Geomembrane

Product Introduction

A geomembrane is essentially a very low-permeability synthetic membrane liner or barrier that is used to control fluid (liquid or gas) migration in civil, geotechnical, hydraulic, and environmental engineering projects.

Common materials include:

• High-Density Polyethylene (HDPE): Known for its excellent chemical resistance, durability, and high strength. It's rigid.

• Linear Low-Density Polyethylene (LLDPE): Offers more flexibility and elongation compared to HDPE, making it suitable for projects with irregular surfaces or potential for differential settlement.

• Ethylene-vinyl alcohol copolymer(EVOH): EVOH layer can effectively block the penetration of gases and volatile organic compounds (VOCs), providing excellent anti-seepage and anti-pollution properties.

Form: They are manufactured in large rolls of various widths and thicknesses, usually ranging from 0.25mm to 3.5mm.

Common applications include landfill liners and caps, pond liners (for wastewater, irrigation, aquaculture), heap leach pads in mining, canal liners, reservoirs, and waterproofing for tunnels and buildings.




How Geomembranes WorkThe fundamental principle behind how geomembranes work is their extremely low permeability, which means they are highly resistant to fluids (liquids and gases) passing through them.This impermeability is achieved through the dense, non-porous structure of the synthetic polymer material.

Here's how they function in various applications:

Containment (Blocking Fluid Migration):

• Primary Barrier: In landfills, geomembranes form the primary liner system at the bottom and sides to prevent leachate (liquid draining from waste) from contaminating the underlying soil and groundwater. Similarly, they line ponds, lagoons, and reservoirs to prevent water or wastewater from seeping into the ground.

• Gas Barrier: They can also act as barriers against gas migration, such as preventing methane gas from landfills or radon gas from soil entering buildings.

Separation:

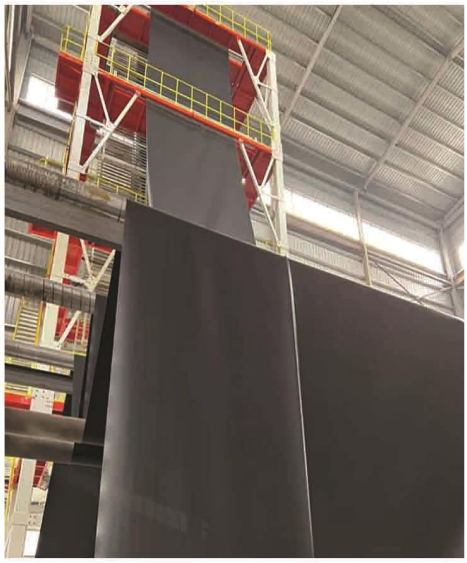
• While their main role is containment, in some composite liner systems (e.g., landfill liners), they separate different layers of soil or other geosynthetics, ensuring that different materials do not mix or interfere with each other's functions.

Waterproofing:

- In tunnels, basements, and other underground structures, geomembranes are installed to prevent water infiltration, protecting the structure from water damage and ensuring dryness.

They are also used in dams and canals to prevent water loss through seepage, improving the efficiency of water storage and transport.

Advanced equipment

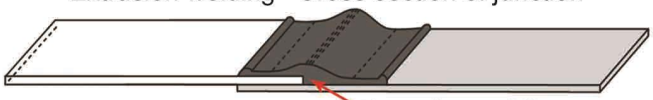

Product Specifications

Index Properties	Test Method	Unit	75	100	150	200	300
Thickness	D5199	mm	0.75	1	1.5	2	3
Density	D1505/D792	g/cm³	0.94				
Yield Strength	D6693 Type IV	kN/m	11	15	22	29	44
Break Strength		kN/m	20	27	40	53	80
Yield Elongation		%	12				
Break Elongation		%	700				
Tear Resistance	D1004	N	93	125	190	250	375
Puncture Resistance	D4833	N	240	320	480	640	960
Stress Crack Resistance	D5397	h	300				
Carbon Black Content	D4218	%	2.0-3.0				
Carbon Black Dispersion	D5596	-	No more than 1 of the 10 data was level 3, and levels 4 and 5 were not allowed				
Oxidative Induction Time(OIT)	D3895/D5885	min	Standard OIT:100 High pressure OIT:400				
Oven Aging at 85°C retained after 90 days	D5721	%	55				
High Pressure OIT–% retained after 1600 hrs	D5885	%	50				

