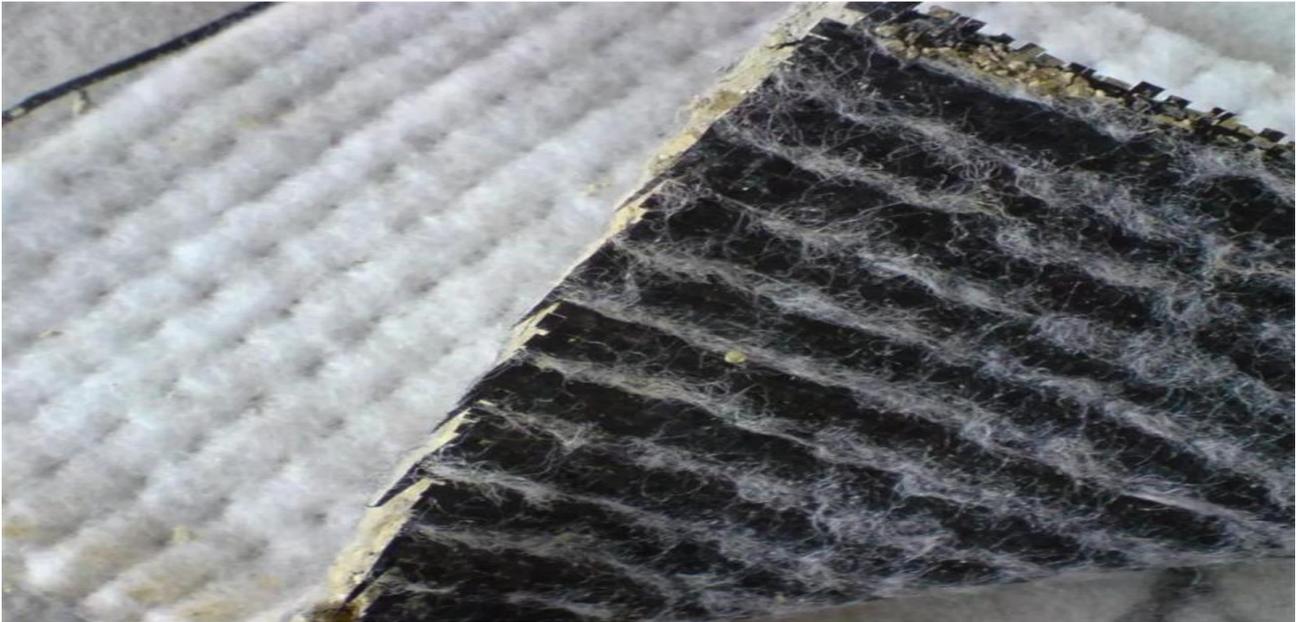


**Geosynthetic clay liner (GCL)** is made from 100% natural sodium bentonite, woven geotextile, nonwoven geotextile. Geosynthetic clay liners (GCLs) are high performance needle punched environmental reinforced composites which combine two durable geotextile outer layers with a uniform core of natural sodium bentonite clay to form a hydraulic barrier. Fibers from the non-woven geotextile are needle punched through the layer of bentonite and incorporated into the other geotextile (either a woven or non-woven).when hydrated under a confining load, the bentonite swells to form a low permeability clay layer with the equivalent hydraulic protection of several feet of compacted clay.



Geosynthetic clay liners (GCL) are an established sealing product in the geoenvironmental industry. They are used in landfill caps and base liner applications under roads, railways, secondary containment for above ground tank farms, as well as within various other containment structures such as dams, canals, ponds, rivers and lakes. They are also used for waterproofing of buildings and other similar structures.



### Property

1. Swell when meet water
2. Long time waterproofing and friendly to environment
3. Separation, reinforcement, protection, filtration and easy for construction



### Application

1. Municipal project, subway, underground and roof waterproofing
2. landfill, waste water treatment, industrial waste
3. Waterproofing and reinforcement in water conservancy, river, lake and dam
4. Artificial lake, golf course and fish pond
5. Petrification and mineral waterproofing

various other containment structures:



**Specification**

Unit weight: 4500g/m<sup>2</sup>, 4800g/m<sup>2</sup>, 5000g/m<sup>2</sup>, 5500g/m<sup>2</sup>, 6000g/m<sup>2</sup> or at customer's request

Width: 5m-6m or at customer's request

Length: 20m, 30m, 35m, or at customer's request

**Technical data**

Landfill Bentonite Pond GCLS Specification:



