

High Performance Erosion Control

Flexterra® HP-FGM™

Profile





Green Design Engineering™

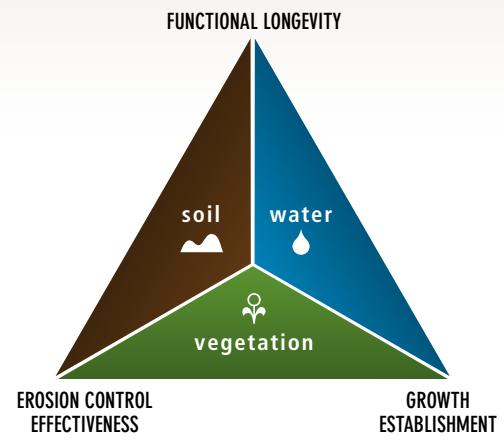


**GREEN DESIGN
ENGINEERING™**

EARTH-FRIENDLY SOLUTIONS
FOR SUSTAINABLE RESULTS™

GREEN DESIGN ENGINEERING™ AT ITS FINEST

Flexterra® HP-FGM™ represents the pinnacle of Profile's Green Design Engineering™, a holistic approach combining agronomic and engineering expertise to produce a broad array of cost-effective and earth-friendly solutions. Illustrated to the right is Profile's Green Design Triangle, a fundamental component of Green Design Engineering that integrates the three primary natural variables: soil, water and vegetation—with the three pillars of product performance—erosion control effectiveness, growth establishment and functional longevity. To obtain an optimal solution of sustainable vegetation, designers must account for these natural variables while selecting products with the proper balance of performance characteristics to achieve project success, particularly when confronted with harsh soil conditions and severe slopes.





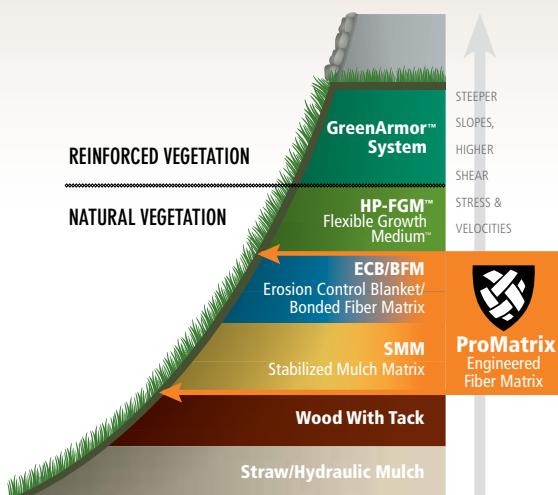
Flexterra® HP-FGM™: The pinnacle of Profile's Green Design Engineering™

Patented Flexterra® High Performance-Flexible Growth Medium™ (HP-FGM™) represents the next generation in Flexible Growth Media—proven to surpass *all* hydraulically applied mulch products and rolled erosion control blankets:

- Immediately effective upon application—bonds directly to soil
- Superior erosion control—99% effective at multiple large-scale testing laboratories
- Less soil preparation, faster lay down and lower installed cost than rolled blankets
- Faster vegetative establishment and greater biomass production than *any* rolled blanket or hydraulically applied mulch available
- Minimizes soil loss and turbidity of effluent runoff

Flexterra HP-FGM has also proven to be more environmentally friendly:

- 100% recycled wood fibers
- Phyto-sanitized wood fibers eliminate weed seeds and pathogens
- 100% biodegradable man-made fibers
- Naturally derived biopolymers
- Non-toxic components
- No nettings, threads or staples to endanger wildlife



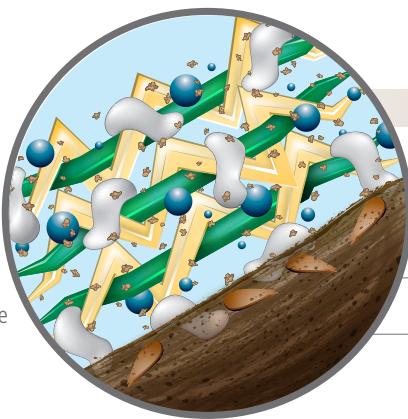
Green Design Engineering™ delivers superior erosion control across our spectrum of products, producing reliable, sustainable solutions for slopes, channels, shorelines, water management projects, pipeline restorations, waste and fly ash containment sites, landfills, fine turf areas and other environmentally sensitive sites. By ensuring more successful erosion control through faster and denser vegetation establishment, Green Design Engineering also helps you achieve the highest return on investment:

- Affordably achieve and maintain environmental compliance
- Meet current and proposed EPA protocols to ensure safety of aquatic and terrestrial life
- Eliminate callbacks and "do-overs" due to insufficient erosion protection or "grow in"
- Contribute to LEED credits

Patented technologies and greener components deliver unmatched performance

Patented new technologies developed through Green Design Engineering™ combined with the patented composition of original Flexterra, are what make Flexterra® HP-FGM™ stand apart from the crowd. 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:

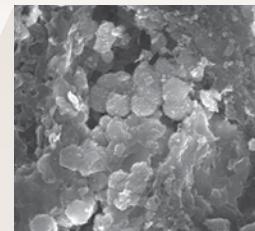
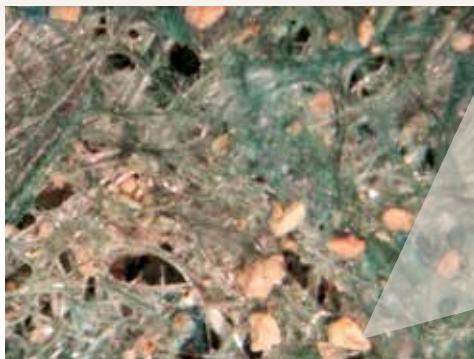
-  New, revolutionary patented "Micro-Pore" particles optimize water and nutrient retention while contributing to increased erosion control effectiveness
-  100% recycled Thermally Refined® wood fibers not only produce the highest yield and coverage per unit weight applied, they are also phyto-sanitized, eliminating weed seeds and pathogens
-  100% biodegradable interlocking man-made fibers help increase erosion control effectiveness and minimize curing time
-  100% non-toxic biopolymers and water absorbents further enhance overall performance



	HP-FGM™
EROSION CONTROL EFFECTIVENESS (%)	≥ 99
GROWTH ESTABLISHMENT (% IMPROVEMENT)	800
LONGEVITY (MONTHS)	≤ 18

> Micro-Pore Technology

PATENTED, REVOLUTIONARY MICRO-PORE TECHNOLOGY INCREASES STRENGTH AND ESTABLISHMENT



Micro-Pore particle magnified 500 times. Each particle traps and holds moisture and nutrients, reduces soil surface evaporation and improves oxygen exchange, all of which contribute to faster, more uniform vegetation establishment.

Micro-Pore particles increase erosion control effectiveness of the flexible growth medium, yielding increased resistance to raindrop impact and sheet flow.

Proven to outperform in any application

Flexterra® HP-FGM™ delivers a nearly perfect balance between three fundamental pillars of performance—erosion control effectiveness, growth establishment and functional longevity—to create the highest performing hydraulically applied medium on the market today.



Highway Projects



Golf Course Construction



Commercial and Residential Development



Oil and Gas Restoration



Mine and Fire Reclamation



Waterways



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

THERMALLY REFINED® WOOD FIBERS— SUPERIOR FIBERS DELIVER SUPERIOR RESULTS

Profile starts with 100% recycled wood chips that are Thermally Refined® in a process that creates fine, long and highly absorbent fibers. These engineered fibers are the source for Profile's superior:

- Yield and coverage
- Water-holding capacity
- Growth establishment
- Erosion control effectiveness

> **Thermally
Refined®
Wood Fibers**



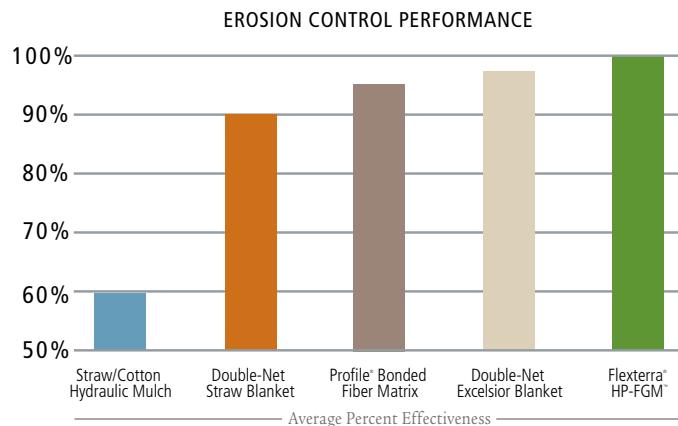
Inferior wood fiber magnified 45 times.

