

# High Performance GSE HD FrictionFlex Geomembrane

High Performance GSE HD FrictionFlex is a single-sided (FrictionFlex single-sided) or double-sided (FrictionFlex) textured high density polyethylene (HDPE) geomembrane, specifically designed to be used in the most stringent applications. A textured surface is available on one or both sides for applications that require increased frictional resistance. This product contains only the finest raw materials to enable exceptional elasticity, environmental stress crack resistance, and excellent multi-axial break resistance. Included in this product is a custom additive package that has been engineered to enable extended geomembrane lifetime and improved resilience in elevated temperatures, hazardous waste containment, or a harsh chemical environment. In addition to a superior UV stabilization package, a well-dispersed premium grade of carbon black is utilized to deliver superb UV resistance in exposed applications. The smooth edges (width approx. 15 cm) allow for an easier, quicker welding process.



**AT THE CORE:**  
An HDPE geomembrane that is used in applications requiring increased frictional resistance, excellent chemical resistance and endurance properties.

## Product Specifications

Tested Property	Unit	Test Method	Values ( * )				
Thickness <sup>(a)</sup>	mm	DIN EN ISO 9863-1	1.0	1.5	2.0	2.5	3.0
Density	g/cm <sup>3</sup>	DIN EN ISO 1183-1/A	≥ 0.94	≥ 0.94	≥ 0.94	≥ 0.94	≥ 0.94
Tensile Properties (each Direction)		DIN EN ISO 527-3 (Type 5; 100 mm/min; lo = 50 mm)					
Stress at Yield	MPa		17 (16)	17 (16)	17 (16)	17 (16)	17 (16)
Elongation at Yield	%		10 (9)	11 (10)	11 (10)	11 (10)	11 (10)
Stress at Break	MPa		35 (26)	35 (26)	35 (26)	35 (26)	35 (26)
Elongation at Break	%		800 (750)	800 (750)	800 (750)	800 (750)	800 (750)
Tear Resistance	N	DIN ISO 34-1/B (a)	145 (130)	225 (210)	300 (280)	375 (350)	450 (420)
Puncture Resistance	N	DIN EN ISO 12236	2,850 (2,400)	4,150 (3,700)	5,450 (4,900)	6,750 (6,050)	8,000 (7,200)
Carbon Black Content	%	ASTM D 4218	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	Category	ASTM D 5596	1/2 <sup>(b)</sup>	1/2 <sup>(b)</sup>	1/2 <sup>(b)</sup>	1/2 <sup>(b)</sup>	1/2 <sup>(b)</sup>
Dimensional Stability (each Direction)	%	DIN 53377 (120°C/1 h)	± 2	± 2	± 2	± 2	± 2
Melt Flow Index <sup>(c)</sup>	g/10 min	DIN EN ISO 1133 (190°C / 5.0 kg) (190°C / 2.16 kg)	≤ 3.0 ≤ 1.0	≤ 3.0 ≤ 1.0	≤ 3.0 ≤ 1.0	≤ 3.0 ≤ 1.0	≤ 3.0 ≤ 1.0
Stress Crack Resistance (NCTL)	h	ASTM D 5397; Appendix	≥ 1,000	≥ 1,000	≥ 1,000	≥ 1,000	≥ 1,000
Oxidative Induction Time (OIT)	min	ASTM D 3895 (200°C; Pure O <sub>2</sub> ; 1 atm)	≥ 160	≥ 160	≥ 160	≥ 160	≥ 160
High Pressure Oxidative Induction Time (HP-OIT)	min	ASTM D 5885	≥ 800	≥ 800	≥ 800	≥ 800	≥ 800
<b>Reference Property</b>							
Multiaxial Elongation at Break	%	ASTM D 5617	≥ 30	≥ 30	≥ 30	≥ 30	≥ 30
Low Temperature Brittleness	°C	ASTM D 746	- 77	- 77	- 77	- 77	- 77
Oven Ageing at 85°C HP-OIT retained after 90 days	%	ASTM D 5721 ASTM D 5885	≥ 80	≥ 80	≥ 80	≥ 80	≥ 80
UV Resistance <sup>(d)</sup> HP-OIT retained after 1,600 hours <sup>(e)</sup>	%	ASTM D 7238 ASTM D 5885	≥ 80	≥ 80	≥ 80	≥ 80	≥ 80
Roll Width <sup>(f)</sup>	m	---	7.5				
Surface	---	---	single-sided or double-sided textured				

**NOTES:**

- (\*): All values - unless otherwise noted - are nominal values. Values in brackets are minimum values within the 95% confidence interval.
- (a): Tolerance ± 5% for the lowest individual reading - Special thickness available upon request.
- (b): Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be category 1 or 2. No more than 1 view from category 3.
- (c): Standard test conditions: 190°C / 5.0 kg.
- (d): Test conditions: 20 hours UV cycle at 75°C followed by 4 hours condensation at 60°C.
- (e): UV Resistance is based on percent retained value regardless of the original High Pressure - OIT value.
- (f): Roll widths and lengths have a tolerance of ± 1%.

GSE is a leading manufacturer and marketer of geosynthetic lining products and services. We've built a reputation of reliability through our dedication to providing consistency of product, price and protection to our global customers.

Our commitment to innovation, our focus on quality and our industry expertise allow us the flexibility to collaborate with our clients to develop a custom, purpose-fit solution.



**[ DURABILITY RUNS DEEP ]** For more information on this product and other, please visit us at [GSEworld.com](http://GSEworld.com), call 49.40.767420 or contact your local sales office.

