

TPO Waterproofing Membrane- Thermoplastic Polyolefin Sheet in Rolls

TPO Waterproofing Membrane

Product Overview

Thermoplastic Polyolefin (TPO) waterproofing membrane (abbreviated as TPO waterproofing membrane) is manufactured from TPO resin as the base material, which combines the weatherability and heat resistance of ethylene-propylene (EP) rubber with the weldability of polypropylene. In the early 1990s, it was applied to roofing waterproofing projects using mechanical fastening installation methods. Because it possesses both the weatherability of EPDM (ethylene-propylene-diene monomer) rubber and the weldability of plastic waterproofing membranes, it offers reliable waterproofing performance and outstanding aging resistance, which has contributed to its rapid development. With its excellent physical and chemical properties as well as environmental friendliness, this membrane has become the fastest-growing waterproofing material in the world today.

Product Features

- Advanced polymerization technology is employed to chemically bond ethylene-propylene (EP) rubber and polypropylene, combining the excellent weatherability of EP rubber with the weldability of polypropylene.
- Special formulation technology eliminates the need for any plasticizers that tend to embrittle the material. Unlike conventional heat-weldable membranes (such as PVC), it does not suffer from embrittlement caused by plasticizer migration, thereby maintaining long-term waterproofing performance.
- Excellent high- and low-temperature performance – like rubber-based materials, it remains flexible at as low as -50° C while maintaining mechanical strength at elevated temperatures.

Outstanding chemical resistance – resistant to acids, alkalis, salts, animal oils, vegetable oils, lubricating oils, as well as microbial growth such as algae and fungi.

- Excellent root-penetration resistance – suitable for use as a root-resistant membrane in green/planted roofing systems.
- Good thermal aging resistance and dimensional stability.
- Light-colored surface, primarily white, with a smooth finish and high reflectivity, providing energy-saving benefits and good resistance to soiling.
- Contains no plasticizers or chlorinated polymers – no harmful gases are generated or released during welding or service life, making it safe for both the environment and human health.
- Lap joints are heat-welded to form a strong, reliable, and watertight sealing layer.

- Reinforced TPO waterproofing membrane features a middle layer of polyester fabric, which provides high tensile strength, high tear resistance, fatigue resistance, and puncture resistance, making it particularly suitable for mechanically fastened roofing systems.
- Backed TPO waterproofing membrane has a fabric layer on the underside, which facilitates better adhesion to the substrate.
- Homogeneous TPO waterproofing membrane offers excellent formability – it can be shaped upon heating to accommodate complex detailing and connections.

Applications

Roofing, basements, underground garages, civil air defense, and other building projects.
Reservoirs, dams, cofferdams, canals, and other water conservancy projects.
Bridges, subways, highways, culverts, and other transportation projects.
Roof gardens, green roofs, landscaping, and other greening projects.

Application Method

Roofing works (GB50207-2002)

(1) The strength, thickness, moisture content, and other parameters of the substrate must meet national standards and design requirements before installing the PVC waterproofing membrane.
(2) Determine the laying direction and sequence. Position the membrane naturally on the substrate according to the waterproofing layer outline. Keep it flat and straight without bending. Overlap according to the width required by the standard.
(3) Fix the membrane according to the selected method, such as mechanical fastening, full bonding, or strip bonding.
(4) The welded overlap area of the membrane shall be wiped clean and dry. Use hot-air welding. During welding, the nozzle shall be at a 45° angle to the welding direction. The pressure roller shall be parallel to the nozzle and maintain a distance of approximately 5 mm. A bright, molten bead shall appear at the welded edge. Burn marks shall not occur.
(5) The membrane termination points shall be secured with battens, sealed with sealant, and closed with cement mortar.
(6) After completing the waterproofing work for the entire project, conduct a comprehensive quality inspection and make necessary corrections.

Below-grade works (GB50208-2002)

(1) The strength, thickness, moisture content, and other parameters of the substrate must meet national standards and design requirements before installing the PVC waterproofing membrane.
(2) Select the appropriate application method according to the waterproofing location, following the GB50208-2002 standard.
(3) The membrane overlap width shall be 100 mm. The lower membrane shall overlap the upper membrane.
(4) Multi-welding is recommended for overlap joints. The width of a single weld shall not be less than 100 mm.

(5) The PVC waterproofing membrane shall be laid smoothly and firmly fixed to the substrate. There shall be no sagging, tensioning, or damage. Only after inspection and confirmation may the next step proceed.

Performance

No.	Parameter		Index				
			H	L	P	G	G
1	Resin layer thickness over mid-layer carrier (mm) ≥		-		0.4		
2	Tensile properties	Max. tensile force (N/cm) ≥	-	120	250	-	120
		Tensile strength (Mpa) ≥	10.0	-	-	10.0	-
		Elongation at max. tensile force (%) ≥	-	-	15	-	-
		Elongation at break (%) ≥	200	150	-	200	100
3	Dimensional change after heat treatment (%) ≤		2.0	1.0	0.5	0.1	0.1
4	Low temperature bending		-25℃, no cracks				
5	Water impermeability		0.3 MPa, 2h, no leakage				
6	Impact resistance		0.5 kg·m, no leakage				
7	Static load [a]		-	-	20 kg, no leakage		
8	Peel strength of weld (N/cm) ≥		4.0 or membrane failure		3.0		
9	Right-angle tear strength (N/cm) ≥		50	-	-	50	-
10	Trapezoidal tear strength (N) ≥		-	150	250	-	220
11	Water absorption (70℃ 168h) (%)	After immersion ≤	4.0				
		After drying ≥	-0.40				
12	Heat aging (80℃)	Duration	672h				
		Appearance	no blistering, cracking, delamination, adhesion, or holes				
		Max. tensile force retention (%) ≥	-	85	85	-	85
		Tensile strength retention (%) ≥	85	-	-	85	-
		Elongation at max. tensile force retention (%) ≥	-	-	80	-	-
		Elongation at break retention (%) ≥	80	80	-	80	80
		Low temperature bending	-20℃ no cracks				
13		Appearance	no blistering, cracking, delamination, adhesion, or holes				
		Max. tensile force	-	85	85	-	85

	Chemical resistance	retention (%) ≥					
		Tensile strength retention (%) ≥	85	-	-	85	-
		Elongation at max. tensile force retention (%) ≥	-	-	80	-	-
		Elongation at break retention (%) ≥	80	80	-	80	80
		Low temperature bending	-20℃no cracks				
14	Accelerated weathering a	Duration	1500hb				
		Appearance	no blistering, cracking, delamination, adhesion, or holes				
		Max. tensile force retention (%) ≥	-	85	85	-	85
		Tensile strength retention (%) ≥	85	-	-	85	-
		Elongation at max. tensile force retention (%) ≥	-	-	80	-	-
		Elongation at break retention (%) ≥	80	80	-	80	80
		Low temperature bending	-20℃no cracks				

a . Static load applies only to membranes used for ballasted roofs ; b. For single-ply roofing products, the duration for accelerated weathering is 2500h.; c . Accelerated weathering is not required for non-exposed applications.