TENCATE

Mirafi®

Geosynthetics Product & Application Quick Reference Guide

Protective & Outdoor Fabrics
Aerospace Composites
Armour Composites

Geosynthetics
Industrial Fabrics
Synthetic Grass

TENCATE™
materials that make a difference

TENCATE Mirafi®

Our story begins in 1953, when a catastrophic flood struck the coast of Holland. This tiny country, about the size of New Jersey, was hard hit, suffering widespread devastation. Nearly 2,000 people lost their lives. Determined not to allow a recurrence of this type of disaster, the resourceful Dutch began developing a new generation of dike. Working in concert, Dutch engineers and master craftsmen sought out materials that would withstand the most severe and erosive forces of water.

Koninklijke Ten Cate nv, corporate headquarters in Almelo, the Netherlands.

Their search for innovative new products led them to Nicolon B.V. of Holland. Here, they discovered an advanced line of tough industrial textiles which they used to reinforce and retain the dike soils.

Recognizing that the demand for such industrial products extended far beyond the Dutch coast, Nicolon Corporation, a Division of Royal Ten Cate (USA) Inc. was established in Cornelia, Georgia, in 1980.

Meanwhile, in Charlotte, North Carolina, a line of experimental fabrics had been developed in the late 1960s using innovative fabric technology. The fabric, formed of "MIRAcle FIbers", was aptly named, Mirafi® geosynthetics. Mirafi®, Inc. became known as "the company that started an industry."

In 1991, Nicolon Corporation and Mirafi®, Inc. joined forces and is now known as TenCate™ Geosynthetics. TenCate™ continues to devote its research, development, manufacturing and marketing expertise to designing products that provide soil reinforcement, sedimentation control, erosion control, filtration, and drainage.

TenCate™ distributes globally, and is backed with 300 years proven experience. TenCate™ continues to provide innovative value-added products and knowledge to the construction, agricultural, recreational, and other niche markets with geosynthetic products which exceed our customers' expectations. TenCate™ is ISO 9001:2000 certified.

TenCate™ Geosynthetics - the global leader in geosynthetics

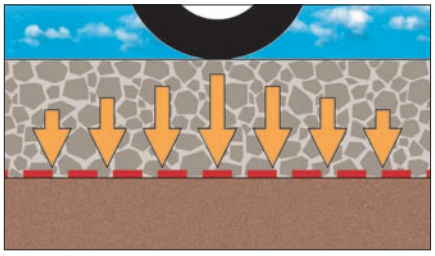
Mirafi® geosynthetics are a specific, engineered response to a specific problem: how to enable landforms to withstand the most severe and erosive forces of nature.

Through engineering and research that span more than 50 years, TenCate™ Geosynthetics has created the most diverse line of geosynthetic fabrics available from any single source on the planet—and has applied them throughout the world to significantly reduce the "hidden" cost of earthen support systems: their frequency of maintenance and repair over a period of years.

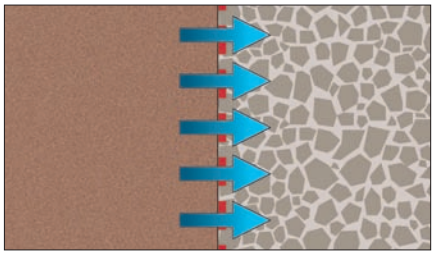
Moreover, geosynthetics are increasingly becoming an economical solution to problems that otherwise could only be solved through drastic, expensive methods.

- Geosynthetics are engineered specifically as a cost-effective solution for geotechnical and hydraulic applications.
- Geosynthetics are easy to install.
- Because they are composed of highly durable polymers, geosynthetics are effective in permanent civil structures.
- Since they reduce the extraction and depletion of sands and aggregates, geosynthetics are environmentally friendly.

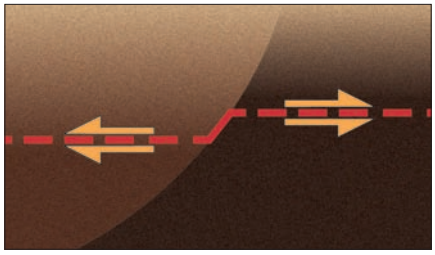
At TenCate™ Geosynthetics, we believe that this proven technology is endowing the age-old relationship between man and nature with a new dimension of compatibility.



