DURA Veg™

*Sustainable revegetation*



DURAVEG®

# Capability Statement

***Proven systems that reclaim and restore environments***

PGG Wrightson Turf




# Assurance in the science



# Confidence in the outcome

DURAVEG®

# Capability Statement


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# Who are we?

***DuraVeg® is at the forefront of innovation delivering complete environment rehabilitation and erosion control solutions to meet the demanding characteristics of Australasian environments.***

DuraVeg® is a sub-brand of PGG Wrightson Turf, and PGG Wrightson Seeds Ltd. through which revegetation products such as mulch, seed and soil amendment products are sold into the revegetation and erosion control market. DuraVeg pair years of seed research and development with sustainable revegetation and erosion control. Their goal is to bring the highest quality revegetation and erosion control to Australasia, that's sown with seed that's been trialled, tested and proven.

PGG Wrightson Seeds are Australasia's most prominent name in seed production, involving thousands of Australian and New Zealand farmers in seed production and servicing both farmers and turf managers in the buying of forage and turf grass seed.

The PGG Wrightson Seeds business have seed production, testing and cleaning facilities right across Australasia, in numerous important locations, such as: Brisbane, Cairns, Forbes, Melbourne, Western Australia, Auckland and Christchurch.

PGG Wrightson Seeds have been breeding revegetation seed specifically for the Australasian environment for over 40 years. In that time the company has established itself as an innovative market leader in revegetation seed breeding, production, research, and evaluation for the delivery of solutions across Australia and New Zealand.

DuraVeg offer a complete range of revegetation and erosion control solutions across the full range of environmental conditions across Australasia.

Over recent years, DuraVeg have established firm relationships across a variety of different sectors, from mining to infrastructure, to renwables and landscaping. We deliver products that our clients and contractors can depend on: industry-leading hydromulch with a diverse seed range that has been trialled, tested and proven.

# *Who are the DuraVeg® Team?*

***Our Territory Managers are spread across all of Australasia, each with a wealth of knowledge and experience in revegetation.***

Our friendly team are more than happy to discuss you revegetation needs and are always available for consultations - always free of charge.

Reach out to your region's territory manager today and let's discuss your next project.

## *Meet our friendly team of DuraVeg Revegetation Managers*



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# *Who are PGG Wrightson Seeds?*

***PGG Wrightson Seeds Ltd are Australasia's most prominent name in seed production, involving thousands of Australian and New Zealand farmers in seed production and servicing both farmers and turf managers in the buying of forage and turf grass seed.***

The company was formed in 2005 following a merger between Pyne Gould Guinness and Wrightson; companies which can trace their formation back to 1851 and 1868 respectively.

Since 2019 PGG Wrightson Seeds have been part of DLF, a Danish seed grower co-operative that has grown to become a global leader operating in more than 100 countries and employing 2000 people.

DLF have significant markets across Europe and North America, and now with the acquisition of PGG Wrightson Seeds, they've now added New Zealand, Australia and South America to their portfolio, making DLF one of the world's largest seed companies.

PGG Wrightson Seeds currently has 550 employees across Australia and New Zealand.

PGG Wrightson Turf is a trading division of PGG Wrightson Seeds, and have been breeding turfgrass seed specifically for the Australasian environment for over 40 years.

Through the launch of the DuraVeg® brand, PGG Wrightson Turf is now positioned as a market leader in revegetation seed breeding, research and evaluation across Australasia.

DuraVeg is at the forefront of innovation in both mulch and seed, delivering complete environment revegetation and erosion control solutions to meet the demanding characteristics of Australasian environments.

DuraVeg merges their parent brand's turfgrass seed that has been trialled, tested and proven with sustainable revegetation and erosion control solutions, where assurance in the science delivers confidence in the results.










# *Research and Development*

PGG Wrightson Seeds have been breeding grass seed suitable for the revegetation industry in both New Zealand and Australia for over 40 years.

In New Zealand, our seed breeding powerhouse is found at the Kimihia Research Facility, a world-class seed breeding centre, based in Lincoln, on the outskirts of Christchurch.

In Australia, we focus on tropical and temperate seed breeding with a dedicated research and development team based across multiple locations, from Tasmania to Mareeba in the far north of Queensland.

We priortise the breeding of climatically adapted turfgrasses specifically bred for Australasia's unique environment.

Our commitment to R&D is at the heart of everything we do. Our investment into the science, gives us the confidence in our results.

Our research and development is ably supported by our Technical Services team, who work with both forage and revegetation customers to ensure our seed delivers consistent solutions in the different geographical locations in which it is required.



**KIMIHIA RESEARCH CENTRE, CANTERBURY**



**LEIGH CREEK RESEARCH FACILITY, VICTORIA**

# Our Plant Breeding Process

## *PGG Wrightson Turf specifically select and breed forage and turf grasses for Australasia's unique temperate and tropical environment.*

The plant breeding process starts with correctly selecting plants, from both locally sourced and international germplasm.

Through a natural process, they are genetically crossed and then further selected for the desired environment.

From there, the suitable plants are rigorously tested in multiple turf trials spread throughout Australasia where only the elite cultivars are finally selected for commercial production.

Through our extensive research and development programmes we constantly aim to find solutions which allow the establishment and persistence of revegetation species, and bring these new technologies to the market to make them accessible to all customers.



KIMIHIA SEED TESTING LABORATORY

# Profile® Products
## Our Partners in Sustainable Revegetation

***PROFILE® Products LLC is an industry-leading developer & manufacturer of hydromulch materials. Their hydromulch products promote environmental sustainability while delivering superior performance.***

Profile® Products' mission is to consistently help their customers in the establishment of sustainable revegetation. They accomplish this by working with knowledgeable teams and people, like PGG Wrightson Turf (DuraVeg®) and proven products and innovative technology to holistically meet real world applications—assuring success in any environment.

Profile® possess an ongoing commitment to research, testing and product and development; they has become an industry leader and a valued resource across the globe. Many of the current global industry standards, started as innovations that were developed and introduced by Profile through their incorporation Green Design Engineering™. Green Design Engineering is a holistic approach combining environmentally beneficial project design with products that are ecologically responsible. Profile are dedicated to the future of sustainable revegetation and helping their customers achieve success.

Our shared vision for the future of sustainable revegetation, and our immense focus into research and product development makes Profile an excellent partner for DuraVeg – PGG Wrightson Turf.









# THE 5 FUNDAMENTALS

DURA Veg™
*Sustainable revegetation*



1. UNDERSTAND YOUR SUBSTRATE



2. PICK THE RIGHT PLANT SPECIES



3. SELECT THE RIGHT EROSION CONTROL MATERIAL



4. ENSURE PROPER INSTALLATION



5. FOLLOW-UP INSPECTION & MAINTENANCE PRACTICES

## STEP 1:

Understand your substrate. The first action should be to conduct a soil test to understand what you are working with and ensure the soil levels are in the ideal range to sustain vegetation. Fertiliser is a good means of increasing levels among the soil where deficient; fertiliser can be applied with the mulch, e.g. within the DuraVeg® Fibre Matrix

Talk to a member of the DuraVeg team about free soil analysis.

## STEP 2:

Species selection. The region and geographic location factors into the seed species selection.

