



Pavement Solutions

Asphalt Overlays
Chip Seals
Joint Repairs



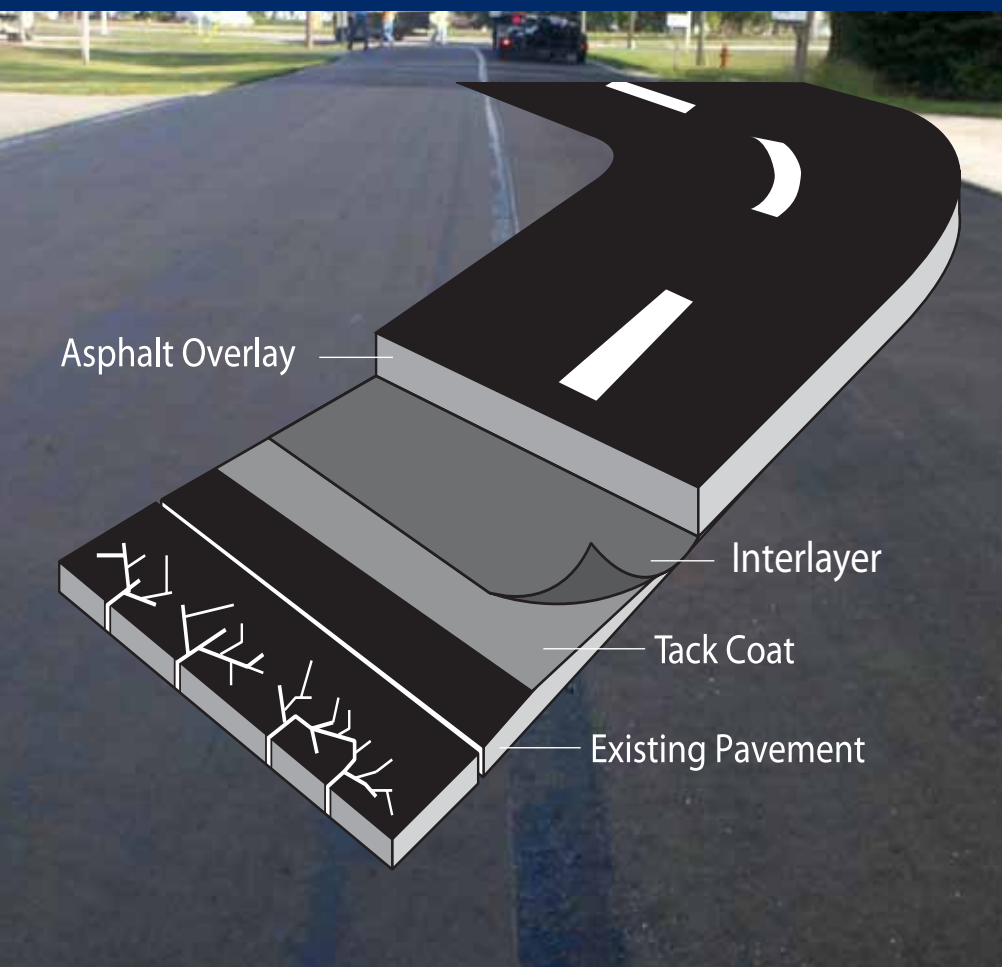
Pavement restoration applications have specific needs and objectives. No one understands that better than TenCate® Geosynthetics.

Developed to increase performance, reduce costs and enable engineers to achieve what was once unachievable, TenCate® Geosynthetics addresses the demands of both large-scale highway projects as well as smaller residential projects. Our interlayer products provide solutions to the most common problems of maximizing maintenance dollars, improving ride quality and reducing pavement deterioration.

Through engineering and research that span more than 50 years, TenCate® Geosynthetics continues to lead the way in textile pavement restoration solutions.

Using our state of the art knowledge of materials and production methods, combined with a resourceful, hands-on approach, TenCate® Geosynthetics delivers materials that make a tangible difference in our customer's businesses. Our products enable asphalt overlays, chip seals and joint repairs to last longer, stretching your maintenance dollars farther.

Regardless of the project type, the pavement being repaired or the design life of the pavement, TenCate® Geosynthetics delivers the materials and knowledge that solve your maintenance challenges.



