



餐厅一角



生产车间

*The advanced equipment is quality assurance*





膨润土车间



公司餐厅

先进的设备是质量的保证





*The advanced equipment is quality assurance*





高强加筋单向格栅（宽2.5米）生产线  
Single direction geogrid production line, 2.5 meters in width



土工三维固土网垫生产线  
Production line of Tri-dimension geomat for soil-fixing



组合式防排储水隔离板生产线  
Drainage board production line





土工膜生产线

*The advanced equipment is quality assurance*





土工格栅生产线

先进的设备是质量的保证





长丝纺粘针刺非织造土工布生产线  
Falament spunbond needle punched geotextile production line.



无纺布生产线





无纺布生产线



无纺土工布车间一角

先进的设备是质量的保证



公司设产品质检中心、新产品研发试验中心，具有精密检测设备25台套，专业检验、设计人员45名。有健全的标准化体系、完善的过程监控程序，严格的原料、产品鉴别及把关制度。依不同的工程要求，不断研发新品种，以满足市场需求。

There are 25 sets of sophisticated test equipment and 45 special inspector and designer in Test Center and new product R&D Test Center of company with its healthiness standardization system, perfecting process control system, strict regulations to control the raw materials and products. In order to meet the market demand, the company develop the new product unceasingly according to different needs in construction project.



万能材料试验机  
Universal material tester

纤维强力机  
Fiber strength testing machine



膨润土生产线  
GCL production line



# 中国土工合成材料工程协会定点新产品试验和研发基地

China Association of geosynthetics Fixed new product testing and R & D base



淋膜生产线  
Drip washing geomembrane production line



先进的设备是质量的保证



# 工程实例



南水北调工程安阳四段工地  
Anyang four section site of South-to-North water diversion



松原垃圾填埋场土工膜铺设现场  
Geomembrane installation site of Songyuan Landfill



# 产品优质 服务真诚



堤坝建设  
Dam Construction



加筋网格多层复合膜  
Reinforced multi-layer composite  
geomembrane with gridding



阻根防水卷材  
Waterproofing membrane for preventing root



防汛专用编织袋 (防老化型)  
Woven bags specially used in flood prevention



土工网 Ggonet



北京鸟巢工程  
Beijing Nest Works



青海盐田防渗工程  
Qinghai Salt Lake Anti-leakage Project



水库防渗  
Reservoir Preventing Leakage





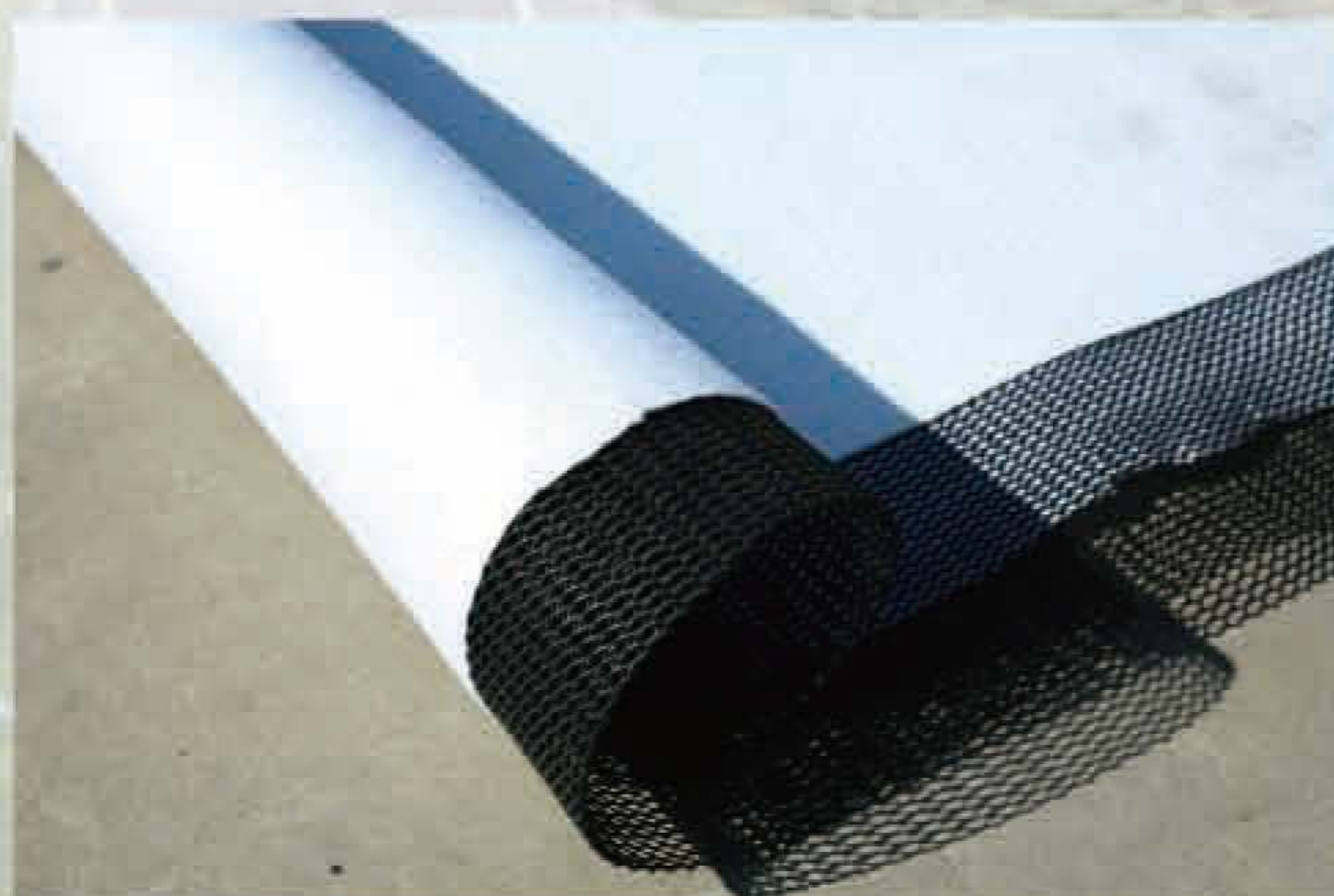
复合排水板  
Composite drainage board



膨润土防水毯 (GCL)  
Geosynthetic Clay Liner



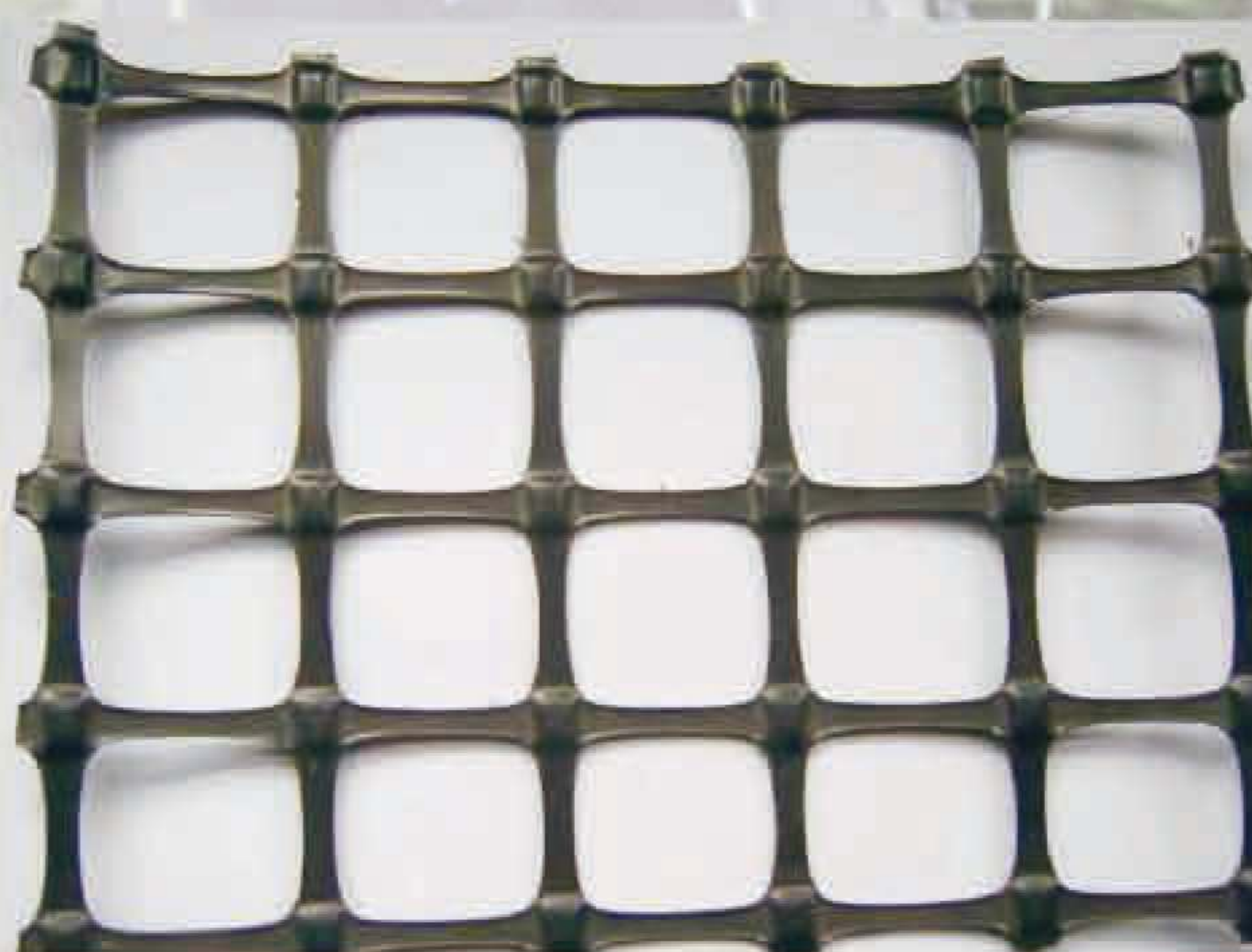
糙面防水板  
Waterproof board with textured surface



复合排水网  
Composite geonet for drainage



土工膜  
Geomembrane



双向钢塑粘焊土工格栅  
Biaxial steel-plastic compound grid



## 建筑工程案例

工程名称	产品名称	规格	用量m <sup>2</sup>
山西大同煤矿集团塔山坑口电厂	HDPE膜	1.5mm	200000
湖北麻城大别山电厂	两布一膜	150g/0.4mm/150g	1000000
内蒙古赤峰市热电厂	两布一膜	200g/0.5mm/200g	50000
内蒙古包头东河热电厂	两布一膜	150g/0.2mm/150g	120000
天津北疆发电厂	HDPE膜	0.75mm	25000
内蒙古呼和浩特市金桥热电厂	两布一膜	150g/0.2mm/150g	180000
内蒙古薛家湾煤矿石电厂	两布一膜	150g/0.2mm/150g	150000
太佳高速公路（吕梁段）	一布一膜	1.2mm/350g	580000
灵山高速公路	一布一膜	1.2mm/350g	600000
阳至平定高速公路	一布一膜	1.2mm/350g	1000000
临青高速公路	一布一膜	1.2mm/350g	300000
平榆高速公路	一布一膜	1.2mm/350g	200000
运城至灵宝高速公路CJ3标中铁十二局项目部	一布一膜	1.2mm/350g	250000
运城至灵宝高速公路CJ2标北京神达项目部	一布一膜	1.2mm/350g	300000
山西晋铝建设公司阳泉项目	防水板	1.0mm	110000
顺义高尔夫球场	复合膜	150g/0.3/150g	30000
明珠文化公园人工湖防渗材料	土工布	300g	560000
安徽省水利防汛材料有限公司	复合土工膜	150g/0.3mm/150g	100000
安徽省水利防汛材料有限公司	土工布	400g	50000



## 环保工程案例

工程名称	产品名称	规格	用量m <sup>2</sup>
牙克石市凤凰湖蓄水工程	两布一膜	150g/0.2mm/150g	40000
涿州京都新世纪人工湖	两布一膜		30000
敦化市东海水库工程	两布一膜		130000
沈阳大兴垃圾填埋厂	防水板	1.5mm	160000
沈阳康平垃圾填埋厂	防水板	1.5mm	70000
湖北宜昌当阳垃圾填埋厂	防水板	1.5mm	60000
涿州京都新世纪人工湖	复合土工膜	150g/0.3mm/150g	30000
敦化市东海水库工程	复合土工膜	150g/0.3mm/150g	130000
辽宁葫芦岛污水处理	防水板	1.0mm	40000
吉林长白山污水处理	防水板	1.0mm	80000
河南驻马店垃圾填埋厂	防水板	1.5mm	70000
青海省贵南县垃圾填埋厂工程	防水板	1.5mm	70000
宜都市吴家湾垃圾卫生填埋厂	防水板	1.5mm	90000
北京朝阳区垃圾填埋场	防水板	1.5mm	45000
北京怀柔雁栖河	复合膜	150g/0.3/150g	600000
北京淮河改造工程	复合膜	150g/0.3/150g	850000
金融街人工湖	复合膜	150g/0.3/150g	270000
北京丰台区大宁蓄水工程	复合膜	150g/0.3/150g	60000
通州区人工湖防渗	复合膜	150g/0.3/150g	40000
鞍山垃圾填埋场	防水板	1.0mm	150000
安徽马鞍山生活垃圾填埋厂	防水板	1.5mm	60000
辽宁新民市生活垃圾填埋厂	防水板	1.5mm	60000
永定河三家店水库清淤及水质改善梯级蓄水工程	复合土工膜	150g/0.2mm/150g	



## 服务真诚 设施精良

山东鑫宇土工材料工程有限公司是专业生产经营土工合成材料系列产品的高新技术企业，在确保质量及按时交货的同时，非常重视售后服务工作，有完善的服务体系和专业技术人员。

专设客户服务部，配备由瑞士、日本进口的精良机械设备140台套，配置专业技术施工、服务人员186人，全部经过专业培训，持证上岗，常年为全国各地的重点工程提供土建、土工材料铺设、焊接施工、技术指导服务。帮助客户设计防水防渗施工方案，免费为客户进行技术培训和现场指导施工。

Shandong Hongxiang Chemical Fibre Group Co., Ltd. is a high-new technology enterprise which mainly produce and deal with Geosynthetics products series. We ensure provide the good quality and short delivery time for costumers and regard the sale-after service. We have perfect service system and professionals.

The company set up the customer service department equipped with more than 140 sets of excellent machinery equipments. We have 186 professionals in construction and service who trained specially and posses post certificates and provided technical instruction in the project of earth construction, laying, welding geosynthetics, help costumer design construction blue print of prevent water leakage, offer free technical traning and guide at site.



手提式焊机 ( TH-2型 )  
Portable welding machine(TH-2 )  
焊接规格: 1.0-2.0mm  
Welding range: 1.0-2.0mm



地工自动爬行焊接机 ( LEISTER瑞士原装进口 )  
Automatic creeping welding machine  
(LEISTER introduced from Switzerland)  
焊接规格: 1.5-2.0mm  
Welding range: 1.5-2.0mm

# 一流的信誉 一流的管理





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## 短纤针刺非织造土工布

Short fiber needle punched geotextile

### 产品规格

SNG100-SNG1500

### 性能特点

柔韧性好，具有良好透水、过滤，隔离性能，施工方便等。

### 用途作用

用于公路、铁路、堤坝、围垦等工程的反滤、隔离排水、养护。

### 包装规格

宽2-6m，长50-100m（或按用户要求）。



### ●Specification

100SNG—1500SNG

### ●Property

Good flexibility, permeability, filtration, separation and easy for construction.

### ●Usage

Used in the area of highway, railway, dam, reclamation for filtration, separation drainage and protection.

### ●Size of Package

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

## 短纤针刺非织造土工布技术指标

Technical specification of short fiber needle punched non woven geotextile

序号 No.	指标 Value 项目 Item	规格 Specification											备注 Note
		100	150	200	250	300	350	400	450	500	600	800	
1	单位面积质量 <sup>2)</sup> 偏差 Weight Variation %	-8	-8	-8	-8	-7	-7	-7	-7	-6	-6	-6	
2	厚度 Thickness mm $\geq$	0.9	1.3	1.7	2.1	2.4	2.7	3.0	3.3	3.6	4.1	5.0	
3	幅宽 <sup>2)</sup> 偏差 Width Variation %	-0.5											
4	断裂强力 Breaking Strength KN/m $\geq$	2.5	4.5	6.5	8.0	9.5	11.0	12.5	14.0	16.0	19.0	25.0	纵横向
5	断裂伸长率 Elongation at Break %	25~100											MD and TD
6	CBR顶破强力 CBR Mullen Burst Strength KN $\geq$	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.2	4.0	
7	等效孔径 Sieve Size $O_{90}$ mm	0.07~0.2											
8	垂直渗透系数 Vertical Permeability Coefficient cm/s	$K \times (10^{-1} \sim 10^{-3})$											k=1.0-9.9
9	撕破强力 <sup>2)</sup> Tear Strength KN $\geq$	0.08	0.12	0.16	0.20	0.24	0.28	0.33	0.38	0.42	0.46	0.6	纵横向 MD and TD



## 长丝纺粘针刺非织造土工布

Filament spunbond needle punched geotextile

**产品规格**

100g/m<sup>2</sup> ~ 800g/m<sup>2</sup>

**性能特点**

强度高，抗老化，耐酸碱，耐磨损，柔韧性好，施工方便等特性。

**用途作用**

用于公路、铁路、堤坝、沿海滩涂等水工建筑、隧洞工程的加筋、反滤、隔离及排水，特别适用于盐碱沼泽、垃圾填埋场。

**包装规格**

宽4-6m，长50-100m（或按用户要求）。

● **Specification**

100g/m<sup>2</sup> ~ 800g/m<sup>2</sup>

● **Properties**

High strength, anti-aging, Anti-acid and alkali, abrasion resisting, flexibility, and easy for construction.

● **Usage**

Used in the area of highway, railway, dam, coastal beach for reinforcement, filtration, separation and drainage, especially used in salt marshes and garbage burying field.

● **Size of Package**

width 4-6 m, length 50-100 m (or at request).



### 长丝纺粘针刺非织造土工布技术指标 ( GB/T 17639-2008 )

Filament spunbond nonwovens Geotextile Specifications ( GB/T 17639-2008 )

项目 Item		指标 Value							
规格 Specification		100	150	200	300	400	500	600	800
1	厚度 Thickness mm	0.8	1.2	1.6	2.2	2.8	3.4	4.2	5.5
2	纵横向断裂强度 KN/m Longitudinal and transverse rupture strength	4.5	7.5	10.0	15.0	20.0	25.0	30.0	40.0
3	纵横向标准强度对应伸长率 % Intensity corresponding to the standard vertical and horizontal elongation	40-80							
4	CBR 顶破强力 kN CBR bursting strength	0.8	1.6	1.9	2.9	3.9	5.3	6.4	7.9
5	纵横向撕破 kN Vertical and horizontal tear	0.14	0.21	0.28	0.42	0.56	0.70	0.82	1.10
6	等效孔径 O mm Sieve size O	0.05-0.20							
7	垂直渗透系数 cm/s Vertical Permeability Coefficient	Kx ( 10 <sup>-1</sup> -10 <sup>-3</sup> )							
8	幅宽偏差 % Width Variation	-0.5							
9	单位面积质量偏差 % Deviation of mass per unit area	-5							



## 复合土工膜 Compound geomembrane

### 产品规格

1. 一布一膜 基布: 100~1000g/m<sup>2</sup> 膜厚: 0.1~1.5mm
2. 两布一膜 基布: 80~600g/m<sup>2</sup> 膜厚: 0.2~1.5mm
3. 一布两膜 基布: 100~1000g/m<sup>2</sup> 膜厚: 0.1~0.8mm
4. 多布多膜 基布: 100~1000g/m<sup>2</sup> 膜厚: 0.1~0.8mm

### •Specification

1. one piece of geotextile and one piece of membrane; Weight of base geotextile: 100-1000g/m<sup>2</sup>; Thickness of geomembrane: 0.1-1.5mm.
2. two pieces of geotextiles and one piece of membrane; Weight of base geotextile: 80-600g/m<sup>2</sup>; Thickness of geomembrane: 0.2-1.5mm.
3. one piece of geotextile and two pieces of membranes. Weight of base geotextile: 100-1000g/m<sup>2</sup>; Thickness of geomembrane: 0.1-0.8mm.
4. multi-layers: Weight of base geotextile: 100-1000g/m<sup>2</sup>; Thickness of geomembrane: 0.1-0.8mm.

