



Flexible Growth Medium™ (FGM™)
The Standard of Excellence for Erosion Control and Revegetation

Flexterra FGM™



Your Trusted Partner In Soil Solutions 



**FLEXTERRA FGM
APPLICATION AND RAPID RESULTS
HIGHWAY PROJECT**

Comprehensive, Customized Solutions for Your Site

Profile Erosion Control Solutions (PECS™) combines the industry's most comprehensive assortment of erosion and sediment control technologies and innovative Green Design Engineering™ to help you maximize erosion control and vegetation establishment on slopes, channels, shorelines, fine turf areas and environmentally sensitive sites. Our dedicated team of erosion and sediment control experts will work with you to create and implement a complete solution, utilizing a range of proven Profile products.



Superior Technology, Exceptional Performance

Introduced in 2004, Flexterra® Flexible Growth Medium™ (FGM™) has rapidly set a new standard of excellence for controlling erosion and establishing vegetation on slopes. Flexterra FGM is designed using patented technology that immediately bonds to the soil, providing slope protection superior to rolled Erosion Control Blankets (ECBs) and Bonded Fiber Matrix (BFM) products—with the speed and cost savings of hydraulic seeding. It can be applied using mechanically agitated hydraulic seeding equipment over uneven terrain and rough seedbeds.

Flexterra FGM has demonstrated unprecedented performance levels when evaluated by the most prominent slope erosion testing laboratories in North America, as well as in a broad range of field applications.

It is proven:

- Effective upon application—bonds directly to the soil
- Superior erosion control—99% effectiveness (near perfection) at all major testing laboratories
- Fastest turf establishment—grows vegetation eight times faster than bare soil and twice as fast as rolled blankets
- Faster lay down and lower installed costs than rolled blankets
- Less soil preparation required versus rolled blankets
- Wildlife safe—no messy nets, threads or staples to entangle wildlife or mowing equipment

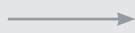
IN THE GROUND



PECS IS A UNIQUE, FULLY INTEGRATED APPROACH TO YOUR SITE, INCLUDING:

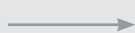
Agronomic solutions that promote rapid seed germination and long-term vegetation establishment.

ON THE GROUND



Innovative products that prevent erosion on slopes, channels, shorelines, streambanks and wetlands while minimizing risk to the environment.

BY YOUR SIDE



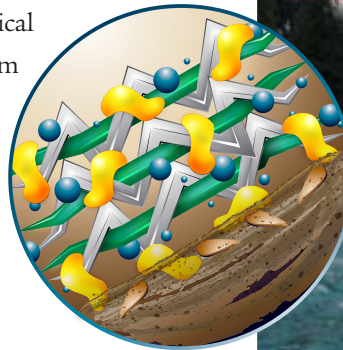
Green Design Engineering ensures unfailing support from agronomic and erosion control experts, to help select and install the right products for maximum results.

Delivers Unmatched Erosion Control and Turf Establishment

INNOVATIVE TECHNOLOGY YOU CAN COUNT ON

Flexterra® FGM™ uses patented technology, combining both chemical and mechanical bonding techniques to lock the engineered medium in place. Thermally Refined® wood fibers, crimped man-made fibers and performance-enhancing additives form a lofty, interlocking matrix that creates air space and water-absorbing cavities that accelerate germination, reduce the impact of raindrop energy and minimize soil loss.

Superior chemistry enables the matrix to handle higher rates of surface flow energy from heavy rains—upon application. Water-resistant tackifiers and flocculants chemically bond the matrix to the soil surface, absorbing water and enabling superior vegetation establishment. Maximum effectiveness is achieved when the matrix dries and has thoroughly cured. For jobs requiring a longer-lasting solution, Profile has taken this advanced chemistry even further by creating CocoFlex™ Extended Term-Flexible Growth Medium™ (ET-FGM), offering up to 24 months of protection.



