



HAOYANG

Haoyang Environmental Co.,Ltd.

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Haoyang Environmental Co.,Ltd.

About US

Haoyang Environmental Co., Ltd. (formerly Shandong Haoyang New Engineering Materials Co., Ltd.) was established in June 2008 and is located in Dezhou (Yucheng) National High-tech Industrial Development Zone, Shandong Province. The company is a high-tech comprehensive service provider integrating environmental engineering consulting, design, construction, environmental protection engineering material research and development and manufacturing, environmental pollution control, hazardous waste treatment and disposal investment and operation.

Haoyang Environment has passed ISO9001 quality management system, ISO14001 environmental management system, OHSAS 18001 occupational health and safety management system certifications. It holds qualifications such as the "National Industrial Product Production License", "Safety Production License", "Professional Contracting of Waterproof, Anti-corrosion and Insulation Projects Level 2", "Professional Contracting of Environmental Protection Projects", and "Professional Contracting of Special Professional Projects".

The company has receive national laboratory accreditation and was recognized as the "Shandong Enterprise Technology Center". It concentrates on environmental engineering design and consulting, environmental engineering material research and development, environmental pollution control, hazardous waste treatment, and disposal technology research and application. The company holds numerous inventions, utility model patents, and provincial scientific and technological achievement appraisals. It is a national "high-tech enterprise", "National Excellent Quality and Integrity Enterprise", "Contract-abiding and Credit-worthy Enterprise", "Member Unit of International Geosynthetic Materials Association", "Director Unit of China Geosynthetic Materials Engineering Association", "China Environmental Protection Industry Association" Member Unit", and its products have won titles such as "National Quality Inspection Stable and Qualified Products" and "Shandong Province Famous Trademark".



Company Profile

The company has more than 20 modern environmentally friendly engineering material production lines, including the country's first 10-meter-wide blown geomembrane production line, the first twin-screw filament geotextile production line, and independently developed high-strength reinforced geomembrane production lines and high-strength composite geomembrane production lines. Fabric production line, ultra-wide woven geotextile production line. Products include HDPE geomembranes, composite geomembranes, polyester spunbond filament geotextiles, high-strength woven geotextiles, short fiber geotextiles, three-dimensional composite drainage nets, bentonite waterproof blankets, etc., which are waterproof, anti-seepage, reinforcement, isolation, and filtration Functional new environmentally friendly engineering materials. It is widely used in many environmental engineering fields such as water conservancy, transportation, urban domestic waste treatment, industrial tailings ponds, environmental pollution control, and hazardous waste treatment and disposal.

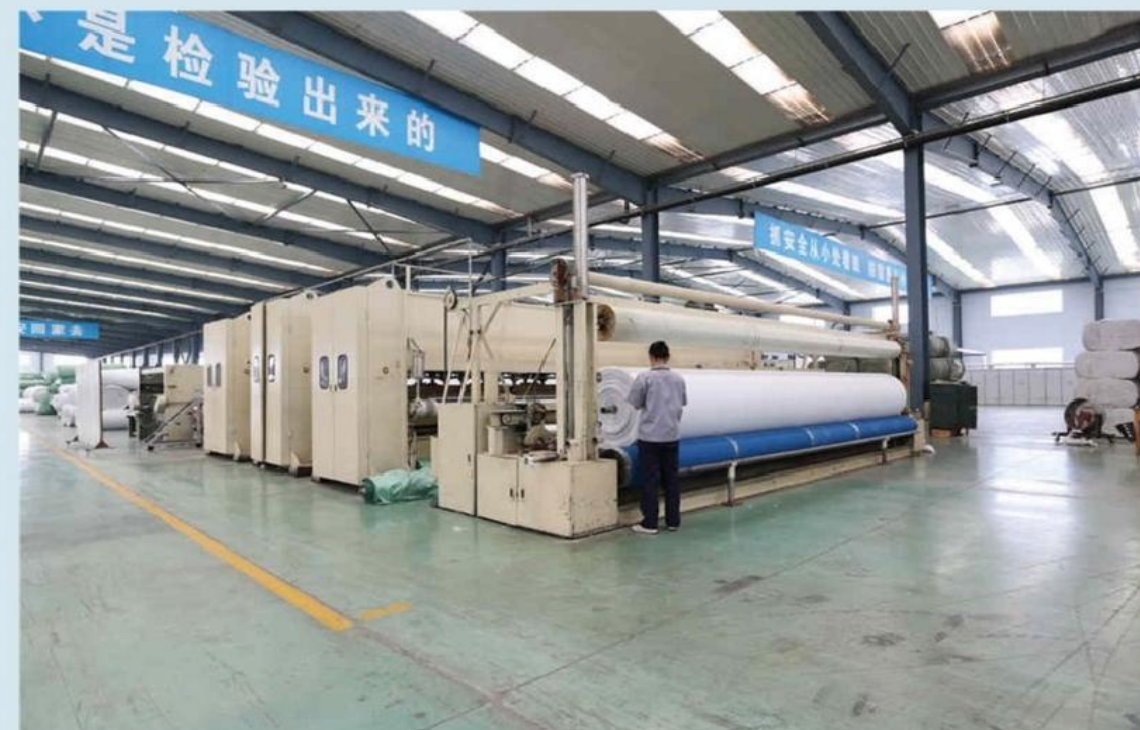
The company has participated in the construction of national key water conservancy and transportation projects such as the Middle Route of the South-to-North Water Diversion Project, the Three Rivers Management Project, the Daxi-Western Railway, the Central-South Corridor. pass project; undertook the "Alumina Red Mud Yard Environmental Treatment Project" of Shandong Weiqiao Entrepreneurship Group, Yunnan Heqing Beiya Mining Co., Ltd. "Gold Mine Tailings Storage Expansion Project Anti-Seepage Project", Sinochem Yunlong Co., Ltd. "Phosphogypsum Slag Storage Phase I Project", Huadian Ningxia Ling wu Power Plant's "Ultra-fine Fly Ash Solid Waste Disposal Package" A large number of environmental pollution control and risk management projects such as the "Ultra-fine fly ash solidity waste disposal supporting slag storage area project" of Wuhan Power Plant, the "Recycled Water Device Evaporation Pond Project" of Neijiaguzhong Coal Mengda Xinnengyuan Huazheng Co., Ltd. The waste treatment and disposal project has achieved good engineering performance. Based on the enterprise spirit of "honesty, trustworthiness, innovation and dedication", Haoyang Environmental Co., Ltd. focuses on the research and development of new environmentally friendly lower-end materials, environmental pollution control and hazardous waste treatment and disposal, and is committed to becoming a domestically leading and internationally renowned environmental protection technology As a comprehensive service provider, we will ultimately realize our historical mission of "making the earth cleaner and humans healthier".