### 性能特点

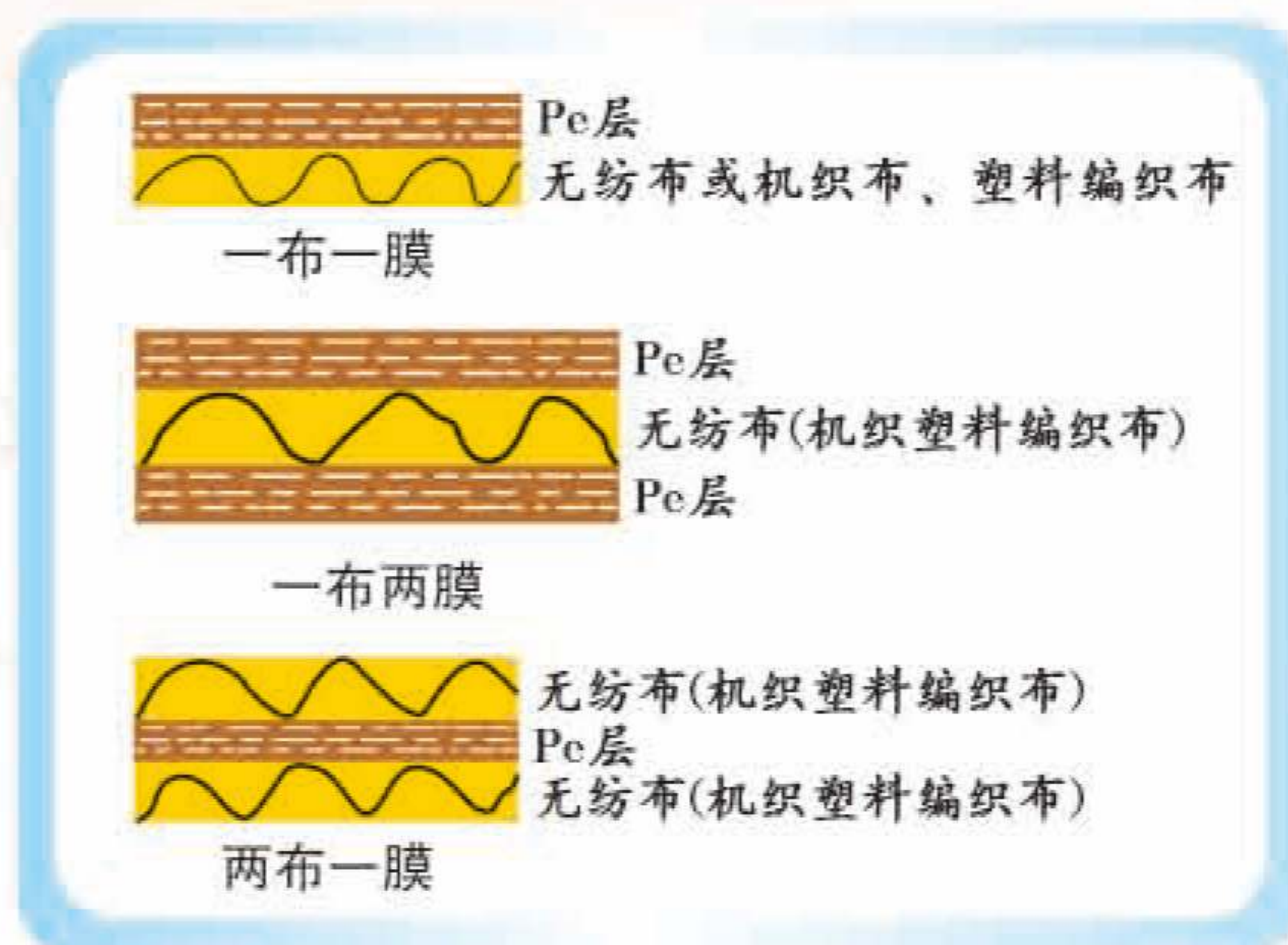
柔韧性好, 除具有土工布隔离、强度高、柔韧性好、排水、加筋、防护、耐老化等作用外, 还具有封闭(防渗)功能。

### 用途

广泛应用于房屋、环保等许多领域, 在工程中主要起防渗、防护、加固等作用。

### 包装规格

宽2-6m, 长50-100m (或按用户要求)



### •Properties

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

### •Size of Package

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

### 短纤针刺非织造复合土工膜技术指标 (GB/T 17642-2008)

Technical Index of Short fiber Needle-punched Non-woven Compound Geo-membrane(GB/T 17642-2008)

房屋、环保等许多领域, 在工程中主要起防渗、防护、加固等作用。

housing, environmental protection and many other fields for waterproof protection, reinforcement etc.

### 短纤针刺非织造复合土工膜技术指标 (GB/T 17642-2008)

Technical Index of Short fiber Needle-punched Non-woven Compound Geo-membrane (GB/T 17642-2008)

表1 table I

项目 Item	指标 Value							
	400	500	600	700	800	900	1000	备注
1 断裂强力 Breaking Strength KN/m	5	7.5	10.0	12.0	14.0	16.0	18.0	纵横向
2 断裂伸长率 Elongation at break%	30~100							纵横向
3 CBR 顶破强力 CBR mullen Burst Strength KN ≥	1.1	1.5	1.9	2.2	2.5	2.8	3.0	
4 撕破强力 Tearing Strength KN ≥	0.15	0.25	0.32	0.4	0.48	0.56	0.62	纵横向
5 剥离强度 Peel Strength N/cm	6							
6 垂直渗透系数 Vertical Permeability Coefficient cm/s	按设计合同要求							

表2 table II

项目 Item	膜材厚度 /mm (Thickness of geomembrane)								
	0.2	0.3	0.4	0.5	0.6	0.7	0.8	1.0	
耐静水压 /Mpa Hydraulic pressure	一布一膜 Geotextile+Geomembrane	0.4	0.5	0.6	0.8	1.0	1.2	1.4	1.6
	二布一膜 Geotextile+Geomembrane+Geotextile	0.5	0.6	0.8	1.0	1.2	1.4	1.6	1.8

注: 上表参照标准分别是: GB/T17639-2008 和 GB/T17642-2008, 特殊规格可按用户要求生产。

Note: The above table is referring to GB/T17639-2008, GB/T17642-2008 Standard. Special sizes are available at customer's request.



## 土工膜系列 Geomembrane series

### 功能:

防渗、隔离

### 用途:

- 垃圾填埋场、污水或废渣处理场防渗
- 江堤、湖坝、尾矿坝、污水坝及库区、渠道、蓄液池（坑、矿）。
- 地铁、地下室和隧道、隧洞防渗衬砌。
- 路基及其它地基盐渍防渗。
- 堤、坝前水平防渗铺盖，地基垂直防渗层、施工围堰、废料场。
- 海水、淡水养殖场。
- 公路、高速公路、铁路的地基；膨胀土和湿陷性黄土的防水层。
- 屋面防渗。

### 产品:

包括LDPE土工膜、LLDPE土工膜、HDPE土工膜、EVA土工膜、ECB土工膜、PVC土工膜、糙面土工膜等。

### FUNCTION:

Antiseepage and seperation

### Usage:

Prevent leakage disposal in waste burying field or waste water or waste dregs disposing field.  
River bank, lake dam, mine remainings, reservior, tunnel, liquid storage pool(pit, mine)  
Preventing leakage in subway, basement, tunnel, hole.  
Anti-solt leakage in roadbed and other groundsill.  
The plane direction laying of dam, the vertical direction laying for groundsill, used in the construction fence and waste material field.  
Used in seawater or freshwater feed field  
Used in groundsill of road,highway, railway and waterproof layer of swelling clay and wet collapsed loess.  
Preventing leakage on rooftop

### Cateryory:

Geomembrane including LDPE, LLDPE geomembrane, HDPE geomembrane, EVA geomembrane, ECB geomembrane, PVC geomembrane geomembrane with textrued surface.



LDPE土工膜在南水北调工程中的应用  
LDPE geomembrane in the South-North Water Transfer Project Application

普通高密度聚乙烯土工膜（GH-1型）技术指标（GB/T 17643-2011） Ordinary HDPE Geomembrane(GH-1)Technical Data(GB/T 17643-2011)

项目 Item		指标 Value								
1	厚度 Thickness mm	0.30	0.50	0.75	1.00	1.25	1.50	2.00	2.50	3.00
2	密度 Density g/cm <sup>3</sup>	≥ 0.940								
3	拉伸屈服强度（纵、横向）N/mm Tensile Yield Strength (TD/MD)	≥ 4	≥ 7	≥ 10	≥ 13	≥ 16	≥ 20	≥ 26	≥ 33	≥ 40
4	拉伸断裂强度（纵、横向）N/mm Tensile Strength at Break (TD/MD)	≥ 6	≥ 10	≥ 15	≥ 20	≥ 25	≥ 30	≥ 40	≥ 50	≥ 60
5	屈服伸长率（纵、横向）% Elongation at Yield (TD/MD)	-	-	-	≥ 11					
6	断裂伸长率（纵、横向）% Elongation (TD/MD)	≥ 600								
7	直角撕裂负荷（纵、横向）N Angle Tear Load (TD/MD)	≥ 34	≥ 56	≥ 84	≥ 115	≥ 140	≥ 170	≥ 225	≥ 280	≥ 340
8	抗穿刺强度 N Puncture Strength	≥ 72	≥ 120	≥ 180	≥ 240	≥ 300	≥ 360	≥ 480	≥ 600	≥ 720
9	炭黑含量 % Carbon Black Content	2.0-3.0								
10	炭黑分散性 Carbon Black Dispersion	10个数据中3级不多于1个，4级、5级不允许								
11	常压氧化诱导时间(OIT) min Oxidation Induction Time	≥ 60								
12	低温冲击脆化性能 Embrittlement Temperature Impact Performance	通过								
13	水蒸气渗透系数 g·cm/(cm·s·Pa) Water vapor permeability coefficient	≤ 1.0×10 <sup>-13</sup>								
14	尺寸稳定性 % Dimensional Stability	± 2.0								

注：表中没有列出厚度规格的技术性能指标要求按照插法执行。





HDPE土工膜在山东平原污水处理场工程中的应用  
Application of HDPE geomembrane in Shandong Plain sewage treatment works



HDPE土工膜在贵州垃圾填埋场中的应用  
HDPE geomembrane in Guizhou garbage burial site



LLDPE土工膜在西藏日喀则引水工程中的应用  
Application of LDPE geomembrane in the South-North Water Transfer Project

环保用光面高密度聚乙烯土工膜 (GH-2S 型) 技术指标 (GB/T 17643-2011)

Glossy Green HDPE Geomembrane ( GH-2S ) Technical Data(GB/T 17643-2011)

项目 Item		指标 Value						
1	厚度 Thickness mm	0.75	1.00	1.25	1.50	2.00	2.50	3.00
2	密度 Density g/cm <sup>3</sup>	≥ 0.940						
3	拉伸屈服强度 (纵、横向) N/mm Tensile Yield Strength ( TD/MD )	≥ 11	≥ 15	≥ 18	≥ 22	≥ 29	≥ 37	≥ 44
4	拉伸断裂强度 (纵、横向) N/mm Tensile Strength at Break ( TD/MD )	≥ 20	≥ 27	≥ 33	≥ 40	≥ 53	≥ 67	≥ 80
5	屈服伸长率 (纵、横向) % Elongation at Yield ( TD/MD )	≥ 12						
6	断裂伸长率 (纵、横向) % Elongation ( TD/MD )	≥ 700						
7	直角撕裂负荷 (纵、横向) N Angle Tear Load [ TD/MD )	≥ 93	≥ 125	≥ 160	≥ 190	≥ 250	≥ 315	≥ 375
8	抗穿刺强度 N Puncture Strength	≥ 240	≥ 320	≥ 400	≥ 480	≥ 640	≥ 800	≥ 960
9	拉伸负荷应力开裂 (切口恒载拉伸法) h Tensile Load Stress Cracking	-	≥ 300					
10	炭黑含量 % Carbon Black Content	2.0-3.0						
11	炭黑分散性 Carbon Black Dispersion	10 个数据中 3 级不多于 1 个, 4 级、5 级不允许						
12	氧化诱导时间 (OIT) min Oxidation Induction Time	常年氧化诱导时间 ≥ 100 高压氧化诱导时间 ≥ 400						
13	85°C热老化 (90d 后常压 OIT 保留率) % 85°C Thermal Aging	≥ 55						
14	抗紫外线 (紫外线照射 1600h 后 OIT 保留率) % uv-	≥ 50						

注: 表中没有列出厚度规格的技术性能指标要求按照插法执行。氧化诱导时间、抗紫外线两项指标的常压 OIT (保留率) 和高压 OIT (保留率) 可任选其一测试。

垃圾填埋场用光面土工膜技术指标 (CJ/T 234-2006)

Landfill geomembrane with smooth surface Specifications (CJ/T 234-2006)

项目 Item		指标 Value						
		0.75	1.00	1.25	1.50	2.00	2.50	3.00
1	最小密度 (g/cm <sup>3</sup> ) Minimum density	0.939						
2	拉伸性能 Tensile Properties							
3	屈服强度 (应力) (N/mm) Yield strength	11	15	18	22	29	37	44
4	断裂强度 (应力) (N/mm) Breaking strength	20	27	33	40	53	67	80
5	屈服伸长率 % Yield elongation	12						
6	断裂伸长率 % Elongation	700						
7	直角撕裂强度 N Right angle tear strength	93	125	156	187	249	311	374
8	穿刺强度 N Puncture Strength	240	320	400	480	640	800	960
9	耐环境应力开裂 (单点切口恒载拉伸法) h Environmental stress cracking (single incision constant load stretching)	300						
10	炭黑 Carbon Black							
11	炭黑含量 (范围) % Carbon Black Content ( range )	2.0-3.0						
12	炭黑分散度 Carbon Black Dispersion	10 个观察区域中的 9 个应属于第一级或第二级, 属于第三级的不应多于 1 个						
13	氧化诱导时间 (OIT) Oxidation Induction Time							
14	标准 OIT min Standard OIT	100						
15	高压 OIT min High Pressure OIT	400						
16	85°C烘箱老化 (最小平均值) 85°C oven aging (minimum average)							
17	烘烤 90d 后, 标准 OIT 的保留 % Baking 90d, the standard OIT reservations	55						
18	烘烤 90d 后, 高压 OIT 的保留 % Baking 90d, the high pressure OIT reservations	80						
19	抗紫外线强度 UV intensity							
20	紫外线照射 1600h 后, 标准 OIT 的保留 % After UV irradiation 1600h, standard OIT reservations	50						
21	紫外线照射 1600h 后, 高压 OIT 的保留 % 1600h after ultraviolet irradiation high pressure OIT reservations	50						
22	-70°C低温冲击脆化性能 -70°C Embrittlement of low temperature impact	通过 ( Pass )						
23	水蒸气渗透系数 g · cm / ( cm · s · Pa ) Water vapor permeability	≤ 1.0x10 <sup>-13</sup>						
24	尺寸稳定性 % Dimensional Stability	± 2						





**铁路隧道专用PE/EVA/ECB单层防水板的理化指标  
科技基 [ 2008 ] 21号标准**

PE/EVA/ECB geomembrane Specifications (Especially used in tunnel)

序号 Number	项目Items	指标Value		
		EVA	ECB	PE
1	厚度 mm Thickness	0.2~4		
2	宽度 m Width	2.5~8m		
3	断裂拉伸强度/Mpa ≥ Tensile strength at break	≥16	17	18
4	扯断伸长率/% ≥ Elongation at break	≥550	600	600
5	撕裂强度/KN/m ≥ Tear strength	≥60	95	95
6	不透水性/0.3MPa/24h Impermeability	无渗漏	无渗漏	无渗漏
7	低温弯折性/°C ≤ Bending at low temperature	-35	-35	-35
8	加热伸缩量, mm Stretch tensor at heating	延伸 ≤ Elongate	2	2
		收缩 ≤ Shrink	6	6
9	热空气老化 (80°C × 168h) Air oven aging	断裂拉伸强度/Mpa ≥ Tensile strength at break	16	14
		扯断伸长率% ≥ Elongation at break	600	550
10	耐碱性 [饱和Ca(OH) <sub>2</sub> 溶液 × 168h] Anti-alkali (saturatln solution of Ca(OH) <sub>2</sub> × 168h)	断裂拉伸强度/Mpa ≥ Tensile strength at break	17	16
		扯断伸长率% ≥ Elongation at break	600	600
11	人工候化 Nuture weathing at manual simulation	断裂拉伸强度保持率% ≥ Tensile strength at break retained %	80	80
		拉断伸长率保持率% ≥ Elongation at break retained %	70	70
12	刺破强度/N Puncture strength	1.5mm	300	300
		2.0mm	400	400
		2.5mm	500	500
		3.0mm	600	600

**PVC土工膜技术指标**

**PVC Geomembrane Specifications**

序号 Number	项目Items	I型	II型
1	拉伸强度 Tensile Strength MPa ≥	8.0	12.0
2	断裂伸长率Elongation at Break%	200	250
3	热处理尺寸变比率 Size change rate in heat treatment %	3.0	2.0
4	低温弯折 Bending low temperature °C	-20°C无裂纹 No crackle at -20°C	-25°C无裂纹 No crackle at -25°C
5	抗穿刺性 Anti-Puncture	不渗水 Not leaking	
6	不透水性 Impermeability	不透水 Impermeable	



PVC土工膜  
PVC geomembrane



## 糙面HDPE土工膜

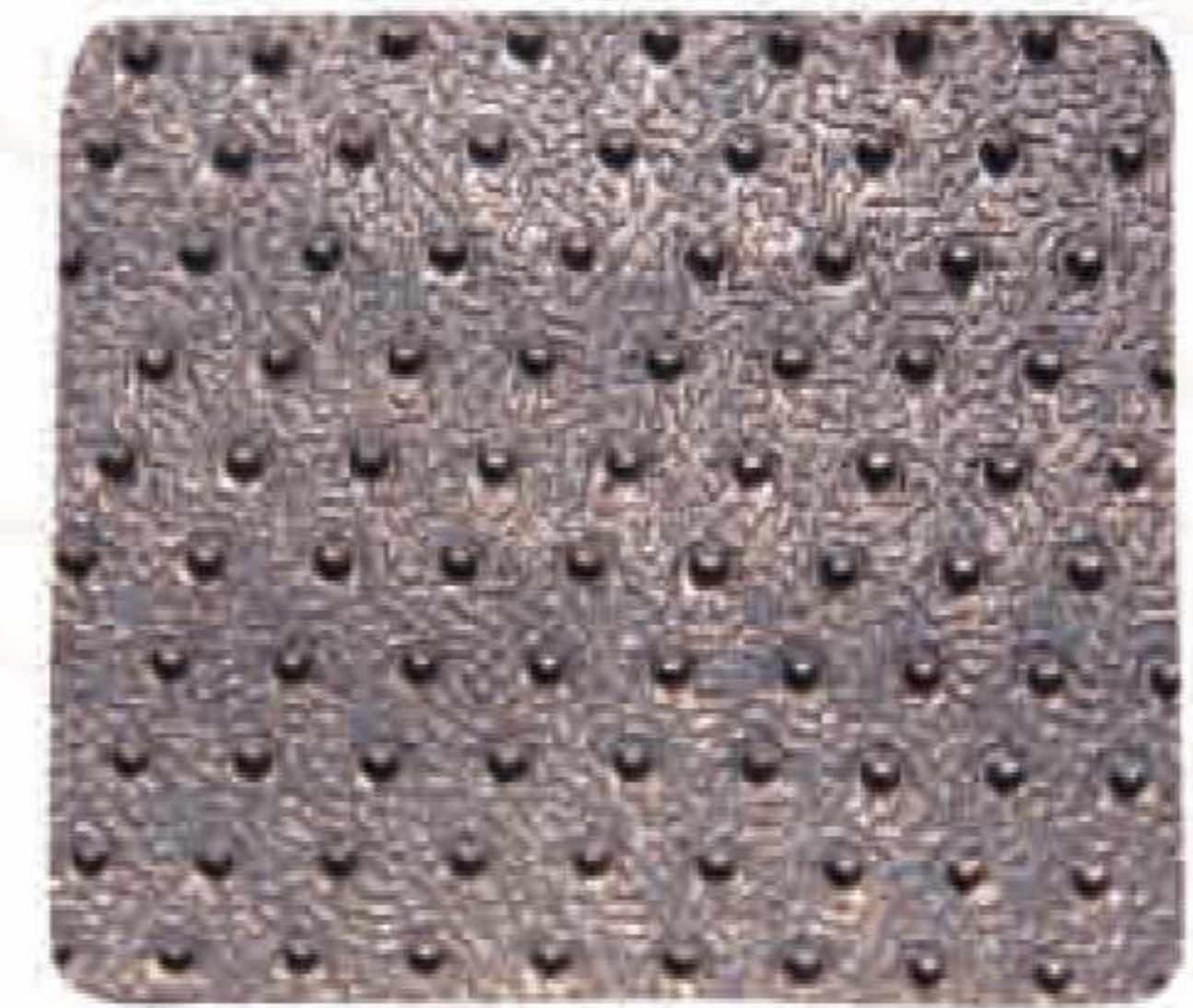
### HDPE geomembrane with textured surface

HDPE具有优异的温度适应性，可焊接性，耐候性和良好的抗老化性、耐化学腐蚀性、耐环境应力开裂性能及抗戳穿性能。因此，特别适合在地下工程、采矿工程、垃圾填埋场、污水或废渣处理场作为防渗漏材料用。

糙面HDPE土工膜是新型防渗材料，单糙面、双糙面等HDPE土工膜增加摩擦系数，防滑功能，更加适用于陡坡及垂直防渗，提高工程稳定性。

HDPE has excellent temperature property of temperature adaptability, property of welding, bearing climate, anti-erosion, anti-crack and anti-puncture. As the leakage material, therefore particularly suitable for the construction of underground, mining, landfill, sewage or dregs disposal.

HDPE geomembrane with textured is a new type of anti-leakage products, its one side textured and both sides textured can increase its coefficient of friction and function of preventing leakage, especially used in anti-leakage in slope and vertical surface in order to enhance its stability.



柱点防滑  
Point anti-skid

#### 产品系列

单糙面、双糙面、柱点防滑、支脚钳固。

#### 产品规格

厚度：1.0-3.0mm

幅宽：4-8m

卷长：按用户要求

#### Products :

One side textured, both sides textured, raised point anti-leakage and leg-clamp method .