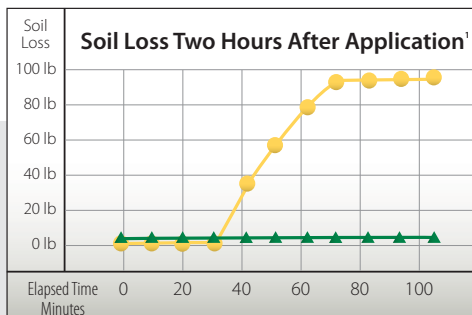
- Wood Fibers
- Co-Polymer Gel
- Interlocking Fibers
- Crosslinking Hydro-Colloid Tackifier



PROVEN 99% EFFECTIVE

Flexterra has demonstrated nearly perfect performance levels, proving to be 98% effective within two hours of application and 99% effective upon curing. This advanced technology has been tested under a range of conditions by the most prominent large-scale slope erosion testing laboratories in North America as demonstrated below:

Erosion Control Effectiveness after Curing



TESTING FACILITY	UWRL ¹	SDSU/SERL ²	TTI ³	TRI ⁴
Test Method	Lab Protocol ¹	Lab Protocol ²	Lab Protocol ³	ASTM D6459 ⁴
Application Rate	3,000 lb/ac	3,500 lb/ac	3,500 lb/ac	3,500 lb/ac
Test Conditions ⁵ :				
Slope Gradient	2.5H:1V	2H:1V	2H:1V	3H:1V
Soil Type	sandy loam	clayey sand	sandy loam	sandy loam
Test Duration	1 hr	3 successive 1.8 hr	3 successive 1/2 hr	3 successive 1/3 hr
Rainfall Rate	5 in/hr	1.9 in/hr	3.5 in/hr	2, 4, 6 in/hr
Cover or "C" Factor ⁶	0.0004	0.0001	0.0026	0.01
% Effectiveness ⁶	99.96%	99.99%	99.74%	99%



1. Tested application rate was 3,000 lbs per acre at a 10-year storm event (1.3 inches/hour) at San Diego State University Soil Erosion Research Laboratory (SDSU/SERL).

1. UWRL—Utah Water Research Laboratory—Lab protocol developed over 20 years of rainfall simulation testing.

2. SDSU/SERL—San Diego State University/Soil Erosion Research Laboratory—Testing simulated three successive 50-year storm events in Los Angeles Basin.

3. TTI—Texas Transportation Institute—Hydraulics, Sedimentation and Erosion Control Laboratory under auspices of Texas DOT.

4. TRI—TRI/Environmental, Inc.—Standard Test Method for Determination of Rolled Erosion Control Product (RECP) Performance in Protecting Hill Slopes from Rainfall Erosion"

5. Testing conducted on fully cured matrix.

6. Cover or "C" Factor determined from comparison of treated slope vs. bare slope condition. The "C" Factor is the component of the Modified Universal Soil Loss Equation (MULSE) that measures the erosion control effectiveness of a product. % Effectiveness = One minus "C" Factor times 100%.



NO NEED TO SMOOTH GRADE STEEP SLOPES WITH FLEXTERRA® FGM™

Why incur the cost of smoothing your slopes for erosion control blankets that are prone to bridging and voiding? Experts recognize that rough seedbeds show lower erosion potential and their undulations retain

seed and moisture for future growth. With Flexterra FGM, fine grading and extensive soil preparation are unnecessary, allowing you to apply the product for immediate protection and superior performance at a

significant cost savings. Flexterra FGM can be applied quickly—even under wet conditions—using less labor and minimizing safety concerns. Get the job done and move on to the next one with no rainouts.

Provides Superior Control and Accelerated Growth—On Any Site

Flexterra® FGM™ has been used on a plethora of projects such as rough-graded and steep, rocky slopes to moderate- or steep-grade fill slopes. It has also been used to ensure rapid establishment of “fine turf” on the fairways of prestigious golf courses. Flexterra is ideal for environmentally sensitive sites and other areas where wildlife and domesticated animals are not compatible with jute or plastic nettings. Flexible FGM is extensively used in the following construction markets:



Mining, Oil and Gas Reclamation

Flexterra exceeds the rigid environmental demands of applications such as steep slopes, pipeline right of ways and abandoned mined land (AML) sites.



Commercial and Residential Construction

Flexterra doesn't use stakes or nets that can pose hazards, interfere with mowing and endanger wildlife or domestic animals.