Separation: preventing the intermixing of soft foundation soils with granular materials thereby maintaining the structural integrity and drainage capacity of the granular material.

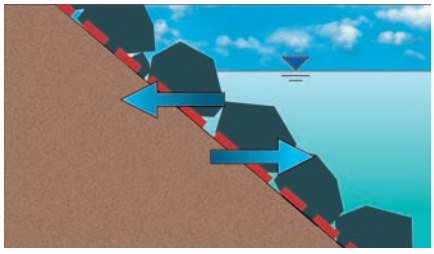


Filtration: allowing fluids to pass while preventing the migration of soil particles.

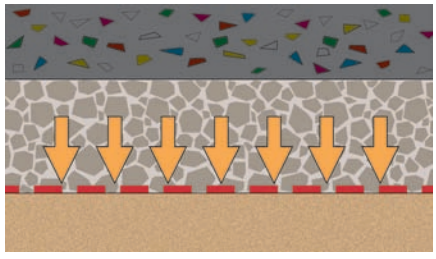


Reinforcement: maintaining the stability of soil by carrying tensile loads.

Erosion control: preventing the erosion of soil particles due to water flow, surface run-off, or wave and tidal action.



Protection: preventing or reducing the damage to a given surface or layer.



Confinement: preventing or reducing the damage to a given surface or layer.

The range of functions fulfilled by Mirafi® geosynthetics makes them suitable for a wide variety of civil engineering applications, namely transportation engineering, reinforced soil engineering, marine engineering and environmental engineering.

Mirafi® HP-Series

Woven High-Performance Polypropylene Geotextile

Roadway Reinforcement

PRODUCT DESCRIPTION

Mirafi® HP woven high-performance polypropylene geotextiles are woven geotextiles comprised of high tenacity polypropylene yarns. Mirafi® HP woven high-performance polypropylene geotextiles yield ultimate tensile strengths up to 20559 lbs/ft (300kN/m) (machine direction) per ASTM D4595. Mirafi® HP woven high-performance polypropylene geotextiles combine the properties of high tensile strength and modulus and high confinement with their ability to act as a filter and separator.

FEATURES AND BENEFITS

- **Strength.** Higher tensile strength at 2% and 5% than any comparable stabilization product.
- **Flow.** Uniform openings provide the same filtration and flow characteristics as that of a fine to coarse sand layer.
- Soil Interaction. Excellent soil confinement resulting in greater load distribution.
- **Seams.** Panels can be sewn together in the factory or field, providing cross-roll direction strength to facilitate installation and providing reinforcement strength.
- **Cost.** Woven reinforcement geotextiles provide low cost tensile strength for reinforced soil structures.

APPLICATIONS

Because of their flexibility and versatility, Mirafi® HP woven high-performance polypropylene geotextiles are used in a variety of applications, including:

- Embankments on soft foundations
- Retaining walls
- Steepened slopes
- Soil stabilization for road and rail construction
- Liner support
- Voids bridging
- Reinforcement over soft, hazardous pond closures

PROPERTIES	Test Method	Units	HP270	HP370	HP570	HP665	HP770
Wide Width Tensile Strength							
Strength @ Ultimate (MD)	ASTM D4595	lbs/ft (kN/m)	2640 (38.5)	3600 (52.5)	4800 (70.0)	4800 (70.0)	7200 (105.1)
Strength @ Ultimate (CD)	ASTM D4595	lbs/ft (kN/m)	2460 (35.9)	2700 (39.4)	4800 (70.0)	6600 (96.3)	5760 (84.0)
Strength @ 2% Strain (MD)	ASTM D4595	lbs/ft (kN/m)	480 (7.0)	540 (7.9)	960 (14.0)	n/a n/a	1140 (16.6)
Strength @ 2% Strain (CD)	ASTM D4595	lbs/ft (kN/m)	588 (8.6)	540 (7.9)	1320 (19.3)	n/a n/a	1560 (22.8)
Strength @ 5% Strain (MD)	ASTM D4595	lbs/ft (kN/m)	1212 (17.7)	1500 (21.9)	2400 (35.0)	1200 (17.5)	3600 (52.5)
Strength @ 5% Strain (CD)	ASTM D4595	lbs/ft (kN/m)	1356 (19.8)	1560 (22.8)	2700 (39.4)	4200 (61.3)	3600 (52.5)
Wide Width Factory Seam Strength	ASTM D4884	lbs/ft (kN/m)	1250 (18.4)	1688 (24.6)	3000 (43.8)	3600 (52.5)	3000 (43.8)
Apparent Opening Size	ASTM D4751	US Sieve (mm)	30 (0.60)	30 (0.60)	30 (0.60)	40 (0.43)	30 (0.60)
Permittivity	ASTM D4491	sec^{-1}	0.70	0.52	0.40	0.26	0.23