## STEP 3:

Select the right erosion control material. For an example, Flexterra High Performance - Flexible Growth Media (HP-FGM). Flexterra HP-FGM is an industry leader in the Erosion Control Space for its longevity once applied and it's ability to be applied at the steepest of slopes.

Flexterra HP-FGM offers a more aesthetically pleasing and environmentally superior means of protecting high-discharge waterways.

The system begins with Enkamat® TRM (Turf Reinforcement Mat) which provides a permanent, lofty and open matrix.

- 30-50% less cost than hard armor such as concrete or riprap
- Higher-density turf
- Twice the erosion resistance of natural vegetation

## STEP 4:

Ensuring proper installation. It is critical to ensure that the product is installed according to the manufacturers guidelines as well as by a contractor with experience applying such product.

## STEP 5:

Follow-up inspections and maintenance practices. The application site should be regularly inspected to ensure the success of establishment.







## LUNCH AND LEARN SESSIONS

The DuraVeg team hold numeorus Lunch and Learn education sessions on the 5 Fundamentals throughout the year.

To register your interest for an upcoming Lunch and Learn, talk to one of the DuraVeg team, or email us on info@duraveg.com.au

Profile® | High Performance Mulch

# Wood Fiber Mulch and Wood Fiber Mulch with Tackifier

## The Industry Standard

When the first wood fiber hydraulic mulch was introduced in 1965, we set a new standard for hydraulically applied erosion control products. Profile® Products has continually built on that heritage and taken wood fiber technology and performance to even higher levels, keeping our products the #1 choice of specifiers, agencies and hydroseeding contractors.



## Superior Fibers Make All the Difference

Only Profile utilizes a patented Thermally Refined® manufacturing process that introduces 100% recycled wood chips into steam heat within a high-temperature and high-pressure vessel to create long and highly absorbent fibers. These fibers are proven to provide:

**BETTER COVERAGE:**
Seven bags of Profile wood fiber mulch provide as much coverage as 10 bags of competitive wood mulch.

**BETTER PROTECTION:**
Superior coverage and greater loft within the matrix effectively reduces soil surface evaporation and erosion.

**BETTER ESTABLISHMENT:**
Greater loft also provides greater air pore space and water-holding capacity to promote more complete seed germination and faster vegetation establishment.

**GREATER PRODUCTIVITY:**
Uniform mulch slurries stay in suspension longer resulting in fewer clogs, better shooting distance and more uniform coverage—you get more done in less time.

# A Close Look at Why Profile® Wood Mulch is Still Superior

| Profile® Wood - Thermally Refined® Wood Fibers | Atmospherically Refined Wood Fibers |
|---|---|
|  |  |

Fibers magnified 45 times by independent lab specializing in fiber analysis

Profile® Thermally Refined® wood fibers have dramatically more surface area which generates greater yield, interlock, loft and coverage, compared to coarser and shorter atmospherically refined fibers typically found in competitive wood mulches.

Wood mulch with tackifier includes 100% recycled wood fibers and tackifier for increased binding capabilities. Tackifier is a blend of polymers and polysaccharides.

## Profile Wood Mulch and Wood Mulch with Tackifier Technical Data

Functional Longevity: ≤ 3 months

**COMPOSITION**

**Wood Fiber Mulch:**
100% Thermally Refined® Virgin Wood Fibers

**Wood Fiber Mulch with Tackifier:**
97% Thermally Refined® Virgin Wood Fibers
3% Tackifier including High-Viscosity Colloidal Polysaccharides

**PACKAGING**

**Bags:** Net Weight – 50 lb (22.7 kg) UV- and weather-resistant plastic film

**Pallets:** 40 bags/pallet; 1 ton (907 kg)/pallet; Weather-proof stretch-wrapped with UV-resistant pallet cover

| SLOPE GRADIENT/CONDITION | APPLICATION RATE |
|---|---|
| ≤ 4H:1V | 2,000 lb/ac (2,240 kg/ha) |
| > 4H:1V and ≤ 3H:1V | 2,500 lb/ac (2,800 kg/ha) |
| Wood maximum slope length: | 20 ft (6.1 m) |
| Wood w/Tackifier maximum slope length: | 30 ft (9.1 m) |

- Application rates may vary depending on site-specific conditions. Visit **profilePS3.com** to determine the right rate for your project.
- You can also customize specifications or select products based on performance at **erosioncontrolspecs.com**.




*Made in Conover, North Carolina, USA*

**Other Hydraulic Mulch Products from Profile:**

- Wood/Cellulose Blend with Tackifier
- Wood/Cellulose Blend
- Cellulose with Tackifier
- Cellulose

**Profile has recycled over 3.5 billion pounds (15.9 billion kg) of wood and paper fibers through the production of Profile High Performance Mulches.**

Profile®
Solutions for your Environment™

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Profile and Thermally Refined are registered trademarks of PROFILE Products LLC. Solutions for your Environment is a trademark of PROFILE Products LLC.

DURA Veg™ Sustainable revegetation Fibre Matrix™



## DuraVeg® Fibre Matrix™

DuraVeg® Fibre Matrix™ is a fully biodegradable, Fibre Matrix™ (FM) composed of 100% recycled Thermally Refined® virgin wood fibres and tackifier. The FM is phytosanitised, free from plastic netting, and upon application forms an intimate bond with the soil surface to create a porous, absorbent and flexible erosion resistant blanket that allows for rapid germination and accelerated plant growth. DuraVeg Fibre Matrix is laboratory tested in Australia and exceeds Bonded Fibre Matrix requirements.

## SUPERIOR FIBRES MAKE ALL THE DIFFERENCE

DuraVeg utilises a patented Thermally Refined manufacturing process that introduces 100% recycled wood chips into steam heat within a high-temperature and high-pressure vessel to create long and highly absorbent fibres. These fibres are proven to provide:

### BETTER COVERAGE

*Seven bags of DuraVeg Fibre Matrix mulch provide as much coverage as 10 bags of competitive wood mulch.*

### BETTER PROTECTION

*Superior coverage and greater loft within the matrix effectively reduces soil surface evaporation and erosion.*

### BETTER ESTABLISHMENT

*Greater loft also provides greater air pore space and water-holding capacity to promote more complete seed germination and faster vegetation establishment.*

### GREATER PRODUCTIVITY

*Uniform mulch slurries stay in suspension longer resulting in fewer clogs, better shooting distance and more uniform coverage — you get more done in less time.*



DURAVEG® FIBRE MATRIX™ THERMALLY REFINED® WOOD FIBRES



ATMOSPHERICALLY REFINED WOOD FIBRES

**Fibres magnified 45 times by independent lab specialising in fibre analysis*

# *A Close Look at Why DuraVeg® Fibre Matrix™ is Superior*

DuraVeg® Fibre Matrix wood fibres have dramatically more surface area which generates greater yield, interlock, loft and coverage, compared to sugar cane, straw, paper and competitive wood mulches containing atmospherically refined fibres.

DuraVeg Fibre Matrix includes 100% recycled wood fibres and tackifier for increased binding capabilities. Tackifier is a blend of polymers and polysaccharides.

