



TAKE VEGETATION TO THE HIGHEST POWER



A *tensar* Company





## The Vmax<sup>3</sup> Difference

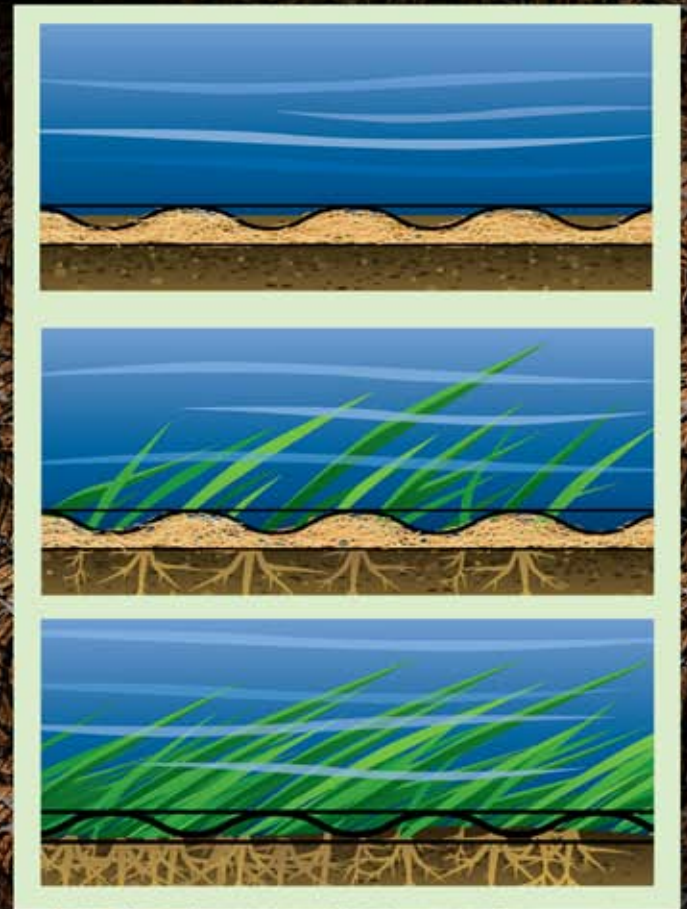
### Composite Construction for Complete Erosion Protection

North American Green's Vmax<sup>3</sup> Permanent Composite Turf Reinforcement Mats are designed to maximize performance through all of the developmental phases of a reinforced vegetative lining — unvegetated, vegetation establishment, and vegetation maturity. All three Vmax<sup>3</sup> TRMs feature a patented composite construction that elevates their erosion control and permanent turf reinforcement capabilities well beyond those of conventional TRMs.

Each Vmax<sup>3</sup> product begins with a permanent, three-dimensional corrugated turf reinforcement matting structure incorporated with either natural organic or UV-stabilized synthetic fibers. This specially-designed TRM structure anchors and reinforces the roots and stems of vegetation for long-term stability, and helps create a shear plane that actually deflects the flowing water away from the soil surface — improving its immediate to long-term erosion control capabilities. The fiber matrix further supplements the TRM structure's ground cover and moisture retention properties for dramatically improved erosion control and mulching action. By ensuring effective seed and soil protection immediately after installation, Vmax<sup>3</sup> TRMs give you confidence from the start that your reinforced turf designs will develop as planned. And, with proven vegetation reinforcement capabilities under flow-induced shear stresses of over 14 lbs./ft.<sup>2</sup> (672 Pa), Vmax<sup>3</sup> products give you confidence that your steep slopes, medium-to high-flow channels, stream banks, and shorelines will withstand nature's forces for years to come. Backed by the most comprehensive product performance guarantee in the industry, Vmax<sup>3</sup> TRMs give you confidence to design with vegetation instead of rock rip rap or concrete in most critical erosion control applications.



## Save Money and Permanently Control Erosion with Vmax<sup>3</sup>



**Earn LEED Green Building Rating System points using Vmax<sup>3</sup>.**

See [www.nagreen.com](http://www.nagreen.com) for details.





