



# Comparisons: GBX<sup>®</sup>11 and TriAx Geogrids

## GENERAL

The geogrids listed below are manufactured from a punched polypropylene sheet, which is then oriented in either two (GBX), or three (TriAx) substantially equilateral directions so that the resulting ribs shall have a high degree of molecular orientation, which continues at least in part through the mass of the integral node.

PRODUCT PROPERTIES	Carthage Mills GBX <sup>®</sup> 11	Tensar TriAx TX130S	Tensar TriAx TX140	Tensar TriAx TX5	Tensar TriAx TX160
<b>Index Properties</b>					
▪ Polymer Type	polypropylene	polypropylene	polypropylene	polypropylene	polypropylene
▪ Aperture Size, MD x XMD (Nominal Dimensions) mm (in)	25 x 33 (1.0 x 1.3)	NP	40 x 40 (1.6 x 1.6)	40 x 40 (1.6 x 1.6)	40 x 40 (1.6 x 1.6)
<b>Structural Integrity</b>					
	<b>MARV<sup>(1)</sup></b>	<b>General<sup>(2)</sup></b>	<b>General<sup>(2)</sup></b>	<b>General<sup>(2)</sup></b>	<b>General<sup>(2)</sup></b>
▪ Junction Efficiency, %	93	93	93	NP	93
▪ Aperture Stability (J) <sup>(3)</sup> kg-cm/deg @ 5.0 kg-cm (m-N/deg @ 5.0 kg-cm)	12.5 (1.23)	3.0 (0.3)	3.0 (0.3)	NP	3.6 (0.36)
▪ Radial Stiffness / Tensile Modulus at low strain <sup>(4)</sup> kN/m @ 0.5% Strain (lb/ft @ 0.5% Strain)	484 (33,200)	200 (13,704)	225 (15,430)	NP	300 (20,580)
▪ Tensile Strength at low strain <sup>(5)</sup> kN/m @ 0.5% Strain (lb/ft @ 0.5% Strain)	2.42 (166)	1.00 (69)	1.13 (77)	NP	1.5 (103)
▪ Flexural Stiffness, mg-cm	250,000	NP	NP	NP	NP
<b>Durability</b>					
▪ Resistance to Installation Damage, % (SC/SW/GP)	95 / 93 / 90	NP	NP	NP	NP
▪ Resistance to Chemical Degradation, %	100	100	100	NP	100
▪ Resistance to UV Degradation, %	100	100	100	NP	100

04/01/16

Unless indicated otherwise, the properties above are from previously published data by the manufacturers.

**Notes:**

1. Unless indicated otherwise, values shown are Minimum Average Roll Values (MARV) determined in accordance with ASTM D 4759-02. Brief descriptions of test procedures are given in the following notes.
2. "General" is the heading of the last column on the TriAx Specification Sheets. As of this writing, "General" is not an industry recognized term; and its true meaning in this context has not been clarified.
3. *Aperture Stability Modulus (J)*: in-plane torsional rigidity measured by applying a moment to the central junction of a 225mm x 225mm specimen restrained at its perimeter in accordance with U.S. Army Corps of Engineers Methodology for measurement of Torsional Rigidity, (Kinney, T.C. Aperture Stability Modulus ref 3, 3.1.2000).  
After proper calibration, this is the only geogrid property used in the state-of-the-art Giroud-Han (G-H) design method (*Giroud and Han, 2004a, b*) and is the heart of the SpectraPave design software for both the BX and TriAx geogrids. The Carthage Mills' GBX<sup>™</sup> geogrids have undergone the laboratory and field tests, and proper calibration of this method.
4. Radial stiffness is determined from tensile stiffness measured in any in-plane axis from testing in accordance with ASTM D 6637-01.
5. Tensile Strengths at low strain for TriAx geogrids are not published; values stated above were calculated from the published Radial Stiffness/Tensile Modulus @ 0.5% strain.