## DURAVEG FIBRE MATRIX TECHNICAL DATA:

**Functional Longevity: ≤ 6 months**

### COMPOSITION

97% Thermally Refined® Virgin Wood Fibres
3% Tackifier including High-Viscosity Colloidal Polysaccharides

### PACKAGING

**Bags:** Net Weight – 22.7 kg. UV and weather-resistant plastic film
**Pallets:** 40 bags/pallet; 908 kg/pallet; Weather-proof stretch-wrapped with UV-resistant pallet cover

| SLOPE BATTERS | APPLICATION RATE |
|---|---|
| *≤ 4H:1V* | *2,800 kg/ha* |
| *> 4H:1V and ≤ 3H:1V* | *3,500 kg/ha* |
| *> 3H:1V and ≤ 2H:1V* | *5,000 kg/ha* |
| *maximum slope length* | *20 m* |

Application rates may vary depending on site-specific conditions. Contact your local DuraVeg expert for help with determining the right rate for your project.

DURA Veg™
Sustainable revegetation

Profile®

High Performance Erosion Control

Flexterra® HP-FGM™







## Profile's 5 Fundamentals are the Foundation to Sustainable Vegetation

Establishing sustainable vegetation and receiving the earliest possible Notice of Termination (NOT) are the goals of every project. Profile's 5 Fundamentals are the surest way to get you there. Picking the right cover like Flexterra® HP-HGM™ is just one of the 5 steps.

### 1. Assess and Create Optimal Soil Conditions

Soil testing provides essential information to determine what adjustments, if any, need to be made to assure a more favorable growing environment for faster, more complete vegetative growth and sustainable establishment.

### 2. Pick the Right Plant Species

It is essential to select plant species that are adapted to all project parameters.

### 3. Select the Correct Erosion Control Material

The right cover protects both seed and soil, and facilitates growth. Flexterra HP-FGM is unsurpassed in delivering outstanding coverage.

### 4. Ensure Proper Installation

Products must be installed in accordance with all mixing and application guidelines to maximize their performance.

### 5. Follow-up Inspections and Maintenance Practices

Continual monitoring is the only way to ensure all site compliance issues are being addressed. Maintenance may be required to mitigate unexpected challenges.

**Profile provides valuable assistance for each of these Fundamentals 24/7—beginning with FREE soil testing. Visit profileps3.com.**

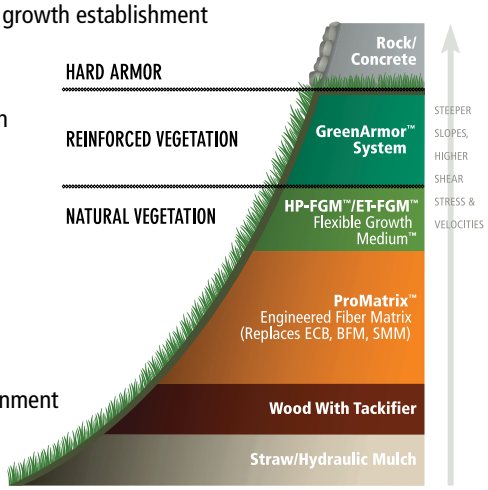
# FLEXTERRA® HP-FGM™

## Absolutely the Most Effective Erosion Control Medium Available

Flexterra® HP-FGM™ represents the next generation in Flexible Growth Media and is proven to surpass the original's outstanding performance. Fine grading and extensive soil preparation are unnecessary, allowing you to apply the product for immediate protection and superior performance at reduced overall costs.

**Flexterra HP-FGM Delivers:**

- The highest germination and growth establishment
- Greater than 99% erosion control effectiveness immediately upon application
- 100% biodegradability
- Greater safety for even the most sensitive aquatic environment because it's non-toxic
- Near-perfect erosion control and denser vegetation while protecting the natural environment



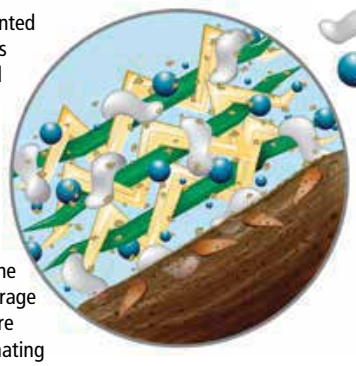

*Superior erosion control across Profile's spectrum of products ensures reliable, sustainable solutions for slopes, channels, shorelines, water management projects, pipeline restorations, waste and fly ash containment sites, landfills, fine turf areas and other environmentally sensitive sites.*

## Patented Technologies and Greener Components Deliver Unmatched Performance

Flexterra HP-FGM combines both chemical and mechanical bonding techniques to lock the engineered medium in place and promote accelerated germination with minimal soil loss. Greener from the inside out, here's what makes it work so well:

Revolutionary patented Micro-Pore particles optimize water and nutrient retention

100% recycled Thermally Refined® wood fibers produce the highest yield and coverage per unit weight, and are phyto-sanitized, eliminating weed seeds and pathogens



100% non-toxic biopolymers and water absorbents enhance erosion control resistance and growth establishment

100% biodegradable interlocking man-made fibers increase mechanical bonding of the matrix to provide immediate performance upon installation

## A Closer Look at Micro-Pore Particles and Thermally Refined® Wood Fibers



- Micro-Pore particles trap and hold moisture and nutrients, reduce soil surface evaporation and improve oxygen exchange, which all contribute to faster, more uniform vegetation establishment.
- Micro-Pore particles also increase erosion control effectiveness of the flexible growth medium, resulting in increased resistance to raindrop impact and sheet flow.



Fibers magnified 45 times by independent lab specializing in fiber analysis.

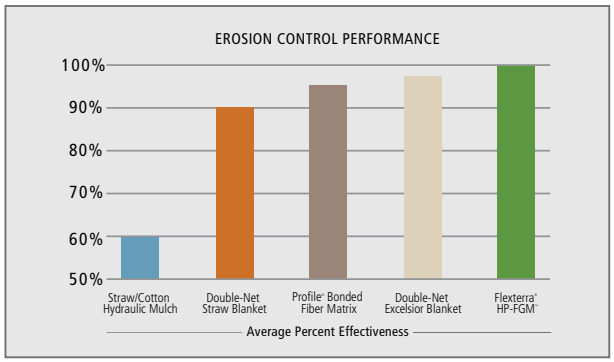


Inferior wood fibers magnified 45 times.

- 100% recycled wood chips are Thermally Refined® in a process that creates fine, long and highly absorbent fibers that deliver superior yield and coverage, and water-holding capacity.
- Competitive refining technologies develop inferior fibers. You need more bales to achieve the coverage of Profile's Thermally Refined wood fiber matrices. Additionally, claims that competitive mulches save or use less water during application just don't hold water.

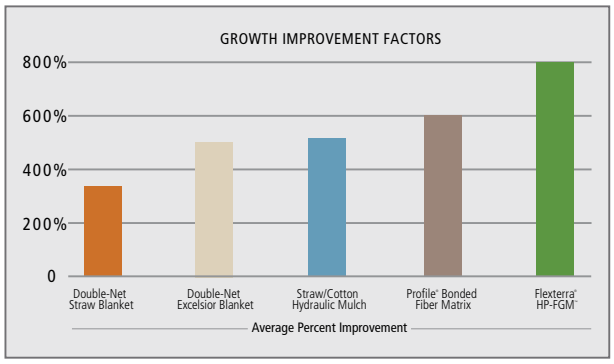
## Nothing Keeps More Soil On Site

Flexterra® HP-FGM™ has demonstrated nearly perfect erosion control performance — even on slopes as severe as 0.25H:1V. In addition to minimizing soil loss, the turbidity (NTU) of runoff is greatly reduced. In large scale testing, Flexterra HP-FGM reduced effluent turbidities of sandy loam soils to less than 100 NTU.