# Vmax<sup>3</sup>® SC250® Permanent Turf Reinforcement Mat

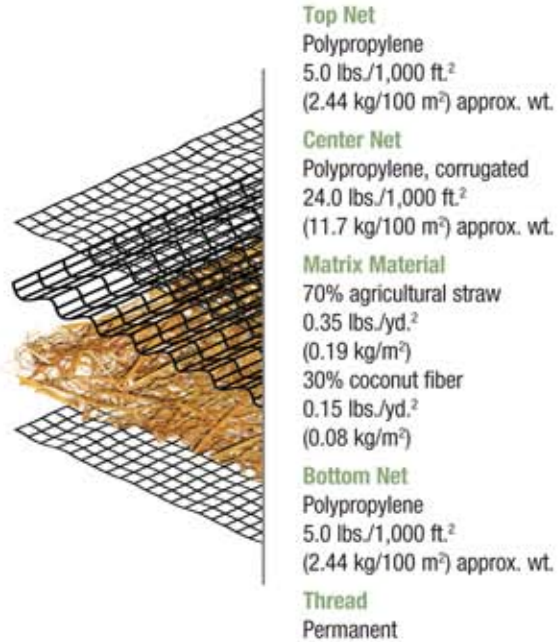


1:1 & greater slopes  
Medium- to high-flow channels  
Stream banks

Vmax<sup>3</sup> SC250 is constructed of a permanent, high-strength, three-dimensional matting structure that incorporates a straw/coconut fiber matrix. The straw/coconut fiber matrix enhances the permanent matting component's initial mulching and erosion control performance for up to 24 months.

SC250 provides extended-term, pre-vegetated erosion protection and permanent turf reinforcement in a wide range of applications, including severe slopes, medium- to high-flow channels, and stream banks. It is proven in extensive laboratory and field research to increase the shear resistance of vegetation to 10 lbs./ft.<sup>2</sup> (480 Pa).

With the toughest unreinforced grasses typically failing at shear stress levels of 3.7 lbs./ft.<sup>2</sup>, the high-performance SC250 more than doubles the shear resistance of vegetation. This enables SC250 to be used in applications where rock rip rap and concrete were once specified.



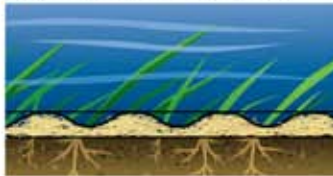
## Performance Profile

### Phase 1 (Unvegetated)



Unprotected seed and soil are highly susceptible to erosion. Upon installation, the SC250's straw/coconut fiber matrix and corrugated matting structure provide a uniform mulch layer and effective erosion protection for seed and soil under flow-induced shear stresses up to 3.0 lbs./ft.<sup>2</sup> (144 Pa).

### Phase 2 (Vegetation Establishment)



The tender stems and undeveloped root systems of immature vegetation provide little protection for the soil surface and are prone to damage or removal at shear stresses of only 0.6 lbs./ft.<sup>2</sup> (29 Pa).<sup>\*</sup> The SC250 continues providing erosion protection between, and structural support for, developing plants — increasing the permissible shear stress of new vegetation up to 8 lbs./ft.<sup>2</sup> (383 Pa).

### Phase 3 (Vegetation Maturity)



Under flow-induced shear stress of only 1.0 lb./ft.<sup>2</sup> (48 Pa), unreinforced mature vegetation may allow significant soil loss and experience physical damage.<sup>\*\*</sup>

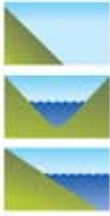
The SC250's corrugated matting structure reinforces soils and anchors vegetation roots and stems — increasing the permissible shear stress of the permanent vegetative stand up to 10 lbs./ft.<sup>2</sup> (480 Pa).

<sup>\*</sup>Based on FHWA HEC#15 Permissible Shear Stress for Class D Vegetation [2 to 6" tall (5 to 15 cm), fair stand].

<sup>\*\*</sup>Based on FHWA HEC#15 Permissible Shear Stress for Class C Vegetation [6" tall (15 cm), good stand].



# Vmax<sup>3</sup> C350<sup>®</sup> Permanent Turf Reinforcement Mat

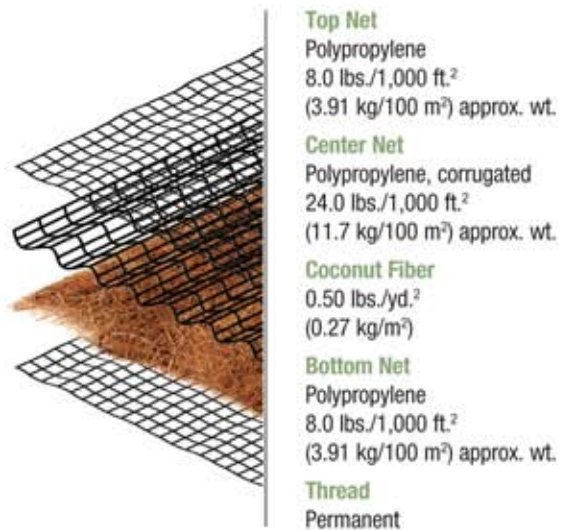


1:1 & greater slopes  
High-flow channels  
Shorelines

Vmax<sup>3</sup> C350 is composed of a permanent, high-strength, three-dimensional matting structure, incorporated with a 100% coconut-fiber matrix that supplements the permanent matting structure's initial mulching and erosion control capabilities for up to 36 months.