Production lines



Filament Spunbond Needle Punched Nonwoven Geotextile Production Line



Medium-Speed Staple Fiber Needle Punched Nonwoven Geotextile Production Line



Singeing Geotextile Production Line



High strength geotextile production line



PP Staple Fiber Production Line



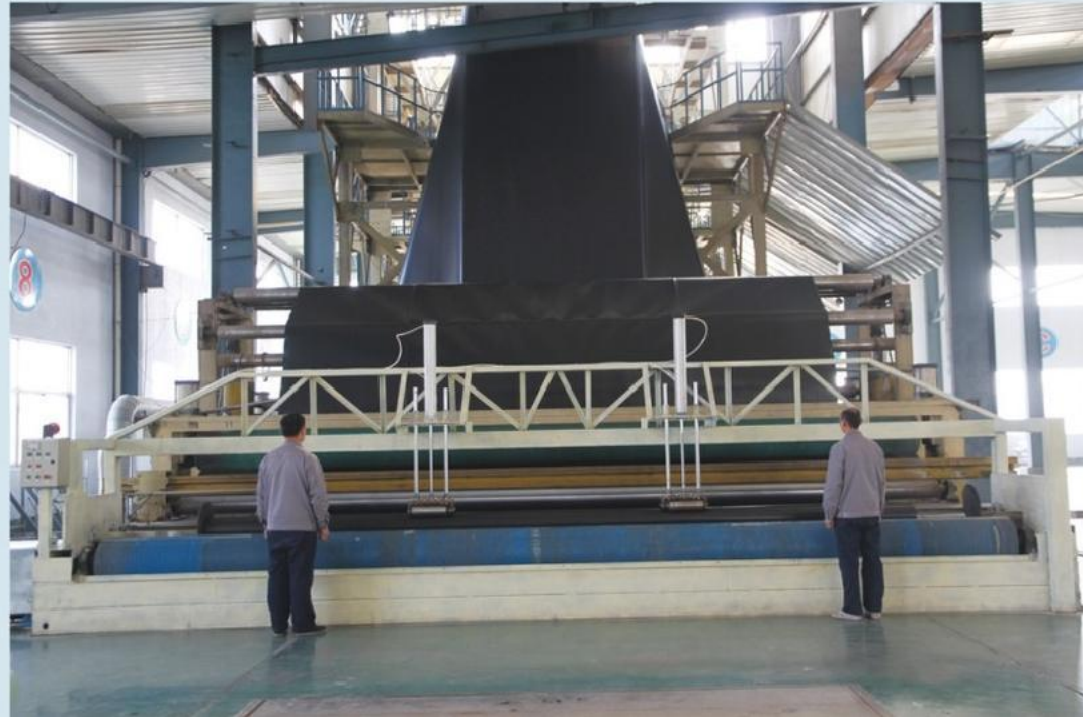
PP Woven Film yarn Geotextile Production Line



