

# High Performance GSE Ultra FrictionFlex Geomembrane

High Performance GSE Ultra FrictionFlex is a co-extruded linear low density polyethylene (LLDPE) 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. It is designed for applications that require increased elasticity and multi-axial break resistance where differential or localized settlements may occur such as in landfill closures. This product contains only the finest raw materials to enable exceptional elasticity 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 in the black layers 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:

A single or doubled-sided textured LLDPE geomembrane with high uniaxial and multiaxial elongation characteristics suitable for applications where differential or localized subgrade settlements are expected.

## 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
Density	g/cm <sup>3</sup>	DIN EN ISO 1183-1/A	≤ 0.939	≤ 0.939	≤ 0.939	≤ 0.939
Tensile Properties (each Direction)		DIN EN ISO 527-3 (Type 5; 100 mm/min; lo = 50 mm)				
Stress at Break	MPa		33 (26)	33 (26)	33 (26)	33 (26)
Elongation at Break	%		900 (800)	900 (800)	900 (800)	900 (800)
Tear Resistance	N	DIN ISO 34-1/B	115 (110)	175 (165)	230 (220)	285 (275)
Puncture Resistance	N	DIN EN ISO 12236	2,350 (2,000)	3,500 (3,100)	4,600 (4,100)	5,700 (5,100)
Carbon Black Content	%	ASTM D 4218	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>
Dimensional Stability (each Direction)	%	DIN 53377 (100°C/1 h)	± 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
Oxidative Induction Time (OIT)	min	ASTM D 3895 (200°C; Pure O <sub>2</sub> ; 1 atm)	≥ 100	≥ 100	≥ 100	≥ 100
High Pressure Oxidative Induction Time (HP-OIT)	min	ASTM D 5885	≥ 800	≥ 800	≥ 800	≥ 800
<b>Reference Property</b>						
Multiaxial Elongation at Break	%	similar to ASTM D 5617 ; Ø = 500 mm	70	70	70	70
Low Temperature Brittleness	°C	ASTM D 746	- 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
UV Resistance <sup>(d)</sup> HP-OIT retained after 1,600 hours <sup>(e)</sup>	%	ASTM D 7238 ASTM D 5885	≥ 60	≥ 60	≥ 60	≥ 60
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.