NOTE: All Mechanical Properties and Hydraulic Properties shown are Minimum Average Roll Values (MARV).
MD: Machine Direction, CD: Cross-Machine Direction

Mirafi® BXG-Series

Biaxial Geogrid

Roadway Reinforcement

PRODUCT DESCRIPTION

Mirafi® BXG biaxial geogrids are woven polyester geogrids for base course reinforcement and subgrade stabilization applications. Mirafi® BXG biaxial geogrids are constructed of high tenacity, high molecular weight polyester to deliver increased passive bearing resistance. Coated with a polymer coating, Mirafi® BXG biaxial geogrids provide optimum interaction in all soil types.

FEATURES AND BENEFITS

- **Performance.** Mirafi® BXG biaxial geogrids can reduce the required granular base fill material and decrease construction time significantly. Mirafi® BXG biaxial geogrids provides excellent durability and long-term performance and allow reduction of the subbase for unpaved and paved roads.
- **Efficiency.** Mirafi® BXG biaxial geogrids are produced in 13.1 ft (4 meter) wide rolls allowing for ease of handling and efficient installation.
- **Strength.** For structures with dynamic short-term loadings, Mirafi® BXG biaxial geogrids offer high strength at low strain. Mirafi® BXG biaxial geogrids are biaxial grids that exhibit high tensile strength in both longitudinal and transverse directions, making them suitable for base course reinforcement and soil stabilization applications.
- **Soil Interaction.** Designed for maximum bearing capacity and shear resistance. A new combination of grid structure and polymers to create optimum soil-grid interaction.

APPLICATIONS

Mirafi® BXG geogrids deliver strength, long-term performance, reliability and quick installation for:

- Base reinforcement for paved roads
- Construction haul roads
- Foundation Reinforcement
- Permanent unpaved roads
- Working platforms on weak soils
- Parking areas
- Secondary reinforcement for soil retaining structures

PROPERTIES	Test Method	Units	BXG10	BXG11	BXG12
Wide Width Tensile Strength					
Strength @ Ultimate (MD)	ASTM D6637	lbs/ft (kN/m)	850 (12.4)	2500 (36.5)	2500 (36.5)
Strength @ Ultimate (CD)	ASTM D6637	lbs/ft (kN/m)	1300 (19.0)	2500 (36.5)	4500 (65.7)
Strength @ 1% Strain (MD)	ASTM D6637	lbs/ft (kN/m)	- -	375 (5.5)	375 (5.5)
Strength @ 1% Strain (CD)	ASTM D6637	lbs/ft (kN/m)	- -	375 (5.5)	530 (7.7)
Strength @ 2% Strain (MD)	ASTM D6637	lbs/ft (kN/m)	280 (4.1)	625 (9.1)	625 (9.1)
Strength @ 2% Strain (CD)	ASTM D6637	lbs/ft (kN/m)	450 (6.6)	625 (9.1)	840 (12.3)
Tensile Modulus Modulus @ 1% Strain (MD)	ASTM D6637	lbs/ft (kN/m)	-	37500 (547.1)	37500 (547.2)
Modulus @ 1% Strain (CD)	ASTM D6637	lbs/ft (kN/m)	-	37500 (547.1)	53000 (773.4)
Aperture size (MD & CD)	--	inches (mm)	1.0 (25.4)	1.0 (25.4)	1.0 (25.4)