TenCate® Interlayer Solutions



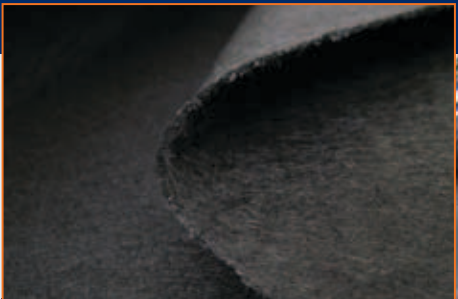
Mirafi® PGM-G4

Paving grid of multi-axial fiberglass attached to a light-weight paving fabric that forms a waterproof interlayer with high levels of multi-directional 360° tensile reinforcement that provides greater delay of reflective cracks.



TruPave® Engineered Paving Mat

A robust fiberglass/polyester pavement interlayer designed to create a moisture-resistant barrier, retard reflective cracking and stand up to high-temperature hot-mix designs with 360° tensile reinforcement.



Mirafi® MPV

Full-width, needle-punched, non-woven polypropylene paving fabric that is a stress-absorbing and waterproof interlayer when saturated with asphalt cement.



Mirafi® MTK

Waterproof, stress-absorbing, preformed, peel & stick composite strip membrane comprised of self-adhering rubberized asphalt and polypropylene non-woven fabric.



TenCate® Pavement Solutions

The idea of waterproofing pavements and slowing reflective crack propagation in new and rehabilitated pavement structures has been around for years and can be seen in use today with asphalt overlays, chip seals, crack sealing and the use of modified asphalt binders. Our family of interlayer products takes these concepts one step further.

Pavement interlayer systems significantly increase the waterproofing benefits of conventional seals, and add additional reinforcing and/or stress-absorbing features to traditional reflective cracking treatments.

Key features of geosynthetic interlayer systems:

- Reduces reflective cracking
- Reduces subgrade moisture infiltration
- Increases subgrade stability
- Increases asphalt strength

Key benefits of geosynthetic interlayer systems:

- Extends pavement life
- Reduces life cycle costs
- Extends pavement maintenance budgets
- Preserves pavement load bearing capacity

TenCate® pavement interlayer solutions are used as integral components in pavement applications such as:

