

TABLE OF WOVEN GEOGRID VALUES

PROPERTY		REQUIRED TEST METHOD	MIRAFI MG 2XT	MIRAFI MG 3XT	MIRAFI MG 5XT (Matrex 30)	MIRAFI MG 7XT	MIRAFI MG 8XT	MIRAFI MG 10XT (Matrex 60)	MIRAFI MG 18XT (Matrex 90)	MIRAFI MG 20XT (Matrex 120)	MIRAFI MG 22XT (Matrex 180)	MIRAFI MG 24XT (Matrex 240)	
UV Stability (Min. Retained Strength @ 500 hr.)		ASTM D 4355	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	
Tensile Strength (lb./ft.)		ASTM D 6637											
Machine Direction	Ultimate ( $T_{ult}$ )		2,000	3,150	4,300	5,700	7,000	9,500	9,360	12,420	17,760	25,380	
	2% Strain		—	—	—	—	—	—	—	—	—	—	
	5% Strain		1,000	1,056	1,740	2,160	2,520	3,120	3,250	5,340	6,700	7,000	
Cross Direction	Ultimate		2,000	—	—	—	—	—	—	—	—	—	—
	2% Strain		—	—	—	—	—	—	—	—	—	—	—
	5% Strain	—	—	—	—	—	—	—	—	—	—	—	
Strain @ Ultimate Tensile Strength		ASTM D 6637	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	
Secant Modulus (lb./ft.)	2% Strain		—	—	—	—	—	—	—	—	—	—	
	5% Strain		20,000	21,120	34,800	43,200	50,400	62,400	65,000	106,800	134,000	140,000	
	10% Strain		—	—	—	—	—	—	—	—	—	—	
Junction Strength (lb./ft.)		GRI : GG2	—	—	—	—	—	—	—	—	—	—	
Soil-Geosynthetic Friction		ASTM D 6706	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Creep Resistance- $T_{creep}$ (lb./ft.)		ASTM D 5262	1,250	1,969	2,688	3,563	4,375	5,938	5,850	7,221	10,326	14,756	
Creep Reduction Factor ( $T_{ult}/T_{creep}$ )			1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.72	1.72	1.72	
Installation Damage (RF <sub>C</sub> )	Sand	GRI : GG4 & GT7	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	
	Limestone		1.5	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	
Durability (RF <sub>D</sub> )	Chemical	ASTM D 5322	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
	Biological	ASTM D1987, D3083, G21 & G22	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Joint Strength (RF <sub>J</sub> )	Mechanical	ASTM D 6637, GRI : GG4 & GT7	—	—	—	—	—	—	—	—	—	—	
	Overlap *	ASTM D 6706	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	
Approved Application Usage			3	3	3	3	3	3	3	3	3	3	

Approved Application Usage:

- 1 = Steepened Slopes
- 2 = Reinforcement of Foundations over Soft Soils
- 3 = Both Steepened Slopes & Reinforcement of Foundations over Soft Soils
- 4 = Reinforced Embankment
- 5 = Construction Expedient
- \* Minimum 3' Overlap

APPROVED GEOSYNTHETIC PRODUCTS  
(WOVEN GEOGRID)  
APPLICATION AND PROPERTIES


REVISIONS				2010 Interim Design Standard				Interim Date	Sheet No.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			01/01/10	5 of 10
01/01/10	LJ	Correct "MARAFI" to "MIRAFI".							
								<b>GEOSYNTHETIC REINFORCED SOILS</b>	
								Index No. <b>501</b>	