NOTE: All Mechanical Properties and Hydraulic Properties shown are Minimum Average Roll Values (MARV).
MD: Machine Direction, CD: Cross Machine Direction

Mirafi® X-Series

Separation

Woven Polypropylene Geotextile

PRODUCT DESCRIPTION

Mirafi® X-Series woven polypropylene geotexiles are geotextiles comprised of UV stabilized polypropylene slit film. Mirafi® X-Series woven polypropylene geotextiles provide excellent puncture and tear resistant properties in addition to high tensile strengths.

FEATURES AND BENEFITS

- **Construction.** Woven construction offers excellent resistance to installation abuse.
- **Strength.** High modulus provide outstanding performance in a wide range of applications.
- **Flow.** Uniform openings provide excellent filtration and flow characteristics.

APPLICATIONS

Mirafi® 500X applications include separation under parking lots, residential streets, and roadways. Mirafi® 500X is used over good to moderate strength subgrades for separation and confinement of base materials. Mirafi® 500X is also utilized over moderate to poor subgrades for separation, confinement, and stabilization of base material.

Mirafi® 600X is used for separation and stabilization over moderate subgrades where coarse, angular, and abrasive base material is required. Mirafi® 600X provides separation and stabilization when moderate loads are expected.

PROPERTIES	Test Method	Units	500X	600X
Grab Tensile Strength[1]	ASTM D4632	lbs (N)	200 (890)	315 (1402)
Grab Tensile Elongation	ASTM D4632	% MD % CD	15 10	12 12
Trapezoid Tear Strength[1]	ASTM D4533	lbs (N)	75 (334)	113 (503)
CBR Puncture Strength[1]	ASTM D6241	lbs (N)	700 (3115)	900 (4005)
UV Resistance after 500 hrs[1]	ASTM D4355	% Strength	70	70
Apparent Opening Size[1]	ASTM D4751	US Sieve (mm)	40 (0.43)	40 (0.43)
Permittivity[1]	ASTM D4491	sec^{-1}	0.05	0.05

NOTE: All Mechanical Properties and Hydraulic Properties shown are Minimum Average Roll Values (MARV).
MD: Machine Direction, CD: Cross-Machine Direction
[1] Values apply to both (MD) machine and (CD) cross directions.

Mirafi® MPV Nonwoven Aspahlt Overlay Fabric

TruPave® Engineered Paving Mat

MIRAFI® MPV DESCRIPTION

Mirafi® MPV nonwoven asphalt overlay system are needle punched heatset polypropylene nonwoven fabrics with high asphalt absorption and specifically designed for asphalt overlay applications.

FEATURES & BENEFITS

- Conforms with AASHTO M288-96 guidelines for paving fabrics
- Provides a waterproof barrier for subgrade soil protection
- Retards the propagation of an existing crack through the new overlay (reflective cracking)
- Extends the useful life of overlays
- Strengthens entire pave system

APPLICATIONS

- Highways
- Streets
- Parking Lots
- Bridges
- Runways
- Tennis Courts
- Running Tracks
- Basketball Courts
- Golf Cart Paths
- Playgrounds

TRUPAVE® PAVING MAT DESCRIPTION

TruPave® is a hybrid fiberglass and polyester paving mat, that when saturated in asphalt cement, forms a monolithic water barrier to limit water intrusion in the pavement. In addition, TruPave® has high tensile strength at low elongation (strain), that is, energy is absorbed and dispersed, mitigating the advent of reflective cracking.

FEATURES & BENEFITS

- Millable and recyclable: TruPave® will breakdown under milling operations due to the unique use of fiberglass and polyester fibers.
- Improves fatigue resistance in flexible pavements.
- TruPave's® unique nonwoven fiber matrix construction provides for a muli-directional, 360° stress relief interlayer. As pavements exhibit cracking in all directions, TruPave's® tensile strength and low elongation attributes are translated to the pavement section, mitigating further crack development; in all directions.
- Helps to reduce the long-term maintenance and rehabilitation costs associated with pavements.
- Withstands the higher temperatures of today's hot mix asphalt paving mixes.