Filament Woven Geotextile



PP Slit Film Production Line



6m Blown Film Production Line



Production Line for Geombrane with Calendering



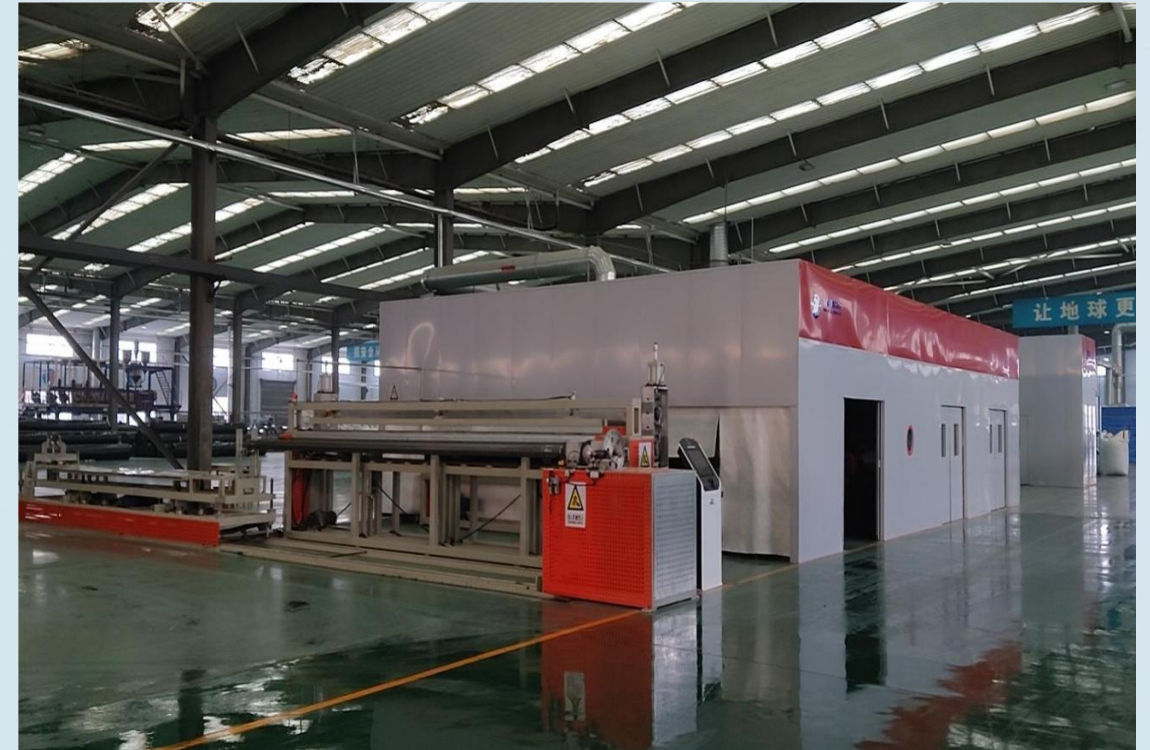
Production Line for Compound Geomembrane



10m Blown Film Production Line



Geosynthetic Clay Liner Production Line



6m 3D Geocomposite Production Line



3m 3D Geocomposite Production Line



Filament spunbond needle punched non woven geotextile



Specification: 100g/m²-800g/m²

Properties:

The production line adopts the international advanced technology industries and the first time in the application of advanced twin-screw extrusion technology, dual-array wire system, pipe flow distraction technique, plate wire systems and high-speed needle placed into the fabric production process, 18 international and domestic patents, the product has high strength, anti-aging, acid, abrasion resistance, good flexibility, easy construction.

Applications:

Especially suitable for landfills, salt marshes, are also widely used in highway, railway, dams, coastal beaches and other projects filtration, separation and drainage.

Packing size: Width 5-6.5m long 50-200m (or by user request).

Technical specification of filament spunbond needle punched non woven geotextile(GB/T17639-2023)

Item		Test Value								
Nominal Breaking strength (kN/m)		6	9	12	18	24	30	36	48	54
1	Breaking strength (MD/CD)	6.0	9.0	12.0	18.0	24.0	30.0	36.0	48.0	54.0
2	Elongation at break (MD/CD) %	30~80								
3	CBR Bursting Strength kN>	0.9	1.6	1.9	2.9	3.9	5.3	6.4	7.9	8.5
4	Tear strength kN	0.15	0.22	0.29	0.43	0.57	0.71	0.83	1.11	1.25
5	Sieve Size O ₉₀ (O ₉₅) mm	0.05~0.30								
6	Vertical Permeability Coefficient cm/s	K × (10 ⁻¹ ~10 ⁻³) [K=1.0~9.9]								
7	Width Variation %	-0.5								
8	Weight per unit area %	-5								
9	Thickness deviation rate ≥	-10								

Staple fiber needle punched non woven geotextile



Specification: 80g/m²-800g/m²

Properties:

The product has the property of anti-aging, high strength, good flexibility and permeability, filtration, isolation and easy construction etc.

Applications:

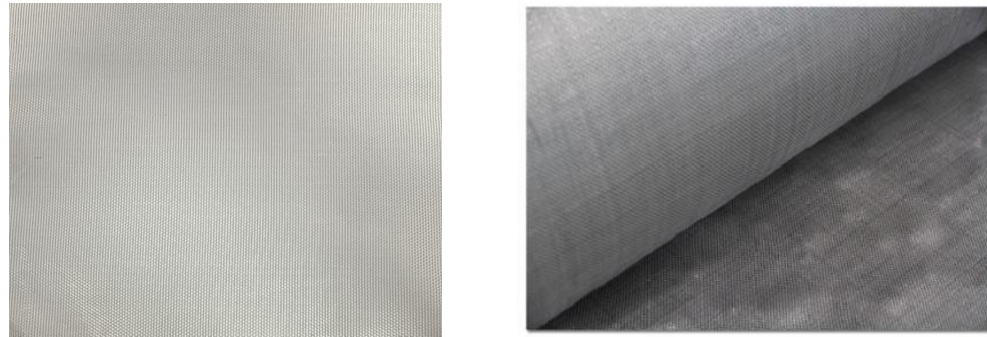
It is widely used in areas of the railway, highway, sport venue, duke, water project construction, tunnel, sea beach, innings, environment protection and so on. It can also be used in the reinforcement, separation, filtration, drainage etc.

