



GSE Ultra FrictionFlex

Product Data Sheet

GSE Ultra FrictionFlex is a single-sided (Ultra FrictionFlex single-sided) or double-sided (Ultra FrictionFlex) textured, black, high quality, linear low density polyethylene (LLDPE) geomembrane produced from specially formulated polyethylene resin with outstanding flexibility. The polyethylene resin is designed specifically for flexible geomembrane applications. GSE Ultra FrictionFlex contains approximately 97.5% polyethylene, 2.5% carbon black and trace amounts of antioxidants and heat stabilizers. Its high uniaxial and multi-axial elongation characteristics make it very suitable for applications where differential or localized subgrade settlements are expected such as landfill closure cappings, leach pads, or any application where elongation or puncture resistance is critical. GSE Ultra FrictionFlex has excellent resistance to UV-radiation and is suitable for exposed applications. 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 allows the design of projects with steeper slopes since frictional characteristics are enhanced and the smooth edges (width approx. 15 cm) allow for an easier, quicker welding process according to the state of the art. These product specifications meet or exceed GRI-GM 17.

Tested Property	Unit	Test Method	Values (°)			
			1.0	1.5	2.0	2.5
Thickness (a)	mm	DIN EN ISO 9863-1	1.0	1.5	2.0	2.5
Density	g/cm ³	DIN 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 (750)	900 (750)	900 (750)	900 (750)
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 1603	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 (b)	1 / 2 (b)	1 / 2 (b)	1 / 2 (b)
Dimensional Stability (each Direction)	%	DIN 53377 (100 °C/1h)	± 2	± 2	± 2	± 2
Melt Flow Index (c)	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 ₂ ; 1 atm)	≥ 100	≥ 100	≥ 100	≥ 100
Reference Property	Unit	Test Method	Values (°)			
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
UV Resistance (d)		GRI-GM 11				
HP-OIT retained after 1,600 hours (e)	%	ASTM D 5885	≥ 35	≥ 35	≥ 35	≥ 35
Roll Width (f)	m	---	7.5			
Surface	---	---	single-sided or double-sided textured			

(*): All values - unless otherwise noted - are nominal values. Values in brackets are minimum values within the 95% confidence interval.

- (a): Tolerance ± 5% - 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; total: 1,600 hours.
- (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 Ultra FrictionFlex is produced at GSE Rechlin plant, Germany.



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