THERMALLY REFINED WOOD FIBERS VS. ALTERNATIVE HYDRAULIC MULCHES

Competitive refining technologies develop inferior fibers that deliver less yield, coverage and water-holding capacity. You need more bales to achieve the coverage and performance of Profile's Thermally Refined wood fiber matrices. Unlike competitive mulches, our fibers also maintain their water-holding ability, enabling them to enhance germination and growth establishment. Claims by competitive mulches that 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. It immediately bonds to the soil surface, and has proven to be greater than 99% effective upon curing. Its flexible, yet stable matrix features greater erosion control effectiveness, yielding increased sheet flow resistance. 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.



> Soil Loss



Straw/Cotton Hydraulic Mulch
75,520 lb soil loss/ac
(84,647 kg soil loss/ha)



Double-Net Straw Blanket
18,025 lb soil loss/ac
(20,203 kg soil loss/ha)



Bonded Fiber Matrix
8,935 lb soil loss/ac
(10,015 kg soil loss/ha)



Double-Net Excelsior Blanket
6,050 lb soil loss/ac
(6,781 kg soil loss/ha)



Flexterra® HP-FGM™
173 lb soil loss/ac
(194 kg soil loss/ha)

Testing conducted at the Utah Water Research Laboratory at a rate of 5 inches of rain per hour on a 2.5H:1V slope with a sandy loam soil.



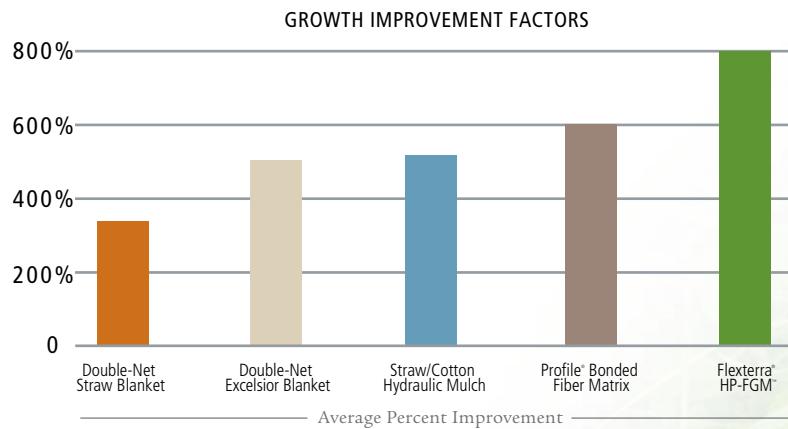
FLEXTERRA® HP-FGM™ REQUIRES MINIMAL SOIL PREPARATION VS. ROLLED BLANKETS

Why incur the cost of smoothing your slopes for erosion control blankets that are prone to bridging and voiding? Experts recognize that rough seedbeds demonstrate lower erosion potential and their undulations retain seed and moisture for growth. With Flexterra® HP-FGM™ 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 can be applied quickly—even under wet conditions—using less labor and minimizing safety and access concerns. Get the job done and move on to the next one with fewer rainouts.

Nothing establishes vegetation more reliably

Flexterra's high-performance matrix outperforms all other erosion control products through a combination of optimized water/nutrient retention and enhanced growth environment. The loft of the HP-FGM™ matrix creates air space, which not only captures more moisture to improve seedling emergence, it also improves the oxygen exchange necessary for robust plant development. Patented Micro-Pore Technology gives the matrix additional water and nutrient retention properties, which results in superior vegetation establishment as documented in independent testing.

Establishing vegetation quickly and completely is the key to long-term erosion control. Compare Flexterra® HP-FGM™ to the average values of common technologies as documented in published AASHTO-NTPEP reports and independent laboratory testing using standard test method ASTM D7322.



