



Filament Geotextile Composite Geomembrane

Composite geomembrane is a new type of geotechnical material that combines geotextiles and geomembranes. Filament composite geomembrane has high physical and mechanical performance indicators such as tensile strength, tearing and top breaking, far exceeding products such as geotextiles and geomembranes. Filament composite geomembrane can meet the application of civil engineering such as water conservancy, municipal, dam, tunnels, and culverts.

Composite geomembrane is formed by heating one or both sides of the film in an oven with far-infrared radiation, and pressing the geotextile and geomembrane together through a guide roller to form a composite geomembrane. Filament geotextile composite membrane made of geotextile (the bottom fabric can be filament needle punched geotextile or woven geotextile) and polymer materials through rolling and hot melt technology is an impermeable material mainly used for anti-seepage. Filament geotextile composite geomembrane retains the mechanical properties of the geotextile and the uniformity of the geomembrane, improving the impermeability of the composite. Composite geomembranes are divided into one fabric one membrane and two fabrics one membrane.



[Filament Geotextile Composite Geomembrane]



[Filament Geotextile Composite Geomembrane]

Filament geotextile composite geomembrane has the characteristics of tensile strength, tear resistance, high physical and mechanical performance indicators, high strength, good elongation performance, acid and alkali resistance, corrosion resistance, aging resistance, and good anti-seepage performance. Due to the use of polymer materials and the addition of anti-aging agents in the production process, it can be used in unconventional temperature environments.

Filament Geotextile Composite Geomembrane Features:

- Filament geotextile composite geomembrane has the characteristics of tensile strength, tear resistance, high physical and mechanical performance indicators, high strength, good elongation performance, acid and alkali resistance, corrosion resistance, aging resistance, and good anti-seepage performance.
- A cloth and a film is a synthetic material composed of a layer of geotextile and a layer of high molecular material by calendaring process and thermal composite; It is characterized by strong strain capacity and excellent anti-aging performance, which reduces the maintenance of the project.
- Two cloth and one film is based on polymer plastic film as the substrate, and geotextile is composite on both sides to achieve the purpose of protective film material.

Composite Products: FILAMENT GEOTEXTILE COMPOSITE GEOMEMBRANE

APPLICATION

Filament geotextile composite geomembrane is widely used in water conservancy engineering, municipal engineering, engineering construction, traffic travel, subway station, tunnel construction, construction of waterproof layer, protection, reinforcement, anti-rust structure reinforcement and river embankment, drainage pipeline water channel waterproof layer solution, and waste field pollution resistance solution.

SPECIFICATIONS OF FILAMENT GEOTEXTILE COMPOSITE GEOMEMBRANE

TECHNICAL STANDARD FOR FILAMENT GEOTEXTILE COMPOSITE GEOMEMBRANE GB T 17642-2008

Number	Item	Indicators							
	Nominal fracture strength (kN/m)	5	7.5	10	12	14	16	18	20
1	Longitudinal and transverse fracture strength \geq (KN/m)	5	7.5	10	12	14	16	18	20
2	Longitudinal and transverse standard strength corresponds to elongation (%)	30~100							
3	CBR Bursting strength kN \geq	1.1	1.5	1.9	2.2	2.5	2.8	3	3.2
4	Longitudinal and transverse tear strength \geq (kN)	0.15	0.25	0.32	0.4	0.48	0.56	0.62	0.7
5	Resistant to hydrostatic pressure /(MPa)	Table 2							
6	Peel strength \geq (N/cm)	6							
7	Vertical permeability coefficient (cm/s)	As per design or contract requirements							
8	Width deviation (%)	-1							
	Item	Membrane thickness/mm							
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	1
Resistant to hydrostatic pressure /(Mpa) \geq	A cloth and a membrane	0.4	0.5	0.6	0.8	1	1.2	1.4	1.6
	Two cloth one membrane	0.5	0.6	0.8	1	1.2	1.4	1.6	1.8