Packing size: Width: 2-6m, Length: 50-100m (or at the client's request)

Technical specification of short fiber needle punched non woven geotextile(GB/T17638—2017)

NO.	Item	Test Value								
		3	5	8	10	15	20	25	30	40
1	Breaking strength (MD/CD) ≥	3.0	5.0	8.0	10.0	15.0	20.0	25.0	30.0	40.0
2	Breaking elongation %	20~100								
3	CBR Mullen Burst Strength KN ≥	0.6	1	1.4	1.8	2.5	3.2	4	5.5	7
4	Weight per unit area %	±5								
5	Width Variation %	-0.5								
6	Thickness %	±10								
7	Sieve Size O ₉₀ (O ₉₅) mm	0.07~0.2								
8	Vertical Permeability Coefficient cm/s	K × (10 ⁻¹ ~10 ⁻³) [K=1.0~9.9]								
9	Tear Strength (MD/CD) KN ≥	0.10	0.15	0.20	0.25	0.40	0.50	0.65	0.80	1.00
10	Acid and alkali resistance, (strong retention rate) %	80								
11	Antioxidant capacity, (strong retention rate) %	80								

Filament woven geotextile



Filament woven geotextile is composed of two sets of filament shuttle woven fabric, geotextile varieties are divided into single layer woven geotextile (also known as filter geotextile), double layer geotextile (also known as geofabric geotextile) and woven cloth seepage control according to the use. High strength, low elongation polypropylene, polyester and other synthetic fiber filament as the raw material.

Specification

120g/m²-300g/m²

Application

Applied to slope and beach protection for river way, coast seawall water catchment area, the harbour, soft soil foundation treatment; Flood control and emergency rescue, the dam reinforcement, slope foundation reinforcement; Filling cofferdam, all kinds of scour prevention project.

Properties:

1. High the tensile strength and initial modulus, low breaking elongation and creep decrescent.

2. Maintain stability of the structure of the yarn depend on mutual extruding of yarn in longitude and latitude, especially suitable for enhancement, reinforcement and isolation.

Filament woven geotextile technical data (GB/T 17640-2008)

Item		Test Value										
Nominal breaking strength/(KN/m)		30	50	65	80	100	120	140	160	180	200	250
1	Longitudinal breaking strength (KN/m) ≥	30	50	65	80	100	120	140	160	180	200	250
2	Zonal breaking strength (KN/m) ≥	According to the agreement, if there are no special requirements, the warp breaking strength × 0.7										
3	Standard strength elongation % ≤	Meridional 35, Weft 30										
4	CBR bursting strength KN ≥	2	4	6	8	10.5	13	15.5	18	20.5	23	28
5	Equivalent aperture 090(095) mm	0.05 - 0.50										
6	Vertical permeability coefficient (cm/s)	K × (10 ⁻² -10 ⁻⁵) Which: K=1.0-9.9										
7	Amplitude deviation %	-1										
8	Mold bag filling thickness deviation %	±8										
9	Mold bag length and width deviation %	±2										
10	Sewing strength (KN/m)	Nominal breaking strength × 0.5										
11	Longitudinal and latitudinal tearing strength KN ≥	0.4	0.7	1	1.2	1.4	1.6	1.8	1.9	2.1	2.3	2.7
12	Weight per unit area deviation %	-5										

Plastic flat yarn woven geotextile



Plastic flat yarn geotextile made of polypropylene and polythene flat strip as raw materials, by two sets of parallel yarn (its shape is flat wire), a set of longitudinal yarn along the loom warp marching direction, another set of horizontal layout called weft. Using different weaving equipment and processes interweave together woven cloth, according to the different using range woven into different thickness and compactness. Generally woven geotextile is thinner, has quite a strong tensile strength MD and CD (MD higher than CD), has good stability.

Application:

Water conservancy engineering, power engineering, highway engineering, aircraft engineering, railway engineering.

Properties:

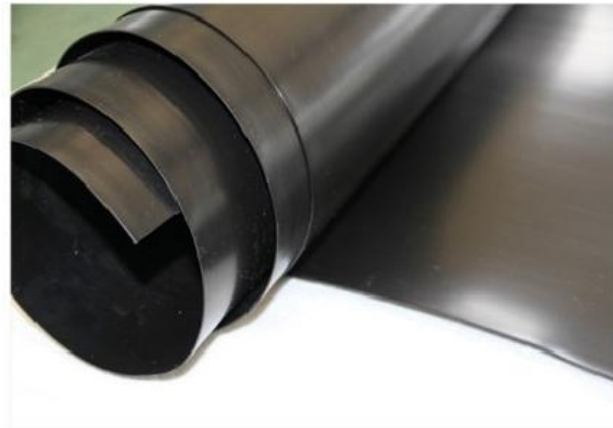
1. Reinforcement: used in highway, railway, airport, dam, breakwater slope, retaining wall backfill soil, slope rock engineering, dispersive soil stress, increase soil modulus and limit soil slip, improve stability.

2. Protection: prevent the bank from wind, wave, tide and rain erosion, and used for bank protection, slope protection, bottom protection, prevent water loss and soil erosion.

3. Filtration: used in filter layer of dam, dyke, the river and coastal rocks, slope, retaining wall, prevent sand grains through, and allow the water or free air to pass through.

