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## Standard Specifications for Silt Fence Materials<sup>1</sup>

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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. **Table 1** is a material purchasing specification based on AASHTO M288. **Table 2** is a specification to be used in areas of high water flow.

1.2 Both specifications are 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 construction sites and other areas affected by water runoff.

**NOTE 1**—It should be noted that proper installation and maintenance are critical for the effective functioning of silt fence.

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 either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents, therefore each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

**NOTE 2**—Although the **Table 1** specification should be acceptable in most erosion control applications, it should be noted that an alternative silt fence specification for a higher water flow rate, listed in **Table 2**, may be required by the engineers in areas that are susceptible to higher water runoff; using **Table 2** specification will minimize safety hazards such as hydroplaning in these areas.

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.25 on Erosion and Sediment Control Technology.

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### 2. Referenced Documents

#### 2.1 *ASTM Standards*:<sup>2</sup>

- D123 [Terminology Relating to Textiles](#)
- D276 [Test Methods for Identification of Fibers in Textiles](#)
- D653 [Terminology Relating to Soil, Rock, and Contained Fluids](#)
- D4354 [Practice for Sampling of Geosynthetics and Rolled Erosion Control Products \(RECPs\) for Testing](#)
- D4355 [Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus](#)
- D4439 [Terminology for Geosynthetics](#)
- D4491 [Test Methods for Water Permeability of Geotextiles by Permittivity](#)
- D4632 [Test Method for Grab Breaking Load and Elongation of Geotextiles](#)
- D4751 [Test Methods for Determining Apparent Opening Size of a Geotextile](#)
- D4759 [Practice for Determining the Specification Conformance of Geosynthetics](#)
- D4873 [Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples](#)
- D6637 [Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method](#)

#### 2.2 *AASHTO Standard*:

- M288-15 [Standard Specification for Geotextile Specification for Highway Applications](#)<sup>3</sup>

### 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 polyolefin 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.

<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> Available from American Association of State Highway and Transportation Officials (AASHTO), 444 N. Capitol St., NW, Suite 249, Washington, DC 20001, <http://www.transportation.org>.

**TABLE 1 Temporary Silt Fence Material Property Requirements**

	Test Methods	Units	Supported <sup>A</sup> Silt Fence	Unsupported <sup>A</sup> Silt Fence	Type of Value
Grab Strength	ASTM <b>D4632</b>	N [lb]	400N [90 lb]	550N [124 lb]	MARV
			400N [90 lb]	450N [101 lb]	MARV
Permittivity	ASTM <b>D4491</b>	sec-1	0.05	0.05	MARV
Apparent Opening Size	ASTM <b>D4751</b>	mm (US Sieve #)	0.60 (30)	0.60 (30)	Max. ARV
Ultraviolet Stability	ASTM <b>D4355</b>	% Retained Strength	70 % after 500 h of exposure	70 % after 500 h of exposure	Typical

<sup>A</sup>Silt fence support shall consist of 14 gage [1.63mm] steel wire with maximum openings of 6 by 6 in. [150 by 150mm] or prefabricated polymer mesh of 200 by 200 lb/ft [2900N/m] in accordance with Test Method **D6637**.

**TABLE 2 Temporary Silt Fence Material Property Requirements Under High Water Flow Conditions**

	Test Methods	Units	Supported <sup>A</sup> Silt Fence	Type of Value
Grab Strength	ASTM <b>D4632</b>	N [lb]	1157N [260 lb]	MARV
			801N [180 lb]	MARV
Permittivity	ASTM <b>D4491</b>	sec-1	1.0	MARV
Apparent Opening Size	ASTM <b>D4751</b>	mm (US Sieve #)	0.60 (30)	Max. ARV
Ultraviolet Stability	ASTM <b>D4355</b>	% Retained Strength	70 % after 500 h of exposure	Typical

<sup>A</sup>Silt fence support shall consist of 14 gage [1.63mm] steel wire with maximum openings of 6 by 6 in. [150 by 150mm] or prefabricated polymer mesh of 200 by 200 lb/ft [2900N/m] in accordance with Test Method **D6637**.

