

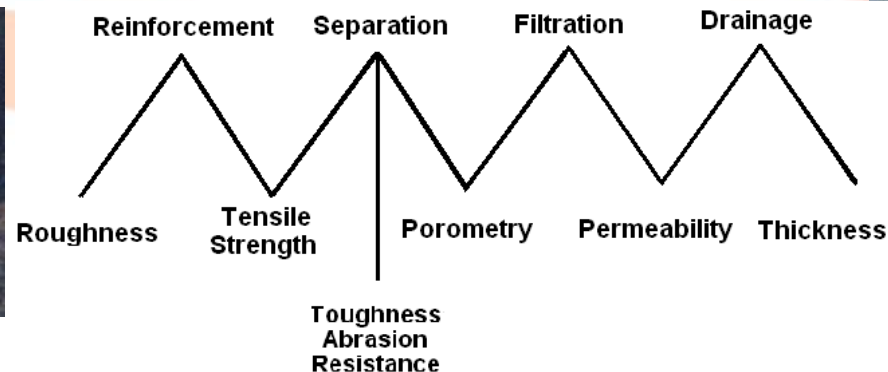
Geosynthetics

Geosynthetics and/or Geotextiles are commonly used in many civil engineering applications. The use of Geotextiles extends the design life of the structure by preventing the deterioration of the initial strength of the pavement. They are used in Civil and environmental applications such as Roadway and railroad stabilization, Roadway separation, road embankments, landfill constructions, foundations, trench and blanket drains, retaining structures and permanent erosion control. Primary functions are filtration, drainage, separation and reinforcement.

- 1. Filtration:** Filtration functions to restrict the migration of fine soil particles from a soil mass while remaining permeable to water movement at least greater than, or equivalent to, permeability of the protected soil.
- 2. Drainage:** Water is conveyed along the plane of the Geotextile due to its construction, and then to an outlet. Water may be vertically or horizontally conveyed. Drainage is related to the role of filtration, and is a function of the permeability of a Geotextile and its pore opening size or porometry. All grades of geotextiles are suitable for filtration and drainage requirements of silt and clay soils, low permeability granular soils and pervious granular soils.
- 3. Separation:** Separation is that function which prevents two distinct soils or different materials from intermixing. The key factors for a Geotextile to satisfy this function are porometry, toughness and strength.
- 4. Reinforcement:** This function involves stabilization of a soil mass by provision of tensile strength to the soil-fabric system.

There are various types of Geosynthetics including nonwoven, woven, high strength and composite knitted – all of which perform various functions within different applications.

The installation of Geosynthetics in numerous applications provides a cost-effective, time-saving addition in reducing the quantity of aggregate needed to achieve stability.



GEOTEXTILE SPECIFICATIONS

Geotextiles Made from Polypropylene (Propex)

Grade QLD MRS Class	Test Method	Units	AS401 "A"	AS501 "B"	AS601 "B"	AS801 "C"	AS1071 "D"	AS1201 "D"	AS1601 "E"
Typical Mechanical Properties									
Trapezoidal Tear Strength	As 3706.3	N	280	350	380	460	640	750	950
CBR Burst Strength	AS 3706.4	N	1400	2100	2200	3200	4400	5100	5900
G-Rating	Austrroads	-	1240	1920	2045	3020	3920	4575	5750
Grab tensile Strength	AS 2001.2.3	N	560	780	870	1200	1600	1950	2600
Typical Hydraulic Properties									
Pore Size O(95)	AS 3706.7	Microns	110	110	100	90	75	75	75
Nominal Flow Rate Q(100)	AS 3706.9	l/m ² /s	250	220	200	130	90	80	70
Typical Physical Properties									
Mass	AS 3706.1	g/m ²	136	170	205	272	340	410	545
Standard Roll Sizes	-	M	2m x 100m 2m x 250m 4m x 100m 4m x 250m	2m x 200m 4m x 200m	2m x 175m 4m x 175m	2m x 115m 4m x 115m	2m x 100m 4m x 100m	2m x 80m 4m x 80m	2m x 60m 4m x 60m
Other									
Stone Size *	-	mm	≤37.5	≤75	≤125	≤200	≤400	≤400	≤600

* All stones should be placed on geotextile, not dumped from a great height, to prevent damage to the fabric