TABLE OF WOVEN GEOGRID VALUES

PROPERTY		REQUIRED TEST METHOD	SYNTEEN SF 11	SYNTEEN SF 12	SYNTEEN SF 20	SYNTEEN SF 35	SYNTEEN SF 40	SYNTEEN SF 50	SYNTEEN SF 55	SYNTEEN SF 80	SYNTEEN SF 110
UV Stability (Min. Retained Strength @ 500 hr.)		ASTM D 4355	70%	70%	70%	70%	70%	70%	70%	70%	70%
Tensile Strength (lb./ft.)		ASTM D 6637									
Machine Direction	Ultimate ( $T_{ult}$ )		2,388	2,388	1,672	2,627	3,050	3,731	3,774	5,583	7,462
	2% Strain		526	526	370	462	488	791	736	1,016	1,186
	5% Strain		990	1,042	670	725	970	922	1,159	1,273	1,684
Cross Direction	Ultimate		3,870	5,268	1,630	2,556	3,050	3,933	2,499	2,206	2,179
	2% Strain		578	797	370	399	430	630	604	882	1,274
	5% Strain	792	1,129	670	583	765	815	796	1,563	1,581	
Strain @ Ultimate Tensile Strength		ASTM D 6637	12.6%	13.0%	9.4%	14.1%	9.9%	14.2%	11.5%	13.9%	18.8%
Secant Modulus @ (lb./ft.)	2% Strain		26,300	26,300	18,494	23,114	24,408	39,551	36,799	50,807	59,298
	5% Strain		15,840	20,840	13,397	14,499	19,404	18,432	23,174	25,459	33,712
	10% Strain		—	—	15,206	15,234	22,089	18,432	27,137	37,910	27,380
Junction Strength (lb./ft.)		GRI : GG2	354	320	—	—	—	—	—	—	—
Soil-Geosynthetic Friction		ASTM D 6706	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Creep Resistance- $T_{creep}$ (lb./ft.)		ASTM D 5262	—	—	1,005	1,523	1,525	2,201	2,265	3,182	4,029
Creep Reduction Factor ( $T_{ult}/T_{creep}$ )			—	—	1.66	1.73	2.00	1.70	1.67	1.75	2.02
Installation Damage (RF <sub>C</sub> )	Sand	GRI : GG4 & GT7	1.18	1.06	1.05	1.15	1.15	1.08	1.08	1.08	1.08
	Limestone		1.31	1.20	1.75	1.70	1.60	1.55	1.55	1.55	1.35
Durability (RF <sub>D</sub> )	Chemical	ASTM D 5322	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
	Biological	ASTM D1987, D3083, G21 & G22	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Joint Strength (RF <sub>J</sub> )	Mechanical	ASTM D 6637, GRI : GG4 & GT7	—	—	—	—	—	—	—	—	—
	Overlap *	ASTM D 6706	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Approved Application Usage			2, 5	2, 5	3	3	3	3	3	3	3

Approved Application Usage:

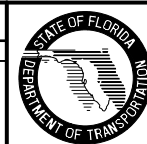
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APPROVED GEOSYNTHETIC PRODUCTS  
(WOVEN GEOGRID)  
APPLICATION AND PROPERTIES

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/10	LJ	Added Application Usage 2 for SYNTEEN SF 11 & SF 12.			



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GEOSYNTHETIC REINFORCED SOILS

Interim Date: 01/01/10  
Sheet No. 6 of 10  
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TABLE OF WOVEN GEOGRID VALUES									
PROPERTY		REQUIRED TEST METHOD	RAUGRID 3/3	RAUGRID 4/2	RAUGRID 6/3	RAUGRID 8/3	RAUGRID 10/3	FORNIT 20	FORNIT 30
UV Stability (Min. Retained Strength @ 500 hr.)		ASTM D 4355	95%	95%	95%	95%	95%	92%	92%
Tensile Strength (lb./ft.)		ASTM D 6637							
Machine Direction	Ultimate ( $T_{ult}$ )		2,233	2,843	4,350	5,288	6,590	1,159	1,890
	2% Strain		—	—	—	—	—	360	600
	5% Strain		712	767	1,144	1,165	1,582	774	1,390
Cross Direction	Ultimate		2,213	1,459	1,959	2,089	2,192	1,641	2,466
	2% Strain		—	—	—	—	—	543	778
	5% Strain	541	356	452	507	521	1,111	1,719	
Strain @ Ultimate Tensile Strength		ASTM D 6637	10.8%	11.8%	13.1%	12.2%	11.5%	6%	6%
Secant Modulus (lb./ft.)	2% Strain		—	—	—	—	—	18,000	30,000
	5% Strain		—	—	—	—	—	15,480	27,800
	10% Strain		—	—	—	—	—	—	—
Junction Strength (lb./ft.)		GRI : GG2	N/A	100%	100%	100%	100%	30	32.2
Soil-Geosynthetic Friction		ASTM D 6706	0.8	0.8	0.8	0.8	0.8	0.9	0.9
Creep Resistance- $T_{creep}$ (lb./ft.)		ASTM D 5262	1,466	1,870	2,862	3,479	4,335	355	588
Creep Reduction Factor ( $T_{ult}/T_{creep}$ )			1.52	1.52	1.52	1.52	1.52	3.5	3.5
Installation Damage ( $RF_c$ )	Sand	GRI : GG4 & GT7	1.10	1.10	1.10	1.10	1.10	1.10	1.10
	Limestone		1.17	1.17	1.17	1.17	1.17	1.10	1.10
Durability ( $RF_d$ )	Chemical	ASTM D 5322	1.15	1.15	1.15	1.15	1.15	1.10	1.10
	Biological	ASTM D1987, D3083, G21 & G22	1.15	1.15	1.15	1.15	1.15	1.0	1.0
Joint Strength ( $RF_j$ )	Mechanical	ASTM D 6637, GRI : GG4 & GT7	—	—	—	—	—	—	—
	Overlap *	ASTM D 6706	—	—	—	—	—	1.0	1.1
Approved Application Usage			2, 5	2, 5	2, 5	2, 5	2, 5	2, 4, 5	2, 4, 5

