.25 on Erosion and Sediment Control Technology.

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[2] *Annual Book of ASTM Standards*, Vol 07.01.

[3] *Annual Book of ASTM Standards*, Vol 04.09.

[4] Available from American Association of State Highway and Transportation (AASHTO), 440 N. Capital Street NW, Washington, DC 2001.

TABLE 1 Temporary Silt Fence Material Property Requirements

	Test Methods	Units	Supported[A] Silt Fence	Unsupported[A] Silt Fence	Type of Value
Grab Strength	ASTM D 4632	N (lbs)			
Machine Direction			400 (90)	550 (90)	MARV
X-Machine Direction			400 (90)	450 (90)	MARV
Permittivity[B]	ASTM D 4491	sec-1	0.05	0.05	MARV
Apparent Opening Size[B]	ASTM D 4751	mm (US Sieve #)	0.60 (30)	0.60 (30)	Max. ARV[C]
Ultraviolet Stability	ASTM D 4355	% Retained Strength	70 % after 500 h of exposure	70 % after 500 h of exposure	Typical

[A]Silt fence support shall consist of 14 gage steel wire with a mesh spacing of 150 mm (6 in.) or prefabricated polymer mesh of equivalent strength.
[B]These default values are based on empirical evidence with a variety of sediments. For environmentally sensitive areas, a review of previous experience and/or site or regionally specific geotextile tests in accordance with Test Method D 5141 should be performed by the agency to confirm suitability of these requirements.
[C]As measured in accordance with Test Method D 4632.

determined by comparing the average test results of all specimens within a given sample to the specification MARV. Refer to Practice D 4759 for more details regarding geotextile acceptance procedures.

5. Certification

5.1 The contractor shall provide to the Engineer a certificate stating the name of the manufacturer, product name, style number, chemical composition of the filaments or yarns and other pertinent information related to posts, post spacing, support mesh, and other components to fully describe the silt fence system.

5.2 The manufacturer is responsible for establishing and maintaining a quality control program to assure compliance with the requirements of the controlling material specification. Documentation describing the quality control program shall be made available upon request.

5.3 The manufacturer's certificate shall state that the furnished silt fence materials meet the requirements of the controlling specification as evaluated under the manufacturer's quality control program. The certificate shall be attested to by a person having legal authority to bind the manufacturer.

5.4 Either mislabeling or misrepresentation of materials shall be reason to reject those silt fence materials.

6. Shipment and Storage

6.1 Silt fence labeling, shipment and storage shall follow Guide D 4873. Product labels shall clearly show the manufacturer or supplier name, style name, and roll number. Each shipping document shall include a notation certifying that the material is in accordance with the manufacturer's certificate.

6.2 Each silt fence roll shall be wrapped with a material that will protect the geotextile from damage due to shipment, water, sunlight, and contaminants. The protective wrapping shall be maintained during periods of shipment and storage.

6.3 During storage, silt fence rolls shall be elevated off the ground and adequately covered to protect them from the following—site construction damage, precipitation, extended ultraviolet radiation including sunlight, chemicals that are strong acids or strong bases, flames including welding sparks, temperatures in excess of 71°C (160°F), and any other environmental condition that may damage the physical property values of the geotextile.

7. Temporary Silt Fence Material Requirements

7.1 The geotextile used for temporary silt fence may or may not be supported between posts with wire or polymeric mesh. The temporary silt fence geotextile shall meet the requirements of Table 1. Grab strength and permittivity values in Table 1 represent minimum average roll values (MARV). Values for AOS represent maximum average roll values (MaxARV). Ultraviolet stability values are typical values.

7.2 The minimum height above ground for all silt fence shall be 750 mm (2.5 ft). Minimum embedment depth shall be 150 mm (0.5 ft). Thus, the minimum silt fence width shall be 900 mm (3 ft).

7.3 Maximum post spacing shall be based on the fabric support or, if unsupported, on elongation as measured in accordance with Test Method D 4632. Supported silt fence shall have a maximum post spacing of 1.2 m (4 ft). Unsupported silt fence with elongation $\geq$ 50 % shall also have a maximum post spacing of 1.2 m (4 ft). Unsupported silt fence with elongation < 50 % shall have a maximum post spacing of 2 m (6.5 ft).

8. Related Material Requirements

8.1 Wood, steel, or synthetic support posts having a minimum length of 1 m (3.3 ft) plus the burial depth may be used. They shall be of sufficient strength to resist damage during installation and to the support applied loads due to material build up behind the silt fence.

NOTE 1—It has been found that hardwood posts having dimensions of at least 30 by 30 mm (1.2 by 1.2 in), No. 2 Southern Pine at least 65 by 65 mm (2.5 by 2.5 in) or steel posts of UTL or C shape, weighing 600 g per 300 mm (1.3 lb/ft) have performed satisfactorily.

8.2 Wire or polymer support fence shall be at least 750 mm (2.5 ft) high and strong enough to support applied loads. Polymer support fences shall meet the same ultraviolet degradation requirements as the geotextile.

NOTE 2—Wire support fence having at least 6 horizontal wires, and being at least 14 gage wire have performed satisfactorily. Vertical wires should be a maximum of 150 mm (0.5 ft) apart.