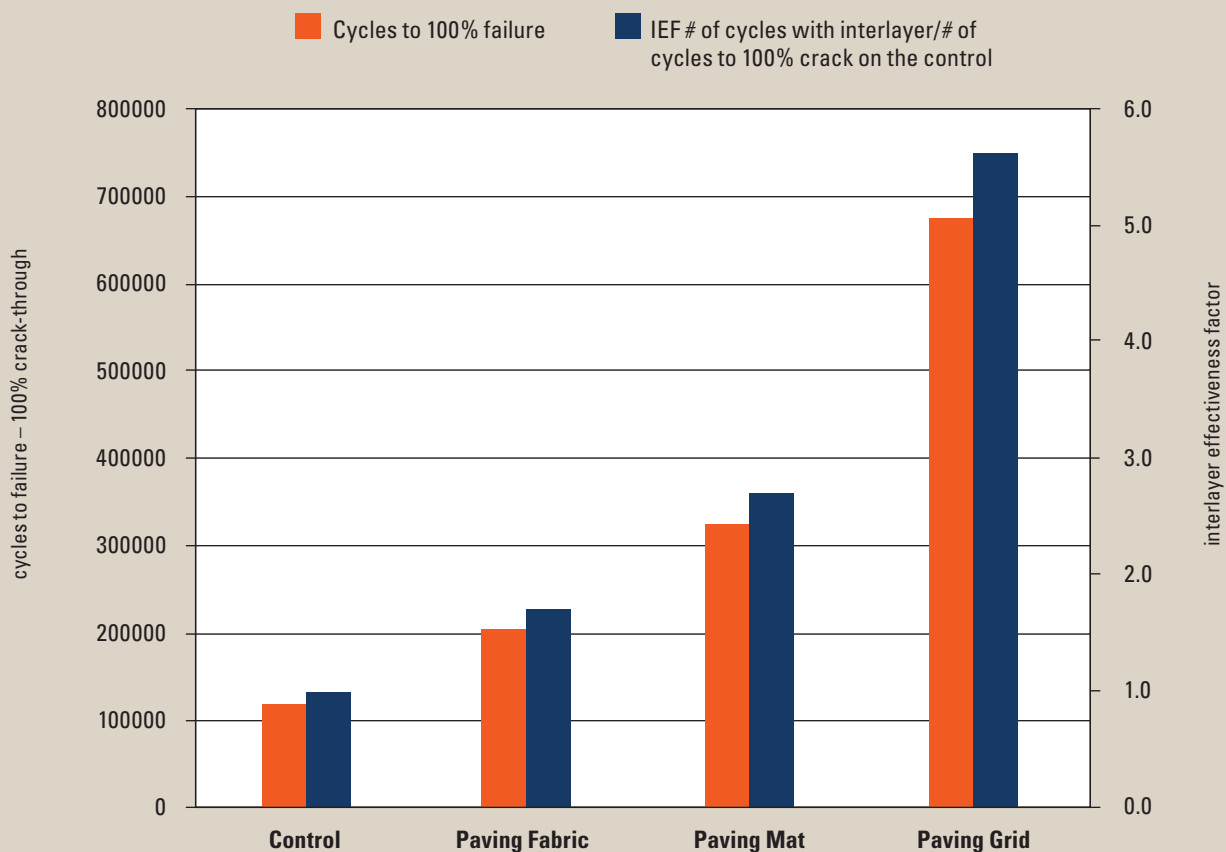


TenCate® pavement interlayer solutions cost significantly less throughout the life cycle of pavements than conventional asphalt overlays and surface treatments. Their ease of use with climate specific asphalt binders and variety of strengths, widths, and asphalt retentions make them practical in all areas of the country in both large highway and small residential applications. They have proven performance when used over existing asphalt and concrete pavements under asphalt overlays and chip seals.

How Interlayers Work:

- Reflective Crack Reduction - interlayers reduce the number and dimensions of reflective cracks in an overlay by creating a stress-absorbing layer at the tip of an existing crack or by adding reinforcement and tensile strength at low strains to an asphalt overlay.
- Moisture Barrier - interlayers prevent water from entering the subgrade through the pavement surface and cracks. This increases the stability of the subgrade and reduces cracking and other pavement damage caused by wet subgrade conditions.
- Fatigue Reduction - reinforcement interlayers reduce a pavement's susceptibility to cracking by increasing the pavement's flexural strength at low strains.
- Recyclability - interlayer products can be milled and recycled.

Interlayer Effectiveness and Total Life Averages



Pavement Maintenance with TenCate® Geosynthetics

Keeping the existing road pavement inventory in a serviceable condition is one of the major challenges of road authorities world-wide. Therefore, the focus of attention is on maintenance techniques and rehabilitation methods which allow the working life of the basic road structure to be extended in a cost-effective and technically reliable manner.

One method which has been successfully used world-wide for more than 30 years is the maintenance of asphalt and concrete roads using paving interlayers. This method represents an economical means of considerably increasing the maintenance intervals and thus the working life of the road.



1

Pavement without interlayer.



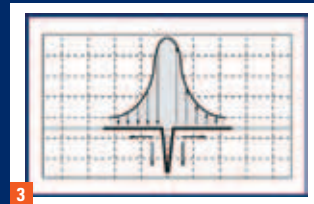
2

Composite paving grid as asphalt-reinforcement.



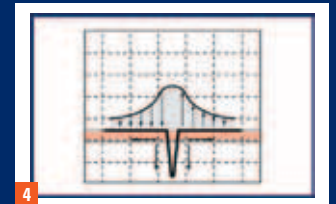
3

Test result: Without interlayer, high stresses occur at the crack.



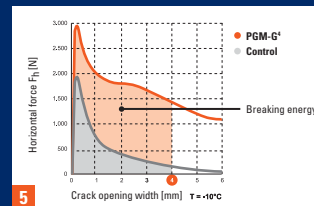
4

Test result: With interlayer, the stresses at the crack are significantly reduced.



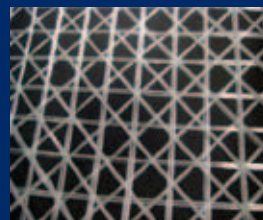
5

Energy-to-break with PGM-G⁴: The area under the load-displacement curve corresponds to the work done at break.



PGM-G⁴

PGM-G⁴ is a composite paving interlayer comprised of a lightweight polypropylene paving fabric reinforced with continuous filament fiberglass, mechanically fastened to achieve 360°, multi-axial reinforcement.



