BENTOMAT® 600CL

GEOSYNTHETIC CLAY LINER

DESCRIPTION

BENTOMAT 600CL GCL is a reinforced geosynthetic clay liner (GCL) consisting of a layer of sodium bentonite between a polypropylene woven geotextile and a polypropylene nonwoven geotextile, which are needlepunched together and laminated to a polyethylene geofilm.

TESTING DATA

CHEMICAL & PHYSICAL PROPERTIES			
MATERIAL PROPERTY	TEST METHOD	TEST FREQUENCY	CERTIFIED VALUES
Bentonite Swell Index[2]	ASTM D5890	1 per 50 tonnes	24 mL/2g min.
Bentonite Fluid Loss[2]	ASTM D5891	1 per 50 tonnes	18 mL max.
Bentonite Mass/Area[3]	ASTM D5993	40,000 ft^2 (4,000 m^2)	0.75 lb/ft^2 (3.7 kg/m^2) min.
Geofilm Density[1]	ASTM D1505	200,000 ft^2 (20,000 m^2)	0.92 g/cm^3
Geofilm Thickness[1]	ASTM D5199	200,000 ft^2 (20,000 m^2)	5 mil (0.12 mm) min.
Geofilm Break Strength[1,4]	ASTM D882	200,000 ft^2 (20,000 m^2)	14 lbs/in (2.5 kN/m) min.
GCL Grab Strength[5]	ASTM D6768	200,000 ft^2 (20,000 m^2)	30 lbs/in (5.3 kN/m) min.
GCL Peel Strength	ASTM D6496	40,000 ft^2 (4,000 m^2)	1.0 lbs/in (175 N/m) min.
GCL Hydraulic Conductivity[6]	ASTM D5887 mod.	Periodic[7]	5 x 10^{-10} cm/s max.
GCL Index Flux[6]	ASTM D5887 mod.	Periodic[7]	1 x 10^{-9} $m^3/m^2/s$ max.
GCL Hydrated Internal Shear Strength[8]	ASTM D6243	Periodic[7]	150 psf (7.2 kPa) typ. @ 200 psf (9.6 kPa)
Geofilm Durability[1,9]	GRI-GCL3 § 5.6.4	Yearly[10]	80% retained min.

Notes:

[1] Geosynthetic property tests performed on the geosynthetic components before they are incorporated into the finished GCL product.

[2] Bentonite property tests performed before the bentonite is incorporated into the finished GCL product.

[3] Reported at 0% moisture content.

[4] Geofilm tensile break strength performed in the machine and cross-machine directions using ASTM D882.

[5] GCL tensile strength testing is performed in the machine direction using ASTM D6768.

[6] ASTM D5887 is modified to include the laminated thin flexible membrane on the test specimen. Index flux and hydraulic conductivity testing with deaired distilled/deionized water at 80 psi (550 kPa) cell pressure, 77 psi (530 kPa) headwater pressure and 75 psi (515 kPa) tailwater pressure. ASTM D5887 (modified) testing is performed only on a periodic basis because the thin flexible membrane is essentially impermeable. The BENTOMAT GCL core (without the flexible membrane) has a maximum hydraulic conductivity of a 5 x 10-11 m/s with deaired distilled/deionized water. For more information, see CETCO Technical Reference Nos. 111 and 112.

[7] Periodic test results can be provided upon request.

[8] Peak values measured at 200 psf (9.6 kPa) normal stress for a specimen hydrated for 48 hours. Site-specific materials, GCL products, and test conditions must be used to verify internal and interface strength of the proposed design.

[9] Geofilm test specimens are oven-aged for 50 days at 60°C prior to testing for tensile strength in accordance with paragraph 5.6.4 of GRI-GCL3, rev. 5, dated 11/21/2019.

[10] Yearly testing results can be provided upon request.

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