

# GSE HD Smooth Geomembrane (available from 0.3 – 3.0 mm)

GSE HD is a smooth high density polyethylene (HDPE) geomembrane manufactured with the highest quality resin specifically formulated for flexible geomembranes. This product is used in applications that require excellent chemical resistance and endurance properties.



**AT THE CORE:**  
An HDPE geomembrane used in applications that require 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 5199	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
Tensile Properties (each Direction)		ASTM D 638 / D 6693; Type IV				
Strength at Yield	N/mm	50 mm/min	24 (22)	32 (30)	40 (37)	48 (45)
Elongation at Yield	%	lo = 33 mm	16 (13)	16 (13)	16 (13)	16 (13)
Strength at Break	N/mm	200 mm/min	49 (40)	66 (53)	83 (67)	100 (80)
Elongation at Break	%	lo = 50 mm	800 (700)	800 (700)	800 (700)	800 (700)
Tear Resistance	N	ASTM D 1004	205 (190)	275 (250)	350 (315)	420 (375)
Puncture Resistance	N	ASTM D 4833	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
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)	%	ASTM D 1204 (120°C/1 h)	± 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
Stress Crack Resistance (NCTL)	h	ASTM D 5397; Appendix	≥ 336	≥ 336	≥ 336	≥ 336
Oxidative Induction Time (OIT)	min	ASTM D 3895 (200°C; Pure O <sub>2</sub> ; 1 atm)	≥ 100	≥ 100	≥ 100	≥ 100
<b>Reference Property</b>						
Low Temperature Brittleness	°C	ASTM D 746	- 77	- 77	- 77	- 77
UV Resistance <sup>(d)</sup> HP-OIT retained after 1,600 hours <sup>(e)</sup>	%	GRI-GM 11 ASTM D 5885	≥ 50	≥ 50	≥ 50	≥ 50
Roll Width (approx.) <sup>(f)</sup>	m	---	7.5 / 6.95		7.5	
Surface	---	---	double-sided smooth			

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): 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%.

[Product specifications continued on back]

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.



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Tested Property	Unit	Test Method	Values ( * )			
Thickness <sup>(a)</sup>	mm	ASTM D 5199	0.3	0.5	0.75	1.0
Density	g/cm <sup>3</sup>	ASTM D 792	≥ 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	5 (4)	8 (7)	13 (11)	16 (15)
Elongation at Yield	%	lo = 33 mm	13 (12)	13 (12)	14 (12)	16 (13)
Strength at Break	N/mm	200 mm/min	10 (8)	17 (12)	26 (20)	33 (27)
Elongation at Break	%	lo = 50 mm	700 (650)	800 (700)	800 (700)	800 (700)
Tear Resistance	N	ASTM D 1004	40 (35)	70 (65)	100 (95)	140 (130)
Puncture Resistance	N	ASTM D 4833	145 (96)	240 (160)	340 (240)	420 (320)
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 <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
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
Stress Crack Resistance (NCTL)	h	ASTM D 5397; Appendix	≥ 336	≥ 336	≥ 336	≥ 336
Oxidative Induction Time (OIT)	min	ASTM D 3895 (200°C; Pure O <sub>2</sub> ; 1 atm)	≥ 100	≥ 100	≥ 100	≥ 100
<b>Reference Property</b>						
Low Temperature Brittleness	°C	ASTM D 746	- 77	- 77	- 77	- 77
UV Resistance <sup>(d)</sup> HP-OIT retained after 1,600 hours <sup>(e)</sup>	%	GRI-GM 11 ASTM D 5885	≥ 50	≥ 50	≥ 50	≥ 50
Roll Width (approx.) <sup>(f)</sup>	m	---	7.0		6.95	6.95 / 7.5
Surface	---	---	double-sided smooth			

NOTES:

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