Golf Course Construction

Flexterra locks soil, seed and sprigs in place, allowing grass to mature quickly. This faster turf establishment costs a fraction of the price of sod and allows for courses to open sooner.



DOT and Highway Projects

Flexterra can be applied quickly to small or large areas with no cutting, trimming or stapling. FGM is now the state of practice for many state DOTs and federal agencies.



HWY 290, GREENVILLE, SC: Highway Project

CHALLENGE:

Strict NPDES Phase II regulations, environmentally sensitive wetlands, steep slopes and erosion-prone water channels required the South Carolina DOT to find alternative solutions to protect the area.

SOLUTION:

Profile's Flexterra® FGM™ and Terra-Tubes® Fiber Filtration Tubes were used to provide immediate erosion control and effective storm water treatment with no impact to the wetlands.

RESULTS:

The slopes demonstrated dramatic growth establishment and saved the South Carolina DOT more than \$1,000 per acre versus the use of traditional blankets. Due to its success, SC DOT has placed FGM into its standard construction specifications as an equal to double-sided blankets for applications up to 2H:1V.

Taking Erosion Control to a Whole New Level

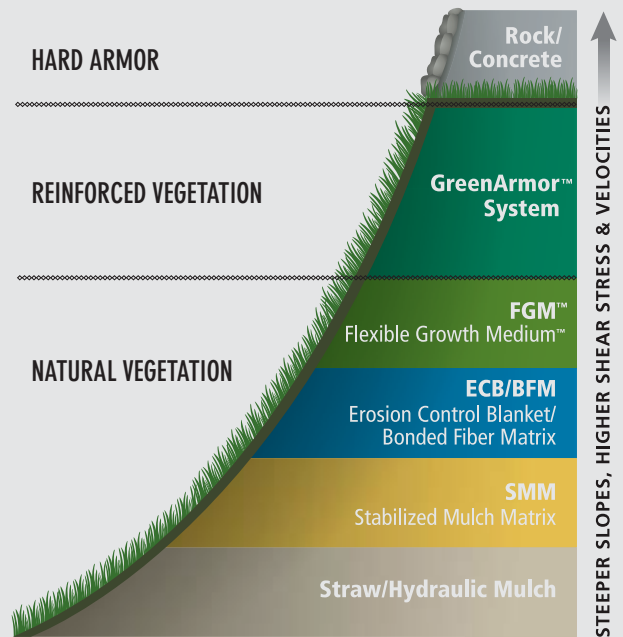
Although BFM technology has its place, Flexterra FGM is engineered for much tougher site and environmental conditions.

Select FGM if:

- You need the fastest vegetation establishment possible
- The site demands immediate erosion protection and you need to eliminate risk from impending wet weather
- The site requires both mechanical and chemical bonds to withstand greater surface flow and/or severe slopes
- Soil needs erosion protection for 12 to 18 months (Ask a Profile expert about new CocoFlex™ ET-FGM for 18 to 24 months of protection)
- You require a high factor of design safety
- You are considering combining with Enkamat® Turf Reinforcement Mat (TRM) to utilize the GreenArmor™ System

Select BFM if:

- There is a high degree of certainty heavy rains will not follow application
- The soil is dry and rain is not expected within 24–48 hours after application
- A chemical bond is strong enough to meet slope severity and length needs
- The required functional longevity of soil protection is 12 months or less
- You require a moderate factor of design safety



Using Green Design Engineering™, Profile Products has set many of today's industry standards. Innovative solutions such as the GreenArmor™ System bring together the technologically advanced Flexterra FGM and Enkamat® Turf Reinforcement Mat (TRM) to extend the boundaries of natural vegetation to velocities of 20 ft/sec and shear stresses of 17.5 lb/sf².



COLLIERVILLE, TN: Residential Development

CHALLENGE:

Developers of a retirement community sought an aesthetically pleasing and environmentally superior means of protecting a storm water conveyance channel located adjacent to a sensitive wetland.

SOLUTION:


Profile's GreenArmor™ System was recommended for its ability to withstand high-discharge water flows with triple the erosion resistance of non-reinforced vegetation, while also addressing environmental and aesthetic considerations.

