

Fibre-reinforced Geosynthetic Clay Liner (GBR-C)

Bentofix® X5F NSP 4900 a

Spicers Landfill, Porirua, Wellington, New Zealand

Bentofix® X5F NSP 4900 a is a shear strength transmitting geosynthetic clay barrier (GBR-C), continuously needle-punched through all components. A GBR-C is also known as geosynthetic clay liner (GCL) or bentonite mat. Following its needling process a polyethylene layer is coated to the entire surface of the woven side. Additional bentonite powder is impregnated into a 500 mm overlapping area on both longitudinal sides of the nonwoven layer. The 300 mm length longitudinal overlapping areas are marked on the coating side. The geotextile layers meet the requirements according to ISO/TS 13434 of at least 100-year service lives.

Property	Test method*	Unit	Values
Geotextile layers:			
Polypropylene nonwoven:			
Mass per unit area	ASTM D5261	g/m ²	≥ 200
Polypropylene woven:			
Mass per unit area	ASTM D5261	g/m ²	≥ 180
Bentonite layer (sodium bentonite powder):			
Mass per unit area	ASTM D5993 ($\rho_{CLAY, 0\%}$)	g/m ²	≥ 3,700
Swell index	ASTM D5890	ml/2g	≥ 24
Fluid Loss	ASTM D5891	ml	≤ 18
Moisture content	ISO 11465 (5hrs, 105 °C)	%	≤ 15
Carbonate content	XRD	% wt	1-2
Particle size, passing a 75µm sieve	Dry screen	%	> 80
Cation exchange capacity	Methylene blue method	meq/100 g	≥ 70
Montmorillonite content	VDP69 (Methylene blue)	mg/g	≥ 300
Polyethylene coating:			
Mass per unit area	ASTM D5261	g/m ²	≥ 500
Bentofix X5F NSP 4900 a:			
Mass per unit area	ASTM D5993 ($\rho_{X5F \text{ and } GBR-C, 0\%}$)	g/m ²	≥ 4,580
Thickness	ASTM D 5199	mm	≥ 5.7
Tensile strength, md/cmd**	EN ISO 10319 / ASTM D6768	kN/m	≥ 19.8 / ≥ 19.8
Elongation at max. strength, md/cmd**	EN ISO 10319 / ASTM D6768	%	≥ 9.0 / ≥ 5.4
Peel strength***	ASTM D6496	N/m	≥ 600
Static puncture	ASTM D6241	N	≥ 2,970
Hydrated internal shear strength*** (maximum peak @10 kPa normal stress)	ASTM D6243	kPa	≥ 40
Hydrated internal shear strength*** (maximum peak @ 30 kPa normal stress)	ASTM D6243	kPa	≥ 60
Nod heights of the structured surface	Naue laboratory	mm	80% ≥ 0.9
Hydraulic Conductivity, PE-coating only	EN 14150 (10 m water head)	m ³ /m ² /day	3 x 10 ⁻⁶
Hydraulic Conductivity (calculated by testing according to EN 14150), PE-coating only	EN 14150 (10 m water head)	m/s	≤ 10 ⁻¹⁴
Hydraulic Conductivity (k ₁₀), GBR-C only	EN 16416 / ASTM D5887	m/s	≤ 2.5 x 10 ⁻¹¹
Index Flux (q ₁₀), GBR-C only	EN 16416 / ASTM D5887	(m ³ /m ²)/s	≤ 4.0 x 10 ⁻⁹
Roll dimensions:			
width x length, / diameter (approx.)	-	m x m / m	4.85 x 35 / 0.60

*based on; **md = machine direction, cmd = cross machine direction; ***nonwoven vs. woven/coating

The listed technical values are either minimum values (≥) or maximum values (≤), achieved in our laboratories and/or independent testing institutes. Our products are subject to changes without prior notice.