

# Benefits of Vmax<sup>3</sup>® TRM Design Compared to Flat Net “Permanent”



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## Not all “Permanent” RECPs are created equal

The three-dimensional design of North American Green’s Vmax<sup>3</sup> composite turf reinforcement mats (TRM) have performance benefits that are not attained with flat net designs.

Vmax<sup>3</sup> composite turf reinforcement mats feature a patented composite construction that elevates their erosion control and permanent turf reinforcement capabilities beyond those of flat net RECP design. Each Vmax<sup>3</sup> product begins with a permanent, three-dimensional corrugated turf reinforcement matting structure incorporated with either natural organic or UV stabilized synthetic fibers.

In comparison, flat net RECPs usually consist of three permanent nets that incorporate organic fibers. While these products claim to be permanent TRMs, because of the UV stability of the nets used, they are not considered TRMs according to industry standards.

## Industry Standards Define TRMs

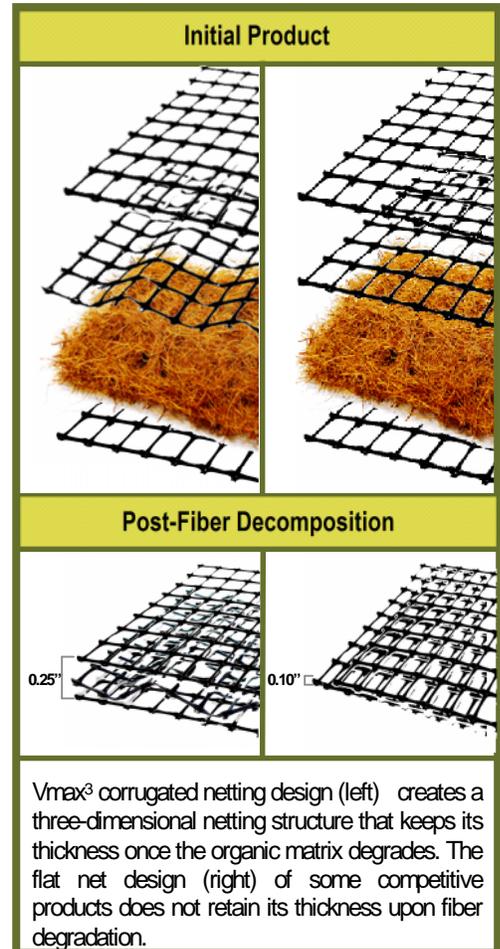
The Erosion Control Technology Council (ECTC), an industry group formed to aid in standardizing the erosion control products industry, has developed an industry standard for TRMs in which permanent thickness plays a prominent role.

Included in the ECTC definition of TRMs, and later adapted by the Federal Highway Association (FHWA), are physical and performance properties that require a **minimum 80% UV stabilized net structure with a permanent thickness of 0.25 inches.**

All of north American Green TRM products meet this specification. Our SC250<sup>®</sup> and C350<sup>®</sup> products which incorporate organic fibers have undergone ASTM thickness testing (ASTM D6525) with and without the degradable fibers, and both exceed the 0.25 inch requirement. Most flat net design RECPs do not list the *permanent* thickness on their product specifications.

According to a recent paper on the classification of rolled erosion control products (RECPs) developed by the ECTC the following describes the fundamentals of the thickness requirement.

“All TRMs must have a permanent three-dimensional structure with high tensile strength characteristics to function as a lofty matrix for entangling plant roots, stems and soils. Together, they form a continuous composite – a unified, living mat.



Vmax<sup>3</sup> corrugated netting design (left) creates a three-dimensional netting structure that keeps its thickness once the organic matrix degrades. The flat net design (right) of some competitive products does not retain its thickness upon fiber degradation.

## Permanent Product Thickness (Without Fibers)

	Inches
FHWA/ECTC Thickness Requirement	0.25
North American Green SC250	0.48
North American Green C350	0.51
Typical Flat Net Design	~ 0.1

# Benefits of Vmax<sup>3</sup> TRM Design Compared to Flat Net “Permanent” RECP Design (Continued)



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This synergism increases root systems' lateral strength, reducing plant dislodgement under high-velocity, high shear stress flows. The TRM's permanent structure also functions to consolidate and protect the soils in which the plants are anchored, preventing soil from being stripped out of the vegetative cover and the resulting weakening of the root support.

Reinforcing vegetation with TRMs has become an acceptable, performance proven, cost effective and environmentally friendly alternative to rock riprap and other forms of non-vegetative lining materials. TRMs are often used in situations where the “green” alternative is preferred to hard armor.” (Lancaster, T. & Austin, D., 2003)

## Importance of TRM design to Project Results

It is important to take into consideration the design of the TRM when evaluating permanent erosion control options. Whether you're specifying or providing products for project sites, for optimum vegetation reinforcement and performance under high flows only permanent three-dimensional turf reinforcement mats will do.

Be active in requiring thickness data in the permanent phase for flat net RECPs that claim to be turf reinforcement mats. And if the thickness is not 0.25 inches or greater, than these products should not be considered “equal to” turf reinforcement mats.

When you design with North American Green's Vmax<sup>3</sup> TRMs, you are assured to be designing with industry approved, performance tested, and guaranteed products.

## References

Lancaster, T. and D. Austin, 2003. *Classifying Rolled Erosion Control Product: A Current Perspective*. ECTC.

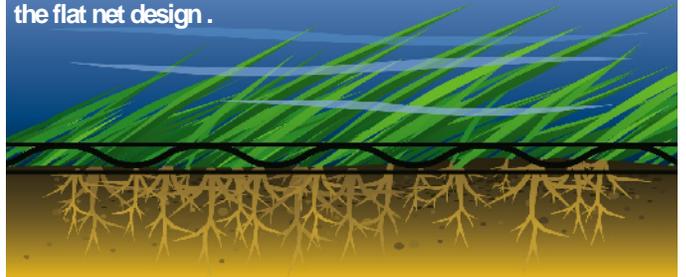
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## ADVANTAGES OF VMAX<sup>3</sup> CORRUGATED DESIGN

- ◆ Corrugated 3-D design of Vmax<sup>3</sup> TRM structure anchors and reinforces both the roots and stems of vegetation.
- ◆ 3-D structure and root interaction increases the root systems' lateral strength, reducing plant dislodgement under high flows.
- ◆ Creates a shear plane perpendicular to water flow that actually deflects the flowing water (hydraulic forces) away from the soil surface, decreasing soil erosion.
- ◆ Fiber matrix further supplements the TRM's structure increasing ground cover and moisture retention properties during vegetation establishment.
- ◆ Center corrugated netting provides the basis for the thickness, tensile strength, longevity, and ultimately establishes the turf reinforcement capabilities/performance of the products.

In the fully vegetated stage, a three-dimensional netting structure offers greater root and stem support compared to the flat net design .



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