



CARLISLE'S **GeoMembrane**

TECHNICAL DATA BULLETIN

CARLISLE SYNTEC INCORPORATED

CARLISLE REINFORCED POLYPROPYLENE GEOMEMBRANE

Carlisle Reinforced Polypropylene GeoMembrane is a heat-weldable polyester reinforced sheet designed for floating covers and liners in potable and industrial water containment applications. The membrane is specifically formulated for long-term use in buried or exposed geomembrane applications. The membrane is based on a UV-stabilized polypropylene copolymer that does not require either polymeric or liquid plasticizers to maintain flexibility.

Physical properties of the membrane are enhanced by a strong, polyester fabric (scrim) that is encapsulated between the polypropylene based top and bottom plies. The combination of the fabric and polypropylene provide reinforced membranes with high breaking / tearing strength and puncture resistance. The relatively smooth surface of the Carlisle GeoMembrane facilitates production of a total surface fusion weld that creates a consistent, watertight monolithic sheet.

FEATURES:

- Outstanding heat seamability
- Outstanding puncture resistance
- Plasticizer-free, does not contain liquid or polymeric plasticizers
- Excellent low temperature impact resistance
- Excellent chemical and environmental stress-cracking resistance
- Exceptional resistance to solar UV, ozone, and oxidation
- Low water vapor permeance and water absorption
- Hot melt extrusion processed (not calendered) for complete scrim encapsulation
- Warp knitted fabric (not woven) for smooth surface and greater thickness-over-scrim
- Polyester reinforcing fabric which is resistant to degradation by soil bacteria
- ANSI/NSF-61 Drinking Water contact certification (Potable Grade)

Carlisle Reinforced Polypropylene GeoMembrane is manufactured in two grades - Potable (water) Grade and Industrial Grade. The Potable Grade was tested by NSF International and meets the requirements of ANSI / NSF Standard 61 for Drinking Water System Components – Health Effects.

Available colors are black, tan and white (black bottom ply) in 36-mil, 45-mil and 60-mil thicknesses. Special colors, with minimum quantity requirements, are available on request. Standard roll sizes are 12 ft wide by 600 ft in 36-mil and 45-mil and 12 ft wide by 400 ft in 60-mil.

TYPICAL PROPERTIES AND CHARACTERISTICS:

Typical weights are 0.17 lb/ft² (0.83 kg/m²) for 36-mil, 0.21 lb/ft² (1.03 kg/m²) for 45-mil and 0.29 lb/ft² (1.42 kg/m²) for 60-mil membrane.

Carlisle is a Carlisle registered trademark

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TYPICAL PROPERTIES AND CHARACTERISTICS

Physical Property	Test Method	Property Of Unaged Sheet	Property After Aging 30 days @ 185 °F
Tolerance on nominal thickness, %	ASTM D 5199	± 10	
Thickness over scrim, in. (mm) 36-mil 45-mil 60-mil	ASTM D 4637 Optical Method	0.010 (0.254) min. 0.013 (0.330) min. 0.018 (0.457) min.	
Mass per unit area, lb/ft ² (g/ ft ²) (kg/m ²) 36-mil 45-mil 60-mil	ASTM D 5261	0.17 (77) (0.83) typical 0.21 (95) (1.03) typical 0.29 (132) (1.42) typical	
Breaking strength, lbf (kN) (grab tensile at strain rate of 12 in./min.) 36-mil 45 & 60-mil	ASTM D 751 Grab Method A	200 (0.9) min. 260 typ. 250 (1.1) min. 300 typ.	200 (0.9) min. 260 typ. 250 (1.1) min. 300 typ.
Elongation at break of fabric, %	ASTM D 751	25 typical	25 typical
Tearing strength, lbf (N) (2 in. / min. strain rate) 36-mil 45 & 60-mil	ASTM D 5884 (max. load)	80 (356) min. 130 (578) typ. 100(445) min. 160 (712) typ.	
Low temperature flexibility, °F (°C)	ASTM D 2136 1/8 in. mandrel 4 hour @ temp.	- 40 (- 40) max. - 50 (- 46) typical	
Linear Dimensional Change (shrinkage), %	ASTM D 1204		+/- 1.0 max. - 0.5 typical
Ozone resistance, 100 pphm, 168 hours	ASTM D 1149	No cracks	No cracks
Resistance to water (distilled) absorption After 30 days immersion 122 °F (50 °C) Change in mass, %	ASTM D 471 (coating compound)	1.0 max. 0.5 typical	
Hydrostatic resistance, lbf/in. ² or psi (MPa) (Mullen burst) 36-mil 45-mil 60-mil	ASTM D 751 Procedure A	350 (2.4) min. 400 (2.8) typical 450 (3.1) typical 500 (3.4) typical	350 (2.4) min. 400 (2.8) typical 450 (3.1) typical 500 (3.4) typical
Field seam strength, lbf/in. (kN/m) Seam tested in peel after weld	ASTM D 4437 1 in. wide	30 (5.3) min. 60 (10.5) typical	
Water vapor permeance, Perms	ASTM E 96	0.10 max. 0.05 typical	
Puncture resistance, lbf (N) 36-mil & 45-mil 60-mil	ASTM D 4833 (index puncture)	85 (378) min. 110 (489) typical 120 (534) typical	
Resistance to xenon-arc weathering ¹ Xenon-Arc, 15,120 kJ/m ² total radiant exposure, visual condition at 10X	ASTM G 155 0.70 W/m ² 80 °C B.P.T.	No cracks No loss of breaking or tearing strength	

¹ Equivalent to 12,000 hours exposure at 0.35 W/m² irradiance B.P.T. is black panel temperature 3/06