

Section 31 25 14.13 – Hydraulically-Applied Erosion Control Engineered Fiber Matrix™

GENERAL

1.01 SUMMARY

- A. This section specifies a hydraulically-applied, 100% biodegradable, Engineered Fiber Matrix™ (EFM™) that is manufactured in the United States and is composed of 100% recycled Thermally Refined™ wood fibers, crimped interlocking man-made biodegradable fibers and naturally derived biopolymers. The EFM is phytosanitized, free from plastic netting, and when cured 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. The EFM may require a 24-48 hour curing period to achieve maximum performance.
- B. Related Sections: Other Specification Sections, which directly relate to the work of this Section include, but are not limited to the following:
1. *Section 01 57 00 – Temporary Erosion and Sediment Control*
 2. *Section 31 00 00 – Earthwork*
 3. *Section 31 91 00 – Planting Preparation*
 4. *Section 32 92 00 – Turf and Grasses*

1.02 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions. Include required substrate preparation, list of materials and application rate.
- B. Certifications: Manufacturer shall submit a letter of certification that the product meets or exceeds all technical and packaging requirements.

1.03 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and products in UV and weather-resistant factory labeled packages. Store and handle in strict compliance with manufacturer's instructions and recommendations. Protect from damage, weather, excessive temperatures and construction operations.

PRODUCTS

2.01 ACCEPTABLE MANUFACTURER

- A. PROFILE Products LLC
750 Lake Cook Road – Suite 440
Buffalo Grove, IL 60089
800-366-1180 (Fax 847-215-0577)
www.profileproducts.com

2.02 MATERIALS

- A. The EFM shall be ProMatrix™ EFM and conform to the following property values when uniformly applied at a rate of 3500 pounds per acre (3900 kilograms/hectare) under laboratory conditions.

Property	Test Method	Req. Value (English)	Req. Value (SI)
Physical			
Mass Per Unit Area	ASTM D6566 ¹	11.6 oz/yd ² minimum	393 g/m ² minimum
Thickness	ASTM D6525 ¹	0.16 inch minimum	4 mm minimum
Ground Cover	ASTM D6567 ¹	98 % minimum	98% minimum
Water Holding Capacity	ASTM D7367	1100% minimum	1100% minimum
Material Color	Observed	Green	Green
Performance			
Cover Factor ²	Large Scale Testing ⁴	0.05 maximum	0.05 maximum
% Effectiveness ³	Large Scale Testing ⁴	95 % minimum	95 % minimum
Cure time	Observed	24 – 48 hours	24 – 48 hours
Vegetation Establishment	ASTM D7322 ¹	600 % minimum	600 % minimum
Yield ⁵	Calculated	1.82 minimum	1541 minimum
Environmental			
Functional Longevity ⁶	Observed	Up to 12 months	Up to 12 months
Ecotoxicity	EPA 2021.0	96-hr LC50 > 100%	96-hr LC50 > 100%
Biodegradability	ASTM D5338	100% minimum	100% minimum

1. ASTM test methods developed for Rolled Erosion Control Products and have been modified to accommodate Hydraulically-Applied Erosion Control Products.
2. Cover Factor is calculated as soil loss ratio of treated surface versus an untreated control surface.
3. % Effectiveness = One minus Cover Factor multiplied by 100%.
4. Large scale testing conducted at Utah Water Research Laboratory. For specific testing information please contact a Profile technical service representative at 800-508-8681.
5. Contact a Profile technical service representative for calculation details at 800-508-8681.
6. Functional Longevity is the estimated time period, based upon ASTM D5338 testing and 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, light conditions, soils, biological activity, vegetative establishment and other environmental factors.

2.03 COMPOSITION

- A. All components of the EFM shall be pre-packaged by the Manufacturer to assure both material performance and compliance with the following values. No chemical additives with the exception of fertilizer, soil pH modifiers, extended-term dyes and biostimulant materials should be added to this product.