Flat strip woven geotextile tenical data (GB/T17690-1999)

Item		Test Value						
		20-15	30-22	40-28	50-35	60-42	80-56	100-70
1	Longitudinal breaking strength (KN/m) ≥	20	30	40	50	60	80	100
2	Zonal breaking strength (KN/m) ≥	15	22	28	35	42	56	70
3	Elongation at break in warp and weft directions % ≤	28						
4	Trapezoid tearing strength (longitudinal) KN ≥	0.3	0.45	0.5	0.6	0.75	1	1.2
5	Bursting strength KN ≥	1.6	2.4	3.2	4	4.8	6	7.5
6	Vertical permeability coefficient cm/s	10 ⁻¹ -10 ⁻⁴						
7	Equivalent aperture 095, mm	0.08-0.5						
8	Weight per unit area g/m ²	120	160	200	240	280	340	400
9	Allowable deviation %	±10						
10	UV-resistant strength retention % ≥	By design, or contractual requirements						
When a user requests, according to the actual design value assessment.								



· Function:
Seepage control, isolation

Application:

landfills, sewage or waste treatment seepage

riverbank, lake dam, dam, water dam and reservoir, channel, liquid pool (pit,mine).

Metro,basements and tunnels, tunnel seepage control lining.

Foundation and other foundations saline seepage.

embankment, upstream impervious blanket level, foundation vertical impermeable layer,

cofferdam construction, waste disposal.

Sea water, fresh water fish farms

road, highway, railway foundation expansive soil and loess of the waterproof layer.

Roof impervious.

Ordinary high density polyethylene geomembrane (GB/T 17643-2011 GH-1type)

Number	Item	Test Value								
		Thickness mm	0.3	0.5	0.75	1.00	1.25	1.50	2.00	2.50
1	Density g/cm ³	≥0.940								
2	Tensile yield strength (MD and CD)N/mm	≥4	≥7	≥10	≥13	≥16	≥20	≥26	≥33	≥40
3	Tensile break strength(MD and CD)N/mm	≥6	≥10	≥15	≥20	≥25	≥30	≥40	≥50	≥60
4	Elongation at yield(MD and CD)%	—	—	—	≥11					
5	Elongation at break(MD and CD)%	≥600								
6	Tear resistance(MD and CD)N	≥34	≥56	≥84	≥115	≥140	≥170	≥225	≥280	≥340
7	Puncture strength N	≥72	≥120	≥180	≥240	≥300	≥360	≥480	≥600	≥720
8	Carbon blank content %	2.0~3.0								
9	Carbon black dispersion	If there are 10 data points, no more than 1 should be of level 3, and levels 4 and 5 are not allowed								
10	Normal pressure oxidation induction time(OIT) min	≥60								
11	Low temperature impact brittleness	Get through								
12	Water vapor permeability g.cm/(cm ² .s.Pa)	≤1.0×10 ⁻¹³								
13	Dimensional stability %	±2.0								

Environmental protection with high density polyethylene geomembrane (GB/T 17643-2011 GH-2Stype)

Number	Item	Test Value						
		0.75	1.00	1.25	1.50	2.00	2.50	3.00
1	Density g/cm ³	≥0.940						
2	Tensile yield strength (MD and CD)N/mm	≥11	≥15	≥18	≥22	≥29	≥37	≥44
3	Tensile break strength(MD and CD)N/mm	≥20	≥27	≥33	≥40	≥53	≥67	≥80
4	Elongation at yield(MD and CD)%	≥12						
5	Elongation at break(MD and CD)%	≥700						
6	Tear resistance(MD and CD)N	≥93	≥125	≥160	≥190	≥250	≥315	≥375
7	Puncture strength N	≥240	≥320	≥400	≥480	≥640	≥800	≥960
8	Tensile stress cracking (incision constant load stretching)h	—	≥300					
9	Carbon blank content %	2.0~3.0						
10	Carbon black dispersion	If there are 10 data points, no more than 1 should be of level 3, and levels 4 and 5 are not allowed						
11	Oxdation induction time(OIT)min	Normal pressure oxidation induction time≥100						
		High pressure oxidation induction time≥400						
12	85°C Oven aging at 85°C (Stand are OIT(min.ave.)-%retained after 90 days)%	≥55						
13	UV Rresistance(High Pressure OIT(min.ave.)-%retained after 1600 hrs)%	≥50						

Number	Item	Test Value								
		Thickness mm								
		0.3	0.5	0.75	1	1.25	1.5	2	2.5	3
1	Density g/cm ³	≤0.939								
2	Tensile break strength(MD and CD)N/mm	≥6	≥9	≥14	≥19	≥23	≥28	≥37	≥47	≥56
3	Elongation at break(MD and CD)%	≥560								
4	Tear resistance (MD and CD)N	≥27	≥45	≥63	≥90	≥108	≥135	≥180	≥225	≥270
5	Puncture strength N	≥52	≥84	≥135	≥175	≥220	≥260	≥350	≥435	≥525
6	Carbon blank content %	2.0~3.0								
7	Carbon black dispersion	If there are 10 data points, no more than 1 should be of level 3, and levels 4 and 5 are not allowed								
8	Normal pressure oxidation induction time(OIT) min	≥60								
9	Low temperature impact brittleness	Get through								
10	Water vapor permeability g·cm/(cm ² ·s·Pa)	≤1.0×10 ⁻¹³								
11	Dimensional stability %	±2.0								

