Unlaminated sodium bentonite GCL

Polymer modified powder

Needle-punched GCL with polymer-modified sodium bentonite powder between polypropylene geotextiles. Codes below carry the GCL prefix.

Specified supply requirements. Confirm the exact grade, source and production evidence before supply. Independent qualification of the selected unlaminated constructions remains pending.

Property	Test method or basis	Unit	Standard 37 S37P	Standard 40 S40P	Heavy Duty 37 H37P	Heavy Duty 40 H40P
GCL components						
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
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	
Hydraulic properties[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	$\leq 2.7 \times 10^{-9}$			
GCL overlaps and supply						
Factory longitudinal edge overlap	Accepted seam detail	mm	≥300			
End joints and field cuts on a base	Accessory bentonite treatment	mm	≥600			
Roll width and length	Common supply format	m	5 × 30			

1 Specified lower and upper supply limits, not MARV. Dry bentonite excludes polymer and geotextiles; verify the clay fraction. Confirm each unlaminated construction; added clay mass does not establish higher performance.

2 Modified swell: 16 h after the final increment in ASTM D1193 reagent water (distilled/deionised) or 20,000 mg/L NaCl. Supplier ≥28/≥22 values used tap/unspecified salt water; defined conditions need confirmation. ASTM D5890-25 excludes polymers. Agree fluid-loss preparation.

3 Hydraulic limits apply to the GCL under agreed confinement, gradient, hydration, liquid and equilibrium criteria. Assess joint performance separately. Use ASTM D6766 within scope for chemicals and report adaptations. Durability, cycling and protection qualification remains pending. This sheet does not establish landfill-specification compliance.

4 The Standard-grade fresh-water flux limit is adopted from Heavy Duty on a same-bentonite assumption and requires ASTM D5887 verification. Hydraulic behaviour also depends on 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.

Keep overlaps clean and in direct GCL contact under continuous confinement. Confirm factory edge treatment; use compatible accessory bentonite on untreated seams, ends and cuts. Slope end joints and repairs require project details. Agree roll dimensions and cores for the order.