



SOLMAX APAC eNEWS

October 2021 Edition

Feature: Geosynthetics Clay Liner (GCL) for Containment Application

Geosynthetics clay liner or GCL are modern hydraulic barrier manufactured from a thin bentonite layer sandwiched in between various types of geosynthetics material (i.e., nonwoven geotextile, woven geotextile or geomembrane). The product is held together by either needle-punched, stitched bonded or adhesive.

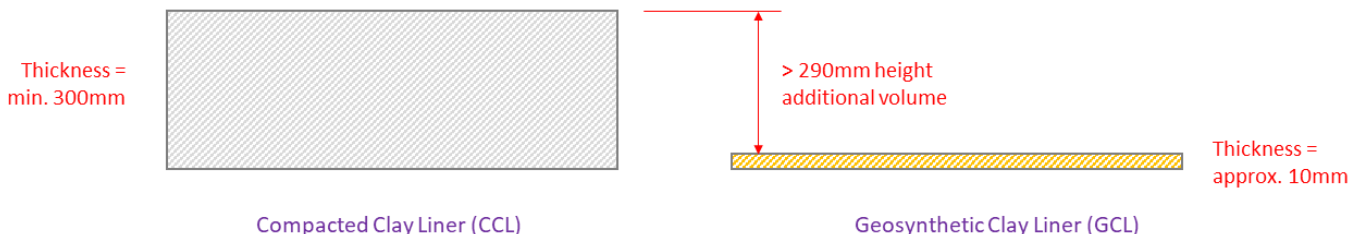
GCL is an excellent substitute with many of its own benefits to a thicker compacted clay liner. It is commonly used as a hydraulic barrier in applications such as:

- Secondary liner of base lining and capping [in landfill](#)
- As barrier [for surface impoundment](#)
- Primary or secondary liner [in various mining applications](#)
- [In secondary containment](#) to prevent hydrocarbon migration

As barrier [in structural waterproofing](#)

Advantages of GCL

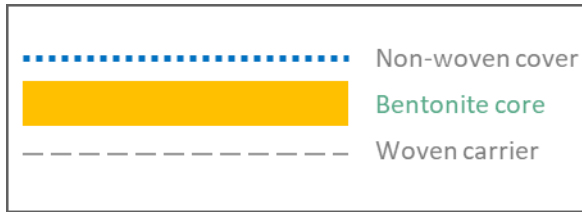
- [High shear resistance](#) – Needle-punched GCL reinforces the otherwise weak layer of sodium bentonite clay. Reinforced GCL can withstand steep slope while maintaining low permeability.
- [Self-healing capability](#) – Bentonite is a type of swelling clay; it is able to self-heal even after the GCL is punctured, without sacrificing its permeability.
- [Increased airspace](#) – GCL can fully or partially substitute the required thickness of compacted clay liner. This results in increased containment volume for more waste.
- [Consistent GCL's quality](#) – Stringent manufacturing quality control in a factory-controlled environment ensures consistent GCL's quality.



Standard Bentoliner: Fabric Encased GCL

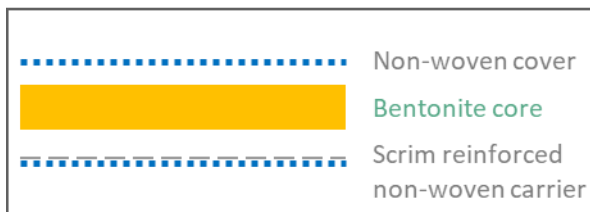
Bentoliner is a type of reinforced GCL through needle-punching in between two layers of geotextile. It has excellent internal shear contributed from fibers holding the GCL together. Bentoliner can be installed at a steeper slope angle compares to compacted clay liner.

Solmax's Bentoliner have a few configurations:



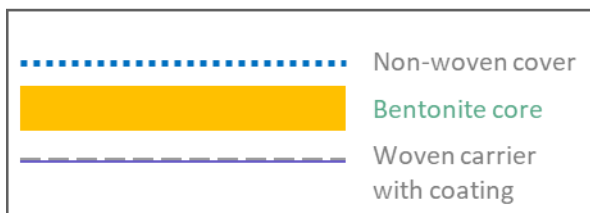
Bentoliner NS, ST & HSL type

Standard type GCL with a woven carrier. Commonly used in various applications from landfill, mining to water containment.