PGM-G⁴

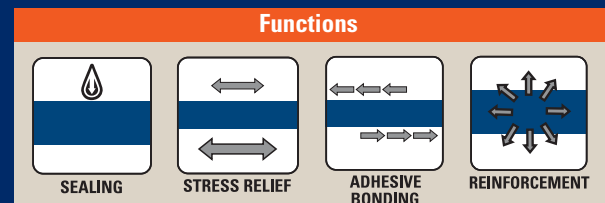
Fiberglass Composite Paving Grid

Reflective Crack Control, Waterproofing, Reinforcement

Mirafi® PGM-G⁴ is the most advanced, highest strength, engineered multi-axial composite paving grid that includes moisture barrier capability, designed to dissipate the low strain energy that result in cracks, maximizing the delay of reflecting cracks and preserving the structural value of the base from moisture intrusion. Mirafi® PGM-G⁴ composite paving grid products are specifically designed for use in the construction and repair of flexible (asphalt) and rigid (concrete) pavements such as roads, parking lots, airfields, and other paved surfaces.

Key benefits of PGM-G⁴:

- Reinforcement – Provides high multi-axial 360° tensile strength at low strain rates (< 3%).
- Cost effectiveness – Suitable for local spot maintenance.
- Sealing - Asphalt saturated paving fabric reduces water intrusion into pavement structure.
- Longevity – Maintenance intervals are considerably extended.
- Stress relief – Retards crack propagation from the old surface to the new overlay.
- Adhesive bonding – Provides uniform bonding between old and new asphalt layers.
- Installation – Easily installed with conventional equipment.
- Recycling – Can be milled without problem.
- Resistance – Chemically resistant to road salt.



Cracked pavements allow surface water to permeate to the subgrade soils, which then saturate and weaken the subgrade. Typical maintenance procedures using nonwoven paving fabric are to install these fabrics with an asphaltic tack coat and hot mix asphalt overlay. The addition of the fiberglass grid to the paving fabric with high tensile modulus, gives Mirafi® PGM-G⁴ composite paving grid the ability to reinforce the pavement by improving the flexural strength and enhance the performance of the pavement.

Mirafi® PGM-G⁴ composite paving grid is specifically designed to provide high strength at very low strains (< 3%). This material property, commonly referred to as modulus, is the key to adding reinforcement to your paved structure. The nonwoven paving fabric, grid and properly applied asphalt tack coat will ensure moisture protection, providing outstanding pavement reinforcement and enhance pavement stability.



PGM-G⁴



Fiberglass Paving Mat

Reflective Crack Control, Waterproofing, Reinforcement

TruPave® Engineered Paving Mat from Owens Corning is a pavement interlayer designed to create a moisture-resistant barrier, retard reflective cracking and stand up to high-temperature hot-mix designs. At the end of the pavement's life, it's millable and recyclable. TruPave® engineered paving mat will extend the performance of your pavement rehabilitation investment.

TruPave® Engineered Paving Mat's unique, nonwoven, randomly dispersed fiberglass construction process, gives your pavement 360 degree tensile reinforcement. Because pavements crack in all directions, the forces that cause cracking can be curtailed with the addition of TruPave® in your pavement overlay application. Highway, parking lot, runway or driveway — TruPave® Engineered Paving Mat is designed to preserve and extend the life of any hot-mix asphalt concrete surface.

Key benefits of TruPave® Engineered Paving Mat:

- Millable and recyclable: TruPave® will breakdown under milling operations due to the unique use of fiberglass and polyester fibers; it is perfect for use in recycled asphalt paving mixes for sustainability and reducing the carbon footprint of producing virgin asphalt mixes and conventional pavement removal techniques.
- Improves fatigue resistance in flexible pavements: Laboratory testing proves that TruPave®'s high tensile strength improves flexural pavement performance under loading.
- 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.

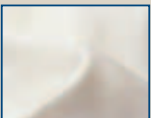


Case Study

application	Reflective Crack Prevention
location	Winston Salem, NC, USA
products	TruPave® Paving Mat

North Carolina Department of Transportation (NCDOT) had a 2 mile section of US52, which required a way to retard reflective cracking over an existing Portland Cement Concrete (PCC) pavement that had previously been overlaid with a Hot Mix Asphalt (HMA). The joints from the old PCC pavement had reflected back through rather quickly, creating transverse and longitudinal cracking in the overlay. There was also major block cracking in the existing HMA. TruPave® Paving Mat was able to extend the life of their overlay. The paving mat tack coat (PG64-22) was placed at the specified rate and then the TruPave® Paving Mat was placed. Over the last four years, the control section has continued to deteriorate while the TruPave® Paving Mat section is only now starting to see typical top down cracking that most asphalt pavements experience.

