ARMORMAX®

ANCHORED REINFORCED VEGETATION SYSTEM
The ARMORMAX® Anchored Reinforced Vegetation System (ARVS) is the most advanced flexible armoring technology available for severe erosion and surficial slope stability challenges. The ARMORMAX® system can be used in erosion control applications where additional factors of safety are required, including protecting earthen levees from storm surge and wave overtopping, and stream, river and canal banks from scour and erosion. In addition, this system is ideally suited to protect storm water channels in arid and semi-arid environments where vegetation densities of less than 30% coverage are anticipated. For slope stability applications, the system can be further engineered to provide surficial slope stabilization to resist shallow plane failures. Consisting of our PYRAMAT® woven three-dimensional High Performance Turf Reinforcement Mat (HPTRM) with X3® fiber technology and Percussion Driven Anchors (PDAs), you can count on the ARMORMAX® system to hold its ground.

**Durable Armoring System**
Lightweight protection layer securely anchored to the subgrade for long-term design life

**Withstands Extreme Hydraulic Stresses**
The PYRAMAT® HPTRM component of ARMORMAX® has been tested at CSU comparable to traditional armoring methods

**Resists Non-Hydraulic Event Damage**
High strength survivability woven surface resists non-hydraulic stresses like debris and maintenance operations

**Secures Erosion Control Applications**
The PDAs act as a tie-down mechanism securing the HPTRM firmly to the ground for additional safety factors

**Stabilizes Slope Stability Applications**
Engineered to provide surficial slope stabilization to resist shallow plane failures

**OTHER FEATURES & BENEFITS**
- Supports the EPA Green Infrastructure initiative
- Recognized as a stormwater Best Management Practice (BMP) and is proven to reduce erosion and reinforce vegetation for low-impact, sustainable design
- Easy to handle, lightweight components for rapid installation
- Use of lightweight equipment and unskilled labor facilitates installation with limited site access
- Aesthetically pleasing and more cost effective than conventional methods such as rock riprap and concrete paving

Outperforms and is more cost effective than conventional methods, including:
- Rock riprap
- Rock slope protection
- Gabions
- Concrete blocks or paving
- Fabric formed revetments
WOVEN THREE-DIMENSIONAL HPTRM PROTECTION LAYER FEATURING X3® FIBER TECHNOLOGY

- Unique X3® fiber shape provides over 40% more surface area than conventional fibers to capture the moisture, soil and water required for rapid vegetation growth
- Exhibits extremely high tensile strength as well as superior interlock and reinforcement capacity with both soil and root systems
- Maximum ultraviolet protection for long-term design life
- Netless, rugged material construction stands up to the toughest erosion applications where high loading and/or high survivability conditions are required

PERCUSSION DRIVEN ANCHORS SECURE THE MAT TO THE GROUND

- Made of corrosion resistant material to provide considerable mechanical strength and durability during installation and in service
- Connected to a zinc-aluminum coated carbon steel or stainless steel tendon to fully enhance corrosion resistance particularly at the soil air interface
- As the load exerted on the soil by the ARMORMAX® system increases, a body of soil above the anchor is compressed and provides resistance to any further anchor movement, permanently securing the mat to the ground

EROSION CONTROL APPLICATIONS

The figures below illustrate the ARMORMAX® system for erosion control applications. The system is comprised of the PYRAMAT® HPTRM and typically Type B1 Percussion Driven Anchors (PDAs).

SLOPE STABILITY APPLICATIONS

The figures below illustrate the ARMORMAX® system in slope stability applications. The system is comprised of the PYRAMAT® HPTRM and typically Type B2 Percussion Driven Anchors (PDAs) as specified by the project engineer. Propex may be able to provide preliminary design information.
Propex GeoSolutions is one of the largest geosynthetic and erosion control manufacturers in the world, offering full service engineering support for multiple applications, all while creating an Engineered Earth Solution. Our solutions are guaranteed to outperform conventional methods, capitalizing in various markets such as Transportation, Slope Stabilization, Shoreline Restoration, and Flood Control.

Applications include:
- Roadway Stabilization
- Pavement Rehabilitation
- Drainage and Filtration
- Canal, Stream, and Channel Protection
- Earthen Levee Protection
- Slope Protection and Stabilization

We provide industry leadership, setting standards for quality innovation, and pride ourselves in offering the most comprehensive and advanced technical services and support in the market. Our number one goal is to provide 100 percent customer support.

THE MANY FEATURES AND BENEFITS OF OUR ENGINEERING SERVICES TEAM INCLUDES:

- Product Selection
- Design Support
- Surficial Slope Stability Analysis
- Erosion Control Analysis
- Paved and Unpaved Roadway Design
- Installation Support
- Construction Details
- Inspection and Validation Testing
- Market Advancement
- Industry Organization Participation
- Product and Application Research

Contact our Engineering Services Team
Hotline at 423.553.2465
or email GeoEngineering@propexglobal.com
to let us help with your next project.
# ARMORMAX KEY PHYSICAL PROPERTIES

- **Material Composition**: Proprietary ultraviolet protection package in PYRAMAT HPTRM, and the durability of the PDA provides long-term design assurance.
- **Tensile Strength**: PYRAMAT HPTRM boasts 4000 x 3000 lb/ft (58.4 x 43.8 kN/m) of tensile strength, which exceeds the U.S. EPA definition of a High Performance Turf Reinforcement Mat.
- **Seedling Emergence**: PYRAMAT HPTRM features X3® fiber technology, which offers 40% more fiber surface area to capture the critical sediment and moisture needed to increase seed germination within the first 21 days.
- **Flexibility**: Allows the system to conform and maintain intimate contact with the prepared subgrade.
- **Anchor Loading Capacity**: Based on anchor size, tendon length and on-site soil parameters the anchor foot provides up to an ultimate of 500 to 3000 lbs of pullout resistance per Percussion Driven Anchor (PDA). Actual holding strengths depend upon soil characteristics, anchor type and installation techniques.