Bentoliner NW & HWL type

Scrim-reinforced non-woven GCL has the highest peel strength among the NS and NW type GCL. It has high internal shear strength with good dimensional stability.



Bentoliner CNS type

CNS type Bentoliner has similar configuration as NS type except it has a thin coated PE on the woven side to further reduce its hydraulic conductivity.

Link: <https://www.solmax.com/en/products-and-services/gcl-bentoliner>

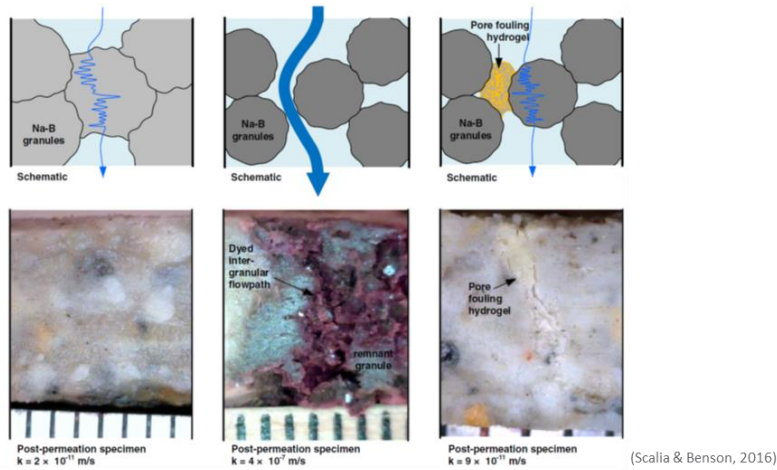
Polymer Enhanced Bentoliner: Specialty GCL for High Ionic Condition

Polymer Enhanced Bentoliner has similar configuration with standard Bentoliner except the core is enhanced with a certain percentage of polymer. This polymer and bentonite form a polymer-bentonite composite to improve GCL performance in adverse condition (i.e., solution with high ionic strength).

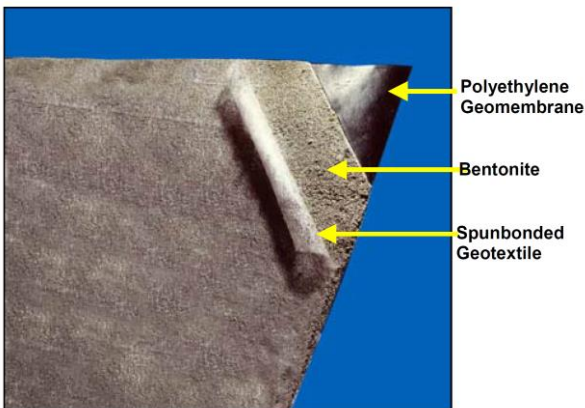
Solmax has a few types of Polymer Enhanced Bentoliner for different conditions:

- **CAR Bentoliner** – A coal ash resistant GCL for coal combustion residual containment.
- **BR Bentoliner** – A brine resistant GCL for secure containment of brine ponds in oil & gas industry.
- **AR Bentoliner** – A bauxite tailing resistant GCL for tailing storage facility with high pH and aggressive leachate.

Link: <https://www.solmax.com/en/products-and-services/gcl-bentoliner>



GundSeal: Geomembrane Backed GCL



GundSeal is a geomembrane backed GCL with bentonite adhered on one side of geomembrane. The material combines the chemical resistance and impermeability of geomembrane with the swelling and sealing of sodium bentonite, making it a unique 2-in-1 composite GCL.

Benefits of using GundSeal:

- Better geomembrane lay flat
- Intimate contact reduces leakage area
- Geomembrane protects bentonite against wet-dry cycles

This product can have various combinations on the geomembrane and bentonite component:

- Geomembrane can be HDPE or LLDPE with textured or smooth surface.
- Bentonite layer can be sodium bentonite or polymer enhanced bentonite.

Link: <https://www.solmax.com/en/products-and-services/gcl-gundseal>

Click on the pictures to access the project...



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