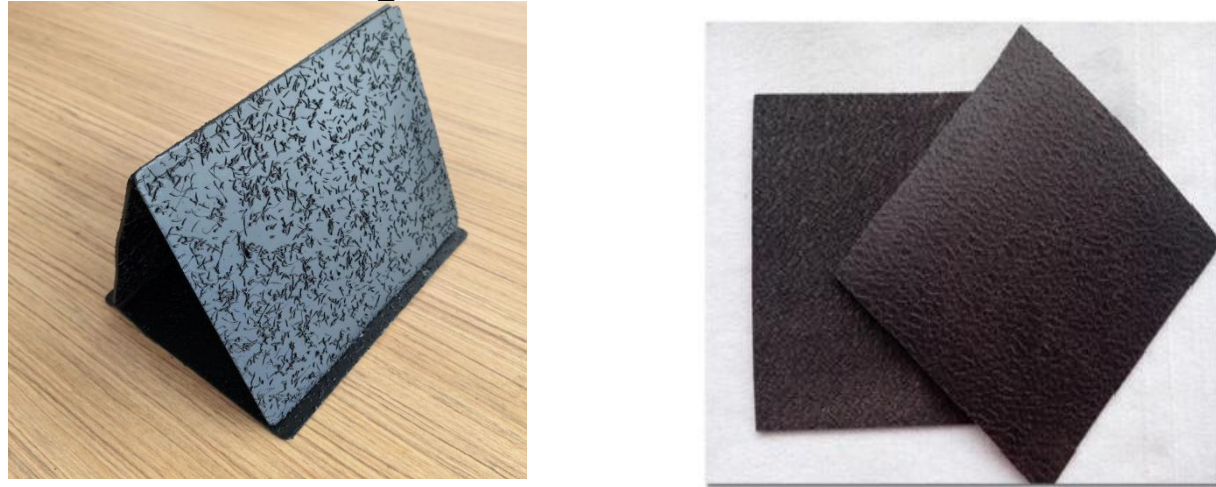
Low density polyethylene geomembrane(GB/T 17643-2011 GL-2type)

序号 Number	Item	Value								
		Thickness mm								
		0.5	0.75	1	1.25	1.5	2	2.5	3	
1	Density g/cm ³	≤0.939								
2	Tensile break strength(MD and CD)N/mm	≥13	≥20	≥27	≥33	≥40	≥53	≥66	≥80	
3	Elongation at break(MD and CD)%	≥800								
4	2%Secant modulus N/mm	≤210	≤370	≤420	≤520	≤630	≤840	≤1050	≤1260	
5	Tear resistance(MD and CD) N	≥50	≥70	≥100	≥120	≥150	≥200	≥250	≥300	
6	Puncture strength N	≥120	≥190	≥250	≥310	≥370	≥500	≥620	≥750	
7	Carbon blank content %	2.0~3.0								
8	Carbon black dispersion	If there are 10 data points, no more than 1 should be of level 3, and levels 4 and 5 are not allowed								
9	Oxidation induction time(OIT)min	Normal pressure oxidation induction time≥100								
		High pressure oxidation induction time≥400								
10	85°C Oven aging at 85°C (Standard OIT(min.ave.)-%retained after 90 days)%	≥35								
11	Uv resistance (OIT after 1600h UV irradiation Retention rate)	≥35								

table 1(b)-High Density Polyethylene (HPDE) Geomembrane-Smooth(GM13-2016)

Properties	Test Method	Test Value							Testing Frequency (minimum)
		0.75mm	1.0mm	1.25mm	1.50mm	2.00mm	2.50mm	3.00mm	
Thickness-mils(min. ave.) • lowest individual of 10 values	D5199	nom. (mil) -10%	nom. (mil) -10%	nom. (mil) -10%	nom. (mil) -10%	nom. (mil) -10%	nom. (mil) -10%	nom. (mil) -10%	Per roll
Formulated Density (min.)	D1505/D792	0.940 g/cc	0.940 g/cc	0.940 g/cc	0.940g/cc	0.940g/cc	0940 g/cc	0.940 g/cc	90,000kg
Tensile Properties(1) (min. ave.) • yield strength • break strength • yield elongation • break elongation	D6693 Type IV	11kN/m 20kN/m 12% 700%	15kN/m 27kN/m 12% 700%	18kN/m 33kN/m 12% 700%	22kN/m 40kN/m 12% 700%	29kN/m 53kN/m 12% 700%	37kN/m 67kN/m 12% 700%	44kN/m 80kN/m 12% 700%	9,000kg
Tear Resistance(min. ave.)	D1004	93N	125N	156N	187N	249N	311N	374N	20,000kg
Puncture Resistance(min. ave.)	D4833	240N	320N	400N	480N	640N	800N	960N	20,000kg
Stress Crack Resistance(2)	D5397 (APP.)	500hr	500hr	500hr	500hr	500hr.	500hr	500hr	Per GRI GM-10
Carbon Black Content-%	D4218(3)	2.0-3.0%	2.0-3.0%	2.0-3.0%	2.0-3.0%	2.0-3.0%	2.0-3.0%	2.0-3.0%	9.000kg
Carbon Black Dispersion	D5596	note(4)	note(4)	note(4)	note(4)	note(4)	note(4)	note(4)	20,000kg
Oxidative Induction Time(OIT) (min. ave.) (5) (a)Standard OIT -Or- (b)High Pressure OII	D3895 D5885	100min 400min	100min 400min	100min 400min	100min 400min	100min 400min	100min 400min	100min 400min	90,000kg
Oven Aging at 85°C (5), (6) (a)Standard OIT(min. ave.)-% retention rate after 90 days -or- (b)High Pressure OIT(min. ave.)-% retained after 90 days	D5721 D3895 D5885	55% 80%	55% 80%	55% 80%	55% 80%	55% 80%	55% 80%	55% 80%	per each formulation
UV Resistance(7) (a)Standard OIT(min. ave.) -Or- (b)High Pressure OIT(min. ave.)-% retained after 1600hrs(9)	D7238 D3895 D5885	N.R. (8) 50%	N.R. (8) 50%	N.R. (8) 50%	N.R. (8) 50%	N.R.(8) 50%	N.R. (8) 50%	N.R. (8) 50%	per each formulation