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Geotextiles made from Polyester (Geofirma and Profab)

Grade	Test Method	Units	AS140 (Low-Grade A Class)	AS150A	AS200B	AS270C	AS350D	AS500E
Typical Mechanical Properties								
Trapezoidal Tear Strength	As 3706.3	N	260	310	400	480	620	900
CBR Burst Strength	AS 3706.4	N	1.7	1.8	2.5	3.5	4.8	6.3
G-Rating	Austrroads	-	>1800	1700	2210	2825	3795	5080
Grab tensile Strength	AS 2001.2.3	N	590	780	1070	1330	1870	2400
Typical Hydraulic Properties								
Pore Size O(95)	AS 3706.7	Microns	120	110	110	100	80	75
Nominal Flow Rate Q(100)	AS 3706.9	l/m ² /s	200	210	180	150	130	110
Typical Physical Properties								
Standard Roll Sizes	-	M	.6 X 50m 1 x 50m 1.2m x 50m 2m x 50m	6 x 250	6 x 175	3 x 150 6 x 150	6 x 100	6 x 75
Stone Size		Mm	≤50	≤37.5	≤75	≤200	≤400	≤4500

* All stones should be placed on geotextile, not dumped from a great height, to prevent damage to the fabric

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Woven Geosynthetics

Woven Geotextiles, unlike their unwoven counterparts, are actually manufactured into tape fabric from woven extrusions of polypropylene, either bundled or as a flat tape. These products are created generally for high strength developed at low strains, to generate reinforcement in separation applications, particularly for roads and pavement, as they can reduce the volume of ag required to achieve stability in wet subgrade and extend life by preventing deterioration of the initial strength of the pavement.

Mechanical Properties	Test Method	Unit	PP30	PP80
Wide Tensile Strength XD	ISO 10319	kN/m	30	80
Wide Tensile Strength MD	ISO 10319	kN/m	28	80
Strain XD	ISO 10319	96	15	14
Strain MD	ISO 10319	96	20	19
CBR Burst Strength	ISO 12236	kN	3.5	10
Hydraulic Properties				
Pore Size	ISO 12956	mm	0.3	0.3
Nominal Flow Rate	ISO 11058	Litres/m ² /s	23	20
Physical Properties				
Mass		g/m ²	150	360
Roll Size		M	5.0 x 150	5.2 x 100
Nominal Roll Weight		kg	105	200

Mechanical Properties	Unit	GT200/200
Tensile Strength T_{ult} (MD)	kN/m	200
Tensile Strength T_{ult} (CD)	kN/m	200
Long Term Design Properties		
Creep Reduction Factor, RF $_{CR 60 yrs}$	-	1.41
Creep reduction Factor, RF $_{CR 120 yrs}$	-	1.46
Installation Damage Reduction Factor RF $_{ID Sand, Silt Clay}$	-	1.10
Installation Damage Reduction Factor RF $_{ID sandy gravel}$	-	1.19
Environmental & Durability Reduction Factor RF	-	1.10
LTDS Long Term Design Strength (120 yrs), T $_{Allowable clay, silt & sand}$	kN/m	113.2
LTDS Long Term Design Strength (120 yrs), T $_{Allowable Sandy Gravel}$	kN/m	104.7
Physical Properties		
Length	m	100
Width	m	5.2

Paving Fabrics
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Specifically manufactured for pavement applications, suited to withstand the chemical properties and heat of asphalts, bitumen and tack coats. Propave has high tear resistance properties and is capable of withstanding heavy forces in all directions.

Mechanical Properties	Aust. Standards	Unit	Propave 400P	Propave 500P
Tensile Properties				
Wide Strip Tensile Strength	AS 3706.2	kN/m	≥7.0	≥10
Wide strip Elongation	AS 3706.2	%	40-70	40-70
G Rating	(QMR)	-	≥950	≥1100
Bitumen Retention Properties				
Bitumen Retention (Class 170)	ASTM D6140	l/m ²	≥0.9	≥1.1
Physical Properties				
Polymer		-	Polyester	Polyester
Melt Point		°C	≥250	≥250
Mass	AS 3706.1	g/m ³	140	180
Thickness	AS 3706.1	Mm	≥0.8	≥1.2
Standard Roll Size		M	4 x 300	4 x 200
Nominal Roll Weight		kg	170	150