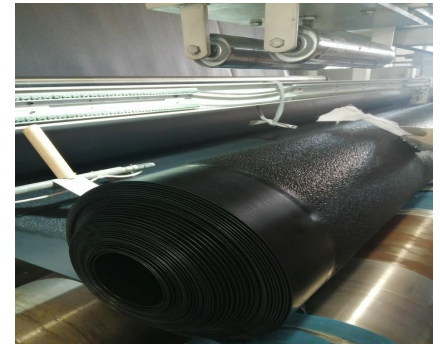


## High Density Polyethylene Single Rough Surface Geomembrane

HDPE single rough surface geomembrane is an HDPE anti seepage geomembrane with rough texture on the surface, which has greatly increased the friction between the anti-seepage geomembrane and the geo-fabric. HDPE single rough surface geomembrane can be used in more convenient and fast use of garbage landfills, dam slopes and other anti-leakage items. At this stage, HDPE rough surface geomembrane are commonly used in various fields of the project, which is convenient for engineering construction to solve the difficulty and problem of engineering construction generated by the polish film sliding of the light surface.

HDPE single rough surface geomembrane is often rough in the construction of the slope anti-seepage engineering construction with the contact with the geofabric on the top to play a non-slip effect. HDPE single rough surface geomembrane increases the friction coefficient and anti-slip function, and is widely used in the anti-landed field, mining, pile of ash, dissolved tank, sedimentation tank, tailing lining, anti-seepage engineering, slope prevention engineering, slope defense In the construction of the seepage project.

HDPE single rough surface geomembrane is a new type of anti-seepage material. The single rough HDPE geomembrane increases the friction coefficient and anti slip function. It is more suitable for steep slopes and vertical anti-seepage, and improves engineering stability.



[HDPE Single Rough Surface Geomembranes]



[High Density Polyethylene Single Rough Surface Geomembranes]

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### HDPE Single Rough Surface Geomembrane Features:

- HDPE single rough surface geomembrane has excellent temperature adaptability;
- HDPE single rough surface geomembrane has weldability;
- HDPE single rough surface geomembrane has good weather resistance;
- HDPE single rough surface geomembrane has good anti aging;
- HDPE single rough surface geomembrane has chemical corrosion resistance;
- HDPE single rough surface geomembrane has environmental stress cracking performance;
- HDPE single rough surface geomembrane has good puncture resistance performance;
- Therefore, HDPE single rough surface geomembrane is particularly suitable for underground engineering, mining engineering, sewage anti-seepage or waste residue treatment for anti-leakage materials.

Geomembrane Products: HIGH DENSITY POLYETHYLENE SINGLE ROUGH SURFACE GEOMEMBRANES

## APPLICATION

HDPE single rough surface geomembrane is mainly used in garbage landfills, sewage or waste residue treatment of defense seepage; rivers, lake dams, tailings dams, sewage dams and reservoir areas, channels, storage ponds (pit, mine) anti-seepage prevention seepage; metro, basement and tunnels, tunnel defense infiltration; road base and other foundation anti-seepage; horizontal anti-seepage coverage, construction coffee weeks, waste field prevention of highway, highway, railway foundation; expansion soil and wet trap Waterproof layer.

## SPECIFICATIONS OF HDPE SINGLE ROUGH SURFACE GEOMEMBRANE

HDPE SINGLE ROUGH SURFACE GEOMEMBRANE GB T17643-2011

Item	Indicators						
	0.75	1	1.25	1.5	2	2.5	3
Thickness (mm)	0.75	1	1.25	1.5	2	2.5	3
Density (g/m <sup>3</sup> )	≥0.940						
Roughness height (mm)	≥0.25						
Tensile yield strength (longitudinal and transverse) N/mm	≥11	≥15	≥18	≥22	≥29	≥37	≥44
Tensile fracture strength (longitudinal and transverse) N/mm	≥8	≥10	≥13	≥16	≥21	≥26	≥32
Yield elongation (longitudinal and transverse) %	≥12						
Elongation at break (longitudinal and transverse)%	≥100						
Right angle tear load (longitudinal and transverse) N	≥93	≥125	≥160	≥190	≥250	≥315	≥375
Puncture resistance strength N	≥200	≥270	≥335	≥400	≥535	≥670	≥800
Tensile load stress cracking (notch constant load tensile method) h	≥300						
Carbon black content %	2.0~3.0						
Carbon black dispersibility	Out of 10 data points, there should be no more than 1 level 3, and levels 4 and 5 are not allowed.						
oxidation induction time (OIT)(min)	Induction time of atmospheric pressure oxidation≥100						
	Induction time of high-pressure oxidation≥400						
85°C thermal aging (atmospheric pressure OIT retention rate after 90 days)	≥55						
UV resistance (OIT retention rate after 1600 hours of UV irradiation) %	≥50						

Note: The technical performance indicators for thickness specifications not listed in the table are required to be executed using interpolation method.

HDPE single rough surface geotextile film is mainly used for slopes, and its main function is anti slip. When laying, it should be rolled from top to bottom, and the overlap width between adjacent films is about 15cm. It is welded using an automatic climbing welding machine.

HDPE rough surface geomembrane is a new type of anti-seepage material. HDPE geomembranes with single rough surface and double rough surface have functions such as increasing friction coefficient and anti slip, which can be applied to steep slope vertical anti-seepage and improve engineering stability. The rough surface improves the friction performance of the geomembrane surface. At the same time, compared with the smooth facial mask of the same specification, the rough facial mask has a rough surface. When laying the film, it will form a micro void layer between the film and the base surface, which can enhance the anti bearing deformation capacity of the film. It is generally used in projects requiring large friction coefficient for slopes.