RESULTS:

In fewer than two months, the conveyance channel exhibited dense vegetative growth, requiring minimal maintenance and enhancing the area's visual appeal to nearby residents.

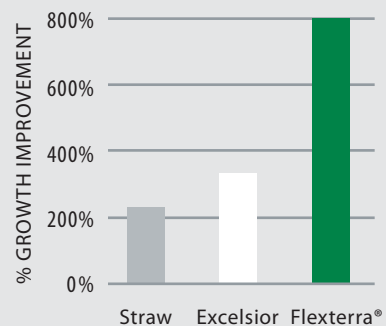
Blanket and BFM Comparisons Fall Flat

Flexterra® FGM™ is an effective alternative to erosion control blankets and BFMs. Straw and excelsior blankets cannot match Flexterra's slope protection, even on critical sites. The loft of the FGM matrix creates air space and captures more moisture to enhance seedling emergence. Flexterra absorbs and holds 15 times its weight in water while standard excelsior blankets retain only twice their weight (ASTM Test Method D1117). And, Flexterra can improve the performance of other products. For example, Turf Reinforcement Mats (TRMs) perform better when a protective layer of Flexterra is hydraulically applied into the three-dimensional matrix.

	Product Comparison:	Flexterra® FGM™	Blankets
	• Effective without special site preparation	✓	NO
	• Can be applied without direct access to site	✓	NO
	• Eliminates costly, labor-intensive staking	✓	NO
	• Bonds directly to the soil	✓	NO
	• Rids site of messy, leftover netting	✓	NO

GROWS GRASS TWICE AS FAST AS BLANKETS

Flexterra's ability to hold water and maintain air space results in superior growth as documented in independent testing. Establishing vegetation quickly and completely is the key to long-term erosion control. The average values of industry-leading single-net straw and excelsior blankets are shown at right as documented in public AASHTO-NTPEP reports and independent laboratory testing using standard test method ASTM D7322.



NORTHERN CALIFORNIA: Mine Project

CHALLENGE:

With final reclamation scheduled to begin in five years, contractors needed to stabilize a Northern California mine located in an environmentally sensitive area featuring steep slopes up to 1,000 feet in length, along with rills and gullies as deep as three feet.

SOLUTION:

An environmentally safe alternative to grading contaminated soils, Flexterra FGM was selected for its longevity and proven ability to withstand erosive forces under highly challenging conditions.

RESULTS:

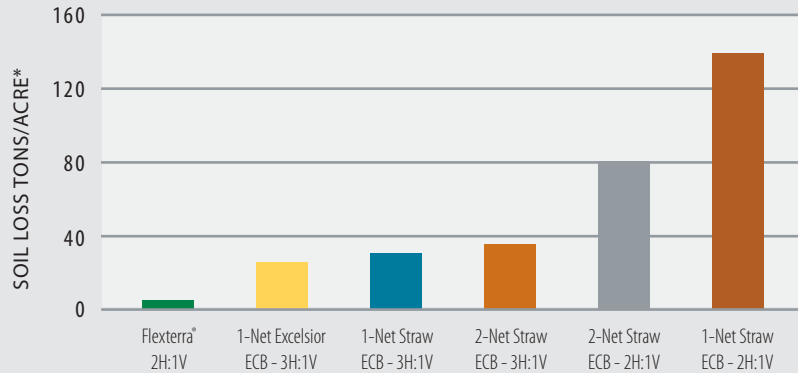
Over the subsequent wet season, Flexterra alone protected nearby land and waterways from contaminants by remaining more than 95% intact, even in areas with pre-existing rills and gullies.



Flexterra has been tested—and proven—by two labs under the most destructive slope conditions to dramatically reduce soil loss versus blankets.

KEEPS YOUR SOIL ON SITE

Testing conducted by the Texas Transportation Institute documented that straw and excelsior blankets lost an average of 50 times more soil than Flexterra (applied at 3,500 lb per acre) after three 20-minute repetitions at a rate of 3.5" of rain per hour on 2H:1V sandy loam slopes. In fact, Flexterra (on 2H:1V slopes) dramatically outperformed straw and excelsior blankets tested on 3H:1V slopes under the same testing protocol. The ECB data used in the chart below is reported in the ASAE Publication, "Comparisons of Field and Laboratory Experiment Test Results for Erosion Control Products" (Li, Landphair and McFalls 2003).