> ProPlus® Solutions



WHEN YOU NEED ADVANCED AGRONOMIC SOLUTIONS

Soil is the foundation of sustainable vegetation. Profile's agronomic experts have engineered a diverse line of unique ProPlus® Prescriptive Agronomic Formulations (PAFs) designed to take erosion control effectiveness to the highest levels possible. Each PAF product addresses specific soil challenges in order to provide optimal growing conditions and help achieve denser vegetative cover more quickly:

- Enhance soil structure
- Increase soil moisture infiltration and retention
- Improve nutrient uptake by plants
- Stimulate germination and growth

SOIL NEUTRALIZERS

NeutraLime™ and **Aqua-pHix™** neutralize acidic and alkaline soils, respectively, to promote more complete germination and establish sustainable vegetation, faster. Balancing soil pH ensures more efficient nutrient uptake and minimizes fertilizer runoff and leaching.

GROWTH STIMULANTS

To establish vegetation faster with long-term effectiveness on challenging soils that lack organic matter and beneficial biotic microorganisms, Profile® offers **JumpStart™** and **BioPrime™**. Both are proven to deliver improved germination, increased root mass and better plant vitality.

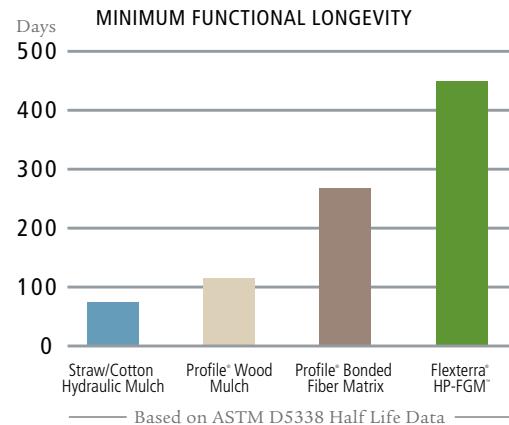
Flexterra® HP-FGM™ is the first erosion control product to offer documented functional longevity based upon ASTM D5338 protocol

Functional longevity is a term describing how long an erosion control material is predicted to provide desired performance attributes. Actual functional longevity is determined by a material's physical composition as well as site-specific conditions such as temperature, moisture, sunlight, soil composition, biological activity and other environmental factors.

The ASTM D5338 protocol confirms Flexterra® HP-FGM's observed functional longevity of up to 18 months. As illustrated in the test results presented below, 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, such as winter or extended dry periods, when seed germination is not possible; yet soil erosion and seed washout can occur from snow melt and runoff.
 - > Flexterra HP-FGM 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
 - > Emerging seedlings need moisture and nutrients near the surface. The exceptional absorptive properties of Flexterra HP-FGM nurture vegetation to better withstand environmental stress.
- Accommodate a broad range of vegetative species
 - > Seed from native and forage grasses, fine turf, shrubs, forbs and other types of vegetation have different germination and establishment requirements. Flexterra HP-FGM protects and helps to cultivate even the slowest developing species.



YOUR SINGLE SOURCE FOR SUSTAINABLE, SITE-SPECIFIC SOLUTIONS

As the industry's first and only web-based design and selection tool, Profile Soil Solutions Software (PS³) integrates erosion and sediment control engineering with agronomic excellence. It addresses both the physical and chemical properties of soil and site characteristics to help you develop holistic, sustainable and environmentally friendly solutions. PS³:

- Facilitates soil testing and offers agronomic recommendations to ensure effective growth establishment
- Integrates slope and channel erosion design methodology using universally accepted protocols
- Provides access to complete documentation, including product specifications, installation guidelines, CAD details and other pertinent technical information
- Offers 24/7 availability, with access to design, diagnostics, explanations and guidance in creating sustainable erosion and sediment control solutions

> PS³ Online Tool



Log on to www.profileps3.com for convenient, comprehensive assistance.

Site available in English and Spanish languages as well as English and metric units.

Flexterra® HP-FGM™ leaves nothing but a better environment behind

A result of Profile's Green Design Engineering™ Flexterra® HP-FGM™ not only leads to sustainable vegetation, it enhances the natural environment. Flexterra HP-FGM:

- Is 100% biodegradable as verified by ASTM Test Method D5338
- Uses 100% recycled (verified via ISO 14021), phyto-sanitized and sterilized wood fibers which are heated to 380° F (193° C) during Thermally Refined® processing, making them weed and pathogen free
- Is non-toxic to aquatic and terrestrial life forms as verified via EPA 2021.0 protocol
- Contains no excessive heavy metals as verified by US EPA Standard Methods 18th Edition
- Exhibits effluent runoff turbidity values less than 100 NTU, well below proposed EPA Effluent Limitation Guidelines (ELGs)
- Has no nets or threads to endanger wildlife and disrupt maintenance activities, a common hazard with many rolled erosion control blankets