C350 is designed to provide long-term, pre-vegetated erosion protection and permanent turf reinforcement in a range of applications, including steep slopes, high-flow channels, and shorelines. Proven in extensive laboratory and field research, C350's high-strength, 3-D matting structure boosts the shear resistance of vegetation to an amazing 12 lbs./ft.<sup>2</sup> (576 Pa).

With permanent erosion protection exceeding that of 30-inch (0.76 m) rock rip rap, C350 provides a cost-effective, environmentally friendly solution to erosion control projects for severe conditions.



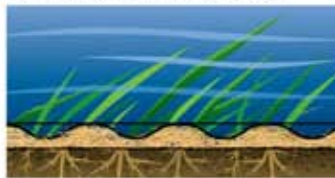
## Performance Profile

### Phase 1 (Unvegetated)



Unprotected seed and soil are highly susceptible to erosion. Upon installation, the C350's coconut fiber matrix and corrugated matting structure provide a uniform mulch layer and effective erosion protection for seed and soil under flow-induced shear stresses up to 3.2 lbs./ft.<sup>2</sup> (153 Pa).

### Phase 2 (Vegetation Establishment)



The tender stems and undeveloped root systems of immature vegetation provide little protection for the soil surface and are prone to damage or removal at shear stresses of only 0.6 lbs./ft.<sup>2</sup> (29 Pa).\* The C350 continues providing erosion protection between, and structural support for, developing plants — increasing the permissible shear stress of new vegetation up to 10 lbs./ft.<sup>2</sup> (480 Pa).

### Phase 3 (Vegetation Maturity)



Under flow-induced shear stress of only 1.0 lb./ft.<sup>2</sup> (48 Pa), unreinforced mature vegetation may allow significant soil loss and experience physical damage.\*\* The C350's corrugated matting structure reinforces soils and anchors vegetation roots and stems — increasing the permissible shear stress of the permanent vegetative stand up to 12 lbs./ft.<sup>2</sup> (576 Pa).

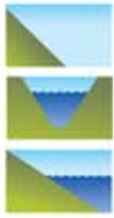
\*Based on FHWA HEC#15 Permissible Shear Stress for Class D Vegetation [2 to 6" tall (5 to 15 cm), fair stand].

\*\*Based on FHWA HEC#15 Permissible Shear Stress for Class C Vegetation [6" tall (15 cm), good stand].





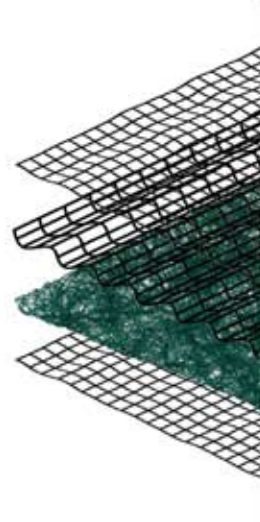
# Vmax<sup>3</sup>® P550® Permanent Turf Reinforcement Mat



1:1 & greater slopes  
Extreme, high-flow channels  
Shorelines

North American Green's P550 is made of a permanent, ultra-high-strength, three-dimensional matting structure incorporated with a permanent, 100% polypropylene fiber matrix. The 100% polypropylene fiber matrix enhances the permanent matting structure's initial mulching and erosion control properties, as well as its permanent vegetation reinforcement capabilities.

P550 is designed to provide long-term, pre-vegetated erosion protection and permanent turf reinforcement in an extensive range of severe applications, including steep slopes; extreme, high-flow channels; and shorelines. P550 is proven to drive the shear resistance of vegetation to over 14 lbs./ft.<sup>2</sup> (672 Pa) — for maximum vegetation reinforcement.