APPLICATIONS

- Highways
- Urban Streets
- Airports
- Bridge Decks
- Parking Lots
- Shopping Centers

PROPERTIES	Test Method	Units	MPV 400	MPV 500	MPV 600	MPV 700
Grab Tensile Strength	ASTM D4632	lbs (N)	90 (401)	101 (449)	120 (534)	150 (668)
Grab Tensile Elongation	ASTM D4632	%	50	50	50	50
Grab Tensile Elongation Asphalt Saturated	ASTM D4632	%	40-70	40-70		
Melting Point	ASTM D276	˚F (˚C)	325 (163)	325 (163)	325 (163)	325 (163)
Mass Per Unit Area	ASTM D5261	oz/yd² (g/m²)	3.5 (119)	4.1 (140)	4.6 (156)	6.0 (203)

PROPERTIES	Test Method	Unit	TruPave	Max
Tensile Strength (MD)	ASTM D5035	lbf/2 in	80	
Tensile Strength (CD)	ASTM D5035	lbf/2 in	70	
Elongation @max load	ASTM D5035	%	<5	
Melting Point	ASTM ED276	F° (C°)	--	>446 (>230)
Mass/Unit Area	ASTM D5261	oz/yd² (g/m²)	4.1 (136.6)	4.4 (146.3)

NOTE: All Mechanical Properties and Hydraulic Properties shown are Minimum Average Roll Values (MARV).
MD: Machine Direction, CD: Cross-Machine Direction

Mirafi® N-Series

Drainage & Filtration

Nonwoven Polypropylene Geotextile

PRODUCT DESCRIPTION

Mirafi® N-Series nonwoven polypropylene geotextiles are geotextiles comprised of polypropylene staple fibers. Mirafi® N-Series nonwoven polypropylene geotextiles provide excellent physical and hydraulic properties in addition to high tensile strengths.

FEATURES AND BENEFITS

- **Construction.** Mirafi® N-Series nonwoven polypropylene geotextiles easily conform to the ground or trench surface for trouble-free installation.
- **Strength.** Mirafi® N-Series nonwoven polypropylene geotextiles withstand severe installation stresses with high puncture and burst resistance.
- **Filtration.** High permeability properties provide high water flow rates while providing excellent filtration properties.
- **Environmental.** Mirafi® N-Series nonwoven polypropylene geotextiles are chemically stable in a wide range of aggressive environments.
- **Cost effective.** Mirafi® N-Series nonwoven polypropylene geotextiles provide economical solutions to many civil engineering applications including a cost-effective alternative to graded-aggregate filters.

APPLICATIONS

Mirafi® N-Series nonwoven polypropylene geotextiles are used in a wide variety of applications including separation, filtration, and protection applications.

- Lightweight nonwovens are predominantly used for subsurface drainage applications along highways, within embankments, under airfields, and athletic fields. For these drainage structures to be effective, they must have a properly designed protective filter.
- Heavyweight nonwovens are use in critical subsurface drainage systems, soil separation, permanent erosion control, and geomembrane liner protection within landfills. These geotextiles provide the required strength and abrasion resistance to withstand installation and application stresses to create an effective, long-term solution.

PROPERTIES	Test Method	Units	140NL	140NC	140N	160N	170N	180N	1100N	1120N	1160N
Grab Tensile Strength Strength @ Ultimate	ASTM D4632	lbs (N)	90 (401)	100 (445)	120 (534)	160 (712)	180 (801)	205 (912)	250 (1113)	300 (1335)	380 (1691)
Elongation @ Ultimate	ASTM D4632	%	50	60	50	50	50	50	50	50	50
Trapezoidal Tear Strength	ASTM D4533	lbs (N)	40 (178)	45 (200)	50 (223)	60 (267)	75 (334)	80 (356)	100 (445)	115 (512)	140 (623)
CBR Puncture Strength	ASTM D6241	lbs (N)	250 (1113)	250 (1113)	310 (1380)	410 (1825)	450 (2003)	500 (2224)	700 (3115)	800 (3560)	1025 (4561)
UV Resistance after 500 hrs	ASTM D4355	% strength	70	70	70	70	70	70	70	70	70
Apparent Opening Size	ASTM D4751	US Sieve (m)	(60) 0.25	(70) 0.212	(70) 0.212	(70) 0.212	(80) 0.18	(80) 0.18	(100) 0.15	(100) 0.15	(100) 0.15
Permittivity	ASTM D4491	sec^{-1}	2.0	2.0	1.7	1.5	1.4	1.4	0.8	0.8	0.7
Flow Rate	ASTM D4491	$gal/min/ft^2$ ($l/min/m^2$)	145 (5907)	140 (5704)	135 (5500)	110 (4481)	105 (4278)	95 (3870)	75 (3056)	65 (2648)	50 (2037)