Products



TruPave® Paving Mat

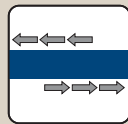
Functions



SEALING



STRESS RELIEF



ADHESIVE
BONDING



REINFORCEMENT

Paving Fabric Interlayer

Reflective Crack Control, Waterproofing

Distressed pavements allow surface water to infiltrate into subgrade soils, weakening the subgrade. A weak subgrade causes premature pavement failure to occur. Asphalt overlays are often used as preventive maintenance before or as rehabilitation after the damage has occurred. TenCate® Geosynthetics interlayer products provide solutions to reduce the potential for damage caused by surface water infiltration, reduce reflective cracking and add reinforcement to new overlays.

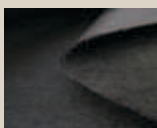
Key benefits of textile pavement interlayer systems:

- Provides a moisture barrier for base and subgrade reinforcement protection.
- Creates a stress relieving membrane between the existing pavement and new asphalt overlay.
- Retards the propagation of existing cracks through a new overlay (reflective crack control).
- Extends the useful life of the overlay.

Applications:

- Severe Climate Considerations: Freeze-thaw cycles cause expansion and contraction of water within a pavement. Laboratory and field studies have shown that a thicker interlayer may delay cracking longer than a thinner one in harsh environments. Thicker paving fabrics, such as Mirafi® MPV600 and Mirafi® MPV700 have higher asphalt retention, increasing the ability to absorb the stresses that are subjected to pavement while enhancing water moisture barrier capabilities.
- Asphalt Overlays: Mirafi® MPV-Series paving fabrics have been used successfully with innovative mix designs such as SUPERPAVE, stone matrix asphalts, rubber asphalt, Warm Mix Asphalt (WMA) and polymer modified mixes.
- Surface Preparation: Mirafi® MPV can be used over existing asphalt and concrete surfaces.

Products



Mirafi® MPV

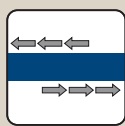
Functions



SEALING



STRESS RELIEF



ADHESIVE BONDING



Case Study

application	Commercial Street Asphalt Overlay
location	Pennsylvania Ave., Washington D.C.
products	Mirafi® MPV500

When it became necessary to overlay Pennsylvania Ave. in Washington D.C. for the 2009 Presidential Inauguration Mirafi® MPV500 was chosen to be installed to improve the service life and performance of the new asphalt overlay.

The project was performed at night due to the heavy volume of traffic on Pennsylvania Ave. during the daytime and installed over three consecutive nights. The tight construction schedule dictated that all phases of the construction operation perform without delay.

The construction process consisted of three phases: milling up the existing pavement, installation of the Mirafi® MPV500 and finally, the new asphalt overlay. After the pavement was milled, PG64-22 asphalt cement was applied to the milled surface at a rate of .25 galyd2. MPV500 was installed over the AC tack coat and was directly followed by 2" of new asphalt pavement. MPV500 extends pavement life by providing a waterproof barrier, retarding reflective cracking and creating a stress relieving membrane between the existing and new pavement layers.

Interlayer Products under Chip Seals

Reflective Crack Control, Waterproofing, Chip Retention

Mirafi® MPV is successfully used with chip seal surface treatments to improve pavement performance. A fabric interlayer, comprised of a Mirafi® MPV-Series paving fabric and an appropriate tack coat, installed between an existing asphalt pavement and a chip seal is proven to extend the life of chip seals from 60 to 100%.

The key component of successful chip sealing over fabric is a quality installation on the right pavement at the right time. TenCate® Geosynthetics paving fabric interlayers can be used under chip seals almost anywhere a conventional chip seal can be used.

At TenCate® Geosynthetics, we take a hands-on, active approach to every project. Our industry experts are available to help you determine where using paving fabric interlayers in your chip seal program will give you the most performance and cost benefits.

TenCate® Geosynthetics has the largest and most experienced paving fabric installer network in the industry. They are available for project quotes and installations in most areas of the U.S. If you use your own crews for in-house chip seals, our experts are also available for training.

Key benefits of textile pavement interlayer systems under chip seals:

- Increases chip seal life by 60-100%
- Prevents surface water infiltration
- Mitigates reflective cracking in chip seal
- Increases chip retention
- Reduces the frequency of maintenance rehabilitation
- Reduces the effects of thermal expansion



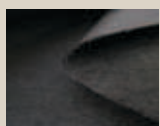
Case Study

application	Pavement Restoration with Chip Seal
location	Martin St., Newton, IL
products	Mirafi® MPV500

The existing seven-year-old asphalt pavement surface of Martin Street was heavily oxidized starting to show signs of fatigue cracking. The city chose to use Mirafi® MPV500 paving fabric in addition to their normal chip seal procedure. Mirafi® MPV500 acts as a moisture barrier within the pavement and prevents water from penetrating the roadway, which reduces the deterioration of the subgrade due to saturated conditions.