**Technical Data(ASTM) FOR GCL**

Physical requirements	Required value	Testing method	Weight(g)				
			4500	4800	5000	5500	6000
Mass per unit area of cover layer(PP nonwoven)	≥200g/m <sup>2</sup>	ASTM D5261	≥200g/m <sup>2</sup>				
Mass per unit area of carrier layer(PP woven)	≥100g/m <sup>2</sup>	ASTM D5261	≥100g/m <sup>2</sup>				
Mass per unit area of bentonite layer	≥4000g/m <sup>2</sup>	ASTM D5261	≥4000g/m <sup>2</sup>				
Thickness	≥5.0mm	ASTM D5199	≥5.0mm				
Swell index(bentonite layer)	≥24ml/2g	ASTM D5890	≥24ml/2g				
Blue absorption power	≥30g/100g	ASTM	≥30g/100g				
Fluid loss(bentonite layer)	≤18ml	ASTM D5891	≤18ml				
Peel strength	≥360N/m	ASTM D6496	≥360N/m				
Permeability coefficient	≤5.0×10 <sup>-11</sup> m/min	ASTM D5887	≤5.0×10 <sup>-11</sup> m/min				
Tear strength	≥500N/m	ASTM D6496	≥500N/m				
Width × length	≥5.0×40m		≥5.0×40m				

JG/T 193-2006

**Bentonite GCL Technical Data**

No.	Item	Technical Index		
		GCL-NP	GCL-OF	GCL-AH
1	Appearance Quality	Surface smoothness, thickness uniformity, no broken hole, no edge damage, no residual broken needle		
2	Size Deviation %	Length	-1	-1
		Width	-1	-1
3	Unit Weight g/m <sup>2</sup>	≥4000	≥4000	≥4000
4	Bentonite Mixture Volume Swelling Degree ml/2g	≥24	≥24	≥24
5	Tensile Strength N/10cm	Longitudinal	≥600	≥700
		Horizontal	≥500	≥600
6	Elongation Under the maximum load	Longitudinal	≥10	≥10
		Horizontal	≥8	≥8
7	CBR Mullen Bursting Strength KN	≥1.5	≥2.0	≥1.0

**Packaging & Delivery**

Packaging Details

Landfill waste bentonite clay waterproof blanket GCL

PE film outside or as requests

- 1, 4000g/m<sup>2</sup>:width 5.8m\*Length35 m per roll, about 3857m<sup>2</sup>/20'gp
- 2,4500g/m<sup>2</sup>:width 5.8m\*Length35m per roll, about 3654m<sup>2</sup>/20'gp
- 3,4800g/m<sup>2</sup>:width 5.8m\*Length35 m per roll, about 3248 m<sup>2</sup>/20'gp
- 4, 5000g/m<sup>2</sup>:width 5.8m\*Length35 m per roll, about 3248 m<sup>2</sup>/20'gp
- 5,5250g/m<sup>2</sup>:width 5.8m\*Length35 m per roll, about 3045 m<sup>2</sup>/20'gp

**Certificate**



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*Grace Wei*

**Globe Marketing Manager**



Sdtianhai

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**BEIJING HANGXIE CERTIFICATION CENTER CO.,LTD.**  
**ENVIRONMENTAL MANAGEMENT SYSTEM CERTIFICATION**

**Shandong Tianhai New Materials Engineering Co., Ltd.**

Registration No : 03415E10508R2M  
Organization Code: 913701817372305213  
Registration Address: Diaozhen Chemical Industrial Park, Zhangqiu district, Jinan City, Shandong Province, China P.C 250204  
Audition Address: Diaozhen Chemical Industrial Park, Zhangqiu district, Jinan City, Shandong Province, China/ 2. 11th Floor,Zhongjian Wenhua Plaza B, Wenhua East Road No.16, Lixia district, Jinan city, Shandong Province, China P.C 250204  
In conformity with : GB/T 24001-2016 idt ISO14001:2015  
Certification scope: Geotextile, Geomembrane, Composite Geomembrane, Geogrid, Waterproof Board, GCL, Drainage Board, Geonet, Drainage Network related production environmental management activities  
Issue Date: Sep. 07,2015 Expiry Date: Sep. 06,2018  
First Issue Date: Sep. 21,2009 Change Date: Oct. 10,2017




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General Manager:  **BEIJING HANGXIE CERTIFICATION CENTER CO.,LTD.**

After this certificate is issued, there should be at least 2 surveillance audits within the 3 year period of validity, the current validity of the certificate can be checked on (www.bhcc.com.cn) The certificate information is available on the official website of the National Certification and Accreditation Administration (www.cnca.gov.cn) It is also available by scanning the two-dimensional code at the bottom right corner.

Address : NO.7 Jingshun Road,Chaoyang District,Beijing,China.