3.2 Geotextiles and related materials used for temporary silt fence shall conform to 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 **D4354**. Acceptance shall be based on testing of conformance samples obtained using Procedure A of Practice **D4354**. 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 (see Terminology **D653**) is specified by each test method. Geotextile product acceptance shall be based on Practice **D4759**.

Product acceptance is determined by comparing the average test results of all specimens within a given sample to the specification MARV. Refer to Practice **D4759** for more details regarding geotextile acceptance procedures.

#### 5. Certification

5.1 The contractor shall provide to the Site 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 an authorized officer of the company 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 **D4873**. 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 may be wrapped with a material that will protect the geotextile from damage due to shipment, water, sunlight, and contaminants; however, silt fence that has been fabricated with wooden stakes shall not be wrapped due to condensation rotting the stakes within the covering. If applicable, 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, strong acids or strong bases, flames including welding sparks, temperatures in excess of 160°F [71 °C], and any other environmental condition that may damage the physical properties of the geotextile.

## 7. Temporary Silt Fence Material Requirements

7.1 The geotextile used for temporary silt fence in **Table 1**, may or may not be supported between posts with wire or polymeric mesh. The temporary silt fence geotextile shall meet the minimum requirements in **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 As a general rule, the minimum height above ground for all silt fence should be 18 in. [450mm] and a maximum of 30 in. [750mm], see **Note 3** discussing the maximum height above ground. Minimum embedment depth shall be 6 in. [150mm]. As a general rule, the minimum silt fence width should be 3 ft [900mm].

7.3 Under **Table 1**, maximum post spacing shall be based on the fabric support or, if unsupported, on elongation as measured in accordance with Test Method **D4632**. Supported silt fence shall have a maximum post spacing of 10 ft [3m]. Unsupported silt fence with elongation  $\geq 50\%$  shall have a maximum post spacing of 4 ft [1.2m]. Unsupported silt fence with elongation  $< 50\%$  shall have a maximum post spacing of 6.5 ft [2m].

7.4 The geotextile used for temporary silt fence in **Table 2**, shall be supported between posts with wire or polymeric mesh. The temporary silt fence geotextile shall meet the minimum requirements in **Table 2**. Grab strength and permittivity values in **Table 2** represent minimum average roll values (MARV). Values for AOS represent maximum average roll values (MaxARV). Ultraviolet stability values are typical values.

7.5 Under **Table 2**, supported temporary silt fence shall have a maximum post spacing of 4 ft [1.2m].

**NOTE 3**—The recommended maximum height of 30 in. [750mm] is designed to trap the flowing sediment without creating a serious downstream flooding problem if the silt fence experienced a total rupture. In addition, the maximum silt fence height must take into account the environmental conditions of the area of installation to, for example, avoid a situation where the silt fence could cause the level of the retained water to rise to a level that would flood an adjacent structure. In that situation, it would be necessary to use a lower height silt fence above ground and consideration should be given to using multiple properly spaced silt fences to slow the velocity of the water flow and provide for additional silt collection without the risk of harmful flooding.

## 8. Related Material Requirements

8.1 When using shorter silt fences, wood, steel, or synthetic support posts having a minimum length of 3 ft [900mm] may be used; however, in most cases a minimum 4 ft T Post would be recommended, the width of the silt fence fabric would be the determining factor. The posts shall have sufficient strength to resist damage during installation and to support the applied loads due to material build up behind the silt fence.

**NOTE 4**—It has been found that hardwood posts having dimensions of at least 1.2 by 1.2 in. [30 by 30mm], No. 2 Southern Pine at least 2.5 by 2.5 in. [65 by 65mm] or steel posts of U, T, L, or C shape, weighing at a minimum 1.15 lb/ft [1.75kg/m] have performed satisfactorily.

8.2 Wire or polymer support fence shall be at least 2.5 ft [750mm] high and strong enough to support applied loads. Polymer support fences shall meet the same ultraviolet degradation requirements as the geotextile. Polymer mesh shall have a minimum ultimate tensile strength of 200 lb/ft in both machine and cross direction measured in accordance with Test Method **D6637**.

**NOTE 5**—Wire support fence shall be 14 g [1.63mm] steel wire and a maximum opening size of 6 by 6 in. [150 by 150mm].

## 9. Keywords

9.1 geotextile; sediment control; silt fence

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