

G-GCL® Geosynthetic clay liner (GCL) is a hydraulic barrier consisting of a layer of high-quality sodium bentonite powder bonded between two or more layers of woven and non-woven geotextiles. Bentonite is a natural sealant, and when in contact with water, swells to form a low permeability clay liner. GCL is an efficient barrier against liquids, vapours, and gases once hydrated, used for both barrier and containment requirements, such as landfill caps and liners, channel liners, artificial ponds, waterproofing of buildings and similar structures.

Features: High shear strength, long term creep resistance, excellent self-sealing capacity.

Applications: Landfills, mining industry, tunnels.

Properties	Units	Test Method	Value Type	GCL800	GCL1000	GCL2000	GCL3000
Geotextile Configuration (Carrier / Cover)				W / NW ⁵	W / NW	W+NW / NW	W+NW / NW
GCL Hydraulic Properties							
Hydraulic Conductivity,K	m/s	ASTM D 5887	MaxAr ²	3.5×10 ⁻¹¹	2.8×10 ⁻¹¹	3×10 ⁻¹¹	2.4×10 ⁻¹¹
			Typical ³	2.5×10 ⁻¹¹	1.9×10 ⁻¹¹	2.4×10 ⁻¹¹	1.7×10 ⁻¹¹
Bentonite Characteristics							
Bentonite Particle Size	% passing 75µm	Dry Screen	Typical	≥75	≥75	≥75	≥75
	% ≤ 0.5µm	AS 1289-3.6.2		≥55	≥55	≥55	≥55
Swell Index	mL/2g	ASTM D 5890	Typical	≥24	≥24	≥24	≥24
Fluid Loss	mL	ASTM D 5891	Typical	≤15	≤15	≤15	≤15
GCL Components-Mass							
Cover Nonwoven Geotextile Mass per Unit Area	g/m ²	AS 3706.1	MARV ⁴	220	240	240	260
			Typical	250	270	270	300
Bentonite Mass per Unit Area @ 0% Moisture Content	g/m ²	ASTM D 5993	MARV	3700	4000	3,700	4,250
			Typical	4100	4500	4,250	4,700
Carrier / Composite Geotextile Mass per Unit Area	g/m ²	AS 3706.1	MARV	110	110	350	350
			Typical	110	110	380	380
GCL - Mass							
GCL Total Mass per Unit Area @ 0% Moisture Content	g/m ²	ASTM D 5993	MARV	3930	4350	4,290	4,860
			Typical	4460	4880	4,900	5,380
GCL - Strength Properties							
Strip Tensile Strength (MD) ⁶	kN/m	ASTM D6768	MARV	7	8	12	12
			Typical	10	11	15	16
CBR Strength	N	AS 3706.4	MARV	1400	1600	3,900	4,100
			Typical	2000	2100	4,900	5,300
CBR Elongation	%	AS 3706.4	MARV	10	15	30	30
			Typical	30	40	80	80
GCL - Shear Strength Properties							
Hydrated Peak Internal Shear Strength@10kPa Normal Stress	kPa	ASTM D6243	Typical ⁷	30	30	35	40
Hydrated Peak Internal Shear Strength@30kPa Normal Stress	kPa	ASTM D6243	Typical	50	50	60	70
GCL Longitudinal Edge Treatment							
Bentonite Impregnation - Width ≥ 300mm -Typical	-	-	-	√	√	√	√
Edge Sealing Performance	m/s	ASTM STP	Typical	2.5×10 ⁻¹¹	1.9×10 ⁻¹¹	2.4×10 ⁻¹¹	1.7×10 ⁻¹¹
GCL Roll Dimensions							
Roll Width	m	Direct measurement	Approx.	According to customization			
Roll length	m	Direct measurement	-	According to customization			
Roll Diamenter	cm	Direct measurement	Approx.	-	-	-	-
Roll weight(gross)	kgs	-	Approx.	-	-	-	-
Approx Load Q'ty rolls/20'GP	rolls	-	Approx.	-	-	-	-
Approx Load Q'ty m2/20'GP	m ²	-	Approx.	-	-	-	-

1. MQC = Manufacturing Quality Control - an ongoing system that monitors and tests materials during manufacture to ensure compliance with certification documents and contract specifications.
2. MaxARV = Maximum Average Roll Value -a MaxARV is defined as the Mean or Typical values plus 2 standard deviations. Mathematically, it is implied that 97.5% of the results of the tested specimens will be less than the MaxARV. A MaxARV provides a confidence level of 97.5%. NOTE- in reference to GCL Permeability, LOWER IS BETTER.
3. Typical = A typical value is the arithmetic mean of a set of results. This implies that 50% of the tested specimens will typically exceed this value and 50% will typically not meet this value.
4. MARV = Minimum Average Roll Value -a MARV is defined as the Mean or Typical values less 2 standard deviations. Mathematically, it is implied that 97.5% of the results of the tested specimens will exceed the MARV. A MARV provides a confidence level of 97.5%.
5. W= Woven,NW= Nonwoven.
6. MD = Roll Machine Direction.
7. Peak Value reported at 10kPa or 30kPa normal stress. [The reported values are not intended to replace site specific internal shear or interface friction testing required for design].
8. Heavy-Duty WLL (Working Load Limit)=1,400kg.
9. Standard WLL (Working Load Limit)=1,000kg.
10. Reference- Daniel,D.E. Trautwein, S.J. and Goswami, PK.1997. Measurement of Hydraulic Properties of Geosynthetic Clay Liners Using a Flow Box, Testing and Acceptance Criteria for Geosynthetic Clay Liners, ASTM STP 1308,p.196-207.
11. Modification Reference .Kendall PM Austin R.A. 2014. Investigation of GCL Overlap Techniques Using a Large Scale Flow Box. 7th International Congress on Environmental Geotechnics.3B-3.0.746-753



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