

## 918-M-060 GEOSYNTHETIC MATERIALS

(Adopted 05-20-21)

The Standard Specifications are revised as follows:

SECTION 918, BEGIN LINE 35, DELETE AND INSERT AS FOLLOWS:

**(b) Geotextile Properties for Underdrains, *Subsurface Drains*, and *Drainage Filtration Applications***

Test	Method, ASTM	Requirements <sup>(1) (2)</sup>				
		Type 1A	Type 1B	Type 2A	Type 2B	Type 3
Grab Tensile Strength, min.	D4632	80 lb	200 lb	160 lb	200 lb	200 lb
Grab Elongation	D4632	> 50%	< 50%	> 50%	< 50%	< 50%
CBR Puncture Strength, min.	D6241	175 lb	600 lb	410 lb	750 lb	1,100 lb
Deterioration in Tensile Strength due to UV Degradation 500 hrs, min.	D4355 D6637	70% strength retained	70% strength retained	70% strength retained	70% strength retained	90% strength retained
Apparent Opening Size, AOS	D4751	≤ No. 50 sieve, for soils ≥ 40% passing the No. 200 sieve	≤ No. 40 sieve, for soils < 40% passing the No. 200 sieve	≤ No. 70 sieve, for soils ≥ 40% passing the No. 200 sieve	≤ No. 30 sieve, for soils < 40% passing the No. 200 sieve	≤ No. 40 sieve
Permittivity	D4491	≥ 1.2 sec <sup>-1</sup>	≥ 2.1 sec <sup>-1</sup>	≥ 0.8 sec <sup>-1</sup>	≥ 0.9 sec <sup>-1</sup>	0.90 sec <sup>-1</sup>
Notes:						
(1) All values are minimum average roll values (MARV) as determined in accordance with ASTM D4354 in the weaker principal direction, except AOS size is based on maximum average roll value.						
(2) Type 3 value is a maximum average roll value (Max ARV) as determined in accordance with ASTM D4354.						

**(c) Geotextile Properties for Pavement or Subgrade Stabilizations**

Test	Method, ASTM	Requirements <sup>(1)</sup>			
		Type 1A	Type 1B	Type 2A	Type 2B
Grab Tensile Strength, min.	D4632	200 lb	300 lb	290 lb	400 lb
Wide Width Tensile, @ 5% Strain, min.	D4595	n/a	n/a	1,200 lb/ft	2,400 lb/ft
Grab Elongation	D4632	≤ 50%	< 50%	≤ 50%	< 50%
CBR Puncture Strength, min.	D6241	175 lb	600 lb	410 lb	750 lb
Trapezoid Tearing Strength, min.	D4533	75 lb	110 lb	n/a	n/a
Deterioration in Tensile Strength due to UV Degradation 500 hrs, min.	D4355 D6637	70% strength retained	70% strength retained	70% strength retained	70% strength retained
Apparent Opening Size, AOS, min.	D4751	No. 50 sieve	No. 40 sieve	No. 30 sieve	No. 30 sieve
Soil Retention, Pore Size, O <sub>50</sub> /O <sub>95</sub> , min.	D6767	n/a	n/a	290/380	100/350
Permittivity, min.	D4491	0.05 sec <sup>-1</sup>	0.050 sec <sup>-1</sup>	0.50 sec <sup>-1</sup>	0.40 sec <sup>-1</sup>
Note:					

<sup>(1)</sup> All values are minimum average roll values (MARV) as determined in accordance with ASTM D4354 in the weaker principal direction, except AOS size is based on maximum average roll value.

**(d) Geotextile Properties for Moisture Management**

Type, IMA geotextile shall consist of woven polypropylene filaments, wicking filaments and shall be in accordance with the following:

Test	Method, ASTM	Requirements
		Type IMA
Wide Width Tensile Strength, min. Machine direction Cross machine direction	D4595 <sup>3</sup>	5,280 lbs/ft 5,280 lbs/ft
Wide Width Tensile Strength, @ 2% Strain, min. Machine direction Cross machine direction	D4595 <sup>3</sup>	480 lbs/ft 1,080 lbs/ft
Apparent Opening Size, AOS, min.	D4751	No. 40 sieve
Flow Rate	D4491 <sup>3</sup>	30 gal./min/ft <sup>2</sup>
Wicking Requirement Wet Front Movement <sup>1</sup> 24 minutes, min.	C1559 <sup>2</sup>	6 in. Vertical Direction
Wicking Requirement Wet Front Movement <sup>1</sup> 983 minutes. Zero Gradient, min.	C1559 <sup>2</sup>	73 in. Horizontal Direction
Permittivity, min.	D4491 <sup>3</sup>	0.4 sec <sup>-1</sup>
Notes: 1. 'STP': Standard Temperature and Pressure 2. Modified, time 3. Minimum average roll values shall be in accordance with ASTM D4759		

**(e) Geotextile Properties for Silt Fence**

Test	Method, ASTM	Requirements <sup>(1)</sup>	
		Wire Fence Supported	Self Supported
Grab Strength	D4632	90 lb	90 lb
Elongation @ 45 lb	D4632		50% max.
Apparent Opening Size <sup>(2)</sup>	D4751	No. 20 sieve	No. 20 sieve
Permittivity <sup>(2)</sup>	D4491	0.01 sec <sup>-1</sup>	0.01 sec <sup>-1</sup>
Ultraviolet Degradation at 500 hrs	D4355	70% strength retained	70% strength retained
<sup>(1)</sup> The value in the weaker principal direction shall be used. All numerical values will represent the minimum average roll value. Test results from a sampled roll in a lot shall be in accordance with or shall exceed the minimum values shown in the above table. The stated values are for non-critical, non-severe conditions. Lots shall be sampled in accordance with ASTM D4354. <sup>(2)</sup> The values reflect the minimum criteria currently used. Performance tests may be used to evaluate silt fence performance if deemed necessary by the Engineer. Note: All values are minimum average roll values (MARV) as determined in accordance with ASTM D4354.			

**918.03 Geomembrane**

This material shall consist of a geomembrane fabricated from high density polyethylene, HDPE, consisting of strong, rot resistant, chemically stable long-chain synthetic polymer materials, dimensionally stable with distinct and measurable openings. The manufacturer shall submit the tests for the intended use to the Department.

SECTION 918, BEGIN LINE 72, INSERT AS FOLLOWS:

**918.05 Geogrid**

Geogrid shall be a biaxial or multi axial of a regular network of connected polymer tensile elements with aperture geometry sufficient to enable significant mechanical interlock with the surrounding material. The material shall be polypropylene, ASTM D 4101 (97% minimum) and Carbon Black, ASTM D 1603 (0.5% minimum). The geogrid structure shall be dimensionally stable and shall be able to retain its geometry under construction stresses. The geogrid structure shall have a resistance to damage during construction, ultraviolet degradation, and all forms of chemical and biological degradation encountered in the soil being placed.

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