**Top Net**  
Polypropylene  
24.0 lbs./1,000 ft.<sup>2</sup>  
(11.7 kg/100 m<sup>2</sup>) approx. wt.

**Center Net**  
Polypropylene, corrugated  
24.0 lbs./1,000 ft.<sup>2</sup>  
(11.7 kg/100 m<sup>2</sup>) approx. wt.

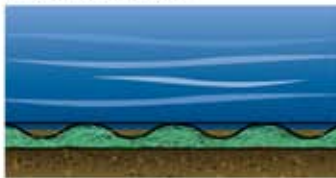
**Polypropylene Fiber**  
0.50 lbs./yd.<sup>2</sup>  
(0.27 kg/m<sup>2</sup>)

**Bottom Net**  
Polypropylene  
24.0 lbs./1,000 ft.<sup>2</sup>  
(11.7 kg/100 m<sup>2</sup>) approx. wt.

**Thread**  
Permanent

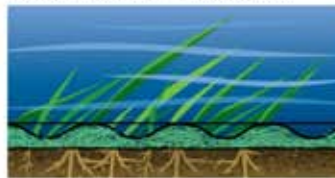
## Performance Profile

### Phase 1 (Unvegetated)



Unprotected seed and soil are highly susceptible to erosion. Upon installation, the P550's polypropylene fiber matrix and corrugated matting structure provide a uniform mulch layer and effective erosion protection for seed and soil under flow-induced shear stresses up to 4.0 lbs./ft.<sup>2</sup> (191 Pa).

### Phase 2 (Vegetation Establishment)



The tender stems and undeveloped root systems of immature vegetation provide little protection for the soil surface and are prone to damage or removal at shear stresses of only 0.6 lbs./ft.<sup>2</sup> (29 Pa).<sup>\*</sup> The P550 continues providing erosion protection between, and structural support for, developing plants — increasing the permissible shear stress of new vegetation to 12 lbs./ft.<sup>2</sup> (576 Pa).

### Phase 3 (Vegetation Maturity)



Under flow-induced shear stress of only 1.0 lbs./ft.<sup>2</sup> (48 Pa), unreinforced mature vegetation may allow significant soil loss and experience physical damage.<sup>\*\*</sup>

The P550 reinforces soils and anchors vegetation roots and stems — increasing the permissible shear stress of the permanent vegetative stand to 14 lbs./ft.<sup>2</sup> (672 Pa).

<sup>\*</sup>Based on FHWA HEC#15 Permissible Shear Stress for Class D Vegetation [2 to 6" tall (5 to 15 cm), fair stand].

<sup>\*\*</sup>Based on FHWA HEC#15 Permissible Shear Stress for Class C Vegetation [6" tall (15 cm), good stand].





## Why Use Vmax<sup>3</sup>® Reinforced Vegetation in Place of Hard Armor?

- Much more economical than rock or concrete, at less than 1/3 the installed cost
- Easier to install than rock or concrete and requires no heavy equipment for installation
- Recognized and emphasized by the U.S. EPA as a preferred Best Management Practice (BMP) in meeting National Pollutant Discharge Elimination System (NPDES) regulations
- Unlike rock, poured concrete, and articulated concrete blocks (ACBs), poses no threat to pedestrians or automobiles when used near travel routes
- Provides a natural filter for runoff water by allowing infiltration, entrapping sediments, and absorbing harmful pollutants; while hard armor enables little or no water infiltration or pollutant removal
- Requires next to no maintenance, other than periodic mowing; whereas rock rip rap collects trash, supports weed growth, and requires special attention when mowed around
- Offers a flexible lining that won't crack and deteriorate like concrete can
- Provides an aesthetically pleasing landscape

## Why Use Vmax<sup>3</sup> Composite TRMs Instead of Conventional TRMs?

### 1 Maximum Erosion Protection

- Vmax<sup>3</sup> TRMs are surface-applied to provide the highest level of erosion protection at the lowest cost. Many conventional TRMs require costly soil in-filling, which is extremely vulnerable to erosion.
- The unique, corrugated permanent matting structure of Vmax<sup>3</sup> forms a shear plane perpendicular to water flow that deflects erosive hydraulic forces away from the soil surface.
- Unlike conventional, open-structured TRMs, the Vmax<sup>3</sup> natural or synthetic fiber matrix shields soil from the erosive forces of raindrop impact and prevents shear stress extraction of soil particles from or through the matting structure.

### 2 Maximum Vegetation Establishment

- Unlike conventional, open-structured TRMs, the fiber matrix of Vmax<sup>3</sup> better regulates moisture and temperature for maximum seed germination and plant development.
- The Vmax<sup>3</sup> corrugated matting structure deflects shear forces away from newly planted seed and structurally reinforces seedlings.