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**APPROVED GEOSYNTHETIC PRODUCTS  
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<b>REVISIONS</b>				2010 Interim Design Standard				Interim Date	Sheet No.
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01/01/10	LJ	Added FORNIT 30. Added Creep Resistance, Creep Reduction and Application Usage "4" to FORNIT 20.							
								Index No.	501

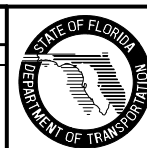


TABLE OF WOVEN GEOGRID VALUES

PROPERTY		REQUIRED TEST METHOD	STRATAGRID MICROGRID	STRATAGRID SG 150	STRATAGRID SG 200	STRATAGRID SG 350	STRATAGRID SG 500	STRATAGRID SG 550	STRATAGRID SG 600	STRATAGRID SG 700
UV Stability (Min. Retained Strength @ 500 hr.)		ASTM D 4355	70%	70%	70%	70%	70%	70%	70%	70%
Tensile Strength (lb./ft.)		ASTM D 6637	—	—	—	—	—	—	—	—
Machine Direction	Ultimate ( $T_{ult}$ )		2,000	1,875	3,400	4,800	6,300	7,800	8,700	11,750
	2% Strain		—	—	—	—	—	—	—	—
	5% Strain		600	450	700	750	1,150	1,200	1,400	1,700
Cross Direction	Ultimate		2,000	1,875	—	—	—	—	—	—
	2% Strain		—	—	—	—	—	—	—	—
	5% Strain	450	—	—	—	—	—	—	—	
Strain @ Ultimate Tensile Strength		ASTM D 6637	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	18.0%	18.0%
Secant Modulus (lb./ft.)	2% Strain		—	—	—	—	—	—	—	—
	5% Strain		12,000	9,000	14,000	15,000	23,000	24,000	24,000	34,000
	10% Strain		—	—	—	—	—	—	—	—
Junction Strength (lb./ft.)		GRI : GG2	—	—	—	—	—	—	—	—
Soil-Geosynthetic Friction		ASTM D 6706	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Creep Resistance- $T_{creep}$ (lb./ft.)		ASTM D 5262	1,149	1,210	2,194	3,097	4,065	5,032	5,613	7,581
Creep Reduction Factor ( $T_{ult}/T_{creep}$ )			1.74	1.55	1.55	1.55	1.55	1.55	1.55	1.55
Installation Damage (RF <sub>C</sub> )	Sand	GRI : GG4 & GT7	1.20	1.10	1.10	1.05	1.05	1.05	1.05	1.05
	Limestone		1.90	1.20	1.20	1.20	1.15	1.15	1.15	1.15
Durability (RF <sub>D</sub> )	Chemical	ASTM D 5322	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
	Biological	ASTM D1987, D3083, G21 & G22	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Joint Strength (RF <sub>J</sub> )	Mechanical	ASTM D 6637, GRI : GG4 & GT7	—	—	—	—	—	—	—	—
	Overlap *	ASTM D 6706	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Approved Application Usage			3, 4, 5	3, 4, 5	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4

Approved Application Usage:

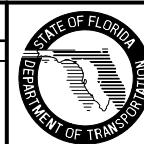
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(WOVEN GEOGRID)  
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01/01/10	LJ	New Sheet Added			



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TABLE OF EXTRUDED GEOGRID VALUES

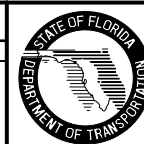
PROPERTY		REQUIRED TEST METHOD	TENSAR BX 4100	TENSAR BX 4200	TENSAR BX 1100	TENSAR BX 1120	TENSAR BX 1200	TENSAR BX 1220	TENSAR BX 1500
UV Stability (Min. Retained Strength @ 500 hr.)		ASTM D 4355	90%	90%	90%	100%	90%	100%	90%
Tensile Strength (lb./ft.)		ASTM D 6637							
Machine Direction	Ultimate ( $T_{ult}$ )		860	1,270	850	850	1,315	1,315	1,790
	2% Strain		240	370	280	280	410	410	580
	5% Strain		480	705	580	580	810	810	1,200
Cross Direction	Ultimate		875	1,370	1,300	1,300	1,975	1,975	2,055
	2% Strain		300	500	450	450	670	670	685
	5% Strain	635	960	920	920	1,360	1,360	1,370	
Strain @ Ultimate Tensile Strength		ASTM D 6637	10%	10%	10%	10%	10%	10%	10%
Secant Modulus @ (lb./ft.)	2% Strain		11,995	18,506	14,000	14,000	20,500	20,500	29,000
	5% Strain		9,596	14,092	11,600	11,600	16,200	16,200	27,400
	10% Strain		—	—	—	—	—	—	—
Junction Strength (lb./ft.)		GRI : GG2	90%	90%	790/1,210	93%	93%	93%	93%
Soil-Geosynthetic Friction		ASTM D 6706	—	0.95	0.90	0.90	0.90	0.90	0.90
Creep Resistance- $T_{creep}$ (lb./ft.)		ASTM D 5262	250	420	280	280	425	425	575
Creep Reduction Factor ( $T_{ult}/T_{creep}$ )			3.5	3.27	3.1	3.1	3.1	3.1	3.1
Installation Damage (RF <sub>C</sub> )	Sand	GRI : GG4 & GT7	1.10	1.10	1.10	1.10	1.10	1.10	1.10
	Limestone		1.43	1.35	1.35	1.35	1.35	1.35	1.35
Durability (RF <sub>D</sub> )	Chemical	ASTM D 5322	1.1	1.1	1.1	1.1	1.1	1.1	1.1
	Biological	ASTM D1987, D3083, G21 & G22	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Joint Strength (RF <sub>J</sub> )	Mechanical	ASTM D 6637, GRI : GG4 & GT7	—	—	—	—	—	—	—
	Overlap *	ASTM D 6706	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Approved Application Usage			3, 4, 5	3, 4, 5	3, 4, 5	3, 4, 5	3, 4, 5	3, 4, 5	3, 4, 5