#### Product Specifications :

Thickness:1.0- 3.0 mm

Roll width :4-8m

Roll length: According to user's requirements



糙面HDPE土工膜  
HDPE geomembrane  
with textured



支脚钳固(垂直防渗专用)  
Leg-clamp (vertical ant-leakage only)

### 传统工艺糙面与防滑性柱点糙面土工膜性能对比

产品名称 Item	技术指标	拉伸强度 MPa Tensile strength	延伸率 % Elongation	磨擦系数 Friction coefficient
传统工艺糙面 Traditional textured geomembrane		≥11	≥100	0.4
防滑性柱点糙面土工膜 HDPE anti-skid point geomembrane		≥28	≥300	0.8



## HDPE 防滑性柱点糙面土工膜产品

### HDPE anti-skid point geomembrane

膜面柱点由特制模型压辊压延而成，柱点分布均匀、美观，提高摩擦系数，且膜面正反两面可由不同材质、不同颜色热融成一体，在工程应用中可根据地质条件、工程要求，设置产品正反面。该生产工艺所生产的产品在保留原树脂本身具有的优异的力学性能和良好的延伸率及化学性能稳定的基础上，通过添加一定比例的功能助剂，经熔融、挤出、压延、牵伸等工艺加工的合理控制，更增强了产品的抗拉、耐磨、耐穿刺性能、功能助剂的配比添加融合，使产品抵抗酸碱、微生物及化学物的侵蚀功能进一步提高，该产品的力学性能比同类普通工艺生产的糙面防滑土工膜高近3倍。详见下表试验结果对比值：



Points evenly distributed with increased friction, and the appearance is very beautiful. The two sides of geomembrane can be hot melted together by different colour and materials. We can set right side or reverse side of products according to geological conditions and project requirements. The product is produced by processing of hot-welt, extrude, press pre-long, extension in reasonable controlling, which increase products' tensile strength, puncture strength, abrasion resistance. It retains superior mechanical property and excellent elongation and stable chemical property of raw materials. And through adding functional agents in fixed proportion, which improved product's functions of anti-acid & alkali and anti-corrosion. It's tensile strength 3 times higher than normal textured geomembrane.

1. 功能特点：柱点外表美观，均匀分布。摩擦系数高，防渗、防污、防滑的作用优异，便于施工。
2. 典型应用：在工程铺设中，除具有防渗、防污、功能外，还具有防滑作用，特别是工程坡面的应用，便于土工织物二次铺设中的附着力度加强，具有施工便捷，应用效率高等优点。它是一种理想的垃圾填埋场，防渗，防污工程的专用材料。

1. Features: High friction, anti-seepage, anti-pollution, anti-skid function, easy for construction.
2. Typical application: Ideal materials in landfill, anti-seepage and anti-fouling project for separation, waterproofing and anti-pollution.

### 环保用糙面高密度聚乙烯土工膜 (GH-2T1、GH-2T2 型) 技术指标 (GB/T 17643-2011) Matte Green HDPE Geomembrane (GH-2T1、GH-2T2) Technical Data (GB/T 17643-2011)

项目 Item		指标 Value						
1	厚度 Thickness mm	0.75	1.00	1.25	1.50	2.00	2.50	3.00
2	密度 Density g/cm <sup>3</sup>	≥ 0.940						
3	毛糙高度 mm Rough Height	≥ 0.25						
4	拉伸屈服强度 (纵、横向) N/mm Tensile Yield Strength(TD/MD)	≥ 11	≥ 15	≥ 18	≥ 22	≥ 29	≥ 37	≥ 44
5	拉伸断裂强度 (纵、横向) N/mm Tensile Strength at Break(TD/MD)	≥ 8	≥ 10	≥ 13	≥ 16	≥ 21	≥ 26	≥ 32
6	屈服伸长率 (纵、横向) % Elongation at Yield( TD/MD)	≥ 12						
7	断裂伸长率 (纵、横向) % Elongation( TD/MD)	≥ 100						
8	直角撕裂负荷 (纵、横向) N Angle Tear Load( TD/MD)	≥ 93	≥ 125	≥ 160	≥ 190	≥ 250	≥ 315	≥ 375
9	抗穿刺强度 N Puncture Strength	≥ 200	≥ 270	≥ 335	≥ 400	≥ 535	≥ 670	≥ 800
10	拉伸负荷应力开裂 (切口恒载拉伸法) h Tensile Load Stress Cracking	≥ 300						
11	炭黑含量 % Carbon Black Content	2.0-3.0						
12	炭黑分散性 Carbon Black Dispersion	10 个数据中 3 级不多于 1 个, 4 级、5 级不允许						
13	氧化诱导时间 (OIT) min Oxidation Induction Time	常年氧化诱导时间 ≥ 100						
		高压氧化诱导时间 ≥ 400						
14	85℃热老化 (90d 后常压 OIT 保留率) % 85℃ Thermal Aging	≥ 55						
	抗紫外线 (紫外线照射 1600h 后 OIT 保留率) % uv-	≥ 50						

注：表中没有列出厚度规格的技术性能指标要求按照插法执行。

毛糙高度项指标在 10 次测试中，8 次的结果应大于 0.18mm，最小值应大于 0.13mm。

85℃热老化项指标的常压 OIT (保留率) 和高压 OIT (保留率) 可任选其一测试。



## 隧道专用防水材料 (发明型专利)

### Waterproof material especially used in tunnel

吊挂式隧道专用防水板是我公司开发创新的新型隧道专用防水材料，实现无穿通钉施工悬吊式排挂一次性完成，可大大简化传统防水材料在隧道中的施工难度，提高铺设质量和铺设效率，缩短工期，大幅降低工程综合造价，具有极强的市场竞争优势。

Hanging waterproof board is a type of new waterproof material used in tunnel only developed by our company which can no nail holes, one-off hang in construction and simplify the difficulty of traditional materials in tunnel construction, improve the quality and efficiency of laying, short the construction time, greatly reduce cost of project and have good advantages of market competition.

#### 产品系列

分离式防水板：土工布与吊带土工膜板分层铺设

复合式防水板：吊带土工布与土工膜整体复合，点式、条式复合，产品边缘留有拼接焊缝，并且土工布上备有吊带，可在现场整体铺设，一次性完成。

#### 产品规格

涤纶针刺土工布：300-400g/m<sup>2</sup>

PE/EVA/ECB/ECD合成树脂卷材厚度：0.8、1.0、1.2、1.5、2.0mm

产品幅宽：2-4m

产品长度：按用户要求

#### 技术性能

达到GB18173.1-2006标准中规定的技术指标

#### 适用范围

铁路隧道、公路隧道、地铁、工矿及各类市政地下工程

#### Products

Separated waterproof board: one layer of geotextile and one layer of geomembrane with strips

Compound waterproof board: whole composite of geotextile with tape and geomembrane, point and strip composite, there is welding line at the edge and the strips in geotextile will be laid as a whole at site one time.

#### Product Specifications

PET needle punched geotextile; 300-400g/m<sup>2</sup>

PE/EVA/ECB/ECD composite resin membrane thickness; 0.8, 1.0, 1.2, 1.5, 2.0mm

Width: 2 - 4 m

Product Length: According to user's requirements

#### Technical performance

GB18173.1-2006 to achieve the technical standard indicators

#### Scope

Railway tunnels, highway tunnels, subways, underground mining and various municipal projects



点式复合  
Point anti-skid



整体复合  
Whole composite



条式复合  
Composite with Strips on it



膜加吊带  
Geomembrane with tape

## EVA 隧道防水专用柱点防水板

EVA Point waterproof board especially used in tunnel

在工程铺设中，除具有本能的防渗功能外，还具有隧道工程铺设中二次衬砌间防止滑移功能。膜面上柱点凹凸均匀分布与水泥面嵌入接触，与传统光面EVA防水板相比增大摩擦系数，固定效果好，同时由于柱点的凸出支撑，使得防水板面与水泥面接触间存有空隙，便于排水。具有应用效率高、功能多等优点，是一种理想的隧道防渗排水工程的专业材料。

1、功能特点：柱点分布均匀、美观，提高摩擦系数，且防水板正反两面均可形成柱点分布。在工程应用中可根据地质条件、工程要求，设置产品正反面。该生产工艺所生产的产品在保留EVA树脂本身具有的优异的力学性能和良好的延伸率及化学稳定性良好的基础上，经熔融、挤出、压延、牵伸等工艺加工的合理控制，更增加排水功能。同时该产品的力学性能比同类普通工艺生产的EVA光面防水板高。详见下表试验结果对比值：

Besides anti-seepage function in engineering construction, it also have anti-skidding function between second lining in the laying of tunnel construction. Roughness of point geomembrane uniformly distributed which insert and contact with concrete layer. Compare with traditional EVA waterproof board, It has increased friction coefficient, and it's fixed effects well. Since the convex support of point, there is a space between the interface of waterproof board and concret. So it is easy to drainage. It also have high efficiency and multi-function. It is the best special materials in tunnel project for anti-seepage and drainage.

产品名称 Item	技术指标	拉伸强度 MPa Tensile strength	延伸率 % Elongation	摩擦系数 Friction coefficient	抗穿刺N Puncture strength
传统工艺EVA光面防水板 Traditional EVA waterproof board with smooth		≥18	≥650	0.3	≥300
EVA柱点防水板 EVA waterproof board with point		≥21	≥750	0.8	≥400

2、应用典型：隧道防排水工程。垃圾填埋场四周边铺设。  
Tunnel waterproof & drainage project, Landfill project.

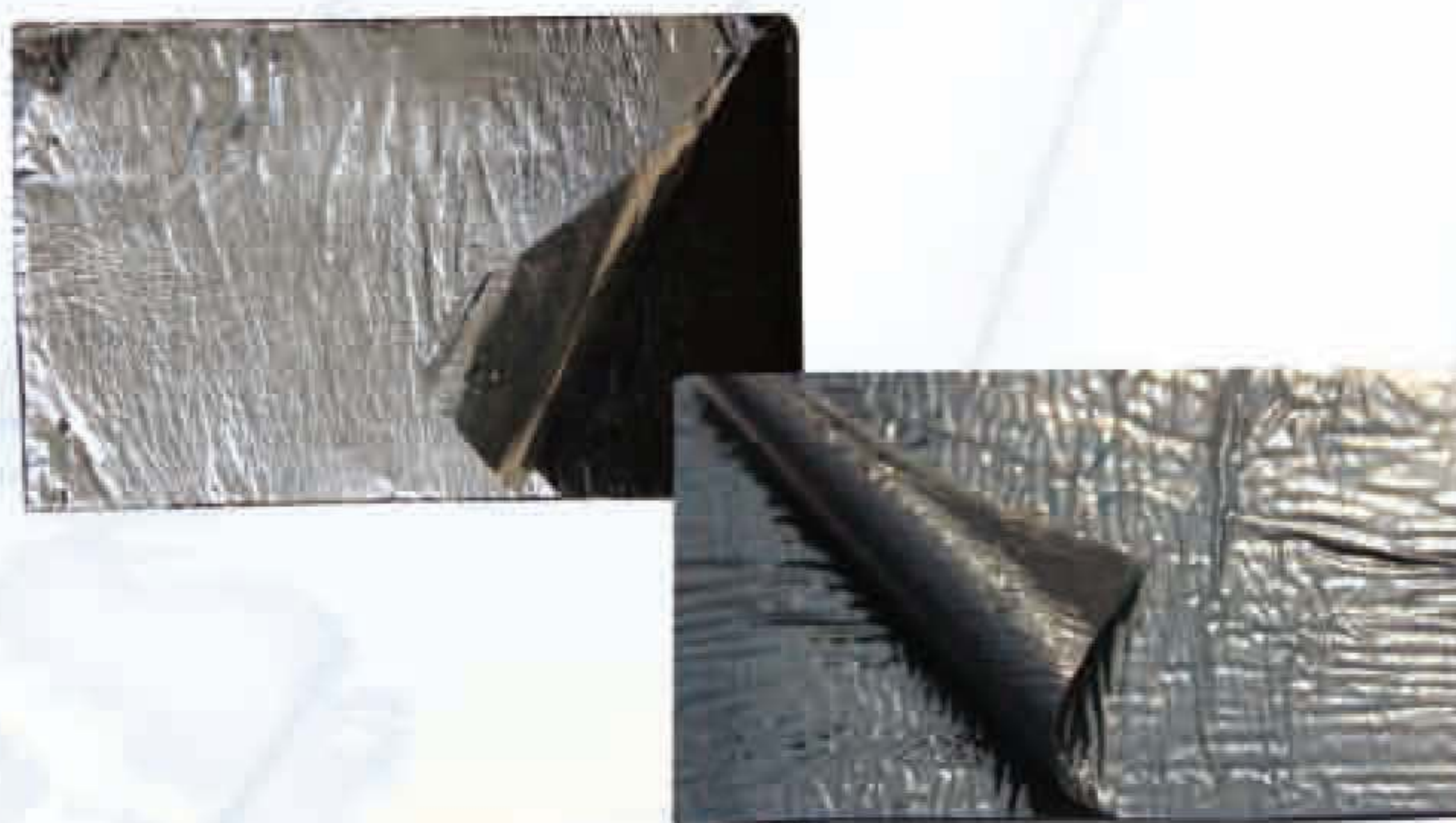


## EVA高分子复合自粘防水卷材

### EVA macromolecule adhesive waterproof material

高分子复合自粘防水卷材，采用合成高分子EVA复合片材、高聚物、改性优质沥青为基料，复合而成的新型具有优良防水性能的合成高分子防水卷材。兼有高分子防水卷材和自粘防水卷材的防水性能，一层卷材，两道设防，大大提高了防水层的防水效果。低温及潮湿环境条件下可施工，粘接密封性好，具有抗穿刺自愈性，延伸率高、产品无毒无味，符合环保要求。

EVA macromolecule composite self-adhesive waterproof membrane is a type of new excellent waterproof property composite macromolecule waterproof membrane which basic materials include composite macromolecule EVA compound sheet, macromolecule polymer and good quality asphaltum. Its has the property of macromolecule waterproof membrane and self-adhesive waterproof membrane. A membrane with both sides of security, greatly improve the function of waterproof layer. It can be constructed under low temperature and humid condition, has good adhesive and seal property, anti-puncture comeback, and high elongation, no smell no poison, according with the environmental protection.



### 材料特点及技术性能

The property and technical specification of EVA macromolecule adhesive waterproof material

项目 Item		指标 Value	
		EVA 300	EVA 500
不透水性 Impermeability	压力pressure MPa $\geq$	0.2	0.3
	保持时间Keep time min $\geq$	30min不透水 impermeable	30min不透水 impermeable
耐温度 <sup>a</sup> temperature-durability		70℃，加热2h，无气泡，无滑动 Heating 2 h, no bubbles, no sliding	
拉力 Pulling force N/5cm $\geq$		350	550
断裂伸长率 Elongation at break% $\geq$		80	90
柔度 Flexibility		-20℃， $\Phi$ 20mm，3s，180° 无裂纹 No Cracking	
剪切性能 Shear Properties (N/mm)	卷材与铝板Aluminium and membrane $\geq$	4.0或粘合面外断裂	4.0 or adhesive surface of fracture
剥离性能Stripping performance N/mm $\geq$		2.0或粘合面外断裂	2.0 or adhesive surface of fracture
抗穿孔性		不渗水 Anti-perforation of not leaking	
与水泥砂浆粘结强度 N/mm $\geq$ And the bonding strength of cement mortar		剪切性能 Shear Properties	6.0或粘合面外断裂 6.0 or adhesive surface of fracture
		剥离性能 Stripping performance	2.0或粘合面外断裂 2.0 or adhesive surface of fracture
粘结面耐水性 <sup>b</sup> Bonding surface of the water		与水泥砂浆剪切性能保持率 Shear properties of cement mortar and retention %， $\geq$ 95	
人工候化 Designate of the artificial	外观 无裂纹，无汽泡 Appearance no crack, no bubble		
	拉力保持率% Force retention rate $\geq$	80	
	柔度 Flexibility	-10℃， $\Phi$ 20mm，3s，180° 无裂纹 Crack-free	

注：

- 1、用于非外露工程时卷材耐温度不做检测。
- 2、粘结面耐水性项目，有用于长期浸泡水工程时检验。

Note:

- 1, for non-exposed works membrane resistance to temperature not detected.
- 2, bonded surface waterproof projects, for long-term water immersion test works.



## 三维复合排水网

Tr-dimension composite geonet for drainage

### 150/2-1600/2三维复合排水网

三维复合排水网由特有的三维土工网双面粘结土工布制成。组合了土工布（反滤作用）和土工网（排水和保护作用），提供完整的“反滤——排水——保护”功效。

三维复合排水网网芯独特的三维结构，在整个使用过程中能够承受较高的压缩荷载，并能保持相当的厚度，提供很好的导水率。

#### 典型应用

垃圾填埋场排水；公路路基和路面排水；铁路排水；隧道排水；地下结构排水，挡墙墙背排水；花园和运动场排水。

#### 三维复合排水网的特点：

- 排水能力强，能承受长期高压荷载
- 极高的抗拉强度和抗剪强度
- 减少土工织物嵌入网芯的几率，能保护长期稳定的导水率
- 三维复合排水网能承受大于2000kpa的压缩荷载，
- 远大于普通排水网的抗压能力

### 150/2-1600/2 3D composite drainage networks

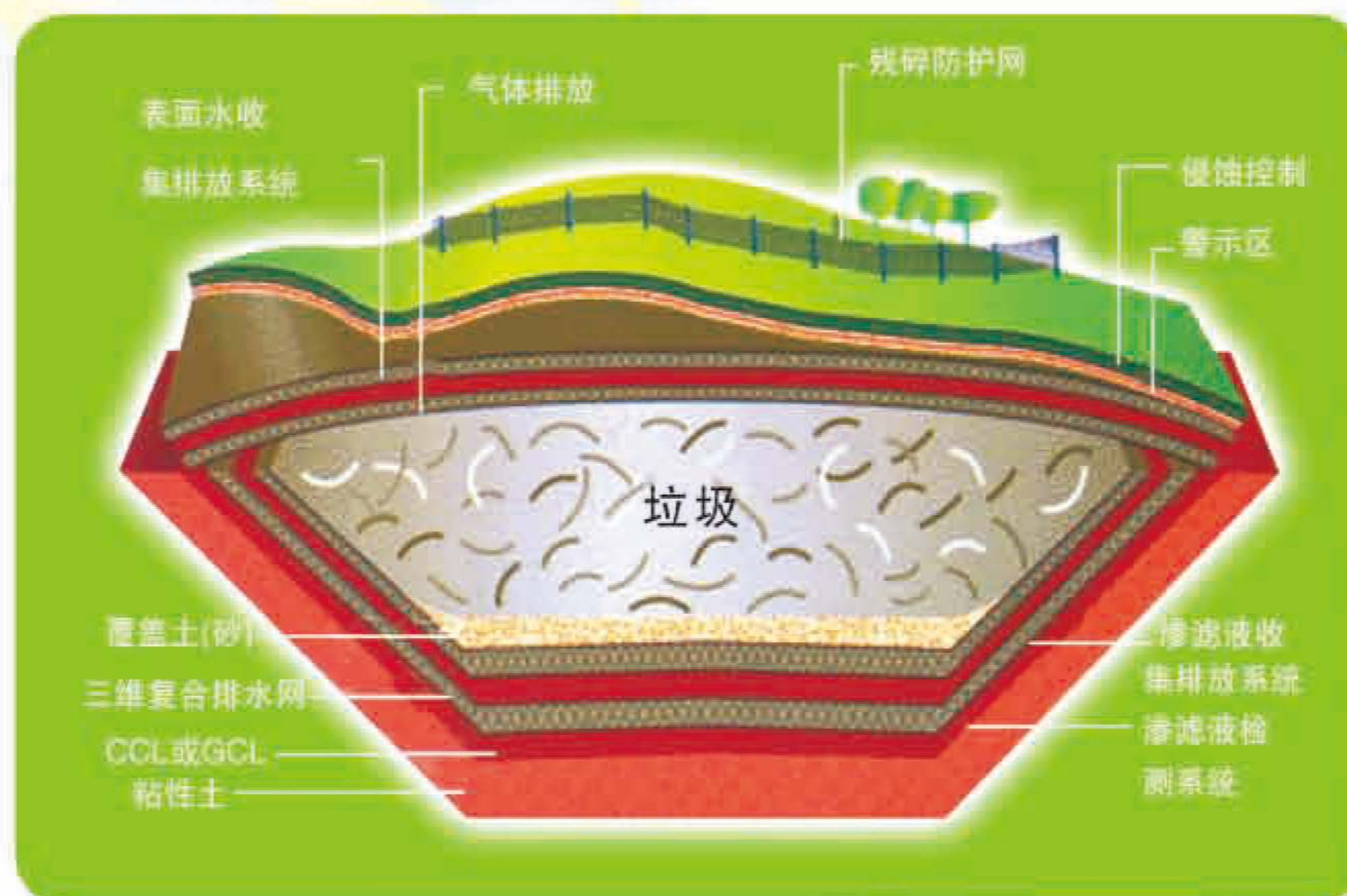
Tri-dimension composite geonet for drainage is made of a unique tri-dimension geonet adhibited geotextile on both sides. It has the property of geotextile( filtration function) and geonet(drainage and protection) and provide a function system “ filtration—drainage—protection”. The core of net with its unique tri-dimension structure can bear higher compressing load in construction 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:

