

PRODUCT DATA SHEET

PYRAMAT®

PYRAMAT high performance turf reinforcement mat (HPTRM) is a three-dimensional, lofty, woven polypropylene geotextile that is available in green or tan which is specially designed for erosion control applications on steep slopes and vegetated waterways. The matrix is composed of polypropylene monofilament yarns **featuring X3® technology** woven into a uniform configuration of resilient pyramid-like projections. The material exhibits very high interlock and reinforcement capacity with both soil and root systems, demonstrates superior UV resistance, and enhances seedling emergence.

PYRAMAT conforms to the property values listed below¹ and is manufactured at a Propex facility having achieved ISO 9001:2000 certification. Propex performs internal Manufacturing Quality Control (MQC) tests that have been accredited by the Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP).

PROPERTY	TEST METHOD	MARV ²	
		ENGLISH	METRIC
Physical			
Mass/Unit Area	ASTM D-6566	13.5 oz/yd ²	455 g/m ²
Thickness	ASTM D-6525	0.4 in	10.2 mm
Light Penetration (% Passing)	ASTM D-6567	10%	10%
Color	Visual	Green or Tan	
Mechanical			
Tensile Strength (Grab)	ASTM D-6818	4000 x 3000 lb/ft	58.4 x 43.8 kN/m
Elongation	ASTM D-6818	65% (max)	65% (max)
Resiliency	ASTM D-6524	80%	80%
Flexibility	ASTM D-6575	0.534 in-lb (avg)	615000 mg-cm (avg)
Endurance			
UV Resistance @ 6000 hours	ASTM D-4355	90%	90%
Performance			
Velocity ³ (Vegetated)	Large Scale	25 ft/sec	7.6 m/sec
Shear Stress ³ (Vegetated)	Large Scale	15 lb/ft ²	718 Pa
Manning's "n" ⁴ (Unvegetated)	Calculated	0.028	0.028
Seedling Emergence ⁴	ECTC Draft Method #4	296%	296%
Roll Sizes		8.5 ft x 90 ft	2.6 m x 27.4 m

NOTES

1. The property values listed are effective 08/2006 and are subject to change without notice.
2. MARV indicates minimum average roll value calculated as the typical minus two standard deviations. Statistically, it yields a 97.7% degree of confidence that any sample taken during quality assurance testing will exceed the value reported.
3. Maximum permissible velocity and shear stress has been obtained through vegetated testing programs featuring specific soil types, vegetation classes, flow conditions, and failure criteria. These conditions may not be relevant to every project nor are they replicated by other manufacturers. Please contact Propex for further information.
4. Calculated as typical values from large-scale flexible channel lining test programs with a flow depth of 6 to 12 inches.



THE ADVANTAGE CREATORS.™

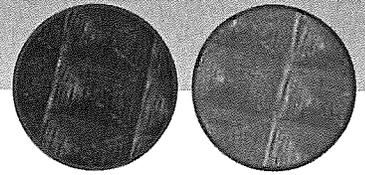
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PYRAMAT® HIGH PERFORMANCE TURF REINFORCEMENT MATS



Pyramat® High Performance Turf Reinforcement Mats (HPTRMs) feature our patented woven technology composed of a unique, three-dimensional matrix of polypropylene yarns. These yarns are designed in a uniform, dimensionally stable and homogenous configuration of pyramid-like structures, and they feature our patented X3® fiber technology specially created to lock soil in place. HPTRMs exhibit extremely high tensile strength as well as superior interlock and reinforcement capacity with both soil and root systems. They stand up to the toughest erosion applications where high loading and/or high survivability conditions are required, including maintenance access, steep slopes, arid and semi-arid environments, pipe inlets and outlets, structural backfills, utility cuts, potential traffic areas, abrasion, high-flow channels and/or areas where greater factors of safety are desired. Pyramat's superior characteristics provide a longer design life than our first and second generation standard TRMs, and meet the definition of HPTRM as defined by the U.S. EPA Storm Water Fact Sheet, "Turf Reinforcement Mats" (EPA 832-F-99-002) and FHWA FP-03 Specifications Section 713.8.