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01/01/10	LJ	Changed Sheet No. from "8 of 9" to "9 of 10".			



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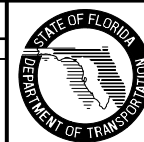
PROPERTY		REQUIRED TEST METHOD	TENSAR UX 1400 HS UX 1400 MSE UX MESA 3	TENSAR UX 1500 HS UX 1500 MSE UX MESA 4	TENSAR UX 1600 HS UX 1600 MSE UX MESA 5	TENSAR UX 1700 HS UX 1700 MSE UX MESA 6	TENAX MS 220	TENAX MS 330	COMBIGRID 30/30 Q1 151 GRK 3	SECUGRID 20/20 Q1	SECUGRID 30/30 Q1
UV Stability (Min. Retained Strength @ 500 hr.)		ASTM D 4355	90%	90%	90%	90%	85%	85%	90%	90%	90%
Tensile Strength (lb./ft.)		ASTM D 6637									
Machine Direction	Ultimate ( $T_{ult}$ )		4,790	7810	9,860	11,980	925	1,370	2,055	1,646	2,055
	2% Strain		1,100	1,850	2,330	2,740	300	418	686	549	686
	5% Strain		2,130	3,560	3,980	5,140	615	925	1,475	1,029	1,475
Cross Direction	Ultimate		—	—	—	—	1,400	2,100	2,055	1,646	2,055
	2% Strain		—	—	—	—	445	616	686	549	686
	5% Strain	—	—	—	—	890	1,340	1,475	1,029	1,475	
Strain @ Ultimate Tensile Strength		ASTM D 6637	10%	10%	10%	10%	12%	12%	8%	9%	7.5%
Secant Modulus (lb./ft.)	2% Strain		55,000	92,500	116,500	137,000	15,000	20,900	34,300	27,450	34,300
	5% Strain		42,600	71,200	79,600	102,800	12,330	18,500	29,500	20,580	29,500
	10% Strain		—	—	—	—	—	—	—	—	—
Junction Strength (lb./ft.)		GRI : GG2	90%	90%	90%	90%	835	1,230	337	549	617
Soil-Geosynthetic Friction		ASTM D 6706	0.462	0.462	0.462	0.462	—	—	0.65	0.93	0.93
Creep Resistance- $T_{creep}$ (lb./ft.)		ASTM D 5262	1,970	3,000	3,960	4,975	—	—	726	581	726
Creep Reduction Factor ( $T_{ult}/T_{creep}$ )			2.43	2.60	2.49	2.41	3.5	3.5	2.83	2.83	2.83
Installation Damage (RF <sub>C</sub> )	Sand	GRI : GG4 & GT7	1.10	1.10	1.10	1.10	1.1	1.1	1.1	1.1	1.1
	Limestone		1.20	1.20	1.20	1.20	1.1	1.1	1.1	1.1	1.1
Durability (RF <sub>d</sub> )	Chemical	ASTM D 5322	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
	Biological	ASTM D1987, D3083, G21 & G22	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Joint Strength (RF <sub>j</sub> )	Mechanical	ASTM D 6637, GRI : GG4 & GT7	1.0	1.0	1.0	1.0	1.0	1.0	—	—	—
	Overlap *	ASTM D 6706	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Approved Application Usage			3	3	3	3	2, 5	2, 5	2, 5	2, 5	2, 5

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01/01/10	LJ	Changed Sheet No. from "9 of 9" to "10 of 10".			



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