



The Pioneer Of Geosynthetics

S I N C E 1 9 7 2

## GSE GundSeal Geosynthetic Clay Liner (Smooth HDPE)

GSE GundSeal geosynthetic clay liner (GCL) is a composite liner system that consists of a high quality sodium bentonite adhered to a smooth high density polyethylene (HDPE) geomembrane with a spunbonded geotextile to protect the bentonite during installation. This one product composite liner system combines the low permeability of an HDPE geomembrane with the self-seaming characteristics of bentonite clay. The intimate contact of the bentonite with the geomembrane provides the best leak protection in the industry.

### Product Specifications

TESTED PROPERTY	TEST METHOD	FREQUENCY	MINIMUM AVERAGE VALUE					
			15 mil	20 mil	30 mil	40 mil	60 mil	80 mil
<b>FINISHED GCL PROPERTY</b>								
Bentonite Coating <sup>(1)</sup> , lb/ft <sup>2</sup> (kg/m <sup>2</sup> )	ASTM D 5993	1/40,000 ft <sup>2</sup> (1/4000 m <sup>2</sup> )	≥ 0.75 (3.66)					
Effective Hydraulic Conductivity, m/s	ASTM D 5887/E 96	periodically	≤ 4 x 10 <sup>-14</sup>					
Bentonite Moisture Content	ASTM D 2216	1/40,000 ft <sup>2</sup> (1/4000 m <sup>2</sup> )	25% Typical					
<b>GEOMEMBRANE PROPERTY<sup>(2)</sup></b>								
Thickness, (minimum average) mil (mm)	ASTM D 5199	1/100,000 ft <sup>2</sup> (1/10,000 m <sup>2</sup> )	15 (0.40)	20 (0.50)	30 (0.75)	40 (1.00)	60 (1.50)	80 (2.00)
Lowest individual reading (-10%)			14 (0.34)	18 (0.45)	27 (0.69)	36 (0.91)	54 (1.35)	72 (1.80)
Density, g/cm <sup>3</sup>	ASTM D 1505	1/200,000 ft <sup>2</sup> (1/20,000 m <sup>2</sup> )	0.94	0.94	0.94	0.94	0.94	0.94
Tensile Properties								
Tensile Break Strength, lb/in (N/mm)	ASTM D 6693	1/200,000 ft <sup>2</sup> (1/20,000 m <sup>2</sup> )	44 (7)	76 (12)	114 (20)	152 (26)	243 (42)	327 (57)
GCL Tensile Strength <sup>(3)</sup> , lb/in (N/mm)	ASTM D 6768	1/200,000 ft <sup>2</sup> (1/20,000 m <sup>2</sup> )	20 (3)	42 (7)	63 (11)	84 (15)	130 (23)	173 (30)
Elongation at Break, %	ASTM D 6693	1/200,000 ft <sup>2</sup> (1/20,000 m <sup>2</sup> )	500	500	700	700	700	700
Puncture Resistance, lb (N)	ASTM D 4833	1/200,000 ft <sup>2</sup> (1/20,000 m <sup>2</sup> )	20 (89)	36 (158)	54 (240)	72 (320)	108 (480)	144 (640)
<b>SODIUM BENTONITE PROPERTY</b>								
Hydraulic Flux: Bentonite, m <sup>3</sup> /m <sup>2</sup> /sec	ASTM D 5887	periodically	≤ 1 x 10 <sup>-8</sup>					
Hydraulic Conductivity, m/s	ASTM D 5887	periodically	≤ 5 x 10 <sup>-11</sup>					
Swell Index, ml/2 g	ASTM D 5890	1/60,000 lb (1/30,000 kg)	≥ 24					
Fluid Loss, ml	ASTM D 5891	1/60,000 lb (1/30,000 kg)	≤ 18					
<b>TYPICAL ROLL DIMENSIONS</b>								
Roll Width <sup>(4)</sup> , ft (m)			17.5 (5.3)	17.5 (5.3)	17.5 (5.3)	17.5 (5.3)	17.5 (5.3)	17.5 (5.3)
Roll Length <sup>(4)</sup> , ft (m)			200 (61)	210 (64)	180 (54)	180 (54)	180 (54)	150 (45)
Roll Area, ft <sup>2</sup> (m <sup>2</sup> )			3,500 (325)	3,675 (341)	3,150 (286)	3,150 (286)	3,150 (286)	2,625 (244)
Roll Weight, lb (kg)			4,500 (2,050)	4,200 (1,900)	4,200 (1,900)	4,200 (1,900)	4,500 (2,050)	4,300 (1,950)

**NOTES:**

- <sup>(1)</sup>0% moisture content.
- <sup>(2)</sup>See specific GSE HD geomembrane product data sheet for additional information.
- <sup>(3)</sup>4 in (101 mm) wide sample, 12 in/min (305 mm/min). Values are representative of the geomembrane tensile yield strength.
- <sup>(4)</sup>Roll lengths and widths have a tolerance of ± 1%.