## Establishes Vegetation More Reliably

Quicker and complete establishment is the key to long-term erosion control. Compare Flexterra HP-FGM to the average values of other technologies as documented in published AASHTO-NTPEP reports and independent laboratory testing using standard test method ASTM D7322.

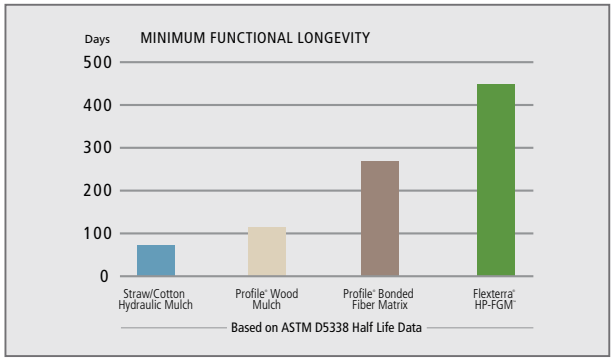



## The First Erosion Control Product to Offer Documented Functional Longevity

The ASTM D5338 protocol confirms Flexterra HP-FGM's observed functional longevity of up to 18 months. As illustrated in these test results, Flexterra HP-FGM is proven to last longer than other hydraulically applied erosion control products.

**Long-lasting Flexterra HP-FGM is designed to:**

- **Provide protection on bare soil over periods of dormancy;** assures that when more optimal growing conditions arrive, the seed and nutrients are still in place and in an environment conducive to germination and emergence.
- **Ensure sustainability of plants;** exceptional absorptive properties nurture vegetation to better withstand environmental stress.
- **Accommodate a broad range of vegetative species;** safeguards and helps to cultivate even the slowest developing species.



# Flexterra® HP-FGM™ Technical Data:

| | TEST METHOD | UNITS | MINIMUM VALUE |
|---|---|---|---|
| **PHYSICAL PROPERTIES*** | | | |
| Mass/Unit Area | ASTM D6566[1] | g/m² (oz/yd²) | 407 (12) |
| Thickness | ASTM D6525[1] | mm (in) | 5.6 (0.22) |
| Erosion Control Effectiveness | ASTM D6818[1] | N/m (lb/ft) | 131 (9) |
| Ground Cover | ASTM D6567[1] | % | 99 |
| Water-Holding Capacity | ASTM D7367 | % | 1700 |
| Material Color | Observed | n/a | Green |
| **ENVIRONMENTAL PROPERTIES*** | **TEST METHOD** | **UNITS** | **TYPICAL VALUE** |
| Biodegradability | ASTM D5338 | % | 100 |
| Functional Longevity[2] | ASTM D5338 | n/a | Up to 18 months |
| Ecotoxicity | EPA 2021.0 | % | 96-hr LC50 > 100% |
| Effluent Turbidity | Large Scale[3] | NTU | < 100 |
| **PERFORMANCE PROPERTIES*** | **TEST METHOD** | **UNITS** | **VALUE** |
| Cover Factor[4] | Large Scale[3] | n/a | < 0.01 |
| Percent Effectiveness[5] | Large Scale[3] | % | > 99 |
| Cure Time | Observed | hours | 0-2 |
| Vegetation Establishment | ASTM D7322[1] | % | > 800 |
| **PRODUCT COMPOSITION** | | | **TYPICAL VALUE** |
| Thermally Processed Wood Fibers[6] (within a pressurized vessel) | | | 80% ± 3% |
| Cross-Linked Biopolymers and Water Absorbents | | | 10% ± 1% |
| Crimped, Man-Made Biodegradable Interlocking Fibers | | | 5% ± 1% |
| Proprietary Mineral Activator | | | 5% ± 1% |

** When uniformly applied at a rate of 3500 lb/ac (3900 kg/ha) under laboratory conditions.*

1. *ASTM test methods developed for Rolled Erosion Control Products that have been modified to accommodate Hydraulic Erosion Control Products.*
2. *Functional Longevity is the estimated time period, based upon field observations, that a material can be anticipated to provide erosion control and agronomic benefits as influenced by composition, as well as site-specific conditions, including; but not limited to—temperature, moisture and light conditions, soils, biological activity, vegetative establishment and other environmental factors.*
3. *Large Scale testing conducted at Utah Water Research Laboratory. For specific testing information please contact a Profile technical service representative at 866-325-6262.*
4. *Cover Factor is calculated as soil loss ratio of treated surface versus an untreated control surface.*
5. *Percent Effectiveness = One minus Cover Factor multiplied by 100%.*
6. *Heated to a temperature greater than 193 degrees C (380 degrees F) for 5 minutes at a pressure greater than 345 kPa (50 psi) in order to be Thermally Refined®/Processed and to achieve phyto-sanitization.*

**GREEN DESIGN ENGINEERING™**
EARTH-FRIENDLY SOLUTIONS FOR SUSTAINABLE RESULTS™

Green Design Engineering™ is a holistic approach, combining environmentally beneficial design and ecologically sound products with agronomic and erosion control expertise, to provide the most effective, customized and cost-efficient solutions for erosion control and vegetative establishment.

PS³ PROFILE SOIL SOLUTIONS SOFTWARE

PS³, Profile's unique online project design and management software, is the best place to start applying The 5 Fundamentals™ to your next project. The process begins with a FREE soil test, and walks you through every Fundamental. It's the only program of its kind that integrates and compares a variety of manufacturers' products to your specific project parameters, and provides complete documentation including product specifications, installation guidelines, CAD details and other pertinent technical information. Get started by visiting **ProfilePS3.com**.



# THE WORLD'S MOST ADVANCED ENGINEERED SOIL MEDIA™

ProGanics™
BIOTIC SOIL MEDIA™

Profile®
Solutions for your Environment™

DURAVeg™
Sustainable revegetation

INTRODUCING

ProGanics™
BIOTIC SOIL MEDIA™

# THE MOST ADVANCED
# — ENGINEERED SOIL MEDIA™ —

## Designed as a topsoil alternative that brings depleted soils back to life!

Profile Products, the world leader in soil modification, erosion control and vegetation establishment has engineered a revolutionary product that is a soil growing media providing a proprietary combination of key soil building components.

## ProGanics™ Biotic Soil Media™ (BSM™)

is designed as an alternative to topsoil on challenging and difficult-to-access sites. ProGanics will accelerate development of depleted soils/substrates with low organic matter, low nutrient levels and limited biological activity. This Engineered Soil Media™ (ESM™) helps build soils to their fullest potential for vegetative establishment and more effective erosion control.