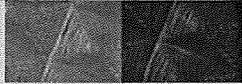
FEATURES & BENEFITS

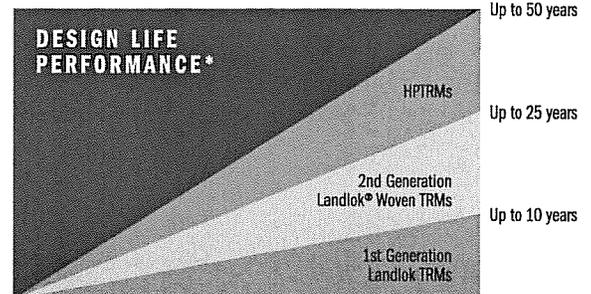
- ▶ A unique, patented matrix of pyramids formed with X3 fibers that gridlocks soil in place under unvegetated, partially vegetated and high-flow conditions
- ▶ Ideal for extended ultraviolet (UV) exposure, utility cuts, maintenance equipment traffic, pipe inlets and outlets and other high loadings
- ▶ X3 cross-sectional area for additional tensile strength, flexibility and seedling emergence
- ▶ Holds seed and soil in place on channels and slopes while vegetation grows
- ▶ Provides permanent reinforcement to enhance vegetation's natural ability to filter soil particles and prevent soil loss during storm events
- ▶ Vegetation solution providing more pleasing aesthetics than conventional methods (i.e. rock riprap and concrete paving)
- ▶ Greater flexibility to maintain intimate contact with subgrade, resulting in rapid seedling emergence and minimal soil loss
- ▶ Can be used in arid and semi-arid environments
- ▶ Completely interconnected yarns that provide superior UV resistance throughout the HPTRM
- ▶ Superior product testing, performance and design life

Outperforms and is more cost-effective than conventional erosion control methods, including:

- ▶ Large rock riprap
- ▶ Grouted riprap
- ▶ Gabions
- ▶ Concrete paving
- ▶ Hard roadside shoulders
- ▶ Articulated concrete blocks
- ▶ Fabric formed revetments

PYRAMAT® HPTRMs PRODUCT FAMILY TABLE

PRODUCT	FUNCTIONAL LONGEVITY	COLOR	FIBER TYPE	# OF NETS	FP-03, SECTION 713 COMPLIANCE
 PYRAMAT®	PERMANENT	TAN OR GREEN	POLYPROPYLENE X3® FIBER TECHNOLOGY	0 (WOVEN)	EXCEEDS TYPE 5C



*Design life performance may vary depending upon field conditions and applications.

PYRAMAT® HIGH PERFORMANCE TURF REINFORCEMENT MATS

APPLICATION SUGGESTIONS FOR PYRAMAT® HPTRMs

	APPLICATION	FUNCTIONAL LONGEVITY	PRODUCT STYLE	INSTALLED COST ¹	ANCHOR SUGGESTIONS ²
SLOPES	1H:1V OR STEEPER	PERMANENT	PYRAMAT®	\$12.00 - 18.00/yd ² \$14.35 - 21.53/m ²	2.5 ANCHORS/yd ² 3 ANCHORS/m ²
	CHANNELS				
BANKS					
CRITICAL STRUCTURES	PIPE INLETS & OUTLETS				

NOTES: 1. Installed cost estimates range from large to small projects according to material quantity. The estimates include material, seed, labor and equipment. Costs vary greatly in different regions of the country. 2. For anchor size and style, please see our HPTRM Installation Guidelines.

KEY PHYSICAL PROPERTIES OF PYRAMAT® HPTRMs

- ▶ Construction: Patented three-dimensional woven matrix makes it 10 times stronger than first generation TRMs, with performance unequalled in turf reinforcement.
- ▶ Tensile Strength: 4000 lb/ft (58.4 kN/m) tensile strength meets U.S. EPA definition of a High Performance Turf Reinforcement Mat.
- ▶ UV Resistance: Patented UV protection package provides superior resistance to the damaging effects of ultraviolet radiation.

SEVEN STEPS FOR SUCCESSFUL TRM SELECTIONS*



*See Propex Engineering Bulletins or EC-DESIGN® software for more information.