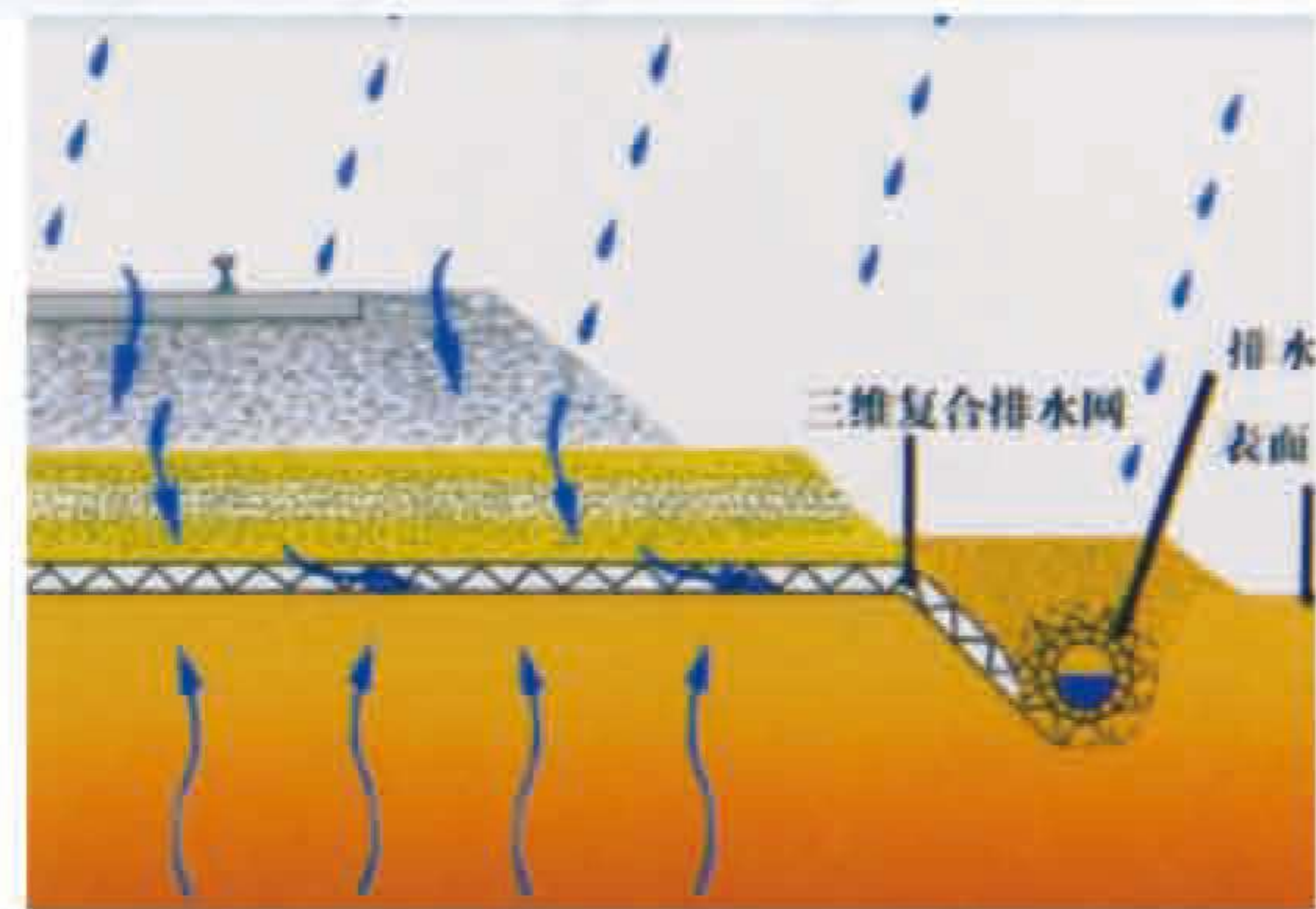
- Excellent drainage function, can bear long time high press load
- High tensile and shear strength
- Reduce the rate geotextile embedding into the core of geonet, can protect long time stable water conductivity
- Tri-dimension composite geonet for drainage can bear more than kpa compression load
- Its anti-compression capacity is much larger than common geonet for drainage



复合排水网用于垃圾填埋场典型结构图

The structure photo of Tr-dimension composite geonet for drainage used in landfill





### 三维复合排水网规格、技术参数

The specifications and technical parameters of Tri-dimension composite geonet for drainage

排水网芯 Drainage network core	单位 Units	规格 Specifications			
单位面积质量 Unit weight	g/m <sup>2</sup>	750	1000	1300	1600
厚度 Thickness OV=20kpa	mm	5.0	6.0	7.0	7.6
导水率 Hydraulic conductivity	m/s	K × 10 <sup>-4</sup>	K × 10 <sup>-4</sup>	K × 10 <sup>-3</sup>	K × 10 <sup>-3</sup>
延伸率 Elongation	%	<50	<50	<50	<50
抗拉强度(网芯) Tensile strength (core network)	KN/m	8	10	12	14
土工布 Geotextiles	g/m <sup>2</sup>	200-200	200-200	200-200	200-200

### 三维复合排水网和天然砂砾石排水层的对比

The contrast of tri-dimension composite geonet for drainage and natural grit drainage layer

应用 Application	三维复合排水网 Tri-dimension composite geonet for drainage	天然砂砾石 Natural gravel
水和气体导排 Conducting and discharging Water and gas	经过质控严格的生产线生产，性能稳定，具有很高的导水性能的产品。Pass through strict quality control production line and have stable performance and good property of conducting water	传统砾石的组成成分复杂，砾石的排水性能随着其属性的变化而改变，砾石中含有大量的矿砂和尘土，其实际的导排性能要远远小于实验室数据。The traditional gravel have complex composition and its drainage property change with its attribute. Its actual drainage property is much lower than laboratory data for its contains of sand and dust.
负荷 / 保护 Load / protection	质轻，在土工膜和废弃物上不会增加额外的负荷。抗拉拔、抗压缩和抗撞击性能好，有效地保护土工膜不受破坏。 Light, no more extral load on geomembrane and waste. Anti-pull, anti-compress, anti-impact and can prevent geomembrane from damage	对废弃物有压力。锐利的石头可以穿破和损害土工膜。通常需要其它保护措施（比如特别厚重的土工布）。Pressure on the waste, the keen stone can puncture and damage geomembrane. Often need other safeguard, such as thicker geotextile.
功能 Function	四种功能：排水，隔离，过滤和保护。Four functions: drainage, separation, filtration and protection;	只有排水功能。容易被堵，需要辅助的过滤系统。Only drainage function, easy be blocked, and need accessorial filtration system.
施工安装 Construction and installation	安装快，施工简易。无需重型机械和专业人才。施工速度是砾石的5-10倍。Fast installation, easy for construction, without heavy machinery and professionals. Construction speed is 5-10 times of gravel.	安装慢，体积大，重。需要重型机械。成本高，斜坡大于1V:4H时，施工难度提高。Slow installation, bulky and heavy, need heavy machinery, high cost and have more difficulties with slope degree is more than 1V:4H.
环境 Environment	原材料为聚乙烯。无毒，无污染。100%可回收产品。Raw material is polyethylene, nontoxic, no pollution, 100% recyclable products.	相对而言，砾石是稀少，珍贵的资源。砾石的开采会破坏自然环境。Relatively speaking, the gravel is scarce and precious resources. The ecological environment will be destroyed when people mine gravel.
耐久性 Durability	抗腐蚀性好，抗氧化，大气介质和雨水，和土工布一起用，具有长期的，最佳化的排水性能。Good anti-erosion, antioxidation, anti-atmospheric media and rain water. It have long-term and the best drainage property if used them along with the geotextile.	容易被堵。耐久性差。Be easily blocked, has poor durability.



## 复合防排水板（导流板、滤层板）

Composite drainage board ( drainage board, filtration board)

鑫宇复合防排水板采用特殊工艺将塑料板材压出封闭突起的柱体壳体，形成凹凸状膜，壳连续，具有立体空间和一定支撑高度，能抵抗长期高压，不会产生变形。壳体顶部覆盖土工布过滤层，确保排水通道不会因外来物而阻塞，如回填土颗粒或混凝土。

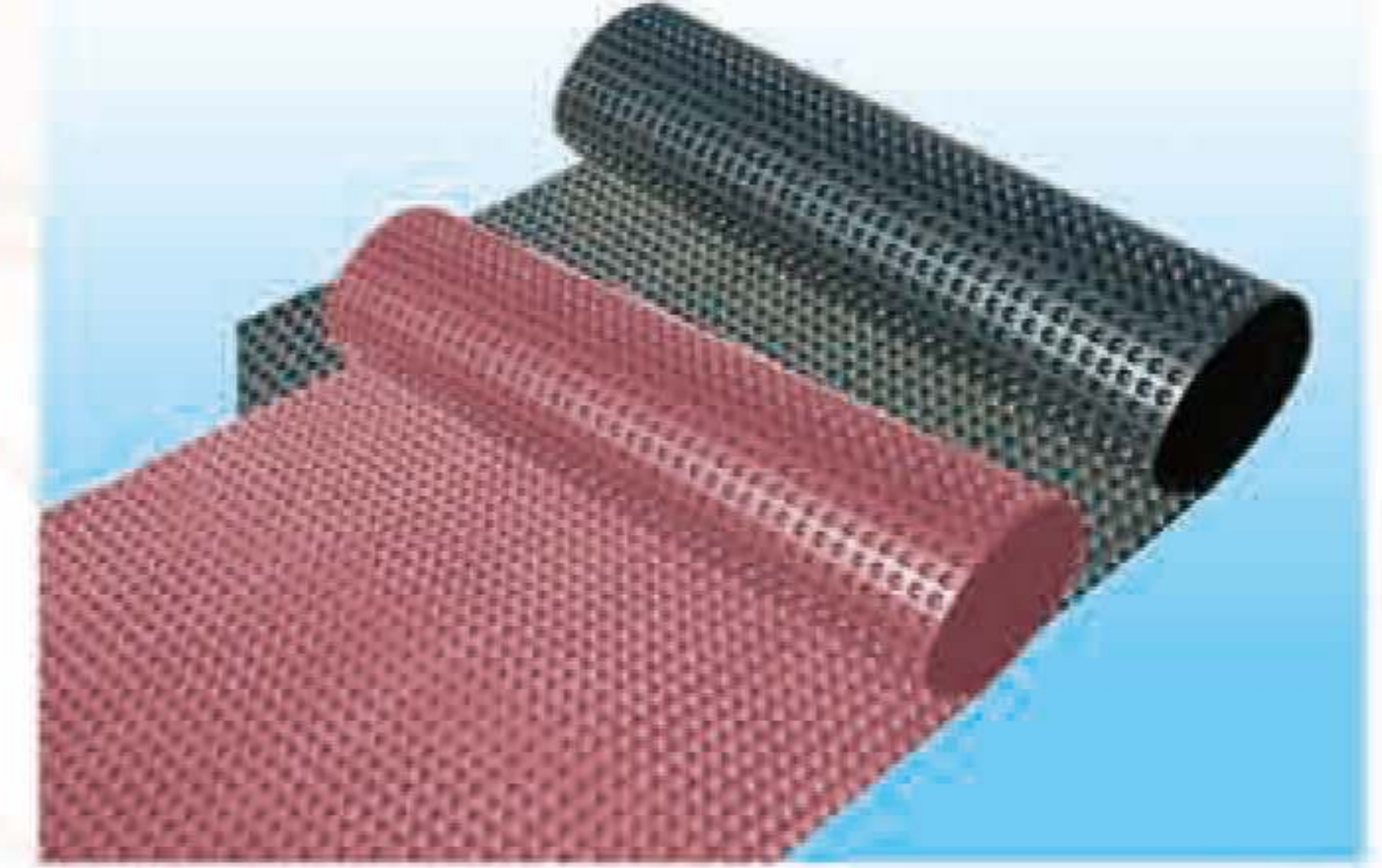
### 典型应用：

绿化工程：车库顶板绿化、屋顶花园、足球场、高尔夫球场、浴场工程。

市政工程：道路路基、地铁、隧道、垃圾填埋场。

建筑工程：建筑物基础上层或下层、地下室外墙体、层面防渗和隔热层等。

交通工程：公路、铁路路基、堤坝和护坡层



XINYU composite drainage board is a dimple geomembrane, which produced by extruding plastic sheet into dimple shape. These dimples, in spatial structure with certain height, can resist long-term high pressure without deformation. On the top of the dimples, there is filtration geotextile to make sure the drainage channel running well without any block for any articles, for example, filling particles or concrete.

### Typical application:

Landscape engineering: garage top greening, roof garden, football field, golf course, beach project.

Municipal engineering: road base, subway, tunnel, landfill.

Construction engineering : upper or bottom layer of building foundation, basement wall, bedding filtration and heat insulation.

Traffic engineering: highway, railway basement, dam and slope.

### 鑫宇复合防排水板主要技术指标

XINYU composite drainage board specifications

型号 item	高度 (mm) height	厚度 (mm) thickness	材质 material	抗压强度 (KPa $\geq$ ) Tensile strength	纵向通水力 (cm <sup>3</sup> /s $\geq$ ) pass water ability in MD	规格 (mm) specification
HX-H10	10	1.0	HDPE	400	5.6	2000 × 30000
HX-H20	20	1.0	HDPE	320	8.9	2400 × 20000



## 新型组合式防、储、排水隔离板 (实用新型专利)

New built-up isolation board (Utility Model patent)

1、新型组合式防、储、排水隔离板的结构：底层为高分子热塑性防水片材，片材表层呈梅花形布置的圆锥形中空凸台，中层为独特的由两层交错筋条组成的TDN三维土工网芯，上层为无纺土工织物，该组合式新型产品在使用过程中保持相当的厚度，承载负荷增大，能提供很高的导水率。

### 2、功能及其用途

多层组合式防、储、排水隔离板集防、储、排、保温隔热、隔离等多功能为一体，在整个使用过程中，形成抗高压力的支撑体系，三层组合物各具不同功能的优势。

#### (1) 底层（梅花型布置的圆锥形中空凸台板材）

表层可以进行通风和排水，圆锥形中空凸台反面的凹窝可截水，储存少量水，通过严密的系统细部节点设计，能够形成防水、排水、截水一体化的防水系统，圆锥形凸起面为中空减轻了产品的自重，方便了施工。并能抵抗回填土产生的压力，可以疏导汇积的环境水，同时表面的圆锥形凸台，还能起到隔音减震作用。

(2) 中层与上层为特有的三维土工网与无纺织物热粘而成，组合了土工布（反滤作用）和土工网（排水和保护作用），提供完整的“反滤—排水—保护”功能，况且三维土工网由两层交错的筋条组成，在渗滤液流动方向交错成一定的角度，这种盘条结构意味着液体为了顺应水流方向必须来回流动，同时三维土工网芯中间加入一层垂直的钢性筋，上下两层筋条能防止无纺织物嵌入中间的过流渠道，而且中间筋条的方向与水流方向平行，具有极高排水性能，尤其适合重荷载下长期排水要求。

(3) 多层组合式新型防储、排水隔离板将梅花型分布的圆锥型中空凸台板材与独特的主体结构的三维复合排水网合成一体，即可正面组合，又可反复组合，解决了防排水工程应用中，受外界压力影响而易于堵的缺陷，增加了整体持续受高压荷载的力度，抗压强度明显增高，排水通风能力最为有效，平面导水率和过滤作用进一步加强，材质本身的特性耐酸碱、耐腐蚀，对土壤环境不造成破坏，且节省工程应用材料占用的空间，独特的凹凸结构，创造出空气及液体流动空间，可以系统的收集及排放各种液体气体，是目前基础建设，环境建设等工程中防、排水设计中最佳首选工程材料。

### 4、新型组合式防、储、排水隔离板与单层防排水隔离板及单层三维复合排水网的功能特性对比：

#### 1. Structure:

Macromolecule thermoplastics waterproof sheet as the bottom layer, the surface of sheet is quincunx arrangement of cone-hollow convex plate. The middle layer is TDN tri-dimensional geonet core which is made up of two layers of crossed-ribs. The top layer is non-woven geotextile. It can keep certain thickness, increase load capacity and provide the high transmissivity in usage.

#### 2. Applications and functions

Multi-layer built-up type isolation board have waterproof, intercept, drainage, heat insulation, isolation function. During use, It formed support system with bearing high pressure and 3 layers combination with different functions.

#### (1) Bottom layer (cone-hollow convex plate in quincunx arrangement)

The surface layer can ventilate and drain water, the reverse dimple of cone-hollow convex plate can intercept and storage small quantity of water. Through compact design, it can formed integrative waterproofing system with waterproof, drainage, intercept water function. The convex of cone hollow reduce weight of the products and easy to construct, and can resistance the pressure of backfill, and drain seep. The cone-convex plate on the surface also can take the effect of noise and vibration dampening.

(2) The middle layer and top layer is made up of tri-dimension geonet which is thermal bonding non-woven geotextile. It have filtration of geotextile and drainage & protection of geonet. So it provide a whole function of "filtration-drainage-protection". Besides, tri-dimension geonet is made up of 2 layers of crossed-ribs, and staggered at an angle in the direction of flowing leachate, this special (coil rod) structure means that the liquid must back and forth flow along flow direction. At the same time, adding a layer of vertical rigid rib into the core of tri-dimensional geonet, the ribs of top and down layers can prevent non-woven geotextile inserting water channels. And middle ribs direction and flow direction are parallel, which made it have high drainage capacity, and It especially fit for drainage for long-term at heavy load capacity.

#### 3. (Multi-layers build-up new type waterproof, storage, drainage isolation board)

New built-up isolation board is composed of cone-hollow convex plate in quincunx arrangement and tri-dimensional geonet of special main structure. It can be composited on one side or other side. The special structure resolve the defect that easily blocked in the outer pressure and engineering application of waterproof and drainage, increased the function of bearing high pressure load capacity. Compression strength is increased obviously and plane transmissivity and filtration capacity, and also have good capacity of drainage and ventilation. The raw materials of isolation board can resist acid & alkali and corrosion. So it can not pollute soil environment. And it will save the space occupied by applied engineering material, and its unique concavo-convex structure created a flowing space of air and liquid, which can collect and discharge all kinds of gases & liquids systematically. It is currently the best choice engineering materials in waterproof and drainage design of infrastructure and environment construction project.

功能特性 Function	组合式新型防、储排水隔离板 New built-up isolation board	防排水隔离板 Composite drainage board	三维复合排水网 composite tri-dimensional drainage geonet
厚度 Thickness (mm)	10mm-15mm	片材厚(thickness)0.8-2.0mm, 凸台高度(dimple height)4-20mm	5mm-8mm
抗拉强度KN/m Tensile strength (KN/m)	16-25	8-9	8-14
抗压负荷Kpa Pressure resistance load capacity (Kpa)	500-3000	250-400	300-1500
导水率M/s Transmissivity (M/s)	$K \times 10^{-1}$	$K \times 10^{-3}$	$K \times 10^{-4}$
通水量 $m^3/n$ Flow capacity ( $m^3/n$ )	5-20	3-5	3-5

### 5、应用典型：

铁路系统排水：铁路路基可能会受到来自地下和地表的水破坏，地下水位过高，上升的地下水会侵蚀路基，破坏铁路结构，使得路基的承载力降低。来自于路表的降雨或雪水，如果不能及时排出，将会污染道碴，产生泛浆冒泥，导致铁轨变形等不良后果，如在路基基础或道碴下设置拓铺这种组合式防、排储水隔离板，排除上升的地下水或者路表渗水，可形成有效的铁路排水系统。

#### 5. Applications.

##### Drainage for railway system

The railway bed may be destroyed by ground water and surface water. If groundwater level is too high, the rise groundwater may erodes roadbed and destroy railway structure, then reduce the load capacity of groundsill. Rainwater and snow water on the ground which not be drained will pollute ballast and produce mud-pumping and cause the deformation of railway track and other negative effects.

If laying the new built-up isolation under roadbed or ballast, It will drain the rised groundwater or exudative on the road, and form effective railway drainage system.



