

## Geotextiles Nonwovens Capabilities



**Filtration** – Thrace nonwoven geotextiles work in equilibrium with the soil, allowing adequate liquid flow with limited soil loss, while avoiding pore clogging.



**Erosion Control** – Thrace nonwoven geotextiles can be used independently or in conjunction with Thrace woven geotextiles to create geobags which provide erosion control of slopes, shoreline protection and riverbank flood control.



**Reinforcement/Stabilization** – Although soil maintains a consistent compressive, the strong tensile mechanical properties of Thrace geotextiles counterbalance soils' poor tensile properties, improving the total system's strength interaction. The high strength and low elongation of the fabrics are ideal for reinforcing embankments of roads, slopes and retaining walls.



**Protection** – Thrace nonwoven geotextiles offer perfect damage protection. Contact with sharp soil surfaces such as stones or subgrade unevenness harms geomembranes and other coated materials. Thrace nonwovens protect these materials using thickness and mass that are directly proportional to the amount of protection they offer.



**Separation** – Inserting Thrace flexible and porous geotextiles between dissimilar earth materials increases the integrity and function of both materials. The earth materials can then be improved or left intact.



**Drainage** – The balance between the soil and Thrace geotextile systems allows for adequate liquid flow, while maintaining limited soil loss. The hydraulic properties of the fabric are suitable to establish structural stability by controlling excess amounts of water during and after construction.

### Civil Nonwovens

We offer a full range of products from 3.2 ounces to 16 ounces / square yard for use in many civil applications, as specified by AASHTO.



#### Features & Benefits

- *Paving Fabrics*
- *Separation*
- *Stabilization*
- *Permanent Erosion Control*
- *Subsurface Drainage*

### Environmental Nonwovens

Geotextiles from 4 ounces to 16 ounces / square yard are available in fabric widths up to 17 feet wide. Reduced seams and increased loading provide unique advantages and savings on these quality intensive projects.



#### Features & Benefits

- *Even Consistent Protection*
- *Wide Width, Reducing Installation and Maximizing Freight*
- *Fewer Seams and Reduced Installation Cost*

### Paving Fabrics

We offer a wide range of Paving Fabrics, from our AASHTO M288 approved AOM to our recently developed 133 CBI Pavement Interlayer.



#### Features & Benefits

- *Delay the Formation of Reflective Cracking*
- *Absorb and Dissipate Stress*
- *Provide a Moisture Barrier*
- *Extend the Life of Distressed Pavements*
- *Offer Economical, Long-lasting Rehabilitation*