*Soil loss extrapolated from test plot areas on a per acre basis.

Based on independent testing at the Utah Water Research Laboratory: Flexterra application rate 3,000 lb/acre; five inches of rain per hour; one hour rainfall event; 2.5H:1V slope; sandy loam soil. Soil loss data extrapolated from one-acre test plot areas.



BELLA VISTA, AR: Residential Construction

CHALLENGE:

Construction of a Bella Vista, AR residential development was hindered by steep slopes composed primarily of rock and red dirt, which were so badly eroded during heavy rains that the road below required regrading.

SOLUTION:

Crews applied Profile's Flexterra® FGM™ along with Pennington Seed's SlopeMaster, a specially formulated erosion-control seed mix, to ensure effective erosion protection and rapid growth establishment on the steep slopes.

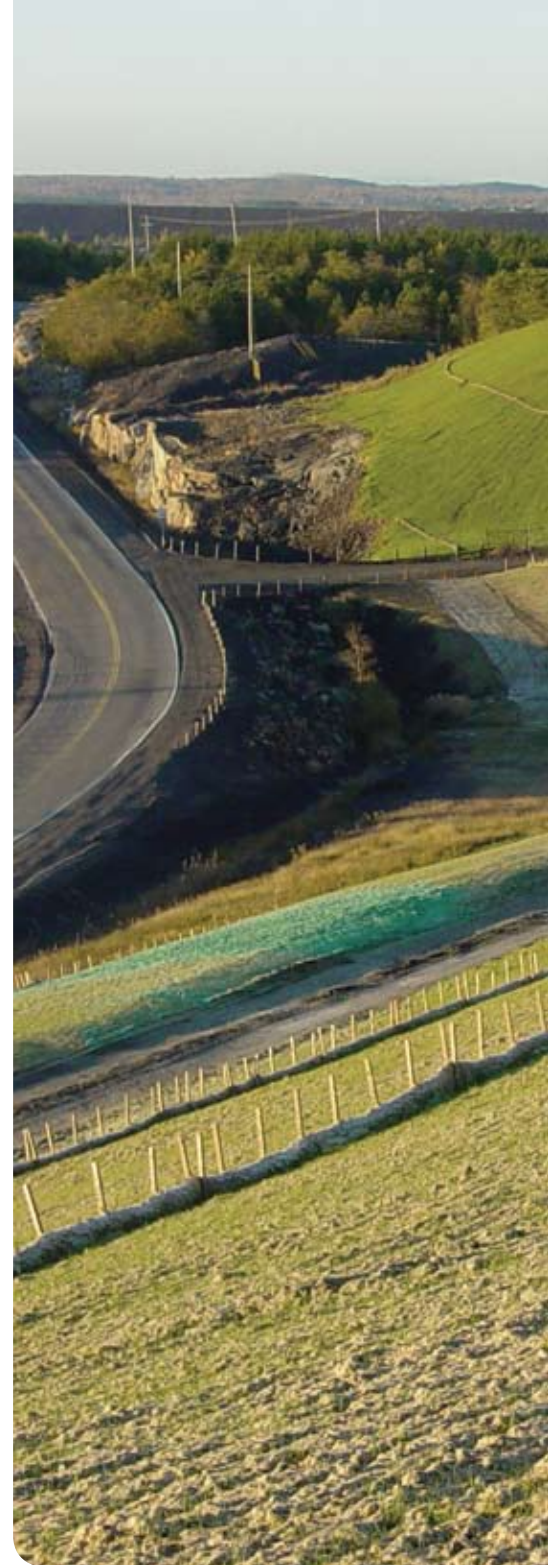
RESULTS:

Flexterra withstood two inches of heavy rainfall only a few hours after application—with no soil loss. Just three weeks later, thick, luxuriant turf was established.