PYRAMAT® HPTRM PROPERTY TABLE¹ ENGLISH & METRIC VALUES

	PROPERTY	TEST METHOD	VALUE ²	PYRAMAT®
PHYSICAL	MASS PER UNIT AREA	ASTM D-6566	MARV	13.5 oz/yd ² 455 g/m ²
	THICKNESS	ASTM D-6525	MARV	0.4 in 10.2 mm
	LIGHT PENETRATION	ASTM D-6567	TYPICAL	10%
	COLOR	VISUAL	-	GREEN, TAN
MECHANICAL	TENSILE STRENGTH	ASTM D-6818	MARV	4000 x 3000 lb/ft 58.4 x 43.8 kN/m
	TENSILE ELONGATION	ASTM D-6818	MaxARV	65%
	RESILIENCY	ASTM D-6524	MARV	80%
	FLEXIBILITY/STIFFNESS	ASTM D-6575	TYPICAL	0.534 in-lbs 615000 mg-cm
ENDURANCE	FUNCTIONAL LONGEVITY	OBSERVED	TYPICAL	PERMANENT
	UV RESISTANCE ⁴	ASTM D-4355	MINIMUM	90% @ 6000 HOURS
PERFORMANCE	SEEDLING EMERGENCE ³	ECTC DRAFT METHOD #4	TYPICAL	296%
PACKAGING	ROLL WIDTH	MEASURED	TYPICAL	8.5 ft 2.6 m
	ROLL LENGTH	MEASURED	TYPICAL	90 ft 27.4 m
	ROLL WEIGHT	CALCULATED	TYPICAL	86 lb 39 kg
	ROLL AREA	MEASURED	TYPICAL	85 yd ² 71 m ²

NOTES: 1. The listed property values are effective 08/2006 and are subject to change without notice. 2. MARV indicates Minimum Average Roll Value calculated as the typical minus two standard deviations. Statistically, it yields a 97.7% degree of confidence that any sample taken during quality assurance testing will exceed the reported value. Maximum Average Roll Values (MaxARV) is calculated as typical plus two standard deviations. 3. Calculated as percent increase in average plant biomass with tall fescue grass seed in sand 14 days after seeding versus a non-RECP protected control specimen. 4. All components must meet UV resistance values.

PYRAMAT® HPTRM PERFORMANCE VALUES ENGLISH & METRIC UNITS

MATERIAL	FUNCTIONAL LONGEVITY	SHORT-TERM MAXIMUM SHEAR STRESS AND VELOCITY						MANNING'S "n"		
		VEGETATED ⁵		PARTIALLY ⁶		UNVEGETATED ⁷		0"-6"	6"-12"	12"-24"
PYRAMAT®	PERMANENT	15 lb/ft ² 718 N/m ²	25 ft/sec 7.6 m/sec	10 lb/ft ² 478 N/m ²	20 ft/sec 6.1 m/sec	6.0-8.0 lb/ft ² 285-383 N/m ²	15 ft/sec 4.6 m/sec	0.035	0.028	0.017

NOTES: 5. Maximum permissible shear stress has been obtained through fully vegetated (70% to 100% density) testing programs featuring specific soil types, vegetation classes, flow conditions and failure criteria. Achieved after 14 weeks of vegetative establishment versus the industry standard of two full growing seasons. These conditions may not be relevant to every project nor are they replicated by other manufacturers. Please contact Propex for further information. 6. Maximum permissible shear stress has been obtained through partially vegetated (30% to 70% density) testing programs featuring specific soil types, vegetation classes, flow conditions and failure criteria. These conditions may not be relevant to every project nor are they replicated by other manufacturers. Please contact Propex for further information. 7. Maximum permissible shear stress has been obtained through unvegetated (0% to 30% density) testing programs featuring specific soil types, vegetation classes, flow conditions and failure criteria. These conditions may not be relevant to every project nor are they replicated by other manufacturers. Please contact Propex for further information.

For downloadable documents like construction specifications, installation guidelines, case studies and other technical information, please visit our web site at geotextile.com. These documents are available in easy-to-use Microsoft® Word formats.

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