**BEIJING HANGXIE CERTIFICATION CENTER CO.,LTD.**  
**OCCUPATIONAL HEALTH & SAFETY MANAGEMENT SYSTEM CERTIFICATION**

**Shandong Tianhai New Materials Engineering Co., Ltd.**

Registration No : 03415S20415R2M  
Organization Code: 913701817372305213  
Registration Address: Diaozhen Chemical Industrial Park, Zhangqiu district, Jinan City, Shandong Province, China P.C 250204  
Audition Address: Diaozhen Chemical Industrial Park, Zhangqiu district, Jinan City, Shandong Province, China/ 2. 11th Floor,Zhongjian Wenhua Plaza B, Wenhua East Road No.16, Lixia district, Jinan city, Shandong Province, China P.C 250204  
In conformity with : GB/T 28001-2011 idt OHSAS18001:2007  
Certification scope: Geotextile, Geomembrane, Composite Geomembrane, Geogrid, Waterproof Board, GCL, Drainage Board, Geonet, Drainage Network related production occupational health and safety management activities  
Issue Date: Sep. 07,2015 Expiry Date: Sep. 06,2018  
First Issue Date: Jan. 13,2010 Change Date: Oct. 10,2017

General Manager:  **BEIJING HANGXIE CERTIFICATION CENTER CO.,LTD.**



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Address : NO.7 Jingshun Road,Chaoyang District,Beijing,China.



**BEIJING HANGXIE CERTIFICATION CENTER CO.,LTD.**  
**QUALITY MANAGEMENT SYSTEM CERTIFICATION**

**Shandong Tianhai New Materials Engineering Co., Ltd.**

Registration No : 03417Q52516R2M  
Organization Code: 913701817372305213  
Registration Address: Diaozhen Chemical Industrial Park, Zhangqiu district, Jinan City, Shandong Province, China P.C 250204  
Audition Address: Diaozhen Chemical Industrial Park, Zhangqiu district, Jinan City, Shandong Province, China/ 2. 11th Floor,Zhongjian Wenhua Plaza B, Wenhua East Road No.16, Lixia district, Jinan city, Shandong Province, China P.C 250204  
In conformity with : GB/T19001-2016 idt ISO9001:2015  
Certification scope: Geotextile, Geomembrane, Composite Geomembrane, Geogrid, Waterproof Board, GCL, Drainage Board, Geonet, Drainage Network Production (involving administrative licensing products, limited within the scope of qualification)  
Issue Date: Oct. 10,2017 Expiry Date: Oct. 09,2020  
First Issue Date: Dec. 05,2011




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CNAS C034-M

General Manager:  **BEIJING HANGXIE CERTIFICATION CENTER CO.,LTD.**

After this certificate is issued, there should be at least 2 surveillance audits within the 3 year period of validity, the current validity of the certificate can be checked on (www.bhcc.com.cn) The certificate information is available on the official website of the National Certification and Accreditation Administration (www.cnca.gov.cn) It is also available by scanning the two-dimensional code at the bottom right corner.

Address : NO.7 Jingshun Road,Chaoyang District,Beijing,China.



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Reg. Imprese 02 332 750 569  
REA MN 0221098

**CERTIFICATE OF COMPLIANCE**  
Certificado de Conformidade - Сертификат соответствия - Konformitätserklärung

1) <b>APPLICANT:</b> Shandong Tianhai New Materials Engineering Co., Ltd Diaozhen Chemical Industrial Park of Zhangqiu, Jinan City, Shandong Province, China.	2) <b>CERTIFICATE NO.:</b> IT021416TH170824 <b>TCF(S) NO.:</b> TH201708004CPR
3) <b>WITH REFERENCE TO EC DIRECTIVE APPLIED:</b> Regulation for the Marketing of Construction Products R305/2011 <b>HARMONIZED STANDARDS APPLIED:</b> EN 13254-2016	4) <b>CERTIFICATION ISET MARK:</b> 
5) <b>PRODUCT CHARACTERISTICS:</b> Geosynthetic Clay Liner <b>MODELS:</b> TH-004 (G,M)	
<b>REMARK:</b> The verification has been carried out on voluntary application of the manufacturer based only on the documents prepared and provided by the manufacturer itself. The product(s) satisfies the requirements of the Mark of ISET according to the ISET regulations. The manufacturer is responsible to maintain the internal production control to ensure the compliance of the product. ISET declines any liability with reference to any other non-compliance of documents, product or test report that have been submitted to evaluation. However, this verification doesn't imply assessment of the production of the product(s). Before putting into service of its product(s) on EU market and affixing the CE mark on the product the manufacturer is required to appoint a Notified Body to get the CE Certification and meet all the necessary law requirements according to the directive and accepted by the Notified Body. The manufacturer should be responsible for the results caused by improperly use this verification.	
6) <b>DATE OF ISSUE:</b> 24/08/2017	<b>DATE OF EXPIRE:</b> 23/08/2022

**CERTIFICATION MANAGER:**  **ISET S.R.L.**