1. Thermally Processed Wood Fiber (within a pressure vessel) Wood Fiber – 77%
³⁵₁₇ Heated to a temperature greater than 380 degrees Fahrenheit (193 degrees Celsius) for 5 minutes at a pressure greater than 50 psi (345 kPa)
2. Wetting Agents – 18%
3. Crimped, Man-made Biodegradable Interlocking Fibers – 2.5%
4. Proprietary Mineral Activator – 2.5%

2.04 PACKAGING

- A. Bags: Net Weight – 50 lb, UV and weather-resistant plastic film
Pallets: Weather-proof, stretch-wrapped with UV resistant pallet cover
Pallet Quantity: 40 bags/pallet or 1 ton/pallet

EXECUTION

3.01 SUBSTRATE AND SEEDBED PREPARATION

- A. Examine substrates and conditions where materials will be applied. Apply product to geotechnically stable slopes that have been designed and constructed to divert runoff away from the face of the slope. Do not proceed with installation until satisfactory conditions are established.
- B. Depending upon project sequencing and intended application, prepare seedbed in compliance with other specifications under Section 1.01 B

3.02 INSTALLATION

- A. Strictly comply with equipment 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 EFM from opposing directions to soil surface. Rough surfaces (rocky terrain, cat tracks and ripped soils) may require higher application rates to achieve 100% cover. Slope interruption devices or water diversion techniques are recommended when slope lengths exceed 50 feet (15 m). Maximum slope length is for product applications on a 3H:1V slope. For application on steeper slopes, slope interruption lengths may need to be decreased based on actual site conditions. Not recommended for channels or areas with concentrated water flow. No chemical additives with the exception of fertilizer, liming and biostimulant materials should be added to this product.
- B. For Erosion Control and Revegetation: To ensure proper application rates, measure and stake area. For maximum performance, apply EFM as follows:

Apply fertilizer with specified prescriptive agronomic formulations, seed and ProMatrix™ at a rate of 60 pounds per 100 gallons (27 kg/379 liters) of water over properly prepared surfaces. Confirm loading rates with equipment manufacturer.

Best results and more rapid curing are achieved at temperatures exceeding 60°F (15°C). Curing times may be accelerated in high temperature, low humidity conditions with product applied on dry soils.

- C. Mixing: A mechanically agitated hydraulic-application machine is strongly recommended:
 1. Fill 1/3 of mechanically agitated hydroseeder with water. Turn pump on for 15 seconds and purge and pre-wet lines. Turn pump off.
 2. Turn agitator on and load low density materials first (i.e. seed).
 3. Continue slowly filling tank with water while loading fiber matrix into tank.
 4. Consult application and loading charts to determine number of bags to be added for desired area and application rate. Mix at a rate of 60 lb per 100 gallons (27 kg/379 liters). Contact Equipment manufacturer to confirm optimum mixing rates.
 5. All EFM should be completely loaded before water level reaches 75% of the top of tank.
 6. Top off with water and mix until all fiber is fully broken apart and hydrated (minimum of 10 minutes, increase mixing time when applying in cold conditions). This is very important to fully activate the bonding additives and to obtain proper viscosity.
 7. Add fertilizer
 8. Shut off recirculation valve to minimize potential for air entrainment within the slurry.
 9. Slow down agitator and start applying with a 50-degree fan tip nozzle.
 10. Spray in opposing directions for maximum soil coverage.
- D. Application Rates: These application rates are for standard conditions. Designers may wish to increase application rates on rough surfaces.

Slope Gradient / Condition	English	SI
≤ 3H to 1V	3000 lb/ac	3400 kg/ha
≥ 3H to 1V and ≤ 2H to 1V	3500 lb/ac	3900 kg/ha

> 2H to 1V and \leq 1H to 1V

4000 lb/ac

4500 kg/ha

3.03 CLEANING AND PROTECTION

- A. After application, thoroughly flush the tank, pumps and hoses to remove all material. Wash all material from the exterior of the machine and remove any slurry spills. Once dry, material will be more difficult to remove.
- B. Clean spills promptly. Advise owner of methods for protection of treated areas. Do not allow treated areas to be trafficked or subjected to grazing.

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