## 膨润土防水毯(GCL)

GCL ( geosynthetic clay layer)

### 产品规格

单位面积质量 $\geq 4000\text{g}/\text{m}^2$ ，幅宽4-6m

### 性能特点

与压实粘土衬垫相比，具有体积小，重量轻，柔性好，密封性良好，抗剪强度高，施工简便，适应不均匀沉降等优点。

### 用途作用

主要应用于环境工程中的废气物填埋场、地下水库、地下基础设施建设等工程中，解决密封、隔离、防渗漏问题，效果好，抗破坏性强。

### ●Specification

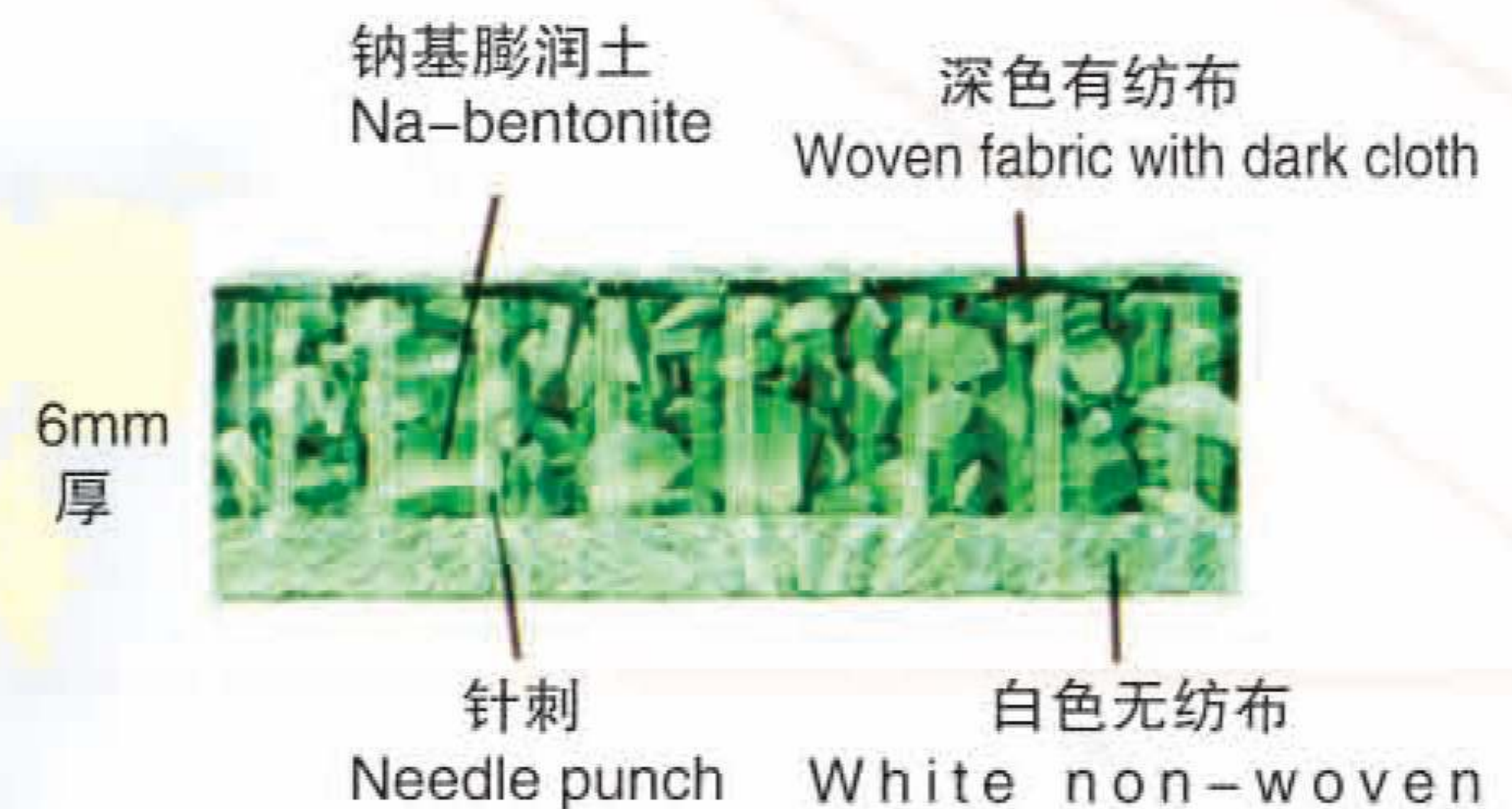
Unit weight  $\geq 4000\text{g}/\text{m}^2$ , width of 4-6 m

### ●Characteristics

Comacted with clay liner,it has the advantages of small size, light weight, good flexibility and seal, easy for construction and suitable for uneven settlement.

### ●Usage

Mainly used in environmental engineering of landfill emissions, underground reservoirs, underground infrastructure construction projects, sealing solution, segregation, anti-leakage, good effect, anti-destructive.



### 膨润土防水毯技术指标

GCL(geosynthetic clay layer)Specifications

项目	技术指标		
	GCL-NP	GCL-OF	GCL-AH
膨润土防水毯单位面积质量 ( $\text{g}/\text{m}^2$ ) GCL, Mass/Unit area( $\text{g}/\text{m}^2$ )	$\geq 4000$ 且 不小于规定值	$\geq 4000$ 且 不小于规定值	$\geq 4000$ 且 不小于规定值
膨润土膨胀指数/ ( $\text{mL}/2\text{g}$ ) Swell Index( $\text{ml}/2\text{g}$ )	$\geq 24$	$\geq 24$	$\geq 24$
吸蓝量/ ( $\text{g}/100\text{g}$ )	$\geq 30$	$\geq 30$	$\geq 30$
拉伸强度/ ( $\text{N}/100\text{mm}$ ) Tensile strengyt( $\text{KN}/\text{m}$ )	$\geq 600$	$\geq 700$	$\geq 600$
最大负荷下伸长率/% Elongation at max load	$\geq 10$	$\geq 10$	$\geq 8$
剥离强度/ ( $\text{N}/100\text{mm}$ ) Peel strength	非织造布与编织布 Non-woven geotextile and woven geotextile	$\geq 40$	—
	PE膜与非织造布 PE geomembrane and Non-woven geotextile	—	$\geq 30$
渗透系数/ ( $\text{m}/\text{s}$ ) Pesistance hydraulic pressure	$\leq 5.0 \times 10^{-11}$	$\leq 5.0 \times 10^{-12}$	$\leq 1.0 \times 10^{-12}$
耐静水压 Resistance hydraulic pressure	0.4MPa, 1 h, 无渗漏 0.4 MPa, 1h, no leakage	0.6MPa, 1 h, 无渗漏 0.6 MPa, 1h, no leakage	0.6 MPa, 1 h, 无渗漏 0.6 MPa, 1h, no leakage
滤失量/ $\text{mL}$ Fluid loss( $\text{ml}$ )	$\leq 18$	$\leq 18$	$\leq 18$
膨润土耐久性/ ( $\text{mL}/2\text{g}$ ) Durability of bentonite( $\text{ml}/2\text{g}$ )	$\geq 20$	$\geq 20$	$\geq 20$

注: GCL-NP 针刺法钠基膨润土防水毯  
GCL-OF 针刺覆膜法钠基膨润土防水毯  
GCL-AH 胶粘法钠基膨润土防水毯

Needle puched process GCL  
Needle puched and cocoon process GCL  
Viscose process GCL



## 单向拉伸土工格栅

Single-direction geogrid

### 产品规格

TGDG35 TGDG50 TGDG80 TGDG110 TGDG120

### 性能特点

是以聚丙烯，高密度聚乙烯为原料，经特别的挤压，拉伸制成。强度高，柔韧性好，抗老化，耐酸碱等。

### 用途作用

各种软土地基加筋处理，增强路基提高路基的承载能力以及长期应力状态下挡土墙、陡坡、堤坝、桥台的加筋，提高工程质量，延长工程寿命。

### 包装规格

宽≤2.1m,长50-100m(或按用户要求)。

### ●Specification

TGDG35 TGDG50 TGDG80 TGDG110 TGDG120

### ●Properties

High strength, good flexibility, anti-aging, resisting acid and alkaline.

### ●Usage

Make reinforcement for various kinds of soft soil foundation enhance and improve bearing ability of the roadbed, make reinforcement for retaining wall, steep slope, dam and bridge abutment under stress status for long term thus to improve quality and prolong service life of the project.

### ●Size of Package

width≤2.5m,length50-100m(or at request).

## 聚丙烯单拉塑料格栅

PP single-direction geogrid specification

产品规格 Item	拉伸强度 (KN/m) Tensile strength	2%伸长率时的拉伸强度 (KN/m) Tensile strength at 2% elongation	5%伸长率时的拉伸强度 (KN/m) Tensile strength at 5% elongation	标称伸 长率% Nomianal elongation	煤矿领域产品 Products in the range of coal mine	
					离焰熄灭时间 (s) Fire out time from outer flam	表面电阻值 (Ω) Surface resistivity
TGDG35	≥35.0	≥10.0	≥22.0	≤10	≤3	<1×10 <sup>9</sup>
TGDG50	≥50.0	≥12.0	≥28.0			
TGDG80	≥80.0	≥26.0	≥48.0			
TGDG120	≥120.0	≥36.0	≥72.0			
TGDG160	≥160.0	≥45.0	≥90.0			
TGDG200	≥200.0	≥56.0	≥112.0			
TGDG260	≥260.0	≥73.0	≥146.0			

## 高密度聚乙烯单拉塑料格栅

PP single-direction geogrid specification

产品规格 Item	拉伸强度 (KN/m) Tensile strength	2%伸长率时的拉伸强度 (KN/m) Tensile strength at 2% elongation	5%伸长率时的拉伸强度 (KN/m) Tensile strength at 5% elongation	标称伸 长率% Nomianal elongation	煤矿领域产品 Products in the range of coal mine	
					离焰熄灭时间 (s) Fire out time from outer flam	表面电阻值 (Ω) Surface resistivity
TGDG35	≥35.0	≥7.5	≥21.5	≤11.5	≤3	<1×10 <sup>9</sup>
TGDG50	≥50.0	≥12.0	≥23.0			
TGDG80	≥80.0	≥21.0	≥40.0			
TGDG120	≥120.0	≥33.0	≥65.0			
TGDG160	≥160.0	≥47.0	≥93.0			
TGDG200	≥200.0	≥70.0	≥140.0			

注：上表参照GB/T17689-2008、MT141-2005标准，特殊规格可按用户要求生产。

Note:The above table is referring to GB/T17689-2008、MT141-2005 Standard.Special sizes are available at cusomer's request.





## 双向拉伸土工格栅 煤矿井下用双向拉伸护帮网

Biaxial geogrid (Biaxial plastic protect-suppait net used in coal mine)

**产品规格**

TGSG15-15 TGSG20-20 TGSG25-25 TGSG30-30 TGSG35-35 TGSG40-40  
 HBP15-15MS HPP20-20MS HBPP25-25MS HBPP30-30MS HBPP35-35MS HBPP40-40MS

**性能特点**

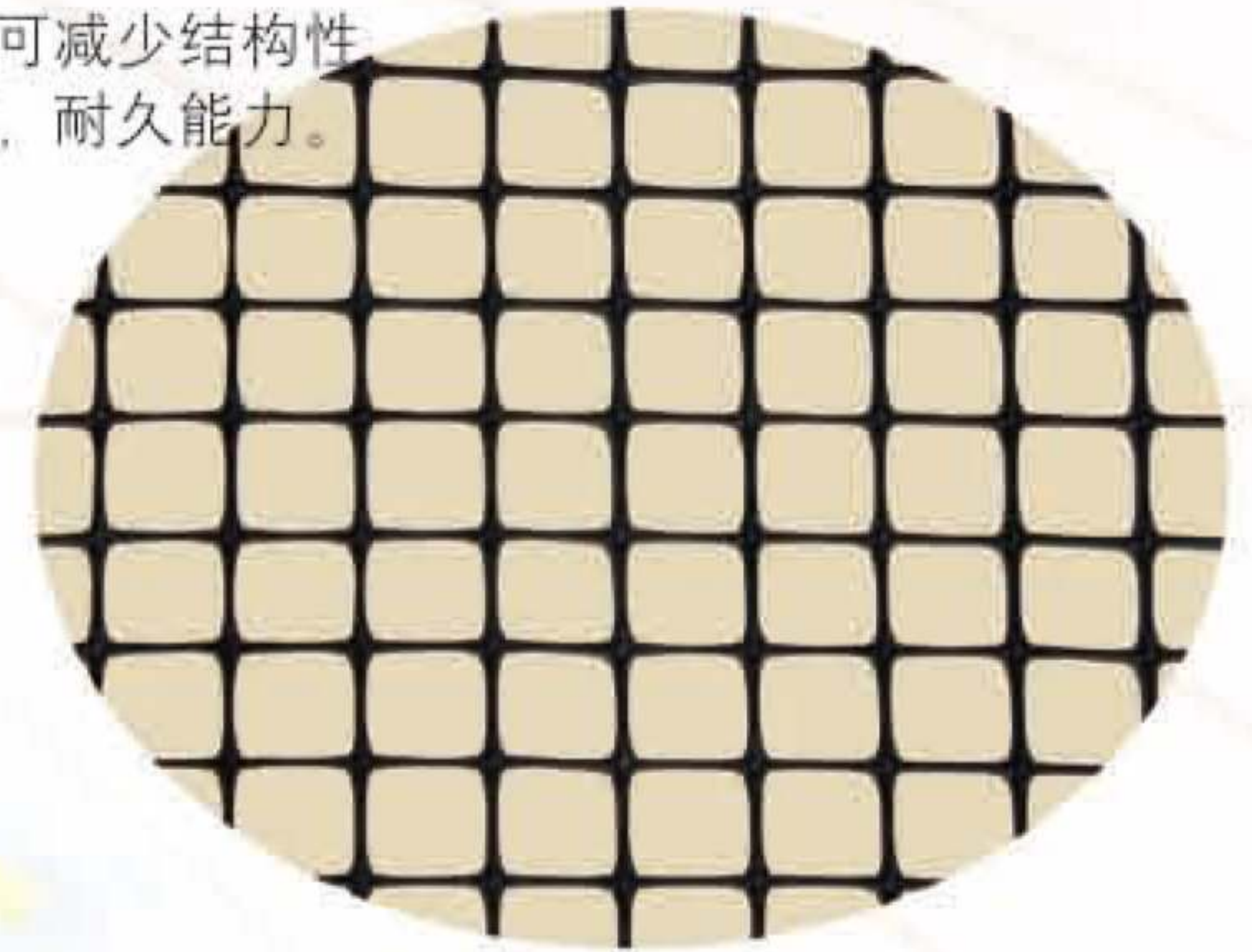
双向土工格栅是以聚丙烯、高密度聚乙烯为原料，以特别的挤压，双向拉伸而制成。可减少结构性填土，均匀荷载分布，具有较高的双向拉伸模量和抗拉强度，较高的抗机械破坏能力，耐久能力。结构均一，低蠕变、抗老化、耐酸碱等。

**用途作用**

各种软土地基加筋处理，均匀分散荷载应力，减少不均匀沉降。在煤矿井下环境里适用，不易产生静电，应用于公路、铁路、港口、机场、市政、等工程。

**包装规格**

宽≤4.0m，长50m（或按用户要求）。



**Specification**

TGSG15-15 TGSG20-20 TGSG25-25 TGSG30-30 TGSG35-35 TGSG40-40  
 HBP15-15MS HPP20-20MS HBPP25-25MS HBPP30-30MS HBPP35-35MS HBPP40-40MS

**Properties**

Homogenous structure, low creepage, anti-aging and resisting acid and alkaline

**Usage**

Make reinforce treatment for various kinds of soft soil foundation to evenly distribute load stress and reduce uneven settlement, not easy to generate static electricity, and flammability property good in the coal mine. It is easy to wash coal. used in highway, railway, port, airport and municipal project. support in the recovery working face of coal mine and roadway in the coal mine.

**Size of Package**

Width≤4.0m, Length50m(or at request).

**双向拉伸塑料格栅**

Biaxial direction plastic geogrid

产品规格 Item	纵/横向 拉伸强度 (KN/m) Tensile strength	纵/横向 2%伸长率时的拉伸强度 (KN/m) Tensile strength at 2% elongation	纵/横向5%伸长率时 的拉伸强度 (KN/m) Tensile strength at 5% elongation	纵/横向 标称伸长率% Nomianal elongation	煤矿领域产品	
					离焰熄灭时 间 (s)	表面电阻 值 (Ω)
TGSG15-15	≥15.0	≥5.0	≥7.0	≤15.0/13.0	≤3	<1×10 <sup>9</sup>
TGSG20-20	≥20.0	≥7.0	≥14.0			
TGSG25-25	≥25.0	≥9.0	≥17.0			
TGSG30-30	≥30.0	≥10.5	≥21.0			
TGSG35-35	≥35.0	≥12.0	≥24.0			
TGSG40-40	≥40.0	≥14.0	≥28.0			
TGSG45-45	≥45.0	≥16.0	≥32.0			
TGSG50-50	≥50.0	≥17.5	≥35.0			

注： 1、上表参照GB/T17689-2008、MT141-2005标准。 2、上表中伸长率的内控指标为≤10%。

Note: 1、The above table is referring to GB/T17689-2008、MT141-2005 Standard.

2、The internal control index of the extension rate in above table is ≤10%.



## 双向钢塑粘焊土工格栅

## 煤矿井下用钢塑复合护帮网

Biaxial steel-plastic compound geogrid (steel-plastic compound support net in the coal mine)

### 产品规格

GSZ30-30-GSZ150-150 HBGS+4000MS HBGS+RE6000MS  
HBGS-RE7000MS HBGS+RE800MS

### 性能特点

强度高，变形小，结构均一，施工方便等。

### 用途作用

各种软土地基加筋处理，增强土体的抗剪强度，广泛应用于建筑基础工程，道路，海防，江河，堤岸，护坡等工程的加筋处理。还适用于煤矿矿井在厚煤层进行分层开采时用作护帮网，防止采空区窜矸与巷道支护。

### 包装规格

宽≤6.1m,长50m (或按用户要求)。

### ●Specification

GSZ30-30-GSZ150-150

### ●Properties

High strength, small deformation, homogenous structure, easy for construction etc.

### ●Usage

Make reinforcement treatment for various kinds of soft soil foundation and strengthen shearing resistance of the soil body, used in reinforcement of retaining wall and widening of old road. It is also used as protect-support net in the coal mine when layer mining of thick (coal) seam and high thick (coal) seam, and support of road way in the coal mine.

### ●Size of Package

Width≤6.1m,length50m(or at request).

### 双向钢塑粘焊土工格栅技术指标

### Technical specification of Biaxial Steel-Plastic Sticking-welding Geogrid

项目 Item	规格 Size	GSZ30-30	GSZ40-40	GSZ50-50	GSZ60-60	GSZ80-80	GSZ100-100	GSZ150-150
纵向抗拉强度 Tensile Strength KN/m(LD)		≥30	≥40	≥50	≥60	≥80	≥100	≥150
横向抗拉强度 Tensile Strength KN/m(TD)		≥30	≥40	≥50	≥60	≥80	≥100	≥150
纵横向延伸率 % Elongation Rate (LD TD)		≤2	≤2	≤2	≤2	≤2	≤2	≤2
伸长率在1%时纵向抗拉强度 KN/M Tensile strength at 1% elongation (LD)		≥20	≥32	≥40	≥48	≥63	≥81	≥125
伸长率在1%时横向抗拉强度 KN/M Tensile strength at 1% elongation (TD)		≥20	≥32	≥40	≥48	≥63	≥81	≥125
粘焊点极限剥离力 N Limit Peel Force at Welded Bonded Point N		≥100	≥100	≥100	≥100	≥100	≥100	≥100
煤矿领域的产品 Products in the range of coal mine	离焰熄灭时间 (S) Fire out time from outer flam	≤3						
	表面电阻值 (Ω) Surface resistivity	<1×10 <sup>9</sup>						

注：1、上表参照标准：JT/T480-2002。2、单向型(GDZ)及特殊规格可按用户要求生产。

Note: 1、The above table is referring to JT/T480-2002 Standard.

2、Unidirectional style (GDZ) and special sizes are available at customer's request.



## 双向高强聚酯经编土工格栅

## 煤矿井下用塑料网假顶

Biaxial warp-knitted Geogrid (Plastic false ceiling net in the coal mine)

### 双向高强聚酯经编土工格栅

#### 产品规格:

GSJ30-30——GSJ150-150 JDPP000MS, JDPP4000MS, JDPP6000MS, JDPP7000MS, JDPP8000MS

#### 性能特点:

质轻, 强度高, 结构均一, 抗弯折性强。经编粘焊便于施工。阻燃, 抗静电, 整体性好, 便于机械化作业。

#### 用途作用:

用于基础工程, 道路, 矿井防护, 海防江河堤岸护坡等工程的地基加筋处理, 提高路基的荷载。对于煤碳矿井巷道、锚喷巷道起支护作用(护帮网, 假顶网)。

#### Application:

It can be widely used in basic engineering, road construction, mine protection, reinforcement groundsill of rivers, bank, coast defence projects. Enhance load capacity of groundsill. It has support and protection function for roadway of coal mine.

#### 包装规格: 宽≤6.0m 长50m(或按用户要求)



### 双向高强聚酯经编土工格栅

### Technical specification of Biaxial warp-knitted Geogrid

产品规格 Specifications	纵/横向 拉伸强度 (KN/m) Tensile strength	纵/横向 2%伸长率时的 拉伸强度 (KN/m) Tensile strength at 2% elongation	纵/横向 5%伸长率时的 拉伸强度 (KN/m) Tensile strength at 5% elongation	纵/横向 标称伸长率% Nomianal elongation	煤矿领域产品		粘焊点极限 剥离强力 N Max peel strength at welding point
					离焰熄灭时间 (s) Fire out time from outer flam	表面电阻值 (Ω) Surface resistivity	
GSJ30-30	≥30.0	≥10.0	≥20.0	≤12	≤3	<1 × 10 <sup>9</sup>	≥30.0
GSJ40-40	≥40.0	≥20.0	≥25.0				
GSJ50-50	≥50.0	≥17.0	≥34.0				
GSJ60-60	≥60.0	≥22.5	≥40.0				
GSJ80-80	≥80.0	≥28.0	≥56.0	≤13			
GSJ100-100	≥100.0	≥35.0	≥70.0				
GSJ120-120	≥120.0	≥60.0	≥90.0				
GSJ150-150	≥150.0	≥52	≥104.0				

注: 1、上表参照标准: JT/T480-2002。2、单向型(GDJ)及特殊规格可按用户要求生产。

Note: 1、The above table is referring to JT/T480-2002 Standard.

2、Unidirectional style (GDJ) and special sizes are available at customer's request.



