

GEOSYNTHETIC RETAINING WALL

Classes 1 and 2 Non-aggressive Environments

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Table 1. Long-term and ultimate strengths of geosynthetic products qualified for use in Classes 1 and 2 walls and reinforced slopes, non-aggressive environments.

Product	Ref. No.	Year last Updated	¹ T _{ult} (lb/ft)	Long-Term Strength Reduction Factors			² Long-Term Tensile Strength, T _{al} (lb/ft)	³ Low Strain Creep Stiffness, J _{2%} (lbs/ft)
				RF _{ID}	RF _{CR}	RF _D		
Fortrac 20 MD - Huesker	2002-073	2002	1500	1.15	1.59	1.15	713	
Fortrac 35 MD - Huesker	2002-073	2002	2400	1.1	1.59	1.15	1200	
Fortrac 55 MD - Huesker	2002-073	2002	3710	1.1	1.59	1.15	1860	
Fortrac 80 MD - Huesker	2002-073	2002	5380	1.1	1.59	1.15	2690	
Fortrac 110 MD - Hueske	2002-073	2002	7410	1.1	1.59	1.15	3710	
Geotex 4X4, MD - Propex	1999-051	1999	4800	1.15	5.6	1.3	569	
Geotex 4X4, XMD - Propex	1999-051	1999	4800	1.10	3.4	1.3	980	
Miragrid 3XT, MD - TenCate	1993-921	2009	3151	1.12	1.56	1.3	1387	21300
Miragrid 5XT, MD - TenCate	1993-921	2009	4295	1.12	1.56	1.3	1891	27400
Miragrid 7XT, MD - TenCate	1993-921	2009	5699	1.12	1.56	1.3	2509	34800
Miragrid 8XT, MD - TenCate	1993-921	2009	6994	1.12	1.56	1.3	3079	41600
Miragrid 10XT, MD - TenCate	1993-921	2009	9694	1.12	1.56	1.3	4180	54800
Miragrid 18XT, MD - TenCate	1993-921	2009	9357	1.12	1.56	1.3	4120	54100
Miragrid 20XT, MD - TenCate	1993-921	2009	12412	1.12	1.56	1.3	5465	70200
Miragrid 22XT, MD - TenCate	1993-921	2009	17748	1.12	1.56	1.3	7814	98400
Miragrid 24XT, MD - TenCate	1993-921	2009	25364	1.12	1.56	1.3	11167	139000
ParaGrid 30/05, MD – Linear Composites		2010	3425	1.1	1.39	1.3	1723	20200
ParaGrid 40/05, MD – Linear Composites		2010	4110	1.1	1.39	1.3	2068	23600
ParaGrid 50/05, MD – Linear Composites		2010	4452	1.1	1.39	1.3	2240	25300
ParaGrid 60/05, MD – Linear Composites		2010	4795	1.1	1.39	1.3	2412	27000
ParaGrid 65/05, MD – Linear Composites		2010	5479	1.1	1.39	1.3	2756	30400
ParaGrid 70/05, MD – Linear Composites		2010	6164	1.1	1.39	1.3	3101	33700
ParaGrid 80/05, MD – Linear Composites		2010	6849	1.1	1.39	1.3	3446	37100
ParaGrid 90/05, MD – Linear Composites		2010	7534	1.1	1.39	1.3	3790	40500
ParaGrid 100/05, MD – Linear Composites		2010	8562	1.1	1.39	1.3	4307	45600
ParaGrid 110/05, MD – Linear Composites		2010	10274	1.1	1.39	1.3	5169	54000
ParaGrid 125/05, MD – Linear Composites		2010	11986	1.1	1.39	1.3	6030	62500
ParaGrid 150/05, MD – Linear Composites		2010	12329	1.1	1.39	1.3	6203	64200
ParaGrid 175/05, MD – Linear Composites		2010	13699	1.1	1.39	1.3	6892	70900
ParaGrid 180/05, MD – Linear Composites		2010	3425	1.1	1.39	1.3	1723	20200
ParaGrid 200/05, MD – Linear Composites		2010	4110	1.1	1.39	1.3	2068	23600
Raugrid 3x3N, MD - Luckenhaus		2010	2055	1.1	1.55	1.3	927	6750
Raugrid 4x2N, MD - Luckenhaus		2010	2740	1.1	1.55	1.3	1236	10300

¹T_{ult} is determined using ASTM D6637 for geogrids and ASTM D4595 for geotextiles. The value provided in the table represents the manufacturer's Minimum Average Roll Value (MARV) or minimum value for the product. WSDOT acceptance test results for the product as delivered to the project must be greater than or equal to this value.