TECHNICAL STANDARD FOR FILAMENT GEOTEXTILE COMPOSITE GEOMEMBRANE ASTM STANDARD

Properties	Test Method	GMSH050	GMSH075	GMSH100	GMSH150	GMSH200
Thickness	ASTM D5199	0.50 mm	0.75 mm	1.00 mm	1.50 mm	2.00 mm
Density	ASTM D1505	0.940 g/cm ³	0.940 g/cm ³	0.940 g/cm ³	0.940 g/cm ³	0.940 g/cm ³
Tensile Properties						
Yield strength	ASTM D6693	7 kN/m	11 kN/m	15 kN/m	22 kN/m	29 kN/m
Break strength	Type IV	13 kN/m	20 kN/m	27 kN/m	40 kN/m	53 kN/m
Yield elongation		12%	12%	12%	12%	12%
Break elongation		700%	700%	700%	700%	700%
Tear Resistance	ASTM D1004	62 N	93 N	125 N	187 N	249 N
Puncture Resistance	ASTM D4833	160 N	240 N	320 N	480 N	640 N
Stress Crack Resistance	ASTM D5397	500 hrs	500 hrs	500 hrs	500 hrs	500 hrs
Carbon Black Content	ASTM D1603	2.0%	2.0%	2.0%	2.0%	2.0%
Carbon Black Dispersion	ASTM D5596	For 10 different views:9 in Categories 1 or 2 and 1 in Category 3				
Oxidative Induction Time (OIT)	ASTM D3895	100 min.	100 min.	100 min.	100 min.	100 min.
UV Resistance High Pressure OIT retained after 1600hrs	ASTM D5885	50%	50%	50%	50%	50%
Dimensions						
Roll Width (m)	-	7	7	7	7	7
Roll Length (m)	-	420	280	210	140	105

PROJECTS CASE OF THE FILAMENT GEOTEXTILE COMPOSITE GEOMEMBRANE



[Liquid Storage Tank in Chile]



[Tailing Dam in Argentina]

GEOTEXTILE CONSTRUCTION

The laying of composite geomembrane is divided into two parts: laying at the bottom of the channel and laying on the slope surface. Laying method: Horizontal rolling along the channel axis direction. After the acceptance of the slope surface, the slope surface is laid by rolling along the axis direction of the slope surface, and the composite geotextile membrane at the bottom of the channel is connected in a T-shape. The laying should be carried out in dry weather. In order to facilitate splicing and prevent stress concentration, a wavy relaxation method should be used for laying, with an excess of about 1.5%. After spreading, it should be leveled in a timely manner, and the membrane should match the slope surface smoothly without any protrusions or wrinkles. Construction personnel should wear flat bottomed cloth shoes or soft rubber shoes, and nail shoes are strictly prohibited to avoid stepping on them. If damage is found to the geotextile membrane during construction, it should be repaired in a timely manner.

COMPARISON BETWEEN ONE CLOTH AND MEMBRANE & TWO CLOTH AND MEMBRANE

- One cloth and one film is suitable for the environment with a little debris on the base surface, and the geotextile replaces the grain material as the geomembrane protective layer to protect the geomembrane impermeable layer from damage and can play the role of drainage.
- Compared to one cloth one film, two cloth one film can adapt to more complex environments and has higher tensile strength and elongation. The laying construction is simple, reduces transportation volume, lowers project cost, and shortens the construction period.

APPLICATION SCENARIOS

- Filament geotextile composite geomembrane can be used for roadbed and roof anti-seepage.
- Filament geotextile composite geomembrane can be used for river embankments, lake dams, tailings dams, sewage dam storage areas, channels, and storage tanks (pits, mines).
- Filament geotextile composite geomembrane can be used in the foundation of highways, highways, and railways.



The composite geomembrane liner combines the functions and benefits of geotextiles and geomembranes. The geotextile layer enhances the essential tensile strength, while the geomembrane layer provides exceptional impermeability, preventing leaks and moisture penetration. This versatile liner is extensively utilized in various applications such as landfills, wastewater treatment facilities, road construction, aquaculture, landscaping, and agriculture.