NOTE: All Mechanical Properties and Hydraulic Properties shown are Minimum Average Roll Values (MARV).
Values apply to both (MD) machine and (CD) cross directions

Mirafi® FW-Series

Drainage & Filtration

Woven Monofilament Polypropylene Geotextile

PRODUCT DESCRIPTION

Mirafi® FW woven monofilament polypropylene geotextiles are woven fabrics of monofilament and multifilament yarn construction which are highly UV stabilized. Mirafi® FW woven monofilament polypropylene geotextiles have high strengths for durability and survivability; consistent, measurable pore sizes; and high percent open area for long-term clogging resistance and high flow rates. Mirafi® FW woven monofilament polypropylene geotextiles are manufactured with highly specialized processes to produce unique physical and hydraulic properties not possible with standard geotextiles, woven or nonwoven.

FEATURES AND BENEFITS

- **Filtration.** Resists clogging while maintaining flow rate in high gradient and dynamic flow conditions. Exhibits high percent open area
- **Strength.** High survivability rating in aggressive installation and loading conditions such as back dumping of large rip rap or underwater placement
- **Performance.** Resistant to chemicals in aggressive landfill environments. Highly uniform opening size (AOS). Maintains high long-term flow rates.

APPLICATIONS

- Underneath rip rap or concrete revetment systems along inland waterways and coastal shorelines
- Underneath armor systems; protecting spillways and embankment dams from overtopping flow
- Encapsulating cut-off drains and collection systems surrounding landfills, within dams, and adjacent to roadways and other critical structures
- Encapsulating leachate collection systems under landfills while maintaining long-term clogging resistance
- Encapsulating edge drains for critical structures in problematic soils

PROPERTIES	Test Method	Units	FW300	FW402	FW403	FW404	FW500	FW700
Wide Width Tensile Strength								
Strength @ Ultimate (MD)	ASTM D4595	lbs/ft (kN/m)	2760 (40.3)	2400 (35.0)	3240 (47.3)	3000 (43.8)	2196 (32.1)	2700 (39.4)
Strength @ Ultimate (CD)	ASTM D4595	lbs/ft (kN/m)	2700 (39.4)	1680 (24.5)	2700 (39.4)	2760 (40.3)	3000 (43.8)	1740 (25.4)
Grab Tensile Strength								
Strength @ Ultimate (MD)	ASTM D4632	lbs (N)	400 (1780)	365 (1624)	425 (1891)	400 (1780)	325 (1446)	370 (1647)
Strength @ Ultimate (CD)	ASTM D4632	lbs (N)	335 (1491)	200 (890)	350 (1558)	315 (1402)	425 (1892)	250 (1113)
Elongation @ Ultimate (MD/CD)	ASTM D4632	%	20/15	24/10	21/21	15/15	15/15	15/15
CBR Puncture Strength	ASTM D6241	lbs (N)	1250 (5563)	675 (3004)	1340 (5963)	1150 (5018)	1000 (4450)	950 (4228)
Apparent Opening Size	ASTM D4751	US Sieve (mm)	30 (0.60)	40 (0.43)	40 (0.43)	40 (0.43)	50 (0.30)	70 (0.212)
Permittivity	ASTM D4491	sec^{-1}	1.50	2.1	0.96	0.90	0.51	0.28
Flow Rate	ASTM D4491	$gal/min/ft^2$ ($l/min/m^2$)	115 (4685)	145 (5907)	70 (2852)	70 (2852)	35 (1426)	18 (733)