PG-64-22 asphalt cement (AC) was applied to the existing pavement surface at a rate of 0.79 l/m² (0.25 gal/yd²). AC placement was directly followed by the installation Mirafi® MPV500. RC-70 asphalt emulsion was applied to at a rate of 0.79 l/m² (0.25 gal/yd²). The chip seal aggregate, which consisted of a CA-16 graded crushed stone material, was then applied using a variable width spreader at a rate of 20 lb/yd². After the chip seal was placed, a second application of RC-70 and crushed stone was applied. The final step was to compact the finished road surface with a rubber-tired (pneumatic) roller compactor.

Products



Mirafi® MPV

Functions



SEALING



STRESS RELIEF



ADHESIVE BONDING

Self-Adhering Waterproofing Membranes

Waterproofing, Reflective Crack Control

As a pavement ages, imperfections appear, joints become prominent and cracks occur, allowing water to infiltrate into and weaken the subgrade causing even more damage to the pavement. Asphalt overlays are commonly used over asphalt and concrete surfaces to extend the life of the pavement and reduce the effects of aging, saturated subgrade and fatigue. Eventually, the process will repeat itself, as cracks and joints reflect through the new overlay.

Mirafi® MTK is a preformed composite membrane designed specifically to prevent water from permeating into joints and large cracks and to minimize the number and size of reflective cracks. Mirafi® MTK is used to seal concrete and wood bridge decks. Mirafi® MTK products are comprised of self-adhering rubberized asphalt and durable polypropylene non-woven fabric. A peel-and-stick release paper makes installation fast and simple.

Key benefits of MTK:

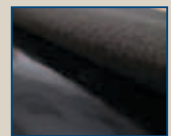
- Reduces further structural deterioration
- Easy and cost effective to install
- Can be installed in a wide range of temperatures
- Reduces traffic disruption
- Minimizes reflective cracking when bridging transverse and longitudinal cracks
- Minimizes reflective cracking between dissimilar surfaces
- Minimizes reflective cracking of concrete joints
- Prevents surface moisture intrusion
- Provides stress-relief layer to pavement section
- Adheres to concrete, asphalt and wood decks

Applications

- Highway and street surfaces
- Transverse and longitudinal cracks
- Concrete joints
- Lane-widening joints
- Taxiways and runways
- Bridge deck restoration



Products



Mirafi® MTK

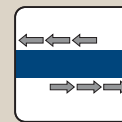
Functions



SEALING



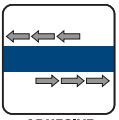
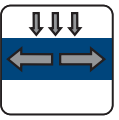
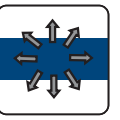
STRESS RELIEF



ADHESIVE BONDING



TenCate® Geosynthetics Americas develops and produces materials that increase performance, reduce costs and enable people to achieve what was once unachievable. Our goal is to contribute significantly to progress in the industries in which we work.

TenCate® Paving Products					
Features and Benefits	 SEALING	 STRESS RELIEF	 ADHESIVE BONDING	 REINFORCEMENT	 REINFORCEMENT
	Moisture Barrier	Crack Stress Relief	Monolithic Bond	Bi-Axial Reinforcing	Multi-Axial Reinforcing
PGM-G ⁴	✓	✓	✓		✓
PGM-G	✓	✓	✓	✓	
TruPave® Engineered Paving Mat	✓	✓	✓		✓
Mirafi® MPV					
400	✓	✓	✓		
500	✓	✓	✓		
600	✓	✓	✓		
700	✓	✓	✓		
Mirafi® MTK	✓	✓	✓		

TenCate® Geosynthetics Americas assumes no liability for the accuracy or completeness of this information or for the ultimate use by the purchaser. TenCate® Geosynthetics Americas disclaims any and all express, implied, or statutory standards, warranties or guarantees, including without limitation any implied warranty as to merchantability or fitness for a particular purpose or arising from a course of dealing or usage of trade as to any equipment, materials, or information furnished herewith. This document should not be construed as engineering advice.

Mirafi® is a registered trademark of Nicolon Corporation.

© 2012 TenCate® Geosynthetics Americas

BR0.PS0912



PO Box 87380
Carol Stream, IL 60188
630.293.3111

www.roadfabrics.com



TENCATE
materials that make a difference