

HIGH STRENGTH

GEOTEXTILES (POLYPROPYLENE, POLYESTER)

• REINFORCEMENT • STABILISATION



reinforcement

Description

Syntex high strength woven geotextiles polypropylene (PP) are manufactured in grades from 35 kN to 105 kN and High Strength polyester (PET) from 150 kN to 1250 kN.

High strength geotextiles have the advantage over conventional geotextiles in when they are subjected to load they can reach full tensile strength without undergoing the initial elongation associated with the straightening of the woven yarns. This allows immediate soil

to geotextile load transfer. These geotextiles provide excellent creep performance and high tensile modulus.

These geotextiles provide maximum performance for weak subgrades and offer a combination of high filtration, high strength and separation. A high frictional surface between the basecourse and the road is created with a high strength at low strain resulting in low vertical deformation. High strength woven geotextile has excellent filtration characteristics allowing for reductions in saturated fill and subgrades for soil reinforcement in applications including embankment stabilisation, steepened slopes, retaining walls, lagoon closures and landfill lining systems.

Syntex high strength geotextiles are also used for geotextile tubes which are used for the dewatering of contaminated materials, shoreline and coastal protection, artificial reefs, etc.

Applications

• Steepened Slopes

The geotextile is placed in layers between the soil to provide tensile strength to the slope and replace geogrids and earth anchors as a cost effective alternative by using existing fill, reducing the need to import rock.

• Retaining Walls

To maximise use of available land it is often necessary to build vertical retaining walls. The choice of materials can be a rigid cast-in-place concrete structure, pre-cast panels, modular blocks, etc. Syntex high strength geotextiles provide soil retention on face wrapped walls and slip resistance in backfill soils. They provide strength plus prevent erosion behind the wall.

● Earth Reinforcement

Construction over soft foundation soil (with a CBR of less than 1) the choices become restrictive due to excavation costs and time factors. Syntex high strength geotextiles were designed with this in mind. They provide a firm and permeable platform to strengthen the ground. This is a considerable cost saving solution to a common problem in construction. Syntex high strength vastly increases the tensile strengths of the soils, thus increasing the factor of safety to acceptable levels against sliding, lateral spreading, ground stability and bearing capacity failures. The geotextile provides high strength and maintains separation from the granular fill above while allowing drainage.



● Landfills and Lagoon Closures

Due to difficulty in building new landfills the current practice is to construct new cells on top or next to existing closed landfills. High strength geotextiles allows the landfill capacity to be expanded by preserving the integrity of the new lining system. They reduce the differential settlement caused by biodegradation under the weight of the new waste. High strength wovens offer greater savings over double layers of uni-axial geogrids.

Lagoons containing industrial wastes often close before settlement which require the installation of an impermeable cap over the thick wastes. High strength geotextile covers over the lagoon provides several advantages including separation, stabilisation and reinforcement, both of which aren't adequately performed by geogrids alone.

● Design and Installation

Permathene can provide designs using software specifically for high strength geotextile applications. This provides engineers with critical data including analysis of sliding, global stability, lateral spreading and settlement calculations.

Our installation crews can provide on-site stitching of high strength geotextiles where specified. This is typically done in areas of very weak subgrades where stresses and shear strengths are such as to demand the separation layer be bonded together to give high strengths in all directions. Non-stitched high strength geotextiles can become costly due to required overlaps of non stitched fabrics, so we can offer greater economy by reducing this fabric loss and still meet the required seam strengths.

Physical Properties

GEOTEXTILES HIGH STRENGTH (product prefix: GHS)

Polypropylene

PROPERTY	TEST METHOD	UNITS	35/ 35	70/ 70	70/ 105
Mass	ASTM D 5261	kg	220	386	525
Wide Width Tensile	ASTM D 4595	kN/ m	35 x 35	70 x 70	70 x 105
Wide Width Elongation		%	10 x 8	9 x 9	14 x 9
Trapezoidal Tear	ASTM D 4533	N	556 x 556	1000 x 1000	1110 x 1335
Grab Tensile	ASTM D 4632	N	1401 x 1335	2700 x 2300	-
Grab Elongation	ASTM D 4632	%	15 x 15	-	-
Puncture Strength	ASTM D 4833	N	668	1200	1155
Mullen Burst	ASTM D 3786, AS 2001.2.4 B	kPa	4481	> 8274	> 8273
Apparent Opening Size (AOS)	ASTM D 4751 (dry)	mm	.425	.425	.425
Water Flow Rate	ASTM D 4491	l/ m ² / min	1200	42	810
UV Resistance	ASTM D 4355	% retained	80 (500 hrs)	80 (500 hrs)	80 (500 hrs)

Values are MARV (minimum average roll values), calculated as typical minus two standard deviations.

Polyester

PROPERTY	TEST	UNITS	150/ 50	150/ 150	200/ 50	200/ 200	300/ 50	300/ 100
Tensile MD (min)	ISO 10319	kN/ m	160	160	220	220	330	330
Tensile CD (min)		kN/ m	55	160	55	220	55	110
Elongation at Break MD		%	11	12	12	11	12	13
Elongation at Break CD		%	11	12	12	11	11	11
CBR	ISO 12236	kN	11	16	11	> 10	> 12	> 18
Cone Drop	ISO 918	mm	7	4	7	17	15	13
Characteristic Opening Size	ISO 12956	mm	0.30	0.20	0.25	0.46	0.11	0.11
Permeability	ISO 11058	m/ sec	0.04	0.02	0.04	0.05	0.02	0.015
Weight		g/ m ²	340	510	450	770	660	760

Polyester

PROPERTY	TEST	UNITS	400/ 50	500/ 50	500/ 100	600/ 50	800/ 100	1000/ 100
Tensile MD (min)	ISO 10319	kN/ m	440	550	550	660	880	1106
Tensile CD (min)		kN/ m	55	55	110	55	110	110
Elongation at Break MD		%	12	13	13	13	13	8
Elongation at Break CD		%	12	11	11	11	12	8
CBR	ISO 12236	kN	11	> 8	> 8	11	11	11
Cone Drop	ISO 918	mm	13	18	18	15	8	
Characteristic Opening Size	ISO 12956	mm	0.45	0.16	0.14	0.15	0.15	
Permeability	ISO 11058	m/ sec	0.02	0.015	0.015	0.04	0.05	
Weight		g/ m ²	950	1100	1200	1340	1900	

Values of polyester fabrics above are Typical = Mean or Average Value of all test data

Note: Other strengths are available for custom orders. Product is manufactured to ISO 9001 and CE. Presented data does not include tolerances. These and other results, including creep performance values, certificates, etc. are available upon request.

Disclaimer

The information presented herein, while not guaranteed, is to the best of our knowledge true and accurate.

While every effort has been made to provide accurate and reliable information, it is up to the user of this brochure to verify all information, including designs it might be based upon, with an independent source. Application of this data must be made on the basis of responsible professional judgement.

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