# Needlepunched Nonwoven

## Civil Nonwoven

Properties	ASTM TEST	UNIT	120EX	125EX	130EX	140EX	145EX	150EX	160EX	180EX	225EX	245EX	250EX	275EX	350EX
						AASHTO			AASHTO			AASHTO			
<b>MECHANICAL PROPERTIES<sup>2</sup></b>															
Grab Tensile Strength	D4632	lbs (N)	80 (356)	90 (400)	105 (467)	120 (534)	140 (623)	160 (712)	180 (801)	205 (912)	215 (956)	250 (1112)	270 (1201)	300 (1334)	380 (1690)
Elongation	D4632	%	50	50	50	50	50	50	50	50	50	50	50	50	50
Trapezoid Tear	D4533	lbs (N)	30 (133)	40 (178)	45 (200)	50 (222)	55 (245)	60 (267)	75 (334)	80 (356)	85 (378)	100 (445)	100 (445)	115 (512)	145 (645)
CBR Puncture	D6241	lbs (N)	210 (934)	265 (1179)	300 (1334)	340 (1512)	360 (1601)	410 (1824)	475 (2113)	535 (2380)	600 (2669)	700 (3114)	725 (3225)	830 (3692)	1050 (4671)
<b>ENDURANCE PROPERTIES<sup>2</sup></b>															
UV Stability	D4355	% @ 500 hrs	70	70	70	70	70	70	70	70	70	70	70	70	70
<b>HYDRAULIC PROPERTIES<sup>2</sup></b>															
Permittivity	D4491	sec <sup>-1</sup>	2.200	2.100	2.000	1.800	1.500	1.500	1.500	1.500	1.300	1.200	1.200	0.900	0.700
Water Flow Rate	D4491	gpm/ft2 (l/min/m2)	160 (6519)	150 (6112)	145 (5908)	130 (5297)	110 (4482)	110 (4482)	110 (4482)	110 (4482)	95 (3871)	85 (3463)	85 (3463)	65 (2648)	50 (2037)
Apparent Opening Size (AOS <sup>3</sup> )	D4751	US Sieve (mm)	70 (0.212)	70 (0.212)	70 (0.212)	70 (0.212)	70 (0.212)	80 (0.180)	100 (0.150)	100 (0.150)	100 (0.150)	100 (0.150)	100 (0.150)	100 (0.150)	100 (0.150)
<b>PHYSICAL PROPERTIES (Nominal)</b>															
Weight	D5261	oz/yd <sup>2</sup> (g/m2)	3.2 (108)	3.5 (119)	4 (136)	4.5 (153)	5 (170)	6 (203)	7 (237)	8 (271)	9 (305)	10 (339)	10.5 (356)	12 (407)	16 (542)
<b>Packaging<sup>4,T</sup></b>															
Roll Width	ft	12.5 / 15	12.5 / 15	12.5 / 15	12.5 / 15	12.5 / 15	12.5 / 15	12.5 / 15	12.5 / 15	12.5 / 15	12.5 / 15	12.5 / 15	12.5 / 15	12.5 / 15	12.5 / 15
	(m)	(3.8 / 4.6)	(3.8 / 4.6)	(3.8 / 4.6)	(3.8 / 4.6)	(3.8 / 4.6)	(3.8 / 4.6)	(3.8 / 4.6)	(3.8 / 4.6)	(3.8 / 4.6)	(3.8 / 4.6)	(3.8 / 4.6)	(3.8 / 4.6)	(3.8 / 4.6)	(3.8 / 4.6)
Roll Length	ft	360 / 360	360 / 360	360 / 360	360 / 360	360 / 360	360 / 300	360 / 300	360 / 300	360 / 300	360 / 300	360 / 300	360 / 300	360 / 300	360 / 300
	(m)	(109.7 / 109.7)	(109.7 / 109.7)	(109.7 / 109.7)	(109.7 / 109.7)	(109.7 / 109.7)	(109.7 / 91.4)	(109.7 / 91.4)	(109.7 / 91.4)	(109.7 / 91.4)	(109.7 / 91.4)	(109.7 / 91.4)	(109.7 / 91.4)	(109.7 / 91.4)	(109.7 / 91.4)
Roll Area	yd2	500 / 600	500 / 600	500 / 600	500 / 600	500 / 600	500 / 500	500 / 500	500 / 500	500 / 500	500 / 500	500 / 500	500 / 500	500 / 500	500 / 500
	(m <sup>2</sup> )	(418 / 502)	(418 / 502)	(418 / 502)	(418 / 502)	(418 / 502)	(418 / 418)	(418 / 418)	(418 / 418)	(418 / 418)	(418 / 418)	(418 / 418)	(418 / 418)	(418 / 418)	(418 / 418)
Roll Weight (est.)	lbs	111 / 133	120 / 144	136 / 163	152 / 182	167 / 201	199 / 201	230 / 232	261 / 263	292 / 294	324 / 326	339 / 341	386 / 388	511 / 513	
	(kg)	(50 / 60)	(54 / 65)	(62 / 74)	(69 / 83)	(76 / 91)	(90 / 91)	(104 / 105)	(118 / 119)	(132 / 133)	(147 / 148)	(154 / 155)	(175 / 176)	(232 / 233)	

The property values listed above are effective 09/2012 and are subject to change without notice.

<sup>1</sup> Contact your Thrace-LINQ distributor or representative for technical assistance and for products meeting AASHTO M288 specifications.

Additional information can also be found at [www.thracelinq.com](http://www.thracelinq.com). Methods and values may change without notice.

<sup>2</sup> Minimum Average Roll Value. All values are MARV unless otherwise noted.

<sup>3</sup> AOS values are reported as Maximum Average Roll Value.

<sup>4</sup> Other products and roll sizes may be available.

Roll lengths, areas, and weights may vary.

<sup>T</sup> Typical roll properties.

Mullen Burst ASTM D3786 and Puncture D4833 have been removed.

Neither test method is recognized by AASHTO M288.

CBR puncture D6241 has replaced D4833, under AASHTO M288.

Mullen Burst is not recognized by D35 committee on Geosynthetics.

