

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.

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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				
SHEAR STRESS UP TO 15 lb/ft ² (718 N/m ²) VELOCITY UP TO 25 ft/sec (7.6 m/sec)					
BANKS					
CRITICAL STRUCTURES	MODERATE WAVE ACTION = 1-2 ft (30 - 60 cm)				
	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 unequaled 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*

1	SELECT APPLICATIONS	2	DETERMINE FUNCTIONAL LONGEVITY	3	ANTICIPATE CLIMATE (ARID, SEMI-ARID, OR TEMPERATE)	4	UNDERSTAND TRADITIONAL SOLUTION	5	PREDICT NON-HYDRAULIC STRESSES (MAINTENANCE STRESSES)	6	KNOW VEGETATION TYPE	7	CALCULATE HYDRAULIC STRESSES
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*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

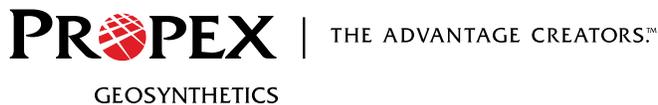
NOTES: 1. The listed property values are effective 08/2006 and are subject to change without notice. 2. MARV indicates Minimum Average Roll Value calculated as the typical minus two standard deviations. Statistically, it yields a 97.7% degree of confidence that any sample taken during quality assurance 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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