SAFETY IN NUMBERS

FLEXTERRA HP-FGM	ENVIRONMENTAL PROPERTIES	TEST METHOD	UNITS	TYPICAL VALUE
	ECOTOXICITY	EPA 2021.0	%	96-hr LC50 > 100%
	EFFLUENT TURBIDITY	Large Scale Rainfall Testing	NTU	100
	Biodegradability	ASTM D5338	%	100

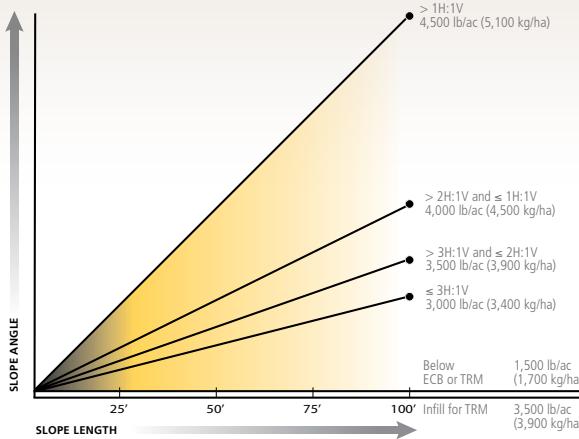
FLEXTERRA® HP-FGM™: THE GOLD STANDARD

Flexterra® HP-FGM™ is a fully biodegradable, hydraulically applied, flexible erosion control blanket composed of 100% recycled and Thermally Refined® wood fibers, crimped interlocking man-made biodegradable fibers, micro-pore granules, naturally derived cross-linked biopolymers and water absorbents. Flexterra HP-FGM is phyto-sanitized, free from plastic netting, requires no curing period and upon application, forms an intimate bond with the soil surface to create a continuous, porous, absorbent and flexible erosion resistant blanket that allows for rapid germination and accelerated plant growth.

HP-FGM shall have a documented erosion control effectiveness rating of 99% (via approved large-scale testing laboratory), an 800% growth improvement factor (via ASTM D7322), exhibit functional longevity of 12-18 months (via ASTM D5338) and as observed under field conditions as well as conform to other performance and physical property values as listed in the Flexterra HP-FGM CSI formatted specification. This document is readily downloadable at www.profileproducts.com.



APPLICATION RATES BY SLOPE GRADIENT



INSTALLATION INSTRUCTIONS

Strictly comply with manufacturer's installation instructions and recommendations. Use approved hydro-spraying machines with fan-type nozzle (50-degree tip). To achieve optimum soil surface coverage, apply HP-FGM™ from opposing directions to soil surface.

STEP ONE

Apply seed, fertilizer and other soil amendments with small amount of Flexterra® HP-FGM for visual metering.

STEP TWO

Mix 50 lb (22.7 kg) of HP-FGM per 125 gal (475 L) of water; confirm loading rates with equipment manufacturer.

BAGS

Net Weight—50 lb (22.7 kg), UV-resistant plastic film.

PALLETS

Weatherproof, stretch-wrapped with UV-resistant pallet cover, 40 bags/pallet, 1 ton/pallet (0.91 tonnes/pallet).

For more details, visit: www.profileproducts.com

Delivering greater value, project after project

A global leader in erosion control and revegetation science, PROFILE Products LLC provides our customers with cost effective and sustainable solutions using environmentally friendly products. We are the preeminent manufacturer and supplier of hydraulically applied erosion control technologies, rolled erosion control blankets, turf reinforcement mats, and vegetation establishment products.

Many of today's industry standards were innovations developed and introduced by Profile incorporating Green Design Engineering™, our holistic approach that combines environmentally beneficial project design with products that are ecologically responsible. We endeavor to provide measurable value to our customers through our team of consulting professionals, innovative products, aggressive research and development, industry support, and delivery of educational resources.



For technical information or distribution, please call (800) 508-8681. For customer service, call (800) 366-1180.
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U.S. Patent #'s: 5,942,029; 5,779,782; 5,741,832; 6,360,478; 7,752,804

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