## 双向玻纤经编土工格栅

Biaxial glass-fiber geogrid

### 产品规格

GSB30-30-GSB150-150

### 性能特点

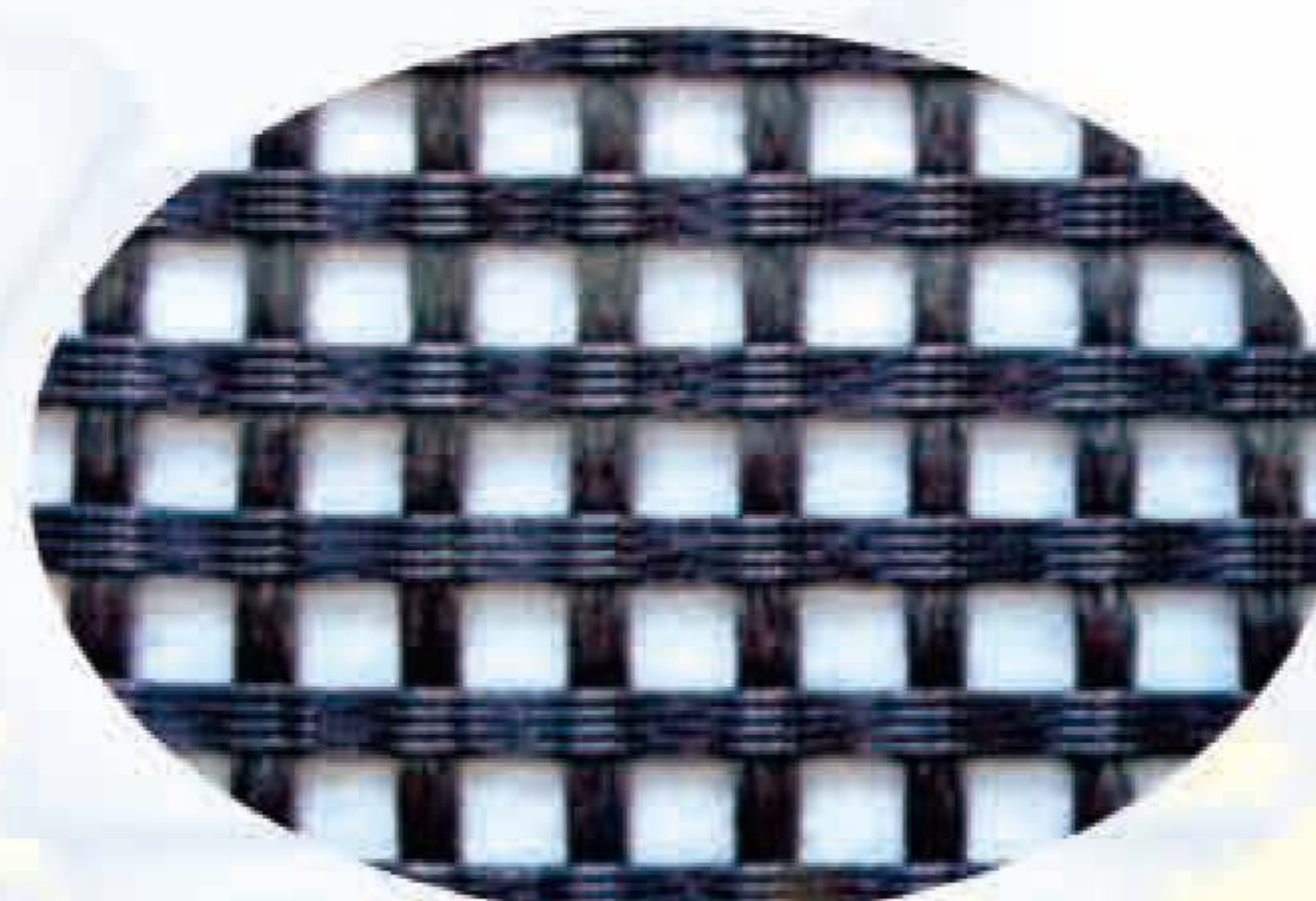
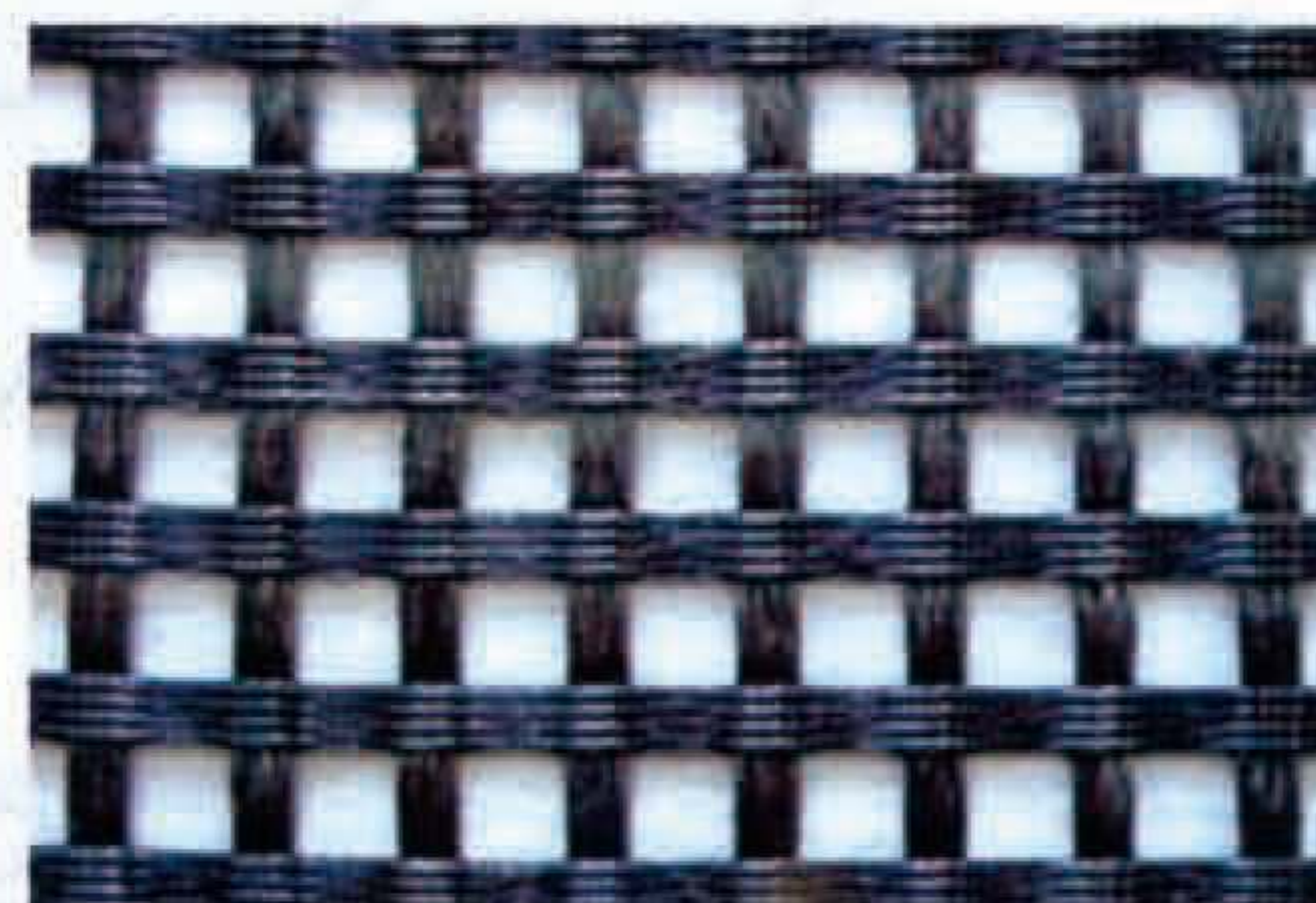
强度高、高模量、耐高低温等。

### 用途作用

加强沥青混凝土路面，减少和防止路面的各种反射裂缝。

### 包装规格

宽≤6.0m，长50-100m（或按用户要求）。



### ●Specification

GSB30-30-GSB150-150

### ●Properties

High strength, high modulus and high and low temperatures Resistance

### ●Usage

Strengthen pavement concrete and reduce and prevent road from kinds of reflection crack

### ●Size of Package

Width≤6.0m, length 50-100m (or at request).

### 双向玻纤经编土工格栅技术指标

Technical specification of Double-direction Glass Fibre Warp-Knitting Geogrid

项目 Item		规格 Size						
		GSB30-30	GSB40-40	GSB50-50	GSB80-80	GSB100-100	GSB125-125	GSB150-150
网眼尺寸 Sizes of mesh mm		12.7 × 12.7 ~ 25.4 × 25.4						
抗拉强度 Tensile Strength KN/m	纵向 Longitudinal	≥30	≥40	≥50	≥80	≥100	≥125	≥150
	横向 Traverse	≥30	≥40	≥50	≥80	≥100	≥125	≥150
伸长率 Elongation Rate %		≤4	≤4	≤4	≤4	≤4	≤4	≤4
耐温性 The rang of temperature Resistance °C		-100~280	-100~280	-100~280	-100~280	-100~280	-100~280	-100~280

注：上表参照标准：JT/T480-2002。特殊规格可按用户要求生产。

Note: The above table is referring to JT/T480-2002 Standard. Special sizes are available at customer's request.



## 土工格室

Geocell

### 产品规格

TGLG5 TGLG8 TGLG10 TGLG15 TGLG20 (cm)

### 性能特点

抗老化、耐酸碱、结构均一、具有很好的侧向限制固土作用，施工简便快捷等

### 用途作用

软土地基的加固、陡坡防护，用于公路、铁路、机场、码头，特别适用于风化的山林、沙漠及沼泽地等。

### 包装规格

长4.1m-6.8m

#### ●Specification

TGLG5 TGLG8 TGLG10 TGLG15 TGLG20 (cm)

#### ●Properties

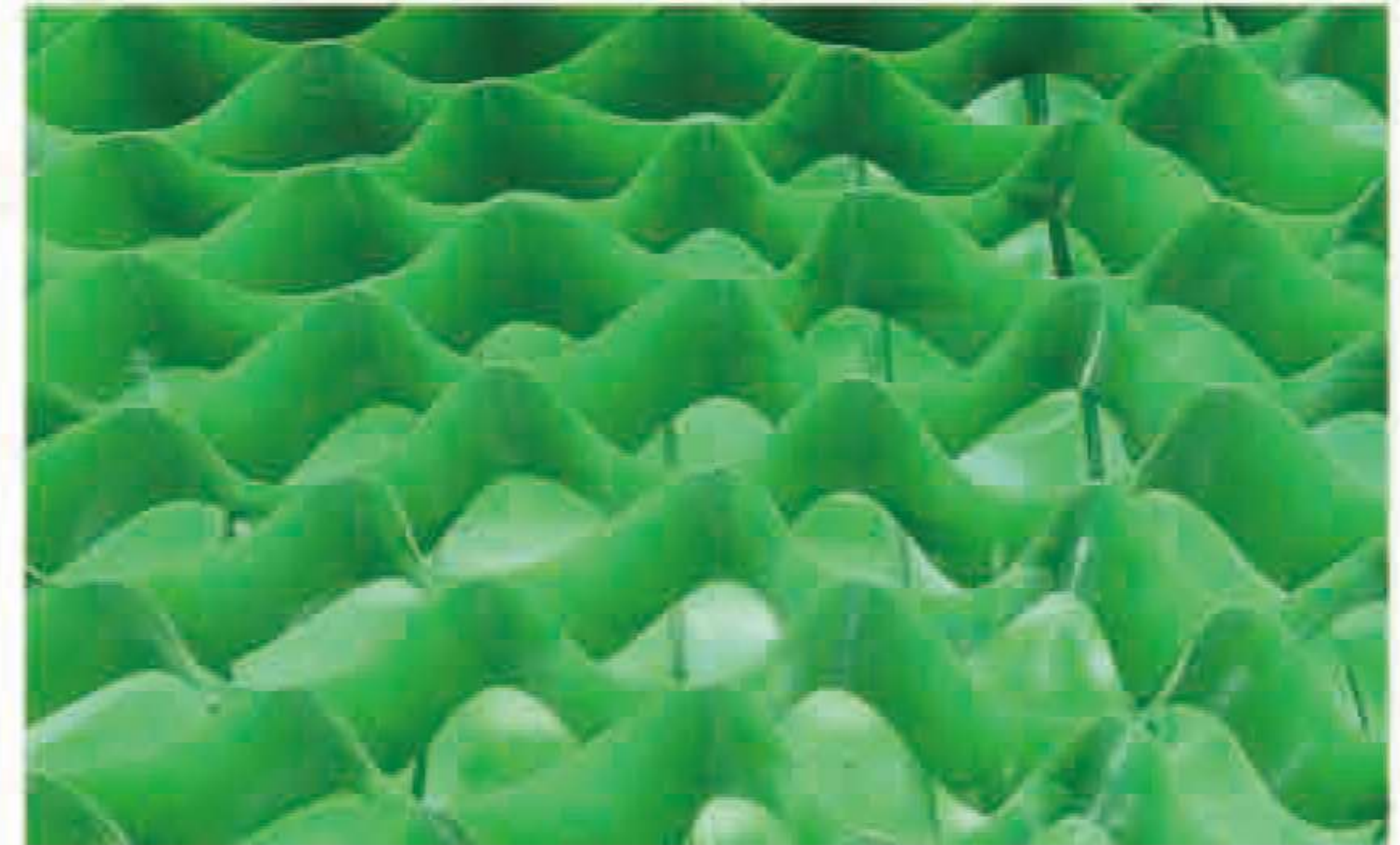
Anti-aging, resisting acid and alkaline, homogenous structure, the best sidewise restriction and soil-fixation, convenient and fast construction.

#### ●Usage

Make reinforcement treatment for soft soil foundation and protection of steep slope, used in highway, railway, airport, wharf, especially in airslaked mountain, desert and swamp land etc.

#### ●Size of Package

Lebgh4.1-6.8m



### 土工格室技术指标

The specification of Geocell

项目 Item	规格 Size	土工格室 Geogrid Chamber	高强型土工格室 High strength geogrid
片材抗拉强度	Tensile Strength of Sheet Materials MPa	≥23	≥200
焊接处抗拉强度	Tensile Strength of Weided Seam N/cm	≥100	≥150
焊接间距	Distance of Welding mm	330~550	
展开尺寸	Stretched Size m×m	4×5~6×7	

注：上表参照标准：GB/T19274-2003。特殊规格可按用户要求生产。

Note: The above table is referring to GB/T19274-2003 Standard. Special sizes are available at cusomer's request.



## 土工网 Geonet

### 产品规格

CE121 CE131 CE151 DN1 HF10

### 性能特点

结构均匀、稳定、抗老化、耐酸碱等。

### 用途作用

一般软土地基加筋处理，石笼固砂，用于排水垫层、边坡防护植草、沿海作业等。

### 包装规格

宽2m，长50m（或按用户要求）。



### ●Specification

CE121 CE131 CE151 DN1 HF10

### ●Properties

Homogenous and stable structure, Anti-aging, resisting acid and alkaline ect.

### ●Usage

Make reinforcement treatment for normal soft soil foundation and sand-fixation gabion, used in drain cushion, side slop, grass planting for slope protection, coastal operation etc.

### ●Size of Package

Width 2m, length 50m (or at request).

### 土工网技术指标 Geonet Specifications

表1 单位面积质量、厚度、网孔尺寸及规格偏差

Table 1 unit weight, thickness, mesh size and specifications of deviation

项目 Item	CE121	CE131	CE151	DN1	HF10
单位面积质量 Unit weight / (g/m <sup>2</sup> )	730 ± 35	630 ± 30	550 ± 25	750 ± 35	1240 ± 60
厚度 Thickness / mm	—	—	—	≥ 6.0	≥ 5.0
网孔尺寸 Mesh Size (a×b) / mm	(8±1) × (6±1)	(27±2) × (27±2)	(74±5) × (74±5)	(10±1) × (10±1)	(10±1) × (6±1)
宽度偏差 Width Variation m	+0.06 0				
长度偏差 Length Variation m	+1 0				

表2 拉伸屈服强度

Table 2 Tensile strength at yield

项目 Item	CE121	CE131	CE151	DN1	HF10
拉伸屈服强度 Tensile strength at yield / (kN/m)	纵、横向 Vertical and horizontal ≥ 6.2	纵、横向 Vertical and horizontal ≥ 5.8	≥ 5.0	纵、横向 Vertical and horizontal ≥ 6.0	纵、横向 Vertical and horizontal ≥ 18



## 土工网垫

Geomat

### 产品型号

塑料三维土工网垫

### 产品规格

EM2 EM3 EM4 EM5

### 性能特点

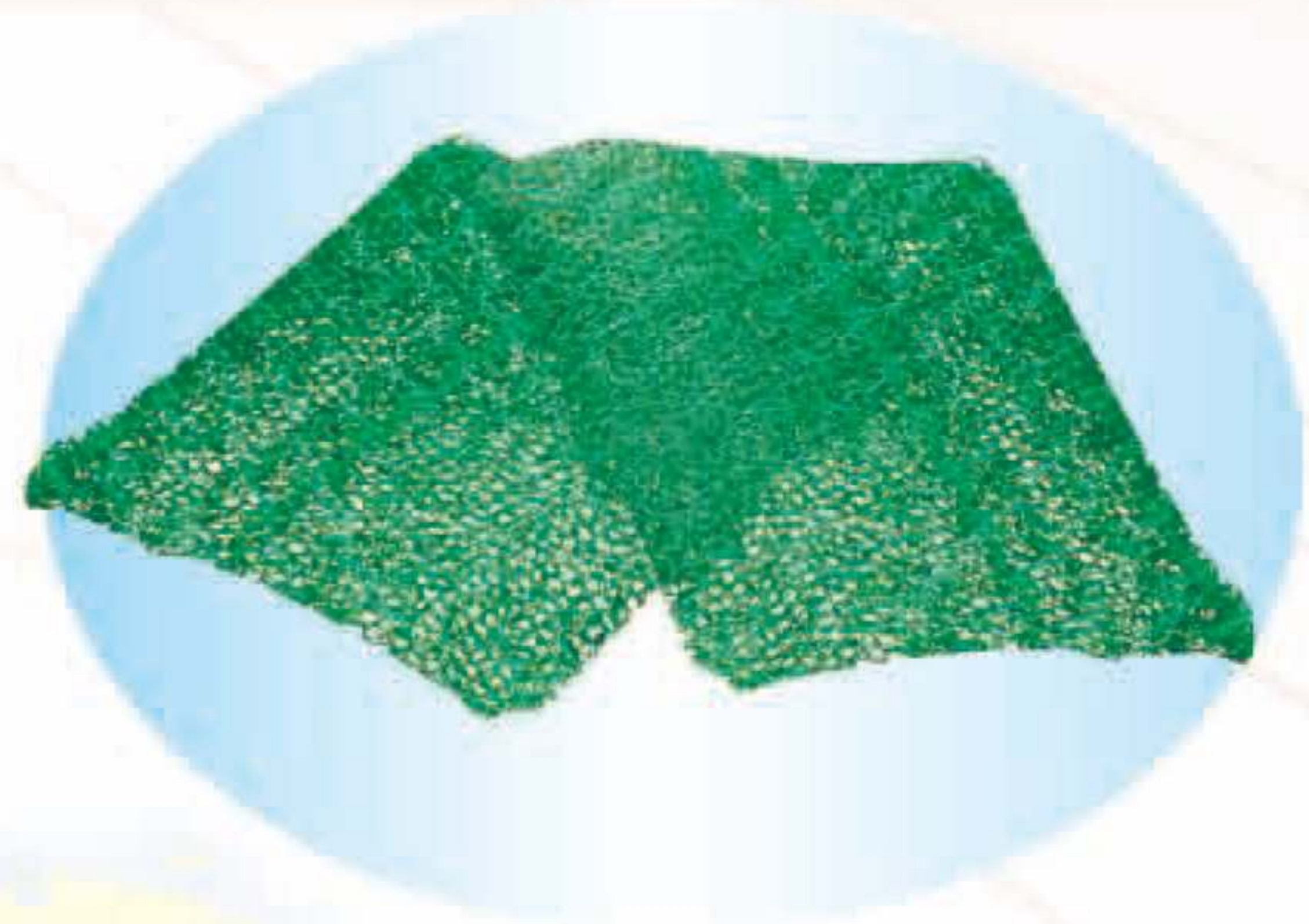
三维立体的空腔能有效地将草和土固定，重量轻、施工简便。

### 用途作用

保护植被，防止水土流失，用于公路、铁路、机场、河道等的护坡植草，园林绿化、沙漠固土等。

### 包装规格

宽1m-2m，长50m（或按用户要求）。



### •Model of Product

Tri-dimesion plastic geomat

### •Sizes of Produc

EM2 EM3 EM4 EM5

### •Properties

Tri-dimension cavum can fix the grass in the soil. It is light and easy for construction

### •Usage

Protect vegetation and prevent loss of water and erosion of soil, used in slope protection and grassing in highway, railway,airport, rivers, greening in gardens and soil-fixation in deserts etc.

### •Size of Package

Width 1-2m,length 50m(or at request).

## 土工网垫技术指标 Geomat Specifications

表1 单位面积质量、尺寸及偏差  
Table 1 unit weight, size and variation

项目 Item	EM2	EM3	EM4	EM5
单位面积质量 Unit weight g/m <sup>2</sup>	≥220	≥260	≥350	≥430
厚度 Thickness / mm	≥10	≥12	≥14	≥16
宽度偏差 Width variation /m	+0.1 0			
长度偏差 Length variation /m	+1 0			

表2 拉伸强度  
Table 2 Tensile strength

项目 Item	EM2	EM3	EM4	EM5
纵向拉伸强度Longitudinal tensile strength / (KN/m)	≥0.80	≥1.4	≥2.0	≥3.2
横向拉伸强度Horizontal tensile strength/ (KN/m)	≥0.80	≥1.4	≥2.0	≥3.2



## 塑料扁丝编织土工布

Split yarn( flat silk) PP woven geotextile

### 产品规格

BT20-15 BT30-22 BT40-28 BT50-35 BT60-42

### 性能特点

耐酸碱、抗变形、具有良好的排水隔离性能，施工方便等。

### 用途作用

用于公路、铁路、堤坝、沿海滩涂等工程的防渗反滤、排水隔离等。

### 包装规格

宽2-6m,长50-100m (或按用户要求)。



### ●Specification

BT20-15 BT30-22 BT40-28 BT50-35 BT60-42

### ●Properties

Resisting acid and alkaline,anti-deformation,good drainage and separation easy for construction.

