



The Pioneer Of Geosynthetics  
S I N C E 1 9 7 2

## GSE GundSeal Geosynthetic Clay Liner (Textured HDPE)

GSE GundSeal geosynthetic clay liner (GCL) is a composite liner system that consists of a high quality sodium bentonite adhered to a textured 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   |               |               |               |               |
|--|------------------|--|-------------------------|---------------|---------------|---------------|---------------|
| <b>FINISHED GCL PROPERTY</b>   |                  |  | <b>20 mil</b>           | <b>30 mil</b> | <b>40 mil</b> | <b>60 mil</b> | <b>80 mil</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 5994      | 1/100,000 ft <sup>2</sup> (1/10,000 m <sup>2</sup> ) | 18 (0.45)               | 30 (0.75)     | 40 (1.00)     | 60 (1.50)     | 80 (2.00)     |
| Lowest individual reading (-10%)   |                  |  | 18 (0.45)               | 27 (0.69)     | 36 (0.91)     | 54 (1.40)     | 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          |
| <b>Tensile Properties</b>  |                  |  |                         |               |               |               |               |
| Tensile Break Strength, lb/in (N/mm)                                       | ASTM D 6693      | 1/200,000 ft <sup>2</sup> (1/20,000 m <sup>2</sup> ) | 30 (5)                  | 66 (11)       | 75 (13)       | 115 (20)      | 155 (27)      |
| 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> ) | 40 (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> ) | 100                     | 100           | 100           | 100           | 100           |
| Puncture Resistance, lb (N)  | ASTM D 4833      | 1/200,000 ft <sup>2</sup> (1/20,000 m <sup>2</sup> ) | 30 (133)                | 65 (289)      | 95 (422)      | 130 (578)     | 160 (711)     |
| <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)    |
| Roll Length <sup>(4)</sup> , ft (m)  |                  |  | 180 (54)                | 180 (54)      | 170 (51)      | 170 (51)      | 150 (45)      |
| Roll Area, ft <sup>2</sup> (m <sup>2</sup> )                               |                  |  | 3,150 (286)             | 3,150 (286)   | 2,975 (276)   | 2,975 (276)   | 2,625 (244)   |
| Roll Weight, lb (kg)   |                  |  | 3,900 (1,770)           | 4,100 (1,870) | 4,300 (1,940) | 4,600 (2,090) | 4,400 (2,000) |

#### NOTES:

- <sup>(1)</sup>0% moisture content.
- <sup>(2)</sup>See specific GSE HD Textured 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%.