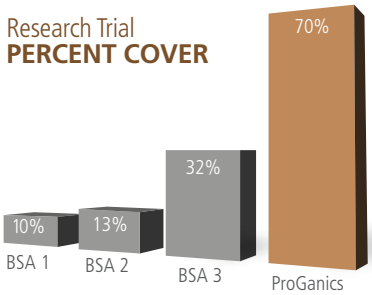




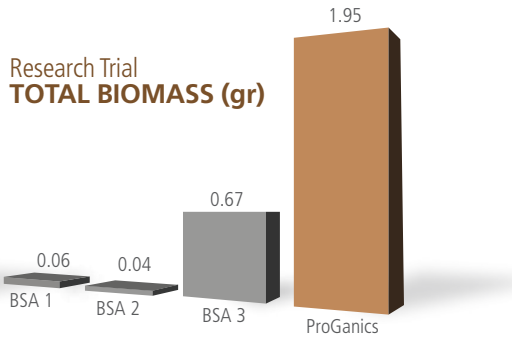


**PATENT PENDING.** ProGanics Biotic Soil Media is a combination of recycled Thermally Refined® bark and wood fibers with a proprietary blend of biopolymers, biochar, seaweed extract, humic acid, endomycorrhizae and other beneficial constituents. These components work synergistically to create a holistic solution to improve the agronomic potential in the rhizosphere. Unlike peat harvested from fragile wetlands, all components of the ProGanics Biotic Soil Media blend are naturally derived and renewable, and engineered to optimize moisture retention, growth and establishment of vegetation.

**ProGanics** outperformed leading Biotic Soil Amendment (BSA) products in replicated random block design greenhouse trials for Total Percent Cover and Total Biomass. No BSA performs like ProGanics BSM when it comes to establishing sustainable vegetation. Please contact Profile Technical Services for additional information on this study.



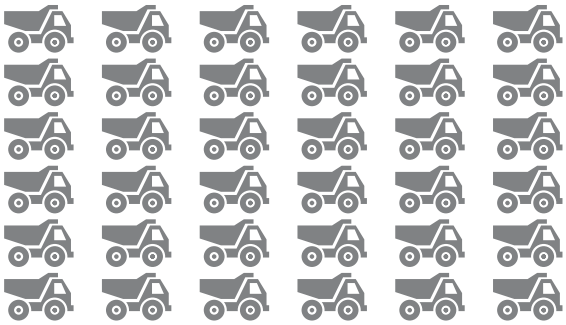

*The ProGanics plots achieved twice the cover of the next best BSA.*




*Biomass was three times greater in the ProGanics plots.*

# — GAME-CHANGING ADVANTAGES —

Many construction sites have depleted soils with low organic matter that require more than just fertilizer and other amendments to establish sustainable vegetation. Placing costly imported topsoil over depleted soils has historically been the preferred option to establish vegetation. Using ProGanics Biotic Soil Media in place of topsoil on challenging and difficult-to-access sites will not only save money and time, but will also provide a growing medium that helps establish vegetation.



**36** TRUCKS OF TOPSOIL*

= **2** TANKLOADS OF **PROGANICS***

3,500–5,000 lb/ac · 3,900–5,600 kg/ha

*Amount needed to cover 1 acre (0.4 ha) with 4 in (10 cm) of topsoil.

*3,000-gallon capacity hydroseeder.

## FREE SOIL TEST

Effective erosion control starts with soil testing to determine deficiencies and excesses which can result in diminished vegetation establishment. Regrettably, the majority of erosion control project designs fail to require soil testing. Fortunately, you can log on to **www.ProfilePS3.com** to access FREE soil tests and recommendations to improve soils, pick the right plant materials, select the right erosion control techniques, and calculate the amount and cost of material needed. There is also informative assistance on proper installation, inspection and maintenance of your site.

PS³ PROFILE SOIL SOLUTIONS SOFTWARE

## MILD TERRAIN





On flat to gentle terrain where erosion potential is lower, ProGanics can be applied with seed, fertilizer and soil amendments covered with a basic Profile® hydraulic mulch or erosion control blankets as recommended from your PS³ soil test and design analysis.

## CHALLENGING SITES





For steeper slopes or where erosion potential is greater, an application of ProMatrix™ EFM™ or Flexterra® HP-FGM™ over ProGanics will provide near perfect erosion control with increased functional longevity and growth establishment.



Quick and Easy Loading



Consistent Slurry



Smooth Shooting

ProGanics mixes quickly into a viscous, dark-brown slurry that is easy to apply and meter. The high-loading rate of 100 pounds per 100 gallons of water (45.4 kg / 379 L) means fewer tank loads per acre (hectare). And unlike many high load, low yield Biotic Soil Amendment products, ProGanics is designed to retain water for slurries that go down evenly and resist dewatering.

Profile® Solutions for your Environment™




ProGanics™ Biotic Soil Media™ (BSM™) is engineered to provide a balanced formulation of soil-building media that contributes to both rapid and sustained vegetation establishment while complementing performance of hydraulic and rolled erosion control products. Testing at the Utah Water Research Laboratory (UWRL) has shown that ProMatrix™ Engineered Fiber Matrix™ (EFM™) applied over ProGanics resulted in 99% erosion control effectiveness with greater germination and growth versus a leading Biotic Soil Amendment applied and tested under the same conditions.

The ProGanics patent-pending, non-toxic formulation has been innovated using time-proven components from the horticultural and erosion control industries. Key ingredients include:

- **Renewable Thermally Refined® Bark and Wood Fibers**—to provide organic matter, high moisture retention and maximum coverage; phyto-sanitized to eliminate weed seeds and pathogens
- **Biochar**—derived from pyrolysis of renewable wood sources (heating under high temperatures)—to create stable, porous particles that demonstrate a high Cation Exchange Capacity and a high ability to hold water and nutrients, while providing prime habitat for beneficial bacteria and fungi
- **Cross-Linked Polysaccharide Biopolymers**—to increase water-holding capacity, viscosity and bond strength of the media matrix
- **Proprietary Formulation of Fast-Acting and Sustained Release Soil Building Components Containing Seaweed Extract, Humic Acid and Endomycorrhizae**—have been proven under demanding conditions in a wide variety of environments

## RECOMMENDED APPLICATIONS

- Replacement of Costly or Difficult to Obtain Topsoil
- Replacement of Compost, Peat, Manure and Other Sources of Organic Material
- Development of Soils with Low Organic Matter (< 3%)
- Rapid Establishment and Sustained Growth of Vegetation
- Typically Installed Beneath HECPs and RECPs as Growing Media

**Typical Application Rates:**

| % Organic Matter | lb/ac | kg/ha |
|---|---|---|
| < 0.75 | 5,000 | 5,600 |
| 0.75 – 1.4 | 4,500 | 5,040 |
| 1.5 – 2 | 4,000 | 4,480 |
| 2.1 – ≥ 3 | 3,500 | 3,920 |

*Always conduct a soil test to determine agronomic needs. Soils with organic matter >3% typically do not require ProGanics. Depending on the test results, it is typically advisable to apply fertilizer, pH neutralizers and/or biostimulants with ProGanics.*

GREEN DESIGN ENGINEERING™
EARTH-FRIENDLY SOLUTIONS FOR SUSTAINABLE RESULTS™

Green Design Engineering™ is a holistic approach, combining environmentally beneficial design and ecologically sound products with agronomic and erosion control expertise, to provide the most effective, customized and cost-efficient solutions for erosion control and vegetative establishment.

PS³ PROFILE SOIL SOLUTIONS SOFTWARE

Put Green Design Engineering into action. PS³ is the industry's first and only web-based design and selection tool that integrates erosion and sediment control engineering with agronomic excellence. Log on to www.ProfilePS3.com to find the right solution for your site.

