

# GPS LL Smooth LLDPE

## Product Description

GPS LL Smooth is designed specifically to fulfill any containment needs. GPS LL Smooth has been well-proven to be effective through numerous oil & gas, industrial, municipal, agricultural and decorative projects. These geomembranes conform to meet heap leaching containment requirements and tailing impoundment design criteria. GPS LL Smooth comes in light colored LLDPE geomembranes for reduction in surface heat and textured membranes for higher friction angle requirements.

Linear low-density polyethylene (LLDPE) GPS LL Smooth is used for its higher flexibility compared to other liners. With excellent elongation properties, it can mold to any pre-existing topography and is often used in buried applications. The overall flexibility of the liner also makes installation easy and reduces potential damage to the system. It also maintains high tear resistance to ensure system integrity even in hazardous conditions. GPS LL Smooth is manufactured with virgin resins to ensure superior performance. Meets GRI GM17 Specifications.

## Applications

- ✓ Coal Ash Impoundments
- ✓ Reserve Pits
- ✓ Frac Pits
- ✓ Under Rig Liners
- ✓ Retention Ponds
- ✓ Fresh Water Pits
- ✓ Flowback Pits
- ✓ Secondary Containment
- ✓ Aboveground Storage Tanks



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# GPS LL Smooth LLDPE

Manufactured In:



**ISO 9001:2008**  
CERTIFIED MANAGEMENT SYSTEM

PROPERTIES	TEST METHOD	MINIMUM AVERAGE VALUES				
		20 MIL	30 MIL	40 MIL	60 MIL	80 MIL
THICKNESS, MIL (MIN. AVE.)		20	30	40	60	80
LOWEST INDIVIDUAL FOR ANY OF THE 10 VALUES	ASTM D5199	-10%	-10%	-10%	-10%	-10%
DENSITY, G/CM <sup>3</sup> (MAX)	ASTM D1505	.939	.939	.939	.939	.939
TENSILE PROPERTIES <sup>(1)</sup>						
STRENGTH AT BREAK, LB/IN WIDTH (MM)	ASTM D6693, TYPE IV	76	114	152	228	304
ELONGATION AT BREAK (%)		800	800	800	800	800
2% MODULUS-LB/IN. (MAX.)	ASTM D5323	1200	1800	2400	3600	4800
TEAR RESISTANCE, (N)	ASTM D1004	11	16	22	33	44
PUNCTURE RESISTANCE, (LB)	ASTM D4833	28	42	56	84	112
AXI-SYMMETRIC BREAK RESISTANCE STRAIN – % (MIN.)	ASTM D 5617	30	30	30	30	30
CARBON BLACK CONTENT, %	ASTM D4218 <sup>(2)</sup>	2.0 – 3.0	2.0 – 3.0	2.0 – 3.0	2.0 – 3.0	2.0 – 3.0
CARBON BLACK DISPERSION	ASTM D5596	NOTE <sup>(3)</sup>				
OXIDATIVE INDUCTION TIME (OIT) (MIN. AVE.) <sup>(4)</sup>						
(A) STANDARD OIT ---OR---	D 3895 D 5885	100 400	100 400	100 400	100 400	100 400
(B) HIGH PRESSURE OIT						
OVEN AGING AT 85°C <sup>(4)</sup>						
(A) STANDARD OIT (MIN. AVE.) – % RETAINED AFTER 90 DAYS ----OR----	D 5721 D 3895 D5885	35 60	35 60	35 60	35 60	35 60
(B) HIGH PRESSURE OIT (MIN. AVE.) – % RETAINED AFTER 90 DAYS						
UV RESISTANCE <sup>(5)</sup>						
(A) STANDARD OIT (MIN. AVE.) ----OR----	D 7238 D 3895 D 5885	N.R. <sup>(6)</sup> 35	N.R. <sup>(6)</sup> 45	N.R. <sup>(6)</sup> 35	N.R. <sup>(6)</sup> 35	N.R. <sup>(6)</sup> 35
(B) HIGH PRESSURE OIT (MIN. AVE.) – RETAINED AFTER 1600 HRS <sup>(7)</sup>						
STANDARD ROLL DIMENSIONS						
ROLL LENGTH <sup>(8)</sup> , FT.		1,330	1,210	910	600	405
ROLL WIDTH <sup>(8)</sup> , FT.		22	22	22	22	22
ROLL AREA, FT. <sup>2</sup>		29,260	26,620	20,020	13,200	8,910

<sup>(1)</sup> Machine direction (MD) and cross machine direction (TD) average values should be on the basis of 5 test specimens each direction.

• Break elongation is calculated using a gage length of 2.0 in at 2.0 in./min

<sup>(2)</sup> Other methods such as D 1603 (tube furnace) or D 6370 (TGA) are acceptable if an appropriate correlation to D4218 (muffle furnace) can be established.

<sup>(3)</sup> Carbon Black dispersion (only near spherical agglomerates) for 10 different views.

• 9 in Categories 1 or 2 and 1 in Category 3

<sup>(4)</sup> The manufacturer has the option to select either one of the OIT methods listed to evaluate the antioxidant content in the geomembrane.

<sup>(5)</sup> The condition of the test should be 20 hr. UV cycle at 75Å°C followed by 4 hr condensation at 60Å°C.

<sup>(6)</sup> Not recommended since the high temperature of the Std-OIT test produces an unrealistic result for some of the antioxidants in the UV samples.

<sup>(7)</sup> UV resistance is based on percent retained value regardless of the original HP-OIT value.

<sup>(8)</sup> Roll widths and lengths have a tolerance of ± 1%

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