Geomembrane Products: HIGH DENSITY POLYETHYLENE SINGLE ROUGH SURFACE GEOMEMBRANES

## SPECIFICATIONS OF HDPE SINGLE ROUGH SURFACE GEOMEMBRANE

### HDPE SINGLE ROUGH SURFACE GEOMEMBRANE GRI-GM13

Properties	Test Method (ASTM)	Test Value					
		1.00 mm	1.25 mm	1.50 mm	2.00 mm	2.50mm	3.0mm
Asperity Height	D7466	0.25mm	0.25mm	0.25mm	0.25mm	0.25mm	0.25mm
Density	D 792	0.940 g/cm <sup>3</sup>	0.940 g/cm <sup>3</sup>	0.940 g/cm <sup>3</sup>	0.940 g/cm <sup>3</sup>	0.940 g/cm <sup>3</sup>	0.940 g/cm <sup>3</sup>
Tensile properties Streneth at Yield N/mm Strength at Break N/mm GElongation at Yield % Elongation at Break %	D6693 Type IV	15 10 12 700	18 13 12 700	22 16 12 700	29 21 12 700	37 26 12 700	44 32 12 700
Tear Resistance	D 1004	125 N	156 N	187N	249 N	311 N	374 N
Puncture Resistance	D 4833	267N	333N	400N	534 N	667 N	800N
Stress Crack Resistance	D 5397	500hr.	500 hr.	500 hr.	500 hr.	500hr.	500 hr.
Carbon Black Content	D 1603	2.0-3.0%	2 0-3.0%	2.0-3.0%	2.0-3.0%	2.0-3.0%	2.0-3.0%
Oxidative Induction Time (OIT) Standard OIT High Pressure OIT	D 3895 D 5885	100 min.	100 min.	100 min.	100 min.	100 min.	100 min.
		400min.	400 min.	400 min.	400 min.	400 min.	400 min.
Oven Aging at 85 °C Standard OIT retained after 90 days High Pressure OIT retained after 90 days	D 5721 D 3895 D 3895	55%	55%	55%	55%	55%	55%
		80%	80%	80%	80%	80%	80%
UV Resistance Standard OIT High Pressure OIT	D 3895 D 5885	50%	50%	50%	50%	50%	50%
		50%	50%	50%	50%	50%	50%

### SERVICE LIFE OF DIFFERENT ENGINEERING GEOMEMBRANES

- Non standard: It may crack in 2-4 months when exposed to light, and can be used for about 5 years when exposed to sunlight. Low price with general waterproof function, can be used for ordinary anti-seepage engineering.
- Old national standard and new national standard common type: service life: 40-50 years in the absence of the sun; slightly higher price; good tensile strength, low temperature resistance and aging resistance; generally used for seepage control projects in cold regions and with slightly poor construction environment.



- New national standard environmental protection and urban construction standard: the service life is 50-70 years, the product quality is good enough to meet the urban construction standards and American standards, the price is high, and it has good acid and alkali resistance, corrosion resistance, aging resistance, low temperature resistance, and ultraviolet resistance. The service life is long, and it is generally used in projects with high requirements for seepage prevention, such as landfill seepage prevention, tailings treatment site seepage prevention, slag site seepage prevention, solid waste landfill seepage prevention, etc.

## PROJECTS CASE OF HDPE SINGLE ROUGH SURFACE GEOMEMBRANE



[Wastewater Treatment Plant in Algeria]



[Landfill in Bahrain]

### GEOMEMBRANE CONSTRUCTION

#### Construction method of geomembrane:

- It should be extended from the bottom to the high level. Do not pull too tightly. There should be 1.50% of the remaining sinking stretch. Considering the actual situation of this project, the slope adopts the order of laying from top to bottom;
- The two adjacent vertical joints should not be on a horizontal line, and it should be staggered by more than 1m;
- The vertical connector should be from the dam of the dam. At the bending foot of 1.50m, it should be located on the plane;
- First slope and backcourt;
- When the slope is laid, the direction of the exhibition membrane should basically parallel on the maximum slope line.

#### Climate requirements for geomembrane construction:

- The temperature should geomembrane be above five degrees Celsius. At low temperature, the geomembrane should be tense, and the geomembrane should be relaxed at high temperature.
- The wind is below level four.
- When the temperature is too low, the wind and rainy weather above level 4 should not be constructed.
- David weather and wind force affect the construction of the geomembrane, the HDPE geomembrane to be welded and the sandbags are applied.

- HDPE single rough surface geomembrane is used to water conservancy engineering (such as the waterproof layer of the river water conservancy hub of rivers and lakes, leakage, reinforcement structure, waterproof layer, vertical wall, slope protection, etc.);
- HDPE single rough surface geomembrane is used to garden landscapes (artificial lakes, river embankments, storage pools, pond lining, slope protection, garden green grass moisture and waterproof, etc.);
- HDPE single rough surface geomembrane is used to agricultural and animal husbandry (method, quotation, water conservancy hub, living pool, water storage pond, spray irrigation system waterproof layer);
- HDPE single rough surface geomembrane is used to use the aquaculture industry (large -scale, large -scale breeding pools, lining of fishing ponds, shrimp ponds, three -round slope protection, etc.).