### 3 Maximum Vegetation Reinforcement

- The high-strength, 3-D matting structure of Vmax<sup>3</sup> fortifies both stem and root systems for the ultimate in vegetation reinforcement.
- Its UV-stabilized, synthetic matting structure maintains strength and integrity even under long-term exposure to sunlight.
- The high-strength matting structure resists damages from natural forces—and from man-made forces, such as heavy foot traffic, maintenance equipment, and vehicular traffic.
- The permanent matting structure of all three Vmax<sup>3</sup> products exceeds FHWA FP-03 standards for TRMs.







# Product Application Guide

All Vmax<sup>3</sup> rolls have standard dimensions of 6.5 ft. (2 m) x 55.5 ft. (16.9 m).

Product	Product Description	Typical Applications	Limiting Shear Stress Flow Duration lbs./ft. <sup>2</sup> (Pascal)				Permissible Velocity ft./s (m/s)		FHWA FP-03 Category	ECTC Category	Typical Projects
			Bare Soil		Vegetated		Unvegetated	Vegetated			
			0.5 hrs	50 hrs	0.5 hrs	50 hrs					
SC250	5.0-lb. UV-stable polypropylene top and bottom nets	1:1 & greater slopes	3.0 (144)	2.5 (120)	10.0 (480)	8.0 (383)	9.5 (2.9)	15.0 (4.6)	Type 5 A, B, and C	Type 5 A, B, and C	Roadside ditches, golf course swales, steep slopes, stream banks
	24.0-lb. UV-stable polypropylene corrugated center net	Medium- to high-flow channels									
	70% straw/30% coconut fiber matrix	Stream banks									
C350	8.0-lb. UV-stable polypropylene top and bottom nets	1:1 & greater slopes	3.2 (153)	3.0 (144)	12.0 (576)	10.0 (480)	10.5 (3.2)	20.0 (6.0)	Type 5 A, B, and C	Type 5 A, B, and C	Severe slopes, drainage areas, high-flow areas, stream banks, shorelines
	24.0-lb. UV-stable polypropylene corrugated center net	High-flow channels									
	100% coconut fiber matrix	Shorelines									
P550	24.0-lb. UV-stable polypropylene top and bottom nets	1:1 & greater slopes	4.0 (191)	3.25 (156)	14.0 (672)	12.0 (576)	12.5 (3.8)	25.0 (7.6)	Type 5 A, B, and C	Type 5 A, B, and C	Severe slopes, spilways, swales, high-flow areas, shorelines
	24.0-lb. UV-stable polypropylene corrugated center net	Extreme, high-flow channels									
	100% polypropylene fiber matrix	Shorelines									

Note: This guide is for general purposes only. Actual project design and product selection should be developed using North American Green ECMSD<sup>®</sup> software, available at [www.nagreen.com](http://www.nagreen.com).

## The North American Green Advantage

North American Green's Erosion Solutions *Specialists* are specially trained to provide on-site support and utilize state-of-the-art North American Green Erosion Control Materials Design Software (ECMSD<sup>®</sup>), to ensure your project design through selection and installation of cost-effective erosion control products.

- As an extra advantage, North American Green's exclusive DOT System<sup>®</sup> is standard on all Vmax<sup>3</sup> products. The DOT System provides installation staple patterns that are clearly marked on the mats. This greatly increases installer accuracy, which ensures proper installation and excellent results in the extremely critical applications for which Vmax<sup>3</sup> products are used.
- North American Green products are known for their quality — all blankets and mats produced by North American Green are stitched on 1.5-inch (3.81-cm) centers, adding significantly to field performance capabilities.
- North American Green products are thoroughly tested under field and laboratory conditions to accurately quantify performance.
- North American Green products are backed by our Ultimate Assurance Guarantee. If our products fail to control soil loss to the specified limits, we will upgrade you to the next higher performance product, free. You can be 100% confident in your project design. Contact your North American Green Erosion Solutions *Specialist* for guaranteed solutions to your most critical erosion problems.

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EROSION CONTROL Products  
Guaranteed SOLUTIONS

A Tensar Company

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www.Vmax3.com



North American Green Vmax<sup>3</sup> products are protected by one or more of the following: U.S. patents #5,849,845, D456,224S, D456,674S, D466,378S, and other U.S. and foreign patents pending.

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All Vmax<sup>3</sup> products have been tested by AASHTO's National Transportation Product Evaluation Program for RECPs.