NOTE: All Mechanical Properties and Hydraulic Properties shown are Minimum Average Roll Values (MARV).
MD: Machine Direction, CD: Cross-Machine Direction

Miragrid® XT

Unaxial Geogrid

Retaining Walls & Slopes

PRODUCT DESCRIPTION

Miragrid® XT unaxial geogrids are high strength, high tenacity, high molecular weight polyester geogrids in a full range of tensile strengths to meet the most demanding applications of soil reinforcement. Miragrid® XT unaxial geogrids are woven and then coated with a polymer coating to provide dimensional stability.

FEATURES AND BENEFITS

- **No recoiling.** Remains in place after being installed; does not roll back.
- **Flexible and tough.** Delivers immediate soil geogrid stress transfer ensuring minimal movement of soil structure.
- **Lightweight.** At least 33% lighter than most rigid geogrids.
- **Cost effective.** Creep resistant polyester fibers provide a higher allowable tensile strength, minimizing the required number of geogrid layers.
- **High Long Term Design Strengths (LTDS).** Miragrid® XT unaxial geogrids long term design strengths are backed up by more than 70,000 hours of tension creep testing performed at an outside, independent test laboratory so you can be assured of credible, dependable long term design strengths.
- **Easy handling.** No sharp edges which may injure workers.
- **Wide rolls.** Rolls are wider than most rigid geogrids, significantly reducing placement time thus lowering cost.
- **Custom fabrication of rolls:** Fabricated to the specific requirements of the project.

APPLICATIONS

Applications where long term design strength is necessary for the stability of the structure are ideal applications where Miragrid® XT unaxial geogrids can be used. Miragrid® XT unaxial geogrids are used in a wide variety of soil reinforcement applications including:

- Reinforced soil walls
- Segmental retaining walls
- Steep reinforced slopes
- Reinforcement in landfill applications
- Voids bridging
- Veneer stability

PROPERTIES	Test Method	Units	2XT	3XT	5XT	7XT	8XT	10XT	20XT	22XT	24XT
Wide Width Tensile Strength @ Ultimate (MD)	ASTM D6637	lbs/ft (kN/m)	2000 (29.2)	3500 (51.1)	4700 (68.6)	5900 (86.1)	7400 (108.0)	9500 (139)	13705 (200)	20559 (300)	27415 (400)
Creep Reduced Strength (MD)	ASTM D5262	lbs/ft (kN/m)	1266 (18.5)	2215 (32.3)	2975 (43.4)	3734 (54.5)	4684 (68.3)	6013 (88)	8674 (127)	13012 (190)	17351 (253)
Long Term Design Strength (MD)	GR-GG4 (sand, silt, clay)	lbs/ft (kN/m)	1096 (16.0)	1918 (28)	2575 (37.6)	3233 (47.2)	4055 (59.2)	5206 (76)	7510 (110)	11266 (164)	15023 (219)
Grid Aperature Size (MD)	--	in (mm)	0.875 (22.2)	0.875 (22.2)	1.2 (30.5)	1.3 (33.0)	1.3 (33.0)	1.3 (33.3)	1.5 (38.1)	1.4 (35.6)	1.4 (35.6)
Grid Aperature Size (CD)	--	in (mm)	1.0 (25.4)	1.0 (25.4)	1.0 (25.4)	0.9 (22.9)	0.9 (21.8)	0.8 (20.8)	0.6 (15.2)	0.6 (15.2)	0.5 (12.7)

NOTE: All Mechanical Properties and Hydraulic Properties shown are Minimum Average Roll Values (MARV).

MD: Machine Direction, CD: Cross-Machine Direction

Mirafi® PET-Series

Woven High-Strength Polyester Geotextiles

Embankments

PRODUCT DESCRIPTION

Mirafi® PET woven high-strength polyester geotextiles are woven geotextiles comprised of high tenacity, high molecular weight polyester yarns. Mirafi® PET woven high-strength polyester geotextiles yield ultimate tensile strengths up to 68,500 lbs/ft (1000 kN/m), machine direction, per ASTM D4595 and Long Term Design Strengths up to 35,600 lbs/ft (520 kN/m) per GRI-GT7. The Mirafi® PET woven high-strength polyester geotextiles combine the properties of high tensile strength with excellent creep resistance to provide superior long term design strengths.

