



GSE HD FrictionFlex

Product Data Sheet

GSE HD FrictionFlex is a single-sided (FrictionFlex single-sided) or double-sided (FrictionFlex) textured, black, high quality, high density polyethylene (HDPE) geomembrane produced from specially formulated polyethylene resin. The polyethylene resin is designed specifically for flexible and durable geomembrane applications. GSE HD FrictionFlex contains approximately 97.5% polyethylene, 2.5% carbon black and trace amounts of antioxidants and heat stabilizers. 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. GSE HD FrictionFlex has outstanding chemical resistance, mechanical properties, environmental stress crack resistance, dimensional stability and thermal aging characteristics. GSE HD FrictionFlex has excellent resistance to UV radiation and is suitable for exposed applications. 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 13.

Tested Property	Unit	Test Method	Values (*)				
			1.0	1.5	2.0	2.5	3.0
Thickness (a)	mm	DIN EN ISO 9863-1	1.0	1.5	2.0	2.5	3.0
Density	g/cm ³	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 (700)	800 (700)	800 (700)	800 (700)	800 (700)
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 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 (b)	1 / 2 (b)	1 / 2 (b)	1 / 2 (b)	1 / 2 (b)
Dimensional Stability (each Direction)	%	DIN 53377 (120 °C/1h)	± 2	± 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	≤ 3.0 ≤ 1.0
Stress Crack Resistance (NCTL)	h	ASTM D 5397; Appendix	≥ 400	≥ 400	≥ 400	≥ 400	≥ 400
Oxidative Induction Time (OIT)	min	ASTM D 3895 (200°C; Pure O ₂ ; 1 atm)	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100
Reference Property	Unit	Test Method	Values (*)				
Low Temperature Brittleness	°C	ASTM D 746	- 77	- 77	- 77	- 77	- 77
UV Resistance (d)	%	GRI-GM 11	≥ 50	≥ 50	≥ 50	≥ 50	≥ 50
HP-OIT retained after 1,600 hours (e)	%	ASTM D 5885	≥ 50	≥ 50	≥ 50	≥ 50	≥ 50
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 HD FrictionFlex is produced at GSE Rechlin plant, Germany.



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Europe, CIS & Africa Headquarters
GSE Lining Technology GmbH
 Normannenweg 28
 20537 Hamburg
 Germany
 Tel.: +49 40 76742-0
 Fax: +49 40 76742-34
 e-mail: europe@gseworld.de

Corporate Headquarters
GSE Lining Technology, Inc.
 19103 Gundale Road
 Houston, Texas 77073
 USA
 Tel: +1 281 443-8564
 Fax: +1 281 875-6010

Other Production facilities & Sales Offices
 United Kingdom Thailand
 Russia Egypt
 Turkey Chile
 Australia



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