Polymer modified sodium bentonite GCL

0.50 mm LDPE laminate

Needle-punched GCL with polymer-modified sodium bentonite powder and PE bonded to the cover nonwoven. Codes below carry the HDL-GCL prefix.

Specified minimum and maximum supply values. Select the grade and production test schedule for the project. Minimum order: 15,000 m².

Property	Test method or basis	Unit	Standard 37 S37P-050	Standard 40 S40P-050	Heavy Duty 37 H37P-050	Heavy Duty 40 H40P-050
GCL components and PE laminate						
Cover nonwoven PP mass	ASTM D5261	g/m²	≥200			
Carrier woven PP mass	ASTM D5261	g/m²	≥100			
Carrier nonwoven PP mass	ASTM D5261	g/m²	Not included		≥200	
Total carrier mass	Component minima	g/m²	≥100		≥300	
Dry bentonite mass at 0% moisture[1]	ASTM D5993 and records	g/m²	≥3,700	≥4,000	≥3,700	≥4,000
PE film thickness and resin	Nominal construction	mm	0.50 LDPE			
Bentonite properties						
Polymer addition	Formulation declaration	-	Yes			
Swell in reagent water[2]	Modified D5890 basis	mL/2 g	≥28			
Swell in 20,000 mg/L NaCl at 16 h[2]	Modified D5890 basis	mL/2 g	≥22			
Fluid loss[2]	Modified D5891 basis	mL	≤18			
Moisture content	ASTM D5993	%	≤13			
Powder passing 75 µm sieve	Validated particle sizing	%	≥80			
GCL properties						
Tensile strength MD and CMD	ASTM D6768	kN/m	≥10 / ≥10			
Internal GCL peel strength	ASTM D6496	N/m	≥360			
Static puncture strength CBR	EN ISO 12236	N	≥1,600		≥2,500	
Hydrated peak internal shear at 10 kPa normal stress	ASTM D6243	kPa	≥30		≥35	
PE to cover peel in bonded areas	Agreed PE/NW procedure	N/m	≥300			
Hydraulic properties of the GCL core[3]						
Hydraulic conductivity in fresh water	ASTM D5084 GCL setup	m/s	$\leq 5.0 \times 10^{-11}$		$\leq 3.0 \times 10^{-11}$	
Conductivity in 20,000 mg/L NaCl	Agreed chemical test[3]	m/s	$\leq 1.0 \times 10^{-10}$			
Fresh water index flux q10[4]	ASTM D5887	m³/m²/s	$\leq 2.7 \times 10^{-9}$			
Longitudinal joints and supply dimensions						
Released PE zone at long edges	Specified edge detail	mm	400			
Direct GCL contact and PE overlap	Separate minimum widths	mm	≥300 / ≥300			
Roll width and length	Common supply format	m	5 × 30			

1 Values are specified minimum and maximum acceptance limits. Dry bentonite mass covers the clay fraction, excluding polymer, geotextiles, adhesive and PE. Film thickness is nominal. Select each construction against its stated property schedule.

2 Modified swell: 16 h after the final increment in ASTM D1193 reagent water (distilled/deionised) or 20,000 mg/L NaCl. Supplier reference values are ≥28 mL/2 g in tap water and ≥22 mL/2 g in 20,000 ppm salt water on the supplier basis. The stated reagent-water and NaCl conditions define acceptance targets. ASTM D5890-25 excludes polymers. Agree fluid-loss preparation.

3 GCL core values exclude PE and joints. Agree confinement, gradient, hydration, liquid and equilibrium criteria. For chemicals, use ASTM D6766 within scope and report adaptations. Specify durability, cycling and protection testing to suit the application.

4 The Standard-grade fresh-water flux is a construction-specific acceptance target based on the same bentonite formulation as Heavy Duty. Specify ASTM D5887 acceptance testing for the selected construction and confinement.

Consider polymer where higher drying resistance is sought during prolonged exposure, or lime-affected water, highly saline water or certain leachates may hydrate the clay instead of typical rainwater. Verify the actual liquid and formulation. Cover promptly; permanent exposed service requires separate design.

Specify the 0.50 mm film and extrusion procedure for the actual filler and laminated assembly, with procedure trials before installation. No wedge welding. Use issued end-joint and repair details. Film is specified by resin type and nominal thickness; select GCL-W for a GM17 membrane. Agree order dimensions and cores.