Profile® Solutions for your Environment™

DURA Veg™ Sustainable revegetation

Profile®
Solutions for your Environment™

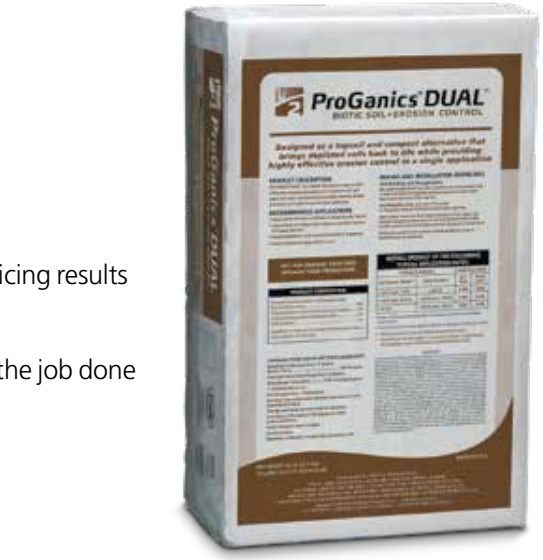
# Now You Can Get Biotic Soil Media™ with Erosion Control That Works.

NEW

## ProGanics® DUAL™
BIOTIC SOIL+EROSION CONTROL

## Get in, Get It Done and Move On

- New ProGanics DUAL is a hydraulically applied Biotic Erosion Control Matrix (BECM) that combines the soil-building properties of ProGanics® Biotic Soil Media™ (BSM™) with the erosion control performance of a Bonded Fiber Matrix (BFM)
- Accelerates development of depleted soils and vegetative establishment while simultaneously providing highly effective erosion protection in a consolidated, one-step application
- Best for sites with:
  - *Poor soil conditions, including low organic matter content*
  - *Low to moderate erosion potential (slopes up to 2H:1V)*
  - *Limited access where multiple applications add significant cost*
  - *Large projects where application efficiency is paramount*
- Reduces total number of tank loads and application time without sacrificing results
  - *Reduces project cost*
- Simplifies complex projects by reducing the number of products to get the job done
- Application rates can be adjusted for differences in site conditions
- Features the highest water-holding capacity and erosion control effectiveness of any "all-in-one" product
- High loading
  - *75 pounds per 100 gallons (34.1 kg/38 lbs) using machines with mechanical agitation and either gear or centrifugal pumps*





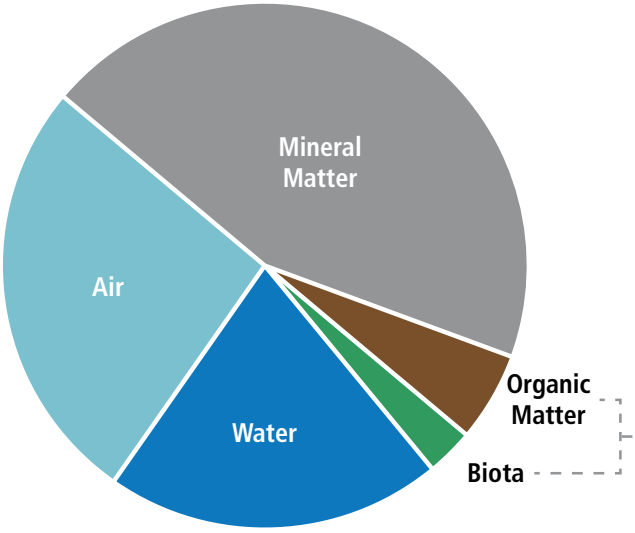


| APPLICATION RATES | | | |
|---|---|---|---|
| % Organic Matter[1] | Slope Gradient | English (lb/ac) | Metric (kg/ha) |
| < 5.0 and ≥ 1.5 | ≤ 4H:1V | 4,000 | 4,480 |
| < 1.5 and ≥ 0.75 | > 4H:1V and ≤ 3H:1V | 5,500 | 6,160 |
| < 0.75 | > 3H:1V and ≤ 2H:1V | 6,500 | 7,290 |

[1] *Based on Soil Test Results. Refer to Profile's Soil Testing and Interpretation Guide for more information.*

# Elements of Healthy Soil

In nature, sustainable vegetation is achieved through the biological process of organic matter breaking down in soil and delivering the nutrients plants need to grow — it's called nutrient cycling. Unfortunately, many erosion control and revegetation projects fail due to soils deficient in organic matter and biological activity.




- Microbes such as bacteria in the soil decompose organic material, making it readily available for plants to take up as nutrients
- Fungi feed on the carbon and carbohydrates plants release and in return they help deliver water and nutrients to plants
- With adequate nutrients and moisture available for uptake, plants flourish
- Healthy vegetation produces new organic material to sustain this nutrient cycle process

ProGanics' biological elements provide the spark and its organic materials are the fuel to ignite the nutrient cycle process to restore depleted soils back to health.

While the proprietary formula of ProGanics is setting the stage for accelerated vegetation establishment and sustainable growth, the renowned Profile® levels of erosion protection are provided in the same hydraulic application. Applied at 6,500 pounds per acre (7,280 kilograms per hectare), ProGanics DUAL delivers Bonded Fiber Matrix (BFM) level performance.

Once ProGanics DUAL is down on the ground, you can be confident the job's been done right and you can move to the next one.

**INGREDIENTS**

Thermally Processed (within a pressurized vessel)
Bark and Wood Fibers ..... 85%

Proprietary Blend of Soil Building Amendments and Tackifiers ..... 10%

Crimped, Biodegradable Interlocking Fibers Derived from Regenerated Plant Sources ..... 4%

Wetting Agents ..... 1%

**Beneficial Soil Bacteria Genus & Species:**
*Bacillus firmus* 250 cfu/gram

**Arbuscular Mycorrhizal Fungi Genus & Species*:**
*Rhizophagus*[1] *intraradices* ..... 0.066 propagules/gram

[1] *Formerly Glomus sp.*

One 50 pound (34.1 kg) bag = 22,680 grams

**Each bag may contain more microbes than shown in the guaranteed analysis.*

Profile® Solutions for your Environment™

DURA Veg™ Sustainable revegetation

DURA Veg®
Sustainable revegetation

# Environmentally Friendly Dust Control

DUST RX™ HYDRO

## For construction, transportation, and renewable energy development

## Benefits

- Maintains soil and vegetation health
- Environmentally friendly, 100% biodegradable and non-toxic
- Water Truck or Hydroseeder-applied formulation
- Water soluble
- Optimal bonding and elasticity when applied to fine materials
- Effective at high dilution rates

***Proven systems that reclaim and restore environments.***

**DustRX Hydro™** is specifically formulated for application using both watering trucks and hydroseeding equipment providing you a way to extend your season and offer more services. This USDA certified biobased product offers an environmentally friendly solution to fugitive dust control. Profile Products' soil health experts took an agronomic approach to create a dust-suppression formula that doesn't degrade soils, impede vegetation or introduce synthetic polymers to the environment. Furthermore, the formula was designed that the use of Dust RX Hydro minimises the challenges in the loading, mixing and application process.

**DustRX Hydro™** offers a dust suppression solution for for mining sites, construction sites, unpaved light-traffic roads, parking lots and recreational venues. Free of solvents and chlorides, DustRX Hydro is non-corrosive on hydroseeding equipment and water trucks.