## Needlepunched Nonwoven Specialty Products

Paving Fabric							Environmental Nonwoven								
Properties	ASTM TEST	UNIT	AOL	AOM AASHTO	AOH	AOE	Properties	ASTM TEST	UNIT	400EX	600EX	800EX	1000EX	1200EX	1600EX
<b>MECHANICAL PROPERTIES<sup>2</sup></b>							<b>MECHANICAL PROPERTIES<sup>2</sup></b>								
Grab Tensile Strength	D4632	lbs (N)	90 (400)	101 (449)	120 (534)	150 (667)	Grab Tensile Strength	D4632	lbs (N)	105 (467)	160 (712)	220 (979)	270 (1201)	320 (1423)	425 (1890)
Grab Tensile Elongation	D4632	%	50	50	50	50	Grab Tensile Elongation	D4632	%	50	50	50	50	50	50
Grab Asphalt Saturated	D4632 mod	lbs (N)	90 (400)	101 (449)	N / A (N/A)	N / A (N/A)	Trapezoid Tear	D4533	lbs (N)	45 (200)	65 (289)	90 (400)	100 (445)	120 (534)	150 (667)
Grab Asphalt Saturated	D4632 mod	%	50	50	N / A	N / A	CBR	D6241	lbs (N)	300 (1334)	435 (1935)	575 (2558)	725 (3225)	900 (4003)	1200 (5338)
<b>ENDURANCE PROPERTIES<sup>2</sup></b>							<b>ENDURANCE PROPERTIES<sup>2</sup></b>								
UV Stability	D4355	% @ 500 hrs	70	70	70	70	UV Stability	D4355	% @ 500 hrs	70	70	70	70	70	70
<b>ASPHALT RETENTION AND MELTING POINT<sup>2</sup></b>							<b>HYDRAULIC PROPERTIES<sup>2</sup></b>								
Asphalt Retention	D6140	gal/yd <sup>2</sup> (l/m <sup>2</sup> )	0.25 (1.13)	0.25 (1.13)	0.25 (1.13)	0.3 (1.36)	Permittivity	D4491	sec <sup>-1</sup>	2.000	1.500	1.400	1.200	0.900	0.600
Melting Point	D276	F (C)	320 (160)	320 (160)	320 (160)	320 (160)	Water Flow Rate	D4491	gpm/ft <sup>2</sup> (l/min/m <sup>2</sup> )	147 (5990)	110 (4482)	100 (4075)	85 (3463)	65 (2648)	40 (1630)
Change in Area asphalt saturated	Tx 3099	%change	+ / - 15%	+ / - 15%	+ / - 15%	+ / - 15%	Apparent Opening Size (AOS <sup>3</sup> )	D4751	US Sieve (mm)	70 (0.212)	80 (0.180)	100 (0.150)	100 (0.150)	100 (0.150)	100 (0.150)
<b>PHYSICAL PROPERTIES<sup>2</sup></b>							<b>PHYSICAL PROPERTIES<sup>2</sup></b>								
Weight	D5261	oz/yd <sup>2</sup> (g/m <sup>2</sup> )	3.5 (119)	4.1 (139)	4.6 (156)	6 (203)	Weight	D5261	oz/yd <sup>2</sup> (g/m <sup>2</sup> )	4 (136)	6 (203)	8 (271)	10 (339)	12 (407)	16 (542)
							Thickness	D5199	mils (mm)	55 (1.397)	70 (1.778)	95 (2.413)	100 (2.540)	120 (3.048)	140 (3.556)
<b>Packaging<sup>4,T</sup></b>							<b>Packaging<sup>4,T</sup></b>								
Roll Width		ft (m)	10.5 / 12.5 (3.2 / 3.8)	10.5 / 12.5 (3.2 / 3.8)	10.5 / 12.5 (3.2 / 3.8)	10.5 / 12.5 (3.2 / 3.8)	Roll Width		ft (m)	12.5 / 15 (3.8 / 4.6)	15 (4.6)	15 (4.6)	15 (4.6)	15 (4.6)	15 (4.6)
Roll Length		ft (m)	360 / 360 (109.7 / 109.7)	360 / 360 (109.7 / 109.7)	360 / 360 (109.7 / 109.7)	360 / 360 (109.7 / 109.7)	Roll Length		ft (m)	360 / 360 (109.7 / 109.7)	300 (91.4)	300 (91.4)	300 (91.4)	300 (91.4)	300 (91.4)
Roll Area		yd <sup>2</sup> (m <sup>2</sup> )	420 / 500 (351 / 418)	420 / 500 (351 / 418)	420 / 500 (351 / 418)	420 / 500 (351 / 418)	Roll Area		yd <sup>2</sup> (m <sup>2</sup> )	500 / 600 (418 / 502)	500 (418)	500 (418)	500 (418)	500 (418)	500 (418)
Roll Weight (est.)		lbs (kg)	123 / 141 (56 / 64)	139 / 160 (63 / 73)	152 / 175 (69 / 79)	189 / 219 (86 / 99)	Roll Weight		lbs (kg)	152 / 182 (69 / 83)	216 (98)	279 (127)	341 (155)	404 (183)	529 (240)

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## Quality

Each Thrace manufacturing facility supplies advanced measurement and accuracy through detailed, hands-on process controls, expert tenured personnel and state-of-the-art warehousing. Thrace nonwovens stand at the forefront of quality.



## Ready to Ship Inventory

Thrace nonwovens are manufactured on both sides of the Atlantic. Our vertically integrated production not only guarantees quality consistency, but also provides satisfactory lead times that meet our customers' needs.

Please do not hesitate to call us if you have a question, need a sample or require a quote on a needle-punched nonwoven product.