### ●Usage

Used in project of highway , railway,dam and coastal tidal land for anti-leakage, filtering,draining,isolating etc.

### ●Size of Package

Width2-6m,Length50-100m(or at request).

### 塑料扁丝编织土工布技术指标

#### Technical Specification of Plastic flat Yarn Woven Geotextile

序号 No.	项目 Project	指标 Index						
		20-15	30-22	40-28	50-35	60-42	80-56	100-70
1	经向断裂强力 Breakage Strength KN/m $\geq$ (LD)	20	30	40	50	60	80	100
2	纬向断裂强力 Breakage Strength KN/m $\geq$ (TD)	15	22	28	35	42	56	70
3	经纬向断裂伸长率 Elongation Rate % $\leq$ (LD,TD)	28						
4	梯形撕破强力(纵向)Trapezoidal Tearing Strength KN $\geq$ (LD)	0.3	0.45	0.5	0.6	0.75	1.0	1.2
5	顶破强力 Burst Strength KN $\geq$	1.6	2.4	3.2	4.0	4.8	6.0	7.5
6	垂直渗透系数 Vertical Permeability Coefficient cm/s	$10^{-1} \sim 10^{-3}$						
7	等效孔径 Sieve size (O%)mm	0.08~0.5						
8	单位面积质量 Unit weight g/m <sup>2</sup>	120	160	200	240	280	340	400
9	允许偏差值 Variation %	$\pm 10$						

注：上表参照标准：GB/T17690-1999。特殊规格和涂膜防渗型可按用户要求生产。

Note: The above table is referring to GB/T17690-1999 Standard. Special sizes and plastic-coating or preventing leakage are customized on request.



## HDPE双壁波纹管

HDPE corrugated pipe with double walls

### 性能特点

用HDPE制成的波纹管具有机械性能优良，耐环境应力开裂性好，耐热应力开裂性好、耐化学腐蚀性好及不易渗透等优点。

### 用途作用

广泛应用于公路、铁路路基、地铁工程、废弃物填埋场、隧道、绿化带运动场及含水量高引起的边坡防护等排水领域。

### ●Properties

Corrugated pipe made of HDPE have advantages of excellent mechanical property, good impact resistance, anti-chemical erosion and impermeability



### ●Usage

Widely used in highway, railway roadbed, the subway project, waste landfill, tunnels, and green belts, sports grounds and high moisture content slope protection, for drainage.

## HDPE双壁波纹管技术指标HDPE double-wall corrugated pipe Specifications

表 1 外径系列管材的尺寸 Table 1 Pipe diameter size

公称外径 DN/OD	最小平均外径 $d_{cm, min}$ Ave. od (mini)	最大平均外径 $d_{cm, max}$ Ave. id (cmax)	最小平均内径 $d_{cm, min}$ Ave. od (mini)	最外层压壁厚 $e_{min}$ Outer layer-thickness	最小内层壁厚 $e_{lmin}$ Inner layer-thickness	接合长度 $A_{min}$ Bondinglength
110	109.4	110.4	90	1.0	0.8	32
125	124.3	125.4	105	1.1	1.0	35
160	159.1	160.5	134	1.2	1.0	42
200	198.8	200.6	167	1.4	1.1	50
250	248.5	250.8	209	1.7	1.4	55
315	313.2	316.0	263	1.9	1.6	62
400	397.6	401.2	335	2.3	2.0	70
500	497.0	501.5	418	2.8	2.8	80
630	626.3	631.9	527	3.3	3.3	93
800	795.2	802.4	669	4.1	4.1	110
1000	994.0	1003.0	837	5.0	5.0	130
1200	1192.8	1203.6	1005	5.0	5.0	150

表2 管材的物理力学性能

Table 2 The physical and mechanical properties of Tube

项目 Project	要求 Request	
环刚度 Central stiffness (KN/m <sup>2</sup> )	SN2	≥2
	SN4	≥4
	(SN6.3)	≥6.3
	SN8	≥8
	(SN12.5)	≥12.5
SN16	≥16	
冲击性能 Impact Performance (TIR)%	≤10	



## 塑料盲沟 Geocomposite drain

### 产品规格

塑料盲沟是将热塑性合成树脂加热熔化后通过喷咀挤压出纤维丝叠置在一起，并将其相接点熔结而成的三维立体多孔材料。在主体外包裹土工布作为滤膜，有多孔矩形，中空矩形，多孔圆形，中空圆形四种结构形式，具有多种尺寸规格。

### 性能特点

- 抗压强度高，耐压性能好
- 表面开孔率高，集排水性好
- 永久的使用寿命
- 滤膜的可选择性
- 施工方便
- 柔性好，适应土体变形



### 用途作用

广泛应用于隧道防渗排水，铁路公路的路基排水，软基筑堤，挡土墙反滤，坡面与坡内排水，地下建筑的排水防潮，草坪的集排水系统，天台花园集排水、污水处理，与垃圾填埋场等各类工程。

### ● Specification

Geocomposite Drain is made of fiber extruded from thermoplastic synthetic resin. It is a tri-dimension material with many holes. There is a layer of geotextile outside the geocomposite drain, whose main function is to sieve sand and clay so as to avoid blockage. This product has four shapes, including rectangular shape with many holes, rectangular shape with empty center, round shape with many holes, round shape with empty center. It also has all kinds of sizes and specifications which can meet different customers' different requirements.

### ● Properties

High pressure resistance strength  
High hole opening rate in surface, good water collection and drain feature  
Permanent using life  
The sieve membrane is selective  
Easy for construction  
Good flexibility and adaptable to the earth distortion

### ● Usage

Drainage for tunnel anti-leakage, roadbed and road shoulder of highway, railway, soft bed disposal, remaining wall back (vertically and horizontally), on or in slope of fill and bank and underground buildings, green field of sport field, roof garden, sewage disposal, garbage burying field and other works.

### 常见规格表 Common Specifications

#### (1) 圆型 Circular shape

规格型号 Item	MY5A	MY7A	MY8A	MY8B	MY10A	MY15A	MY20A
截面尺寸 mm Sectional size	外径(OD) φ 50	外径(OD) φ 70	外径(OD) φ 80	外径 φ 80 OD 内径 φ 45 ID	外径 φ 100 OD 内径 φ 60 ID	外径 φ 150 OD 内径 φ 100 ID	外径 φ 200 OD 内径 φ 140 ID

#### (2) 矩型 Rectangle

规格型号 Item	MF7	MF12	MF13	MF30	MF40
截面尺寸 mm Sectional size	70 × 30 内径(OD) 10 × 40	120 × 35	130 × 35 内径(OD) 10 × 50 × 2	300 × 35	400 × 35

### 通水量指标表 Water flux Indicators Table

型号	MF7	MF12	MF13	MY5A	MY7A	MY8A	MY10A	MY15A	MY20A	
项目										
截面尺寸mm Sectional size	70 × 30 内径(ID) 10 × 4	120 × 35	130 × 35 内径(ID) 10 × 50 × 2	外径 (OD) φ 50	外径 (OD) φ 70	外径 (OD) φ 80	外径(OD) φ 100 内径(ID) φ 80	外径(OD) φ 150 内径(ID) φ 100	外径(OD) φ 200 内径(ID) φ 140	
抗压强度	压强MPa Pressure	0.1	0.3	0.3	0.2	0.2	0.2	0.2	0.2	
	变形量cm Deflection	<0.9	<0.8	<0.8	<0.4	<0.5	<0.6	<1.0	<2.5	<4
通水量	测试方法 Test methods	参照国家行业标准 SL/T235-1999 As china stadcrd sl/T235-1999								
	m <sup>3</sup> /d	52.8	72	72	81	112	148	180	240	360
	m <sup>3</sup> /h	2.2	3	3	3.3	5.0	6.2	7.5	11.2	15
测试条件 Test conditions	水力梯度(Hydranlic gradient) i=0.2; 水头差(Cross-hcad) Δh: 0.3m, 管长(Pipe length) L: 1.5m									



## 软式透水管

Soft pervious pipe for drain

钢丝由PVC过塑成框架结构的软式透水管。它们具有通过整体的周身全方位过滤并快速有效排除地下水，渗透率高，排水量大，取代传统的聚氯乙烯打孔管渗水。使用方便，功能高等优点。

Its structure made of steel wire wrapt with PVC, It has the advantages of whole filtration and draining quickly and efficently, hitgh permeability, large tonnage, replacing traditional PVC pipe with holes, easy for using, good function.

### 使用范围

- 机场、铁路、公路、运动场、公园绿地排水；
- 矿山尾坝、电力灰坝、垃圾填埋场排渗系统；
- 隧道、挡土墙、路基、路面排水；
- 农田低洼潮湿地、屋顶花园灌溉等地的排水；

### Use of

- Drainage for railway, highway, sport ground park green field.
- Drainage system for tail dam of mine landfill.
- Drainage for tunnel, remaining wall roadbed, road surface.
- Drainage and irriagation for humid low-lying farmland, roof garden.

### 耐酸碱试验

软式透水管采用特多龙纱及钢丝外覆PVC，具有很强的耐酸碱性，对于水质与土质中的有机或无机化学成份，实验结果如下：（室温72小时）

- 10%NaCl溶液无外观异状。
- 10%NaOH溶液无外观异状。

### Acid and Basic Resistance Test

Soft previous pipe for drainage wrapt with Polyester fibre and steel wire composite PVC outside. Its chemical composition in water and soil is following:(72 hours at room temperature)

- No appearance difference in 10% NaCl solution
- No appearance difference in 10% NaOH solution

### 施工方法：

Construction method:

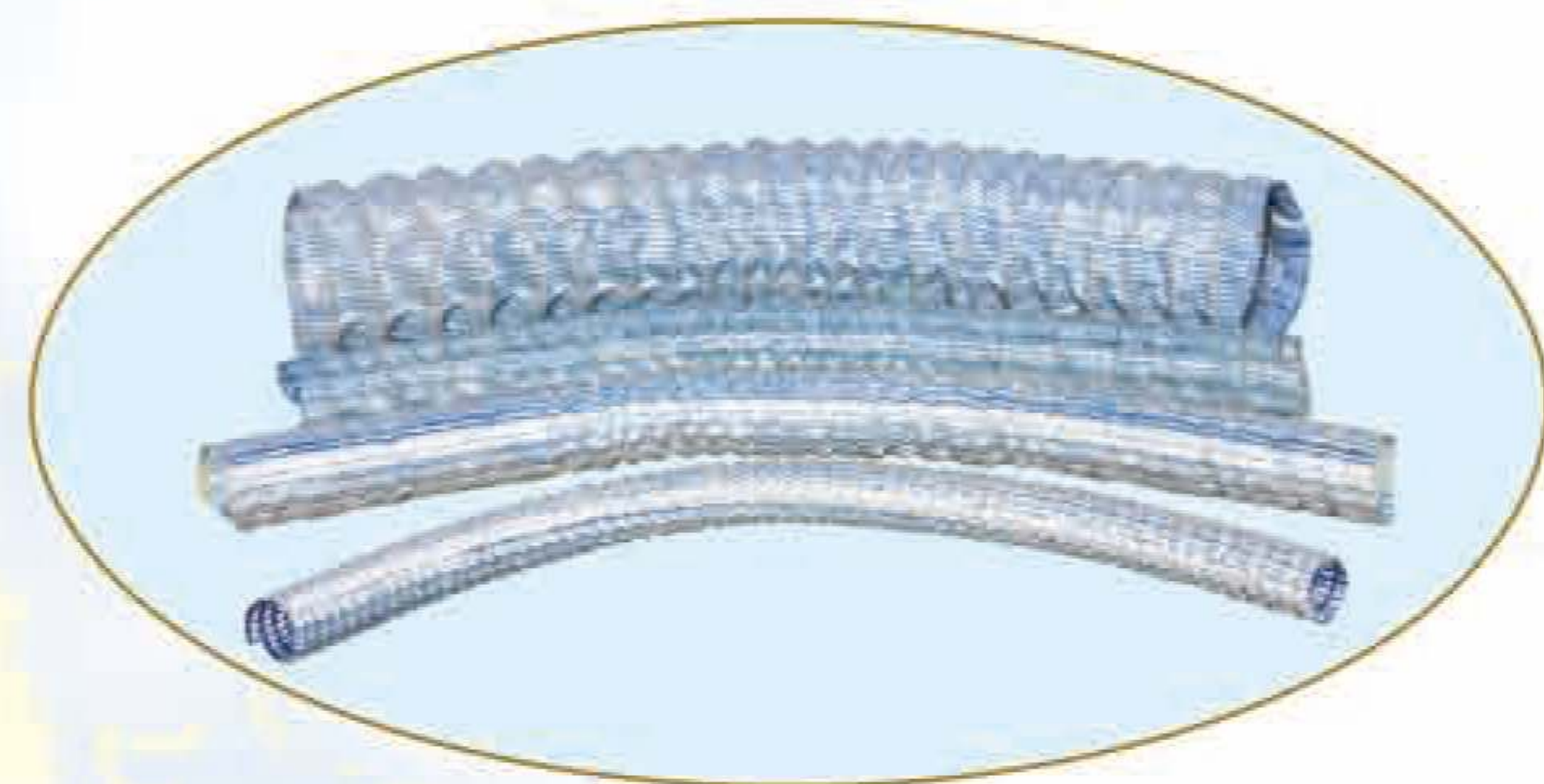
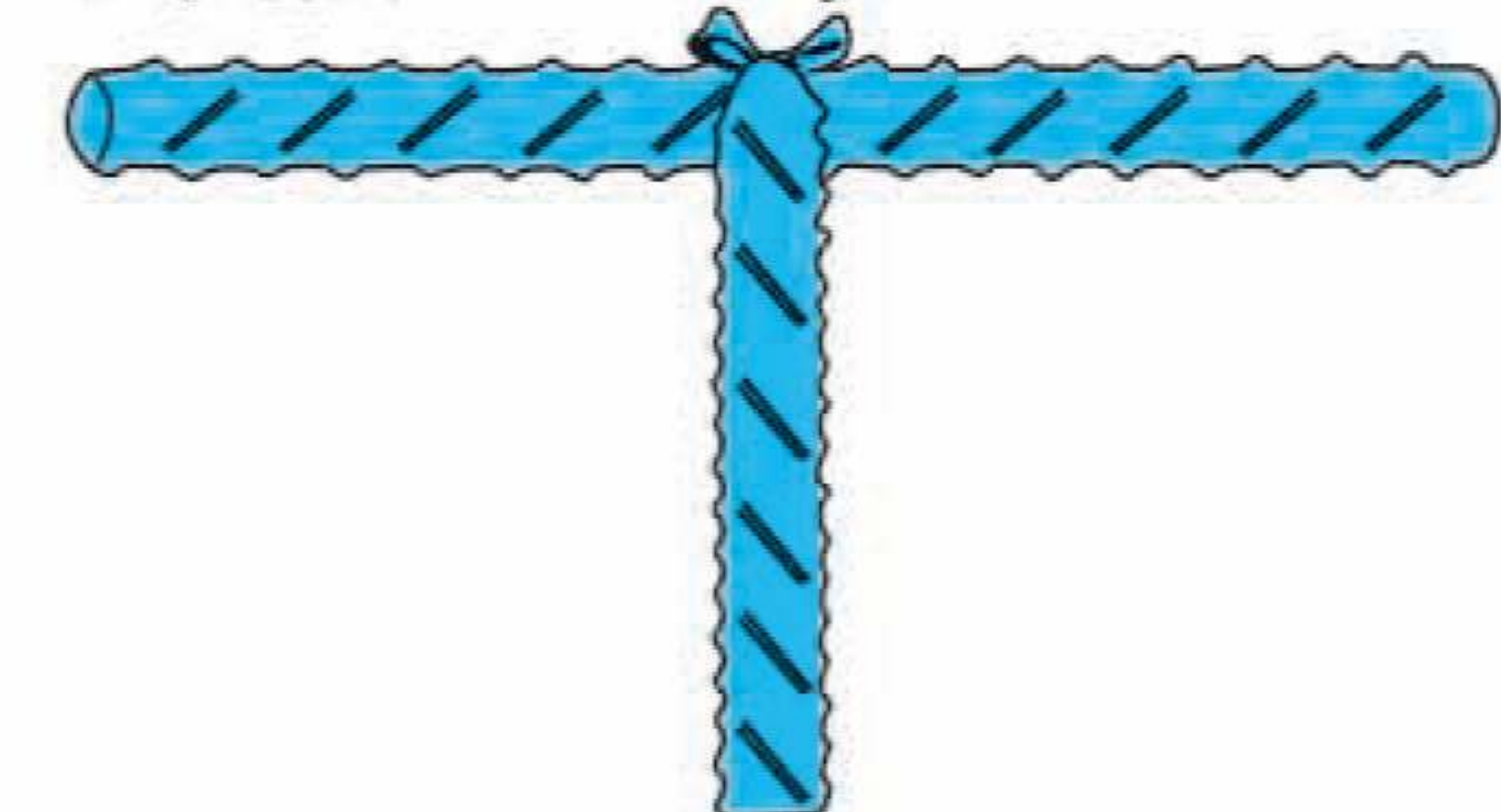
#### 末端处理 Terminal handling



#### 直线接头续法 Linear continued joint

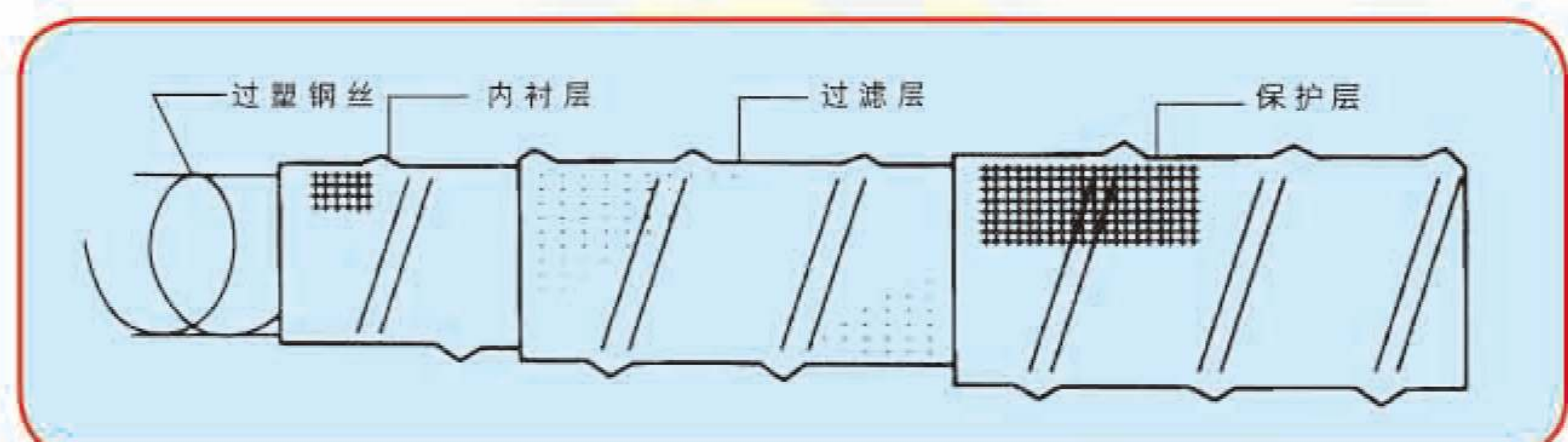


#### 十字接头 Cruciform joints



### 产品结构示意图：

The structure of products:





## 丙纶短纤维

### Polypropylene short fiber

以聚丙烯树脂为主要原料，经熔融纺丝，牵伸，卷曲，烘干定型切断，打包等工艺制成有色、本色、规定旦数和长度的蓬松纤维。

Polypropylene resins as main raw materials, It can be made in colored, natural colour, specified filament denier and length of fluffy fiber. And PP short fiber can produced by melt-spining, drawing, crimping, and frizzle up, fixed shape and cut off, and package technology.

#### 产品系列:

●棉型（纺织用）、毛型（非纺织用）、彩色、阻燃、远红外、亲水性等不同种类纤维。

#### 产品规格:

●线密度：1.7~22.2 dtex；长度：38mm, 51mm, 65mm, 76mm, 102mm, 130mm。

#### 产品性能:

1. 具有优越的导湿性和柔软性，良好的成网和梳理性，热粘合性 优异。

2. 强力高、卷曲弹性强、比重轻、熔点低、表面渗透性好、耐酸碱、耐磨性优于其他纤维。

#### 产品用途:

针刺地毯、汽车内饰、无纺布、高强生态布、绳索、装饰材料、医疗卫生用品、过滤制品。

#### Products:

● Cotton type fiber ( used in woven ), Wool type fiber (used in non-woven)、Colour fiber、Anti-flaming fiber、Far-IR

#### Specification:

● Linear density: 1.7~22.2 dtex;  
● Length: 38mm, 51mm, 65mm, 76mm, 102mm, 130mm.