**DustRX Hydro™** represents a groundbreaking, environmentally friendly dust control solution that is entirely biodegradable and engineered for utilisation in conventional water trucks and hydroseeders. The fine particles are coated with a proprietary agent that briefly delays the hydration process upon introduction into the water tank. This unique feature ensures that the product disperses uniformly in water before becoming a soluble, yielding a seamless, clump-free mixture ideal for a variety of dust control applications.



## Agronomic Solution

Setting out to develop a temporary solution to fugitive dust, Profile Products created an agronomically and environmentally responsible formulation. Unlike salt-based or synthetic polymer alternatives, DustRX Hydro does not degrade soil, adversely affect surrounding vegetation, or introduce synthetic polymers to the jobsite.

## Dust Suppression Performance

With greater functional longevity than traditional watering practices, the benefit of such a product is reduced water usage and fuel consumption on the jobsite. Further benefits to Dust Supression performance is cost savings on construction sites, maintenance roads, mining and energy development sites. DustRX Hydro is also a great solution for recreational venues, fair sites and equine arenas.

## Ease of Application

**DustRX Hydro™** is specifically formulated for use in water trucks and hydroseeders. Spray from the hydroseeder tower or hose without fear of clumping, fish-eyes or corrosive wear on equipment. Formulated with a temporary dye to gain visibility of your coverage when applying. These factors assist the applicator and ensure uniform coverage and avoid over-application inefficiencies. See where the products is applied – then watch the colour fade away and become a clear dust control solution as it dries.

Fugitive dust on jobsites can increase maintenance costs, decrease productivity and adversely affect the health of workers and the surrounding community. By controlling dust, contractors, mine, and transport operators can better meet environmental, regulatory and community requirements and reduce profit loss on projects.

| PHYSICAL CHARACTERISTICS | |
|---|---|
| **Toxicity** | Non-toxic |
| **Application Color** | Green on application; fades to clear |
| **Solubility** | Water soluble |
| **Compliance** | PM2.5 and PM10 compliant |

| PACKAGING AND SHIPPING DATA | |
|---|---|
| **Bag Weight** | 22.7 kg Bags; 40 bags per pallet |

| PHYSICAL DESCRIPTION | |
|---|---|
| **Moisture** | 6 – 11% |
| **pH** | 7.5% +/- 1% |

| APPLICATION RATE | |
|---|---|
| **112 kg/ha** | Dependent on soil composition and site condition |

| MIXING RATE | |
|---|---|
| **Hydroseeder Application** | 22.7 kg/ 3,790 litres of water |
| **Water Truck Application** | 22.7 kg/ 3,790 litres of water |

Profile®
Solutions for your Environment™

GreenArmor™ SYSTEM

A Revolutionary Green Alternative to Hard Armor

DURA Veg™
Sustainable revegetation



# EXTEND THE BOUNDARIES OF NATURAL VEGETATION

The GreenArmor™ System combines engineering and agronomic excellence to create the world's most effective Green Design Engineering™ alternative. The system begins with Futerra® TRM (Turf Reinforcement Mat) which provides a permanent, lofty and open matrix. It is then hydraulically infilled with Flexterra® HP-FGM™ (High Performance-Flexible Growth Medium™) to intimately bond soil and seeds while accelerating growth. This unique system protects against elevated levels of hydraulic lift and shear force while encouraging turf establishment and long-term root reinforcement—growing denser vegetation, faster, in areas where other TRMs have fallen short. This synergistic combination of cost effective technologies enables the GreenArmor System to provide unprecedented levels of design safety.

# QUICK, THICK AND LONG-TERM KEYS TO THE GREENARMOR SYSTEM




## 1) FUTERRA TRM PERMANENT PROTECTION

The resilient three-dimensional matrix of thermally fused nylon filaments creates the ideal anchor for root reinforcement. Because the lofty matrix consists of 95% open space, it readily accepts a hydraulic infill, captures soil and encourages vegetative growth. And unlike stitch-bonded TRM products combining loose fibers, threads and nets, Futerra TRMs resist crushing, unraveling and tearing during and long after installation. The durable, UV-stabilized Futerra TRM matrix offers unrivaled structural integrity.



## 2) FLEXTERRA HP-FGM IMMEDIATE PROTECTION/RAPID GROWTH

This hydraulically applied blanket provides immediate erosion control with no cure time required. Flexterra HP-FGM is designed with Thermally Refined® wood fibers, biodegradable crimped interlocking fibers and additives engineered to perform under extreme conditions, delivering > 99% erosion control effectiveness. When applied into a Futerra TRM, Flexterra HP forms an intimate bond with the matrix, seeds and soil. Holding 17 times its weight in water, the GreenArmor System doubles turf establishment rates of other TRMs.

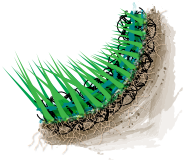


## 3) SYNERGISTIC SOLUTION UNMATCHED ROOT REINFORCEMENT

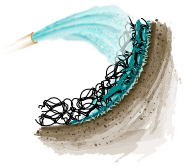
Combining today's most technologically advanced erosion control and revegetation products, the GreenArmor System is a superior way to reinforce turf. Futerra TRM is designed to maximize root reinforcement and stand up to high water velocity and shear conditions. Flexterra HP-FGM offers immediate protection while speeding growth establishment and root entanglement. Together these components provide up to ten times the erosion resistance of natural vegetation.

www.greenarmorsystem.com

### UNMATCHED FACTORS OF SAFETY
Providing immediate and lasting protection, the GreenArmor System exceeds safety factors of other TRMs at 1/3 to 1/2 the cost of hard armor.



### TWICE AS FAST!
Holding 17 times its weight in water, the GreenArmor System doubles turf establishment rates of other TRMs.



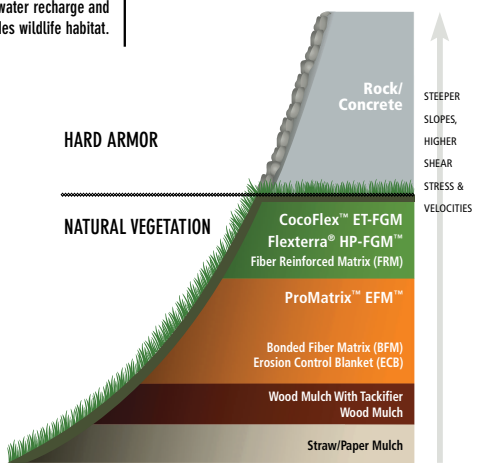
### HYDRAULICALLY INFILLED
Flexterra HP-FGM is sprayed into the Futerra® TRM matrix to provide immediate erosion control.

### STRUCTURAL INTEGRITY
Designed with durable, UV-stabilized, thermally fused nylon filaments, Futerra TRM will not unravel, crush or tear.

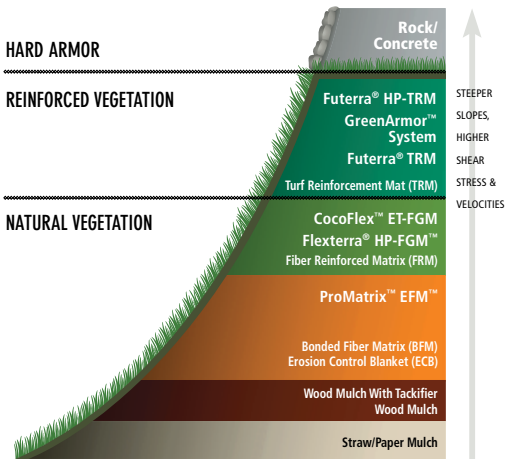
### HIGHER-DENSITY TURF
With 95% open space, Futerra TRM assures thicker turf establishment and enhanced root reinforcement.

