

# GSE HD FrictionFlex Geomembrane

GSE HD FrictionFlex is a single-sided (FrictionFlex single-sided) or double-sided (FrictionFlex) textured high density polyethylene (HDPE) geomembrane. It is manufactured from the highest quality resin specifically formulated for flexible geomembranes. GSE's texturing process is the only manufacturing method that provides a textured geomembrane without significant reduction of any of the physical properties of the smooth product. This product is used in applications that require increased frictional resistance, excellent chemical resistance and endurance properties. The smooth edges (width approx. 15 cm) allow for an easier, quicker welding process according to the state of the art.



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

## Product Specifications

These product specifications meet or exceed GRI GM13.

Tested Property	Unit	Test Method	Values ( * )				
Thickness <sup>(a)</sup>	mm	ASTM D 5994	1.0	1.5	2.0	2.5	3.0
Density	g/cm <sup>3</sup>	ASTM D 792	≥ 0.94	≥ 0.94	≥ 0.94	≥ 0.94	≥ 0.94
Tensile Properties (each Direction)		ASTM D 638 / D 6693; Type IV					
Strength at Yield	N/mm	50 mm/min	16 (15)	24 (22)	32 (30)	40 (37)	48 (45)
Elongation at Yield	%	lo = 33 mm	16 (13)	16 (13)	16 (13)	16 (13)	16 (13)
Strength at Break	N/mm	200 mm/min	33 (27)	49 (40)	66 (53)	83 (67)	100 (80)
Elongation at Break	%	lo = 50 mm	800 (700)	800 (700)	800 (700)	800 (700)	800 (700)
Tear Resistance	N	ASTM D 1004	140 (130)	205 (190)	275 (250)	350 (315)	420 (375)
Puncture Resistance	N	ASTM D 4833	420 (320)	560 (480)	690 (640)	830 (800)	980 (960)
Carbon Black Content	%	ASTM D 1603	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)	%	ASTM D 1204 (120°C/1 h)	± 2	± 2	± 2	± 2	± 2
Melt Flow Index <sup>(c)</sup>	g/10 min	ASTM D 1238 (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	≥ 336	≥ 336	≥ 336	≥ 336	≥ 336
Asperity Height (each side) (Minimum Average)	mm	ASTM D 7466	0.25 <sup>(d)</sup>	0.25 <sup>(d)</sup>	0.25 <sup>(d)</sup>	0.25 <sup>(d)</sup>	0.25 <sup>(d)</sup>
Oxidative Induction Time (OIT)	min	ASTM D 3895 (200°C; Pure O <sub>2</sub> ; 1 atm)	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100
<b>Reference Property</b>							
Low Temperature Brittleness	°C	ASTM D 746	- 77	- 77	- 77	- 77	- 77
UV Resistance <sup>(e)</sup> HP-OIT retained after 1,600 hours <sup>(f)</sup>	%	GRI-GM 11 ASTM D 5885	≥ 50	≥ 50	≥ 50	≥ 50	≥ 50
Roll Width <sup>(g)</sup>	m	---	6.95 / 7.5			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 ± 10% - 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) : 8 out of 10 readings must be ≥ 0.18 mm and lowest individual reading must be ≥ 0.13 mm.
- (e) : Test conditions: 20 hours UV cycle at 75°C followed by 4 hours condensation at 60°C; total: 1,600 hours.
- (f) : UV Resistance is based on percent retained value regardless of the original High Pressure - OIT value.
- (g) : 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.