²T_{al} is determined at a design life of 75 years and is based on the MARV or minimum value for T_{ult} provided in this table.

³J_{2%} is the creep stiffness determined at a strain level of 2% after 1,000 hours of loading, based on the MARV or minimum value for T_{ult} provided in this table.

RF_{ID} = installation damage reduction factor, RF_{CR} = creep reduction factor, RF_D = durability reduction factor.

MD = Machine Direction (longitudinal direction), XMD = Cross Machine Direction (transverse direction)

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Raugrid 5x2N, MD - Luckenhaus		2010	3425	1.1	1.55	1.3	1545	13800
Raugrid 6x3N, MD - Luckenhaus		2010	4110	1.1	1.55	1.3	1854	17200
Raugrid 8x3N, MD - Luckenhaus		2010	5480	1.1	1.55	1.3	2472	23800
Raugrid 11x3N, MD - Luckenhaus		2010	7535	1.1	1.55	1.3	3399	33000
Raugrid 13x3N, MD - Luckenhaus		2010	8905	1.1	1.55	1.3	4018	38700
Raugrid 15x3N, MD - Luckenhaus		2010	10275	1.1	1.55	1.3	4636	44100
SF20, MD - Synteen		2010	1939	1.18	1.58	1.3	800	8390
SF35, MD - Synteen		2010	3055	1.18	1.58	1.3	1260	11900
SF55, MD - Synteen		2010	4199	1.18	1.58	1.3	1732	15600
SF80, MD - Synteen		2010	7398	1.18	1.58	1.3	3052	29800
SF90, MD - Synteen		2010	8500	1.18	1.58	1.3	3507	30900
SF110, MD - Synteen		2010	10207	1.18	1.58	1.3	4211	37600
SF350, MD - Synteen		2010	27400	1.18	1.58	1.3	11305	124000
SG150, MD - Stratagrid		2010	1875	1.1	1.5	1.3	874	8530
SG200, MD - Stratagrid		2010	3600	1.1	1.5	1.3	1678	26500
SG350, MD - Stratagrid		2010	5000	1.1	1.5	1.3	2331	42400
SG500, MD - Stratagrid		2010	6400	1.1	1.5	1.3	2984	20500
SG550, MD - Stratagrid		2010	8150	1.1	1.5	1.3	3800	31100
SG600, MD - Stratagrid		2010	9100	1.1	1.5	1.3	4242	35600
SG700, MD - Stratagrid		2010	11800	1.1	1.5	1.3	5501	37600
Tensar UX1400MSE MD		2010	4800	1.12	2.59	1.1	1504	26100
Tensar UX1500MSE MD		2010	7810	1.1	2.59	1.1	2492	41000
Tensar UX1600MSE MD		2010	9870	1.1	2.59	1.1	3149	53800
Tensar UX1700MSE, MD		2010	11990	1.1	2.63	1.1	3768	69100
Tensar UX1400HS MD		2010	4800	1.12	2.59	1.1	1504	26100
Tensar UX1500HS MD		2010	7810	1.1	2.59	1.1	2492	41000
Tensar UX1600HS MD		2010	9870	1.1	2.59	1.1	3149	53800
Tensar UX1700HS, MD		2010	11990	1.1	2.63	1.1	3768	69100
Tensar BX1100, MD	1994-038	1994	850	1.15	5.0	1.3	113	
Tensar BX1100, XMD	1994-038	1994	1300	1.15	5.0	1.3	175	
Tensar BX1120, MD	1994-038	1994	850	1.15	5.0	1.3	113	
Tensar BX1120, XMD	1994-038	1994	1300	1.15	5.0	1.3	175	
Tensar BX1200, MD	1994-038	1994	1200	1.1	5.0	1.3	168	

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Tensar BX1200, XMD	1994-038	1994	1970	1.1	5.0	1.3	274	

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