### 99% EFFECTIVE
Upon installation, the GreenArmor System delivers superior erosion control on slopes and in channels.

### ENVIRONMENTALLY SUPERIOR
More aesthetically pleasing—vegetation filters pollutants and cools runoff, promotes groundwater recharge and provides wildlife habitat.




Prior to the introduction of turf reinforcement systems, hard armor was used exclusively to accommodate sites where velocities of 6-8 ft/sec (1.8-2.4 m/sec) and shear stresses over 2-3 lb/ft² (95-143 N/m²) exceeded the limits of natural vegetation.




Today, the fully vegetated GreenArmor R45 can protect against velocities as high as 30 ft/sec (9.1 m/sec) and shear stresses up to 20 lb/ft² (958 N/m²).

# REVOLUTIONARY SYSTEM—
## UNPRECEDENTED RESULTS

Designers need to know TRM performance limits in vegetated and unvegetated conditions. The GreenArmor™ System has been comprehensively evaluated at the world renowned Colorado State University (CSU) Hydraulics Laboratory. All testing was conducted according to ASTM D6460-12 protocol—"Determination of Rolled Erosion Control Product (RECP) Performance in Protecting Earthen Channels from Stormwater-Induced Erosion."



## VEGETATED RESULTS:

The GreenArmor 7020 System has been scrutinized for its performance with both cool season (Kentucky Bluegrass) and warm season (Bermuda Grass) species. Both species were seeded and established in portable planter boxes that were placed into a hydraulic flume at a fixed slope of 50 percent (2:1 H:V). The reinforced vegetation was then subjected to a series of increasing water discharge rates.

Close monitoring of the severe conditions proved the reinforced warm and cool season grasses resisted extreme flow velocities and shear stresses—a testimony to the strength, dimensional stability and true root reinforcement provided by the GreenArmor System. Further, High Performance GreenArmor R45 was evaluated with Bluegrass under the same conditions and demonstrated even higher levels of performance.



Image taken during testing at Colorado State University.



View of the GreenArmor System, demonstrating extensive root development within and below the reinforcing matrix.

| Vegetated Product | Critical Shear Stress | Critical Velocity |
|---|---|---|
| GreenArmor™ System 7020 | 17.0 lb/ft² (814 N/m²) | 20 ft/sec (6.1 m/sec) |
| GreenArmor™ System R45 | 20.0 lb/ft² (958 N/m²) | 30 ft/sec (9.1 m/sec) |

## UNVEGETATED RESULTS:

The objective of unvegetated testing is to measure the ability of an RECP to resist soil erosion prior to vegetative establishment. The unvegetated GreenArmor System was installed within an indoor flume above a one-foot thick soil layer and subjected to increasing flow discharges.

This research demonstrated the unique properties of Flexterra® HP-FGM™ to physically bond to the soil surface and create a barrier to overland flow; resisting soil erosion and holding seeds in place. The GreenArmor 7020 System produced the highest unvegetated critical shear stress and velocity ratings reported in the industry—easily outperforming other TRM products.



Image taken during testing at Colorado State University.



Post-test endurance results concluded that unvegetated GreenArmor 7020 exhibited a critical shear stress of 5.8 lb/ft² (276 N/m²).

| Unvegetated Product | Critical Shear Stress | Critical Velocity |
|---|---|---|
| GreenArmor™ System 7010 | 3.3 lb/ft² (158 N/m²) | 12 ft/sec (3.7 m/sec) |
| GreenArmor™ System 7020 | 5.8 lb/ft² (276 N/m²) | 16 ft/sec (4.9 m/sec) |

# *Profile® Soil Solutions Software (PS3)*

USE THE PS3 ONLINE TOOL

## *The industry's online product comparison and selection tool + free soil test*

Profile® Soil Solutions Software (PS3) is a single, comprehensive source for designing and selecting the right products to address both the physical and chemical properties of soil and site characteristics. It helps the development of holistic, sustainable solutions for cost-effective erosion control, vegetation establishment and subsequent reductions in sediment and other pollutants from leaving disturbed sites and entering water bodies.

It also provides access to complete documentation, including product specifications, installation guidelines, CAD details and other pertinent technical information. It's available 24/7, offering design, diagnostics, explanations and guidance in creating sustainable erosion and sediment control solutions.

PS3 PROFILE SOIL SOLUTIONS SOFTWARE

### *PS3 Addresses the Five Fundamentals of Immediate and Long-Term Vegetation:*

Use the PS3 Tool, free of charge, today at www.profilePS3.com

# *Erosion Control Specs Builder*

USE THE EROSION CONTROL SPECS BUILDER ONLINE

## *Custom Erosion Control and Revegetation Specifications made easy. Always the most up-to-date specs in just minutes.*

Whether you need Hydraulically applied Erosion Control Products (HECPs), topsoil/compost alternative or soil amendment specifications, Erosion Control Specs has the most up-to-date and customizable specifications available in this free and intuitive site.

Get started by selecting the "Build Now" button below and follow the step-by-step prompts to build your perfect erosion control/revegetation product specification packages. When you're finished, you'll have instant access to your complete documentation in an editable Word file.


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Veg™
Sustainable revegetation

DURA Veg™
Sustainable revegetation


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DURAVEG® FIBRE MATRIX™ THERMALLY REFINED® WOOD FIBRES



ATMOSPHERICALLY REFINED WOOD FIBRES

**Fibres magnified 45 times by independent lab specialising in fibre analysis*

# *A Close Look at Why DuraVeg® Fibre Matrix™ is Superior*

DuraVeg® Fibre Matrix wood fibres have dramatically more surface area which generates greater yield, interlock, loft and coverage, compared to sugar cane, straw, paper and competitive wood mulches containing atmospherically refined fibres.

DuraVeg Fibre Matrix includes 100% recycled wood fibres and tackifier for increased binding capabilities. Tackifier is a blend of polymers and polysaccharides.

## DURAVEG FIBRE MATRIX TECHNICAL DATA:

**Functional Longevity: ≤ 6 months**

### COMPOSITION

97% Thermally Refined® Virgin Wood Fibres
3% Tackifier including High-Viscosity Colloidal Polysaccharides

### PACKAGING

**Bags:** Net Weight – 22.7 kg. UV and weather-resistant plastic film
**Pallets:** 40 bags/pallet; 908 kg/pallet; Weather-proof stretch-wrapped with UV-resistant pallet cover

| SLOPE BATTERS | APPLICATION RATE |
|---|---|
| *≤ 4H:1V* | *2,800 kg/ha* |
| *> 4H:1V and ≤ 3H:1V* | *3,500 kg/ha* |
| *> 3H:1V and ≤ 2H:1V* | *5,000 kg/ha* |
| *maximum slope length* | *20 m* |

Application rates may vary depending on site-specific conditions. Contact your local DuraVeg expert for help with determining the right rate for your project.