### PROPERTY | TEST METHOD | ENGLISH | METRIC
---|---|---|---
% U.S. Manufactured | | 100% | 100%
**PHYSICAL**
Thickness | ASTM D-6525 | 0.40 in | 10.2 mm
Light Penetration (% Passing) | ASTM D-6567 | 10% | 10%
Color | Visual | Green or Tan
**MECHANICAL**
Tensile Strength | ASTM D-6818 | 4000 x 3000 lbs/ft | 58.4 x 43.8 kN/m
Elongation | ASTM D-6818 | 40 x 35 % | 40 x 35 %
Resiliency | ASTM D-6524 | 80% | 80%
Flexibility | ASTM D-6575 | 0.534 in-lb | 616,154 mg-cm
**ENDURANCE**
UV Resistance % Retained at 6,000 hrs | ASTM D-4355 | 90% | 90%
UV Resistance % Retained at 10,000 hrs | ASTM D-4355 | 85% | 85%
**PERFORMANCE**
Velocity (Vegetated) | Large Scale | 25 ft/sec | 7.6 m/sec
Shear Stress (Vegetated) | Large Scale | 16 lb/ft² | 766 Pa
Manning's n (Unvegetated) | Calculated | 0.028 | 0.028
USACE / CSU Wave Overtopping | Large Scale | USACE Approved
Seedling Emergence | ASTM D-7322 | 296% | 296%
**ROLL SIZES**
| 8.5 ft x 90 ft | 2.6 m x 27.4 m
| 15.0 ft x MR | 4.6 m x MR

### TYPE B1 ANCHOR PROPERTIES

<table>
<thead>
<tr>
<th>PHYSICAL</th>
<th>ENDURANCE/ COMPONENT MATERIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anchor Head Length</td>
<td>3.4 in</td>
</tr>
<tr>
<td>Anchor Head Width</td>
<td>1.0 in</td>
</tr>
<tr>
<td>Anchor Head Bearing Area</td>
<td>2.5 in²</td>
</tr>
<tr>
<td>Anchor Head Weight</td>
<td>0.1 lbs</td>
</tr>
<tr>
<td><strong>PERFORMANCE</strong></td>
<td><strong>MECHANICAL</strong></td>
</tr>
<tr>
<td>Load Range (Cohesive through Non Cohesive Soils)</td>
<td>Up to 500 lbs</td>
</tr>
<tr>
<td>Embedment Depth</td>
<td>Up to 5 ft</td>
</tr>
</tbody>
</table>

**NOTES:**
1. The property values listed above are effective 07/13/2015 and are subject to change without notice.
2. Minimum average roll values (MARV) are calculated as the typical minus two standard deviations. Statistically, it yields a 97.7% degree of confidence that any samples taken from quality assurance testing will exceed the value reported.
3. Maximum Average Roll Value (MaxARV), calculated as the typical plus two standard deviations. Statistically, it yields a 97.7% degree of confidence that any samples taken from quality assurance testing will meet the value reported.
4. Typical Value.
5. 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.
6. Calculated as typical values from large-scale flexible channel lining test programs with a flow depth of 6 to 12 inches.
7. Master Roll (MR) is to be up to 600 feet in length.
SUPPORTING A STABLE TOMORROW

PROPEX EROSION CONTROL
PRODUCT GUIDE PERMANENT SOLUTIONS

MODERATE

LANDLOK® STITCH-BONDED TRMs
✓ 1st generation Turf Reinforcement mats (TRMs)
✓ Moderate-flow channels, bank protection and steep soil slopes
✓ Up to 10 years*

LANDLOK® WOVEN TRMs
✓ 2nd generation Turf Reinforcement mats (TRMs)
✓ Moderate-flow channels, bank protection, and steep soil slopes where greater loading and/or survivability is required
✓ Up to 25 years*

PYRAMAT® WOVEN HPTRMs
✓ High Performance Turf Reinforcement Mats (HPTRMs)
✓ High-flow channels, extreme slopes, pipe inlets and outlets and other arid/semi-arid applications
✓ Up to 50 years*

SEVERE

ARMORMAX® SYSTEM
✓ Anchored Reinforced Vegetation System (ARVS) consisting of HPTRM and percussion driven anchors (PDAs)
✓ Earthen levees and stream, river and canal banks
✓ Stormwater channels in arid and semi-arid environments
✓ Surficial slope stabilization
✓ Up to 50 years or greater*

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

CONTACT THE PROPEX TEAM TODAY:

1.800.621.1273
PROPExGLOBAL.COM

LL-573E-002 (12/2016)