#### Property:

1. It have the good wicking and flexibility, and excellent net form and carding and thermal bonding.

2. High strength and crimp elasticity, light weight, low melting-point., permeability, anti-acid and alkaline, excellent abrasion resistance.

#### Application:

Needle punched carpet, automotive trim, non-woven geotextile, high strength ecological fabric, rope, decorating materials, Medtech, filter products.

### 丙纶短纤维主要性能指标

#### Polypropylene short fiber main specification

项目 Item	单位 unit	1.7~3.3 dtex	3.4~7.8 dtex	7.8~22.2dtex
断裂强度 Tensile strength at break	crltex	≥4.0	≥3.5	≥3.0
断裂延伸率 Elongation at break	%	≤60	≤70	≤80
线密度偏差 Deviation of linear density	%	±3.0	±4.0	±5.0
卷曲弹性回复率 Elastic recovery rate	%	≥80	≥80	≥75
电阻 resistors	Ω.cm		≤R×10 <sup>7</sup>	

## 工程纤维

### Engineering fiber

工程纤维选用优质高分子材料制成，可用于水泥混凝土，沥青混凝土及水泥砂浆，能有效地提高混凝土工程的综合性能。

Engineering fiber is made of excellent macromolecule materials used cement concrete, asphalt concrete and cement sand and improve compositive property in cement concrete construction.

#### 产品系列:

- 水泥混凝土纤维——聚丙烯网状纤维
- 水泥砂浆纤维——聚丙烯单丝纤维
- 沥青混凝土纤维——聚酯纤维

#### 应用范围:

- 混凝土路面、桥面、机场道面、工厂地坪等工程
- 隧道、矿井等墙面、顶板、储水池等
- 河道、水坝等工程
- 军事防护工程、码头护岸、桥墩等
- 建筑层面防水层、土面处理、内外墙面处理
- 厂房、仓库、停车场道路
- 游泳馆地面、游泳池、水池、水渠等

#### Products:

- Cement concrete fiber----PP net fiber
- Cement slop fiber----PP single fiber
- Asphalt concrete fiber—PET fiber

#### Application:

- Surface of road, bridge, airport, ground of factory
- Wall surface of tunnel, mine, top board and sluice pool
- River, dam, and other projects
- The project of military protection and dock pier protection
- Waterproof layer of building soil disposal, wall surface disposal
- Workshop, storehouse, park
- The bottom of swimming pool, swimming pool, pond, aqueduct



### 聚丙烯网状纤维的性能

#### The performance of polypropylene mesh fiber

密度 Density (g/cm <sup>3</sup> )	0.91	弹性模量 Modulus of elasticity (MPa)	>3500
长度 Length (mm)	10, 15, 20	当量直径 Equivalent diameter (um)	<100
产品形状 Product shape	束状网 Bunch Network	断裂延伸率 Fracture elongation (%)	≥6
抗酸性 Anti-acids alkaline	强 Powerful	吸水性 Superabsorbent	不吸水 Non-absorbent
抗拉强度 Tensile Strength (MPa)	≥346	熔点 Melting point (°C)	160-170



## 高分子止水带

### Macromolecule water seal strips

高分子止水带为片状带体状，止水带的上下两侧设置固定肋，具有柔韧性、耐用性、抗侵蚀性、变形性能优异等特点。

#### 用途:

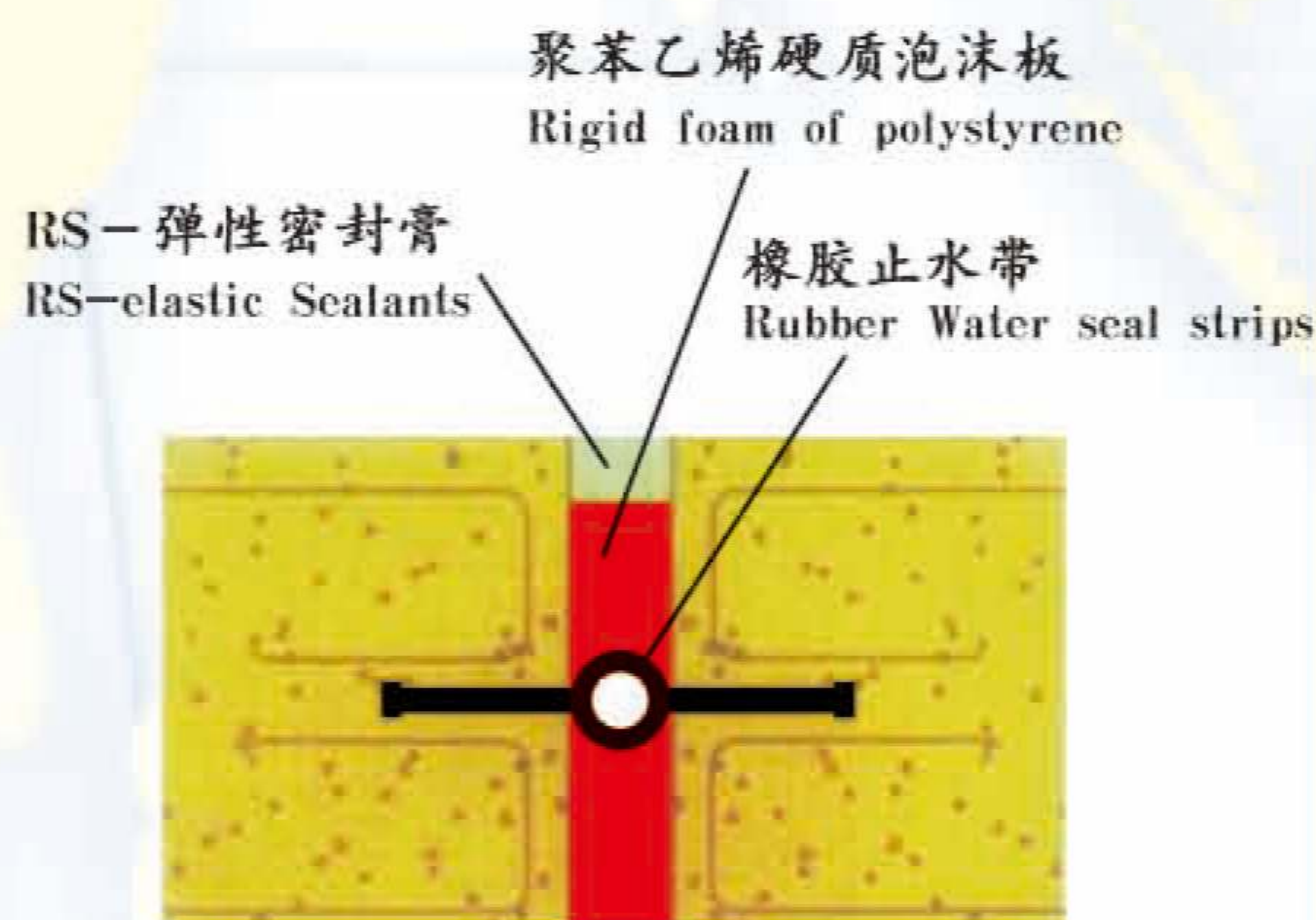
应于水利、水电工程，堤坝涵闸、隧道地铁、人防工事、高层建筑地下室和停车场等工程的变形和施工缝、沉降缝中，起到隔离和防水的作用。

Macromolecule water seal strips is sheet shape and its upside and downside with rib fixed. It has the advantages of flexibility, durability, anti-corrosion, good distortion.

#### Uses:

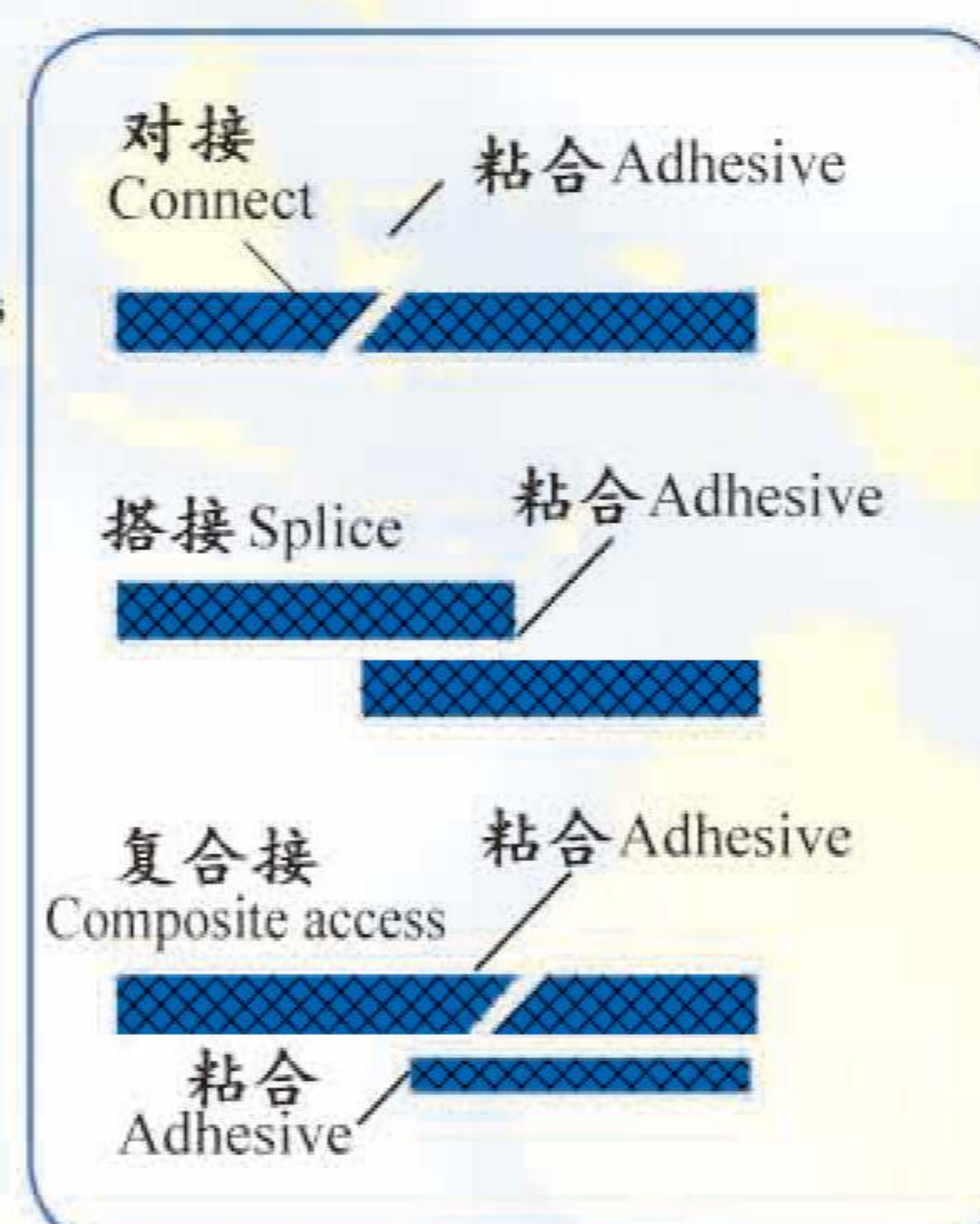
Widely used in sew of construction and settlement water conservancy, water and electricity, dam, tunnel and underground, defence works, basement of high building and park for separation and waterproofing.

序号 Number	项目 Item	指标 Value			
		厚度 Thickness, mm			
		2	3	4	5
1	硬度(邵氏) Hardness(Shao A), 度	70			
2	拉伸强度 Tensile Strength, MPa	15	14	13	12
3	扯断伸长率 Elongation at Break, %	380			
4	撕裂强度 Tear Strength, kN/m	25			
5	脆性温度 Brittleness Temperature, °C	-40			
6	压缩永久变形 Compression Distortion	0 × 24h, %	35		
		23 × 168h, %	20		
7	热空气老化 Aging in hot air	硬度变化(邵氏) Change of Hardness(Shao a), 度	+8		
		拉伸强度 Tensile Strength MPa	10		
		扯断伸长率 Elongation at Break %	300		



止水带安装示意图

Installation of Water seal strips





## 桥梁伸缩装置系列

## Bridge expansion and contraction installation

### 桥梁伸缩装置

GQF-Z、C型、F型模数式桥梁伸缩装置是采用国产热轧整体成型的异形钢材设计的新型桥梁伸缩装置，C型、F型伸缩装置适用于80mm以下的单缝，XF型、GQP-Z型装置是由边梁、中梁、横梁和连动机构、减震支座组成。模数式系列桥梁装置适用于80mm-1200mm的大位移量伸缩。

#### 一、胶料适用范围

- 1、伸缩装置所用橡胶制品采用氯丁胶(CR)适用于温度为-25℃-60℃的地域。
- 2、采用天然橡胶的伸缩装置适用于温度为-40℃-60℃的地区。

#### 二、设计制造技术条件

- 1、设计荷载：采用JT01-88(1995)《公路工程技术标准》规定的汽车-超20挂120荷载进行设计。
- 2、在结构使用异型钢材为16Mn桥梁结构用钢材抗拉强度应不低于480Mpa，容许弯曲应力为210Mpa。
- 3、结构中支承梁使用16Mn或45号钢，其容许弯曲应力为210Mpa或220Mpa。
- 4、其余配件钢材可使用不低于A3强度钢材。

### Bridge Expansion and Contraction Installation

This a new kind of modules bridge expansion and contraction installation, covering GQF-Z -type, C-type, F-type, etc. The C-type and F-type expansion and contraction installation are suitable for single joint below 80mm. XF-type and GQP-Z type are constituted of edge girder, middle girder, traverse girder and shock absorber bearing, which are suitable for large size expansion and contraction 80mm-1200mmR.

#### Applicable range of Rubber Material

- (1) This expansion and contraction installation is made of Chloroprene Rubber(CR) and the applicable temperature shall be from -25℃ to 60℃.
- (2) If this installation is made of natural rubber, the applicable range shall be from -40℃ to 60℃.

#### The technical condition of design and manufacture

- (1) Design load : design under trucks over 20 hangs 120 load according with JT01-88(1995) " Highway engineering standard"
- (2) If use profiled bar for the main structure of 16Mn steel bridge, the tensile strength is not less than 480Mpa and allowing the bend stress is up to 210Mpa.
- (3) If use 16 or 45 Mn steel for bearing structure, then the bend stress must be up to 210Mpa or 220Mpa.
- (4) The other steel components can use the steel material not less than A3 strength.





### C型桥梁伸缩装置

GQF-C型装置建筑高度仅50mm，结构简单安装更方便，具有明显的可靠性，舒适性和耐久性，适用于伸缩量小于80mm的各种桥梁。

### FM、FD、CD桥梁伸缩装置

FM-80FD-80DC-60型桥梁伸缩装置由交通部公路规划设计院研制，它吸收消化了所引进的欧洲先进技术，适用于我国现行行业标准所规定的重载高密度交通的各类桥梁。以上三种伸缩装置是由热轧F型钢、C型钢、橡胶密封带和锚固系统组成。

### M-A型 伸缩装置

本装置采用M型钢制造，适用于板式桥梁、T型桥梁及旧桥改造工程。

本装置根据密封橡胶带伸展长度的不同可分为20、40、60、80四种型号。

### M-B型伸缩装置

本装置采用M型钢制造，适用于板式桥梁、T型桥梁及旧桥改造工程。

本装置根据密封橡胶带伸展长度的不同可分为20、40、60、80四种型号。

### C-type bridge expansion and contraction installation

GQF-C bridge installation with its height of 50mm and simple structure and convenient stalling. It has obvious reliability and comfort and durability, suitable for all kinds of bridges which contraction allowance less than 80mm.

### FM, FD, CD bridge expansion and contraction installation

FM-80FD-80DC-60 type bridge expansion and contraction installation was developed by Highway Planning Design Institute of Ministry of Communications adopted and absorbed Europe advance technology which used in all kinds of bridges bearing heavy load and high density according with active industry standard at present in China. The three types above are made of hot F-type roll steel, C-type steel, rubber seal strips and anchor-fixed system.

### M-A-type bridge expansion and contraction installation

It is made of M-type steel, suitable for board bridge, T-type bridge and old bridge alteration.

It can be divided into four types of 20,40,60,80 according to the stretching length of rubber seal strips.

### M-B type bridge expansion and contraction installation

It is made of M-type steel, suitable for board bridge, T-type bridge and old bridge alteration.

It can be divided into four types of 20,40,60,80 according to the stretching length of rubber seal strips.



### Z-A型伸缩装置

本装置采用Z型钢制造，适用于板式桥梁、T型桥梁改造工程。

本装置根据密封橡胶带伸展长度的不同可分为20、40、60、80四种型号。

### Z-B型伸缩装置

本装置采用Z型钢制造，适用于板式桥梁、T型桥梁改造工程。

本装置根据密封橡胶带伸展长度的不同可分为20、40、60、80四种型号。

### Z-C型伸缩装置

本装置采用Z型钢制造，适用于板式桥梁、T型桥梁及旧桥改造工程。

本装置根据密封橡胶带伸展长度的不同可分为20、40、60、80四种型号。

### Z-D型伸缩装置

本装置采用Z型钢制造，适用于板式桥梁、T型桥梁及旧桥改造工程。

本装置根据密封橡胶带伸展长度的不同可分为20、40、60、80四种型号。

### Z-A type bridge expansion and contraction installation

It is made of Z-type steel, suitable for board bridge, T-type bridge and old bridge alteration.

It can be divided into four types of 20,40,60,80 according to the stretching length of rubber seal strips.

### Z-B type bridge expansion and contraction installation

It is made of Z-type steel, suitable for board bridge, T-type bridge and old bridge alteration.

It can be divided into four types of 20,40,60,80 according to the stretching length of rubber seal strips.

### Z-C type bridge expansion and contraction installation

It is made of Z-type steel, suitable for board bridge, T-type bridge and old bridge alteration.

It can be divided into four types of 20,40,60,80 according to the stretching length of rubber seal strips.

### Z-D type bridge expansion and contraction installation

It is made of Z-type steel, suitable for board bridge, T-type bridge and old bridge alteration.

It can be divided into four types of 20,40,60,80 according to the stretching length of rubber seal strips.



## ◆◆◆石笼网 PVC Coated/galvanized Gabion Box

石笼网是将抗腐耐磨高强度的低碳高镀锌钢丝或5%--10%铝锌稀合金镀层钢丝(或同质包覆聚合物钢丝),由机械将双线绞合编织成多绞状、六边形网目的网片,其双线绞合部分的长度应不小于5cm,以不破坏钢丝的防护镀层。

石笼网可根据工程设计要求组装成箱笼,并装入石块等填充料后连接成一体,用做堤防、路基防护等工程的新技术。石笼网适用于高流速、冲蚀严重,岸破渗水多之缓河岸。石笼属柔性结构,对于不均匀沉陷自我调整性佳。岸面多孔性,石材间之缝隙利于动物栖息,植物生长,水线以上之石笼面可利用客土袋植生绿化符合生态的考量及安全的要求。

Gabion Boxes are rectangular boxes which are form panels of triple twisted mesh which are framed by thicker selvedge wire. End panels and internal diaphragms at 1.0m centres are wired to the base of the gabion. The triple twist weaving of the wire prevents unraveling.

MATTRESSES are also rectangular boxes which are larger in area and thinner in depth than gabions. They are made with a smaller mesh size and a thinner wire to provide a higher degree of flexibility. like the gabions, the mesh is framed by a thicker selvedge wire but due to the larger size of the mattress the lid is made of a separate panel of mesh to the base. Additional end panels and internal diaphragms at 1.0m centres are then wired to the base of the mattress.

Material: heavy Galvanized zinc coating: 240-260g/m<sup>2</sup>

PVC coated gabion box

galvan(95% zinc-5% Alu Alloy) low carbon steel wire, which has good ability of resistance corrosion.

Gabion box Tensile strength: 38-50kg/m<sup>2</sup>.

Length	Width	Height	Diaphragm	Volume	Tolerance
2.0m	1.0m	0.3m	1	0.6m <sup>3</sup>	
3.0m	1.0m	0.3m	2	0.9m <sup>3</sup>	
4.0m	1.0m	0.3m	3	0.2m <sup>3</sup>	
2.0m	1.0m	0.5m	1	1.0m <sup>3</sup>	L +/- 3%
3.0m	1.0m	0.5m	2	1.5m <sup>3</sup>	W +/- 5%
4.0m	1.0m	0.5m	3	2.0m <sup>3</sup>	H +/- 5%
1.0m	1.0m	0.5m	0	1.0m <sup>3</sup>	
1.5m	1.0m	1.0m	0	1.5m <sup>3</sup>	
2.0m	1.0m	1.0m	1	2.0m <sup>3</sup>	
3.0m	1.0m	1.0m	2	3.0m <sup>3</sup>	
4.0m	1.0m	1.0m	3	4.0m <sup>3</sup>	

Opening (mm)	Wire Diameter (Wire) (mm)	Wire Diameter (PVC Coate) Inner/outside (mm)	Strands
60x80	Φ2.0-2.8	Φ2.0/3.0-2.5/3.5	3
80x100	Φ2.0-3.2	Φ2.0/3.0-2.8/3.8	3
80x120	Φ2.0-3.2	Φ2.0/3.0-2.8/3.8	3
100x120	Φ2.0-3.4	Φ2.0/3.0-2.8/3.8	3
100x150	Φ2.0-3.4	Φ2.0/3.0-2.8/3.8	3
120x150	Φ2.0-4.0	Φ2.0/3.0-3.0/4.0	3





◆◆◆石笼网 Gabion Box

