

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

Notes:

<sup>1</sup> Geosynthetic property tests performed on the geosynthetic components before they are incorporated into the finished GCL product.

<sup>2</sup> Bentonite property tests performed before the bentonite is incorporated into the finished GCL product.

<sup>3</sup> Reported at 0% moisture content.

<sup>4</sup> Geofilm tensile break strength performed in the machine and cross-machine directions using ASTM D882.

<sup>5</sup> GCL tensile strength testing is performed in the machine direction using ASTM D6768.

<sup>6</sup> 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<sup>-11</sup> m/s with deaired distilled/deionized water. For more information, see CETCO Technical Reference Nos. 111 and 112.

<sup>7</sup> Periodic test results can be provided upon request.

<sup>8</sup> 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.

<sup>9</sup> 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.

<sup>10</sup> Yearly testing results can be provided upon request.

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