• ISOBENT (GCL)

• GEOMEMBRANE

Mokarrar Geosynthetics

شرکت کامپوزیت مکرر

Mokarrar Composite Co.

Mokarrar Composite Company is a subdivision of Mokarrar industrial group and started its activities in 2000. The company started its activities in the field of designing, offering and projecting geo-synthetic products. The company was able to be an agent of reputable global producers such as Solomax Co. in Canada for different types of membranes, Terram Co. in England for different textiles, Tema Co. in Italy for dimple sheets, Ten Cate Co. of Netherlands for different geo-tubes, CETCO Co. of USA for GCL.

Mokarrar Geosynthetics

All of these activities have caused our company to become the first EPC Company in the country to stand on a special position. Performing tens of geo-synthetics projects used millions of square meters of product, Mokarrar composite company have started to domesticate the technology of GCL sheets production. This way, Mokarrar Composite company has moved itself from an EPC company to a manufacturer and distributor of GCL with the brand of ISOBENT in the country and in the region. The factory of the Mokarrar Composite company is located in industrial city of Liya in Ghazvin city near Tehran.

What is the ISOBENT (GCL)?

This product includes 2 layers of geo-textiles (woven and non-woven) with grained sodium bentonite in between. The nonwoven textile is locked to the woven