FEATURES AND BENEFITS

- **Creep Resistance.** Polyester fibers provide excellent creep resistance which results in higher long term design strengths per GRI-GT7 requirements.
- **Strength.** Higher tensile strength than any comparable product.
- **Soil Interaction.** Excellent soil confinement resulting in greater load distribution.
- **Seams.** Panels can be sewn together in the factory or field to facilitate installation.
- **Cost.** Woven reinforcement geotextiles provide low cost strengths for reinforced soil structures.

APPLICATIONS

For any application where long term design of earth reinforcement structures are involved, Mirafi® PET woven high-strength polyester geotextiles is the logical choice. Because of their flexibility and versatility, woven geotextiles are used in a variety of soil reinforcement applications, including:

- Embankments on soft foundations
- Retaining walls
- Steepened slopes
- Liner support
- Voids bridging
- Reinforcement over soft, hardous pond closures.

PROPERTIES	Test Method	Units	PET70/70	PET100	PET150	PET200	PET300	PET 400/50	PET 600/100
Wide Width Tensile Strength									
Strength @ Ultimate (MD)	ASTM D4595	lbs/ft (kN/m)	4800 (70.0)	7200 (105.1)	10283 (150)	13800 (201.4)	20580 (300.4)	27417 (400)	41121 (600)
Strength @ 5% Strain (MD)	ASTM D4595	lbs/ft (kN/m)	1080 (15.8)	2400 (35.0)	3600 (52.5)	6000 (87.6)	8400 (122.6)	9594 (140)	14400 (210)
Strength @ 10% Strain (MD)	ASTM D4595	lbs/ft (kN/m)	3360 (49.0)	5760 (84.0)	9000 (131.3)	12000 (175.1)	16800 (245.1)	n/a n/a	n/a n/a
Creep Reduced Strength (MD)	ASTM D5262	lbs/ft (kN/m)	2880 (42.0)	4320 (63.0)	5760 (84.0)	8280 (120.8)	12348 (180.2)	16447 (240)	24673 (360)
Long Term Design Strength (MD)	GR-GT7 (sand, silt, clay)	lbs/ft (kN/m)	2280 (33.2)	3420 (49.9)	6170 (90.0)	6545 (95.5)	10208 (148.9)	13590 (198.3)	20391 (297.5)
Apparent Opening Size	ASTM D4751	US Sieve (mm)	40 (0.43)	20 (0.85)	20 (0.85)	30 (0.60)	20 (0.85)	n/a n/a	n/a n/a
Permittivity	ASTM D4491	sec^{-1}	0.10	0.32	0.20	0.32	0.10	n/a	n/a

NOTE: All Mechanical Properties and Hydraulic Properties shown are Minimum Average Roll Values (MARV).
MD: Machine Direction, CD: Cross-Machine Direction

TENCATE
Mirafi®

	Mirafi® HP-Series	Mirafi® BXG-Series	Mirafi® X-Series	Mirafi® N-Series	Mirafi® FW-Series	Miragrid® XT	Mirafi® PET-Series
Transportation							
Site Drainage				✓	✓		
Separation/ Stabilization	✓		✓	✓	✓		✓
Roadway Reinforcement	✓	✓					✓
Sediment Control				✓	✓		
Paving				✓			
Marine							
Armored Revetment Systems	✓			✓	✓		✓
Reinforced Soil							
Segmental Retaining Walls						✓	✓
Temporary Retaining Walls	✓	✓				✓	✓
Steepened Slopes	✓	✓				✓	✓
Embankments on Soft Soils	✓	✓				✓	✓
Environmental							
Waste Lagoon Capping	✓						✓
Sludge Dewatering	✓						✓
Voids Bridging						✓	✓
Veneer Reinforcement						✓	✓
Geomembrane Protection				✓			

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