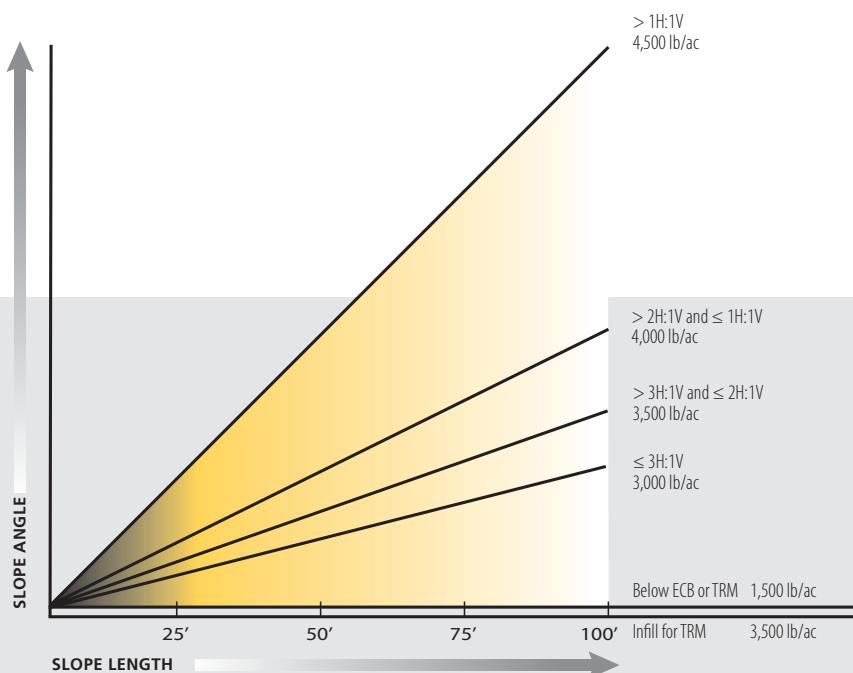
The Gold Standard: Flexterra Specifications

Flexible Growth Medium™ shall be Flexterra® FGM,™ a hydraulically applied, flexible erosion control blanket composed of long strand, thermally processed wood fibers, crimped, interlocking fibers and performance enhancing additives. Flexterra FGM requires no curing period, and upon application, forms an intimate bond with the soil surface to create a continuous, porous, absorbent and erosion-resistant blanket that allows for rapid seed germination and accelerated plant growth.

FGM shall have a documented erosion control effectiveness rating of 99% (via ASTM D6459 or other approved testing laboratory), an 800% growth improvement factor (via ASTM D7322), exhibit an observed functional longevity of 12-18 months under field conditions and conform to other performance and physical property values as listed in the Flexterra FGM CSI formatted specification. This document is readily downloadable at www.profileproducts.com.



Application Rates by Slope Gradient



Consult comprehensive CSI formatted specifications for additional details.

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 FGM from opposing directions to soil surface.

**FLEXTERRA FGM AND TERRA-TUBES
MINED LAND RECLAMATION PROJECT
SUDBURY, ONTARIO**



Cat tracking perpendicular to the slope prior to installing Flexterra reduces the potential for erosion and overland flow while creating pockets that help capture moisture and hold seeds in place.

APPLICATION

Step One: Apply seed, fertilizer and other soil amendments with small amount of Flexterra for visual metering.

Step Two: Mix 50 lb of FGM per 125 gal of water; confirm loading rates with equipment manufacturer.

For more details, visit www.profileproducts.com.

PACKAGING

Bags:
Net Weight—50 lb,
UV-resistant plastic film.

Pallets:
Weatherproof, stretch-wrapped
with UV-resistant pallet cover,
40 bags/pallet, 1 ton/pallet.



Your Trusted Partner in Soil Solutions™

By creating products using Green Design Engineering™, PROFILE Products LLC has become the world's largest combined supplier of hydraulically applied mulches, hydraulic mulch additives, turf reinforcement mats and erosion control blankets, and Profile is a leader in erosion control and revegetation science. Many of today's industry standards were innovations introduced by Profile. Our leadership continues through aggressive research and development, active support of trade associations and education designed to advance the industry's effectiveness and professionalism.



For technical information, distributor location and customer service call (800) 508-8681.

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