HDPE geomembrane with textured surface



HDPE geomembrane is a new type of rough surface impervious material, a single rough surface, such as HDPE geomembrane dual rough surface to increase friction coefficient, anti-skid function, more conducive to steep slope sand vertical anti-seepage, thereby improving stability. HDPE has excellent temperature flexibility, good solder ability and aging resistance, chemical resistance, resistance to environmental stress cracking resistance and anti-wear performance. Thus, particularly suitable for underground works, landfills, sewage or waste disposal sites, mining works as anti-leakage materials used.

Products

Single rough surface, double-rough surfaces

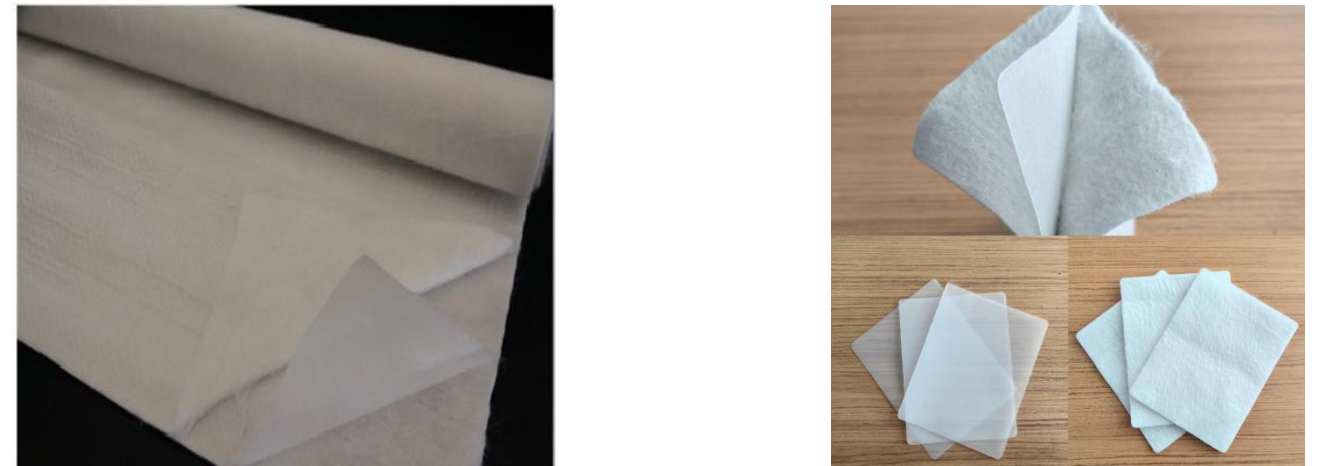
Specification:

Thickness:1.0-2.0mm; Roll width: 4-10m Roll

Environmental protection with rough high density polyethylene geomembrane (GB/T 17643-2011 GH-2T1.GH-2T2 type)

Number	Item	Value						
		0.75	1	1.25	1.5	2	2.5	3
1	Density g/cm ³	≥0.940						
2	Rough height mm	≥0.25						
3	Tensile yield strength(MD and CD)N/mm	≥11	≥15	≥18	≥22	≥29	≥37	≥44
4	Tensile break strength(MD and CD)N/mm	≥8	≥10	≥13	≥16	≥21	≥26	≥32
5	Elongation at yield(MD and CD) %	≥12						
6	Elongation at break(MD and CD) %	≥100						
7	Tear resistance (MD and CD) N	≥93	≥125	≥160	≥190	≥250	≥315	≥375
8	Puncture strength N	≥200	≥270	≥335	≥400	≥535	≥670	≥800
9	Tensile stress cracking(incision constant load stretching)h	≥300						
10	Carbon blank content %	2.0~3.0						
11	Carbon black dispersion	If there are 10 data points, no more than 1 should be of level 3, and levels 4 and 5 are not allowed						
12	Oxidation induction time min	Normal pressure oxidation induction time≥100						
		High pressure oxidation induction time≥400						
13	Oven aging at 85 °C, (Standard OIT (min.ave.) -retention rate after 90 days)%	≥55						
14	Uv resistance (OIT after 1600h UV irradiation Retention rate)	≥50						

Compound geomembrane



1. One piece of geotextile and one piece of membrane; Weight of base geotextile: 100-1000 g/m²; Thickness of geomembrane: 0.1-1.5 mm.
2. Two pieces of geotextiles and one piece of membrane; Weight of base geotextile: 80-600g/m²; Thickness of geomembrane: 0.2-1.5 mm.
3. One piece of geotextile and two pieces of membranes. Weight of base geotextile: 100-1000 g/m²; Thickness of geomembrane: 0.1-0.8 mm.
4. Multi-layers: weight of base geotextile:100-1000g/m²; Thickness of geomembrane: 0.1-0.8mm.

