



Excerpt from Section 10.1.1 of the AREMA Manual for Railway Engineering

Nonwoven Geotextile Guidelines for Railroad Separation / Stabilization Applications

Table 1-10-2. Physical Property Requirements for Railroad Track Separation/Stabilization

Test Methods for Nonwoven Geotextiles			Survivability Requirements		
Property	ASTM Method	Units	Regular MIRAFI S1000	Heavy MIRAFI S1200	Extra Heavy MIRAFI S1600
*Mass per Unit Area	D5261	oz/yd ² (g/m ²)	10.0 (339)	12.0 (407)	16.0 (542)
Grab Tensile Strength	D4632	lb (N)	270 (1202)	310 (1380)	425 (1890)
Elongation	D4632	Percent (%)	50	50	50
Hydraulic Transmissivity by Radial Flow (3.5 psi load, 15 min seat time)	D6574	ft ² /min (m ² /s)	0.0019 (3.0 x 10 ⁻⁶)	0.0023 (3.5 x 10 ⁻⁶)	0.0035 (5.4 x 10 ⁻⁶)
Coefficient of Normal Permeability (K)	D4491	(cm/sec)	0.3	0.3	0.3
Permittivity	D4491	(sec ⁻¹)	1.0	0.9	0.7
Apparent Opening Size	D4751	(mm)	(0.212)	(0.212)	(0.212)
Trapezoid Tear Strength	D4533	lb (N)	100 (444)	125 (555)	150 (665)
CBR Puncture Strength	D6241	lb (N)	725 (3226)	900 (4005)	1200 (5340)
Abrasion Resistance	D4886	% strength retained in breaking load	80	80**	80**

*Mass per Unit Area: The values indicated the minimum weight required for each survivability classification. The designer may increase the geosynthetic survivability at their discretion by increasing the mass property value.

Excerpt from Section 10.1.2 of the AREMA Manual for Railway Engineering

Enhanced Woven Geotextile Guidelines for Railroad Trackbed Stabilization Applications

Table 1-10-3. Physical Properties for Enhanced Woven Geotextiles used in Track Stabilization

Property	Test Method	Units	Minimum Average Roll Value MIRAFI HP570
Ultimate Tensile Strength (MD x CD)	ASTM D4595	lbs/ft (kN/m)	4800 x 4800 (70 x 70)
Flow Rate	ASTM D4491	Gal/min/ft ² (l/min/m ²)	30 (1222)
Permittivity	ASTM D4491	sec ⁻¹	0.2
Apparent Opening Size ²	ASTM D4751	US Std Sieve (mm)	30 (0.6) MaxARV
UV Stability (Retained Strength after 500 hrs of exposure)	ASTM D4355/4355M	%	70
¹ Unless otherwise indicated, values shown are minimum average roll values (MARVs) determined in accordance with ASTM D4759-02. ² Values for Apparent Opening Size represent MAXIMUM Average Roll Values (MaxARV)			



Geotextile Guidelines for Railroad Subsurface Drainage Applications & Geotextile Guidelines for Use in Railroad Permanent Erosion Control Applications

Table 1-10-7 and 1-10-10. Geotextile Survivability Properties (See Notes 1 and 2)

Survivability Properties	Subsurface Drainage			
	Class 1		Class 2	
	Monofilament Woven	Nonwoven	Monofilament Woven	Nonwoven
	MIRAFI FW404	MIRAFI 180N	MIRAFI FW700	MIRAFI 160N
ASTM D4632 Grab Strength lb (N)	315 (1400)	202 (900)	247 (1100)	157 (700)
ASTM D4632 Elongation (%)	<50%	>50%	<50%	>50%
ASTM D4632 Sewn Strength lbs (N) (Note 6)	283 (1260)	182 (810)	223 (990)	142 (630)
ASTM D6241 CBR Puncture Strength lb (N)	618 (2750)	433 (1925)	495 (2200)	309 (1375)
ASTM D4533 Trapezoid Tear lb (N)	56 (250)	79 (350)	56 (250)	56 (250)
ASTM D4533 UV Degradation @ 500 hours	50% Strength retained for all classes			

Table 1-10-8 and 1-10-11. Geotextile Filtration Properties (See Notes 1 and 2)

Filtration Properties	³ Requirements,		
	Percent in-situ Soil Passing No. 200 Sieve (0.075 mm)		
	< 15%	15% to 50%	> 50%
⁴ ASTM D4491 Permittivity (sec ⁻¹)	0.5 FW700 Does Not Comply	0.2	0.1
^{4, 5} ASTM D4751 Apparent Opening Size (mm)	0.43	0.25 FW404 Does Not Comply	0.22 FW404 Does Not Comply
<p>Note 1: These table to be used when site specific soil data is not available for non-severe/non-critical applications.</p> <p>Note 2: A site specific soil-geotextile filter design following the process summarized in Table 1- 10-9 should be performed for:</p> <ul style="list-style-type: none"> a) critical applications or severe installations b) unstable or highly erodible soils such as non-cohesive silts and gap- graded soils c) alternating sand/silt laminated soils d) dispersive clays e) rock flour <p>Note 3: Based on grain size analysis of in-situ soil in accordance with AASHTO T88 Standard Method of Test for Particle Size Analysis of Soils or ASTM D6913 Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis.</p> <p>Note 4: These default geotextile filtration property values are based on the predominant particle size of the in-situ soil.</p> <p>Note 5: The geotextile maximum average roll value for apparent opening size (AOS) is 0.30 for cohesive soils with a plasticity index in accordance with AASHTO T90 greater than seven.</p>			