

## Drain Liner®

HDPE

## MicroDrain Liner®

LLDPE

Agru's HDPE and LLDPE Drain Liners are designed for single or double lined containment projects where leak detection is critical, such as landfills, waste ponds/lagoons, heap leach pads and process ponds. It provides a strong and durable liquid barrier with drainage capability.

This product eliminates the need for a separate Geonet or Geocomposite drainage layer in solid and hazardous waste landfill designs, which can mean significant cost savings. Elimination of additional layers also makes it easier to detect leaks. Manufactured using a flat cast extrusion process, as opposed to blown film extrusion, Drain Liner has consistent core thickness and high tensile strength. Its studs are fully integrated with the liner in one production step, leaving no risk of separation during use.

Consistent stud pattern and spacing also gives the liner high flow rates and consistent drain capacity. The consistent stud pattern also reduces potential of chemical and biological clogging. The product's smooth edges allow wedge welds between adjacent sheets, and a special cutting tool can remove studs from cross seams as needed prior to welding.

## High Density Polyethylene Drain Liner® Liner

Property	Test Method	Frequency	Minimum Average Values			
Thickness (nominal ), mil (mm)	ASTM D5994	Per Roll	50 (1.25)	60 (1.5)	80 (2.0)	100 (2.5)
Thickness (min avg ), mil (mm)			47.5 (1.19)	57 (1.43)	76 (1.9)	95 (2.38)
Thickness (min 8 of 10), mil (mm)			45 (1.12)	54 (1.35)	72 (1.8)	90 (2.25)
Thickness (lowest individual), mil (mm)			42.5 (1.06)	51 (1.28)	68 (1.7)	85 (2.13)
Drainage Stud Height mils, (mm)	ASTM D7466	2nd Roll	130 (3.3)	130 (3.3)	130 (3.3)	130 (3.3)
Density, g/cc, minimum	ASTM D792, Method B	200,000 lb	0.94	0.94	0.94	0.94
Tensile Properties (both directions)	ASTM D6693, Type IV					
Strength @ Yield, lb/in width (N/mm)	2 in/minute	20,000 lb	110 (19.3)	132 (23.1)	176 (30.8)	220 (38.5)
Elongation @ Yield, % (GL=1.3in)			13	13	13	13
Strength @ Break, lb/in width (N/mm)			110 (19.3)	132 (23.1)	176 (30.8)	220 (38.5)
Elongation @ Break, % (GL=2.0in)			300	300	300	300
Tear Resistance, lb, s. (N)	ASTM D1004	45,000 lb	38 (169)	42 (187)	56 (249)	70 (310)
Puncture Resistance, lbs. (N)	ASTM D4833	45,000 lb	80 (356)	95 (422)	126 (560)	158 (703)
Carbon Black Content, % (range)	ASTM D4218	20,000 lb	2 - 3	2 - 3	2 - 3	2 - 3
Carbon Black Dispersion (Category)	ASTM D5596	45,000 lb	Only near spherical agglomerates: 10 views in Cat. 1 or 2			
Stress Crack Resistance (SP-NCTL), hrs.	ASTM D5397 Appendix	200,000 lb	500	500	500	500
Oxidative Induction Time, minutes	1 atm O2	200,000 lb	≥140	≥140	≥140	≥140



## Low Density Polyethylene MicroDrain Liner®

Property	Test Method	Frequency	Minimum Average Values			
Property	Test Method	Frequency	Minimum Average Values			
Thickness (nominal ), mil (mm)	ASTM D5994	Per Roll	50 (1.25)	60 (1.5)	80 (2.0)	100 (2.5)
Thickness (min avg ), mil (mm)			47.5 (1.19)	57 (1.43)	76 (1.9)	95 (2.38)
Thickness (min 8 of 10), mil (mm)			45 (1.12)	54 (1.35)	72 (1.8)	90 (2.25)
Thickness (lowest individual), mil (mm)			42.5 (1.06)	51 (1.28)	68 (1.7)	85 (2.13)
Drainage Stud Height mils, (mm)	ASTM D7466	2nd Roll	130 (3.3)	130 (3.3)	130 (3.3)	130 (3.3)
MicroSpike® Asperity Height, mil (mm)	ASTM D7466	2nd Roll	20 (0.51)	20 (0.51)	18 (0.46)	18 (0.46)
Density, g/cc, minimum	ASTM D792, Method B	200,000 lb	0.939	0.939	0.939	0.939
Tensile Properties (both directions)	ASTM D6693, Type IV					
Strength @ Break, lb/in width (N/mm)			105 (18.4)	126 (22.1)	168 (29.4)	210 (36.8)
Elongation @ Break, % (GL=2.0in)			300	300	300	300
Tear Resistance, lb, s. (N)	ASTM D1004	45,000 lb	30 (133)	40 (178)	53 (236)	67 (298)
Puncture Resistance, lbs. (N)	ASTM D4833	45,000 lb	55 (245)	70 (311)	90 (400)	110 (489)
Carbon Black Content, % (range)	ASTM D4218	20,000 lb	2 - 3	2 - 3	2 - 3	2 - 3
Carbon Black Dispersion (Category)	ASTM D5596	45,000 lb	Only near spherical agglomerates: 10 views in Cat. 1 or 2			
Oxidative Induction Time, minutes	ASTM D3895, 200°C, 1 atm O2	200,000 lb	≥140	≥140	≥140	≥140

## Benefits of HDPE and LLDPE Drain Liner®

- Reduced installation time and cost with elimination of geonet drainage layer
- Higher flow rates than a conventional geonet
- Resistant to long term creep
- Faster leak detection
- Meets or exceeds GRI's GM13 (HDPE Drain Liner®)

## Drain Liner® Supply Information (Standard Roll Dimensions)

Thickness		Width		Length		Area (approx)	
mil	mm	ft	m	ft	m	ft <sup>2</sup>	m <sup>2</sup>
50	1.25	23	7	300	91.4	6,900	640
60	1.5	23	7	300	91.4	6,900	640
80	2	23	7	300	91.4	6,900	640
100	2.5	23	7	300	91.4	6,900	640