·Properties

Flexibility is good, except of a geotextile's isolation, drainage, reinforcement, protective functions, it is also impermeable.

·Usage

Widely used in dam, traffic tunnel, road, airport, drainage, housing, environmental protection and many other fields for waterproof protection, reinforcement etc.

·Size of Package

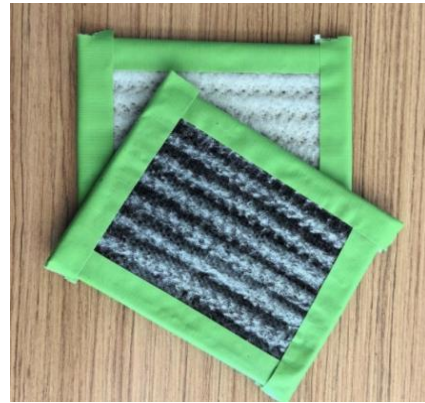
2-6 m width, length 50-100 m (or at request)

Technical specification of compound geomembrane(GB/T17642-2008)

Item		Value							
Nominal breaking strength		5	7.5	10	12	14	16	18	20
1	Breaking strength(MD/CD)KN/m≥	5	7.5	10	12	14	16	18	20
2	Breaking elongation %	30~100							
3	CBR Bursting Strength KN ≥	1.1	1.5	1.9	2.2	2.5	2.8	3	3.2
4	Tear strength KN ≥	0.15	0.25	0.32	0.4	0.48	0.56	0.62	0.7
5	Hydraulic pressure Mpa	As table II							
6	Peel strength N/cm≥	6							
7	Vertical permeability coefficient	According to request							
8	Width Variation %	-1.0							
Item		Thickness of geomembrane mm							
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	1
Hydraulic pressure MPa	(Geotextile + Geomembrane)	0.4	0.5	0.6	0.8	1	1.2	1.4	1.6
	(Geotextile + Geomembrane + Geotextile)	0.5	0.6	0.8	1	1.2	1.4	1.6	1.8

Geosynthetic clay liner

Tri-dimension composite geonet for drainage



Specification Unit weight 2:4000g I m², width of 4-6m

Characteristics

Compared with compacted clay liners, it has a small size, light weight, good flexibility, good sealing, easy construction, adapt to uneven settlement and other advantages.

Usage

Mainly used in environmental engineering in the waste landfill, underground reservoirs, underground infra-structure construction projects to solve the sealing, isolation, anti-leakage, good effect, strong anti-destructive.

GCL(geosynthetic clay liner) Specifications(JG/T 193-2006)

Items	Technical Indicators		
	GCL-NP	GCL-OF	GCL-AH
GCL Weight per unit area g/m ²	≥4000 and not less than the specified value	≥4000 and not less than the specified value	≥4000 and not less than the specified value
Swell Index ml/2g	≥24	≥24	≥24
Methylene blue adsorbed g/100g	≥30	≥30	≥30
Tensile strength N/100mm	≥600	≥700	≥600
Elongation at max load %	≥10	≥10	≥10
Peel strength N/100mm	Non -woven geotextile and woven getotextik	≥40	≥40
	PE geomembrane and Non-woven geotextile	—	≥30
Resistance hydraulic pressure m/s	≤5.0×10 ⁻¹¹	≤5.0×10 ⁻¹²	≤1.0×10 ⁻¹²
Resistance hydraulic pressure	0.4MPa. 1h. no leakage	0.6MPa. 1h. no leakage	0.6MPa. 1h. no leakage
Fluid loss ml	≤18	≤18	≤18
Durability of bentonite ml/2g	≥20	≥20	≥20

150/2-1600/23D composite drainage networks

Tri-dimension composite geonet for drainage is made of a unique tri-dimension geonet adhibited geotextile on both sides. It has the property of geotextile (filtration function) and geonet (drainage and protection) and provide a function system "filtration-drainage-protection". The core of net with its unique tri-dimension structure can bear higher compressing load in con-struction and remain the certain thickness, provide good water conductivity.

Typical Applications

Landfill drainage; roadbed and road drainage; railway drainage, tunnel drainage, underground structure drainage, the retaining back wall drainage, gardens and sports grounds drainage.

Three-dimensional network of drainage features:

Excellent drainage function, can bear long time high press load;

High tensile and shear strength;

Reduce the rate geotextile embedding into the core of geonet, can protect longtime stable water conductivity;

Tri-dimension composite geonet for drainage can bear more than kpa compression load;

Its anti-compression capacity is much larger than common geonet for drainage.

Geotechnical drainage network for landfills(CJ/T452-2014)

Item	Value	
	Geonet for drainage	Composite geonet for drainage
Density g/cm ³	≥0.939	
Carbon blank content %	2~3	
Tensile Strength MD KN/m	≥8.0	≥16
Hydraulic conductivity MD m ² /s	≥3.0×10 ⁻³	≥3.0×10 ⁻⁴
Peel strength KN/m		≥0.17
Weight per unit area g/m ²		≥200