Construction Method

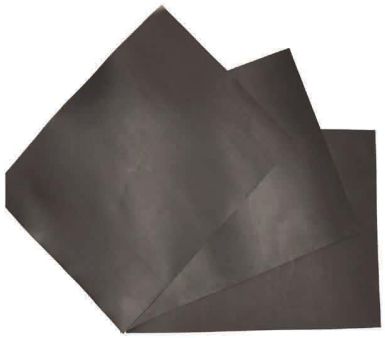
Self-propelled fusion Cross section of junction

Extrusion welding Cross section of junction



LLDPE Geomembrane

LLDPE (Linear Low-Density Polyethylene) geomembrane is a flexible, durable synthetic liner manufactured from specialized polyethylene resins. It offers superior elongation, puncture resistance, and adaptability to irregular terrains, making it ideal for applications prone to differential settlement like landfill caps, pond liners, and water containment.



Index Properties	Test Method	Unit	50	75	100	150	200	250
Thickness	D5199	mm	0.5	0.75	1	1.5	2	2.5
Density	D1505	g/cm³	0.939					
Break Strength	D6693	kN/m	13	20	27	40	53	66
Break Elongation	D6693	%	800					
Tear Resistance	D1004	N	50	70	100	150	200	250
Puncture Resistance	D4833	N	120	190	250	370	500	620
Carbon Black Content	D1603	%	2.0-3.0					
Carbon Black Dispersion	D5596	-	No more than 1 of the 10 data was level 3, and levels 4 and 5 were not allowed					
Low Temperature Brittleness	D746	˚C	<-77					
Oxidative Induction Time(OIT)	D3895	min	100					
Melt Flow Index (190°C, 2.16kg)	D1238	g/10 min	< 1.0					
2% Modulus	D5323	kN/m	210	370	420	630	840	1050
Dimensional Stability (100 ˚C, 1 hr)	D1204	%	±1					
Axi-Symmetric Break Strain	D5617	%	56					

EVOH Geomembrane

An EVOH geomembrane is a specialized multi-layer synthetic liner that incorporates a core layer of ethylene vinyl alcohol (EVOH). This EVOH layer provides exceptionally low permeability to gases and volatile organic compounds (VOCs), making it an ideal barrier for environmental containment applications like landfills and brownfield remediation.

Textured HDPE Geomembrane

Rough geomembranes are synthetic liners characterized by a textured surface on one or both sides, which significantly increases their friction coefficient. This enhanced friction makes them ideal for applications on steep slopes or where improved stability and anti-slip properties are crucial, such as in landfill liners, mining heap leach pads, and dam construction.

Index Properties	Test Method	Unit	100	150	200	250
Thickness	D5994	mm	1	1.5	2	2.5
Asperity Height	D7446	mm	0.25			
Density	D1505/D792	g/cm³	0.94			
Yield Strength	D6693 Type IV	kN/m	15	22	29	37
Break Strength		kN/m	10	16	21	26
Yield Elongation		%	12			
Break Elongation		%	100			
Tear Resistance	D1004	N	125	190	250	315
Puncture Resistance	D4833	N	270	400	535	670
Stress Crack Resistance	D5397(App)	h	300			
Carbon Black Content	D4218	%	2.0-3.0			
Carbon Black Dispersion	D5596	-	No more than 1 of the 10 data was level 3, and levels 4 and 5 were not allowed			
Oxidative Induction Time(OIT)	D3895/D5885	min	Standard OIT:100 High pressure OIT:400			
Oven Aging at 85°C retained after 90 days	D5721	%	55			
High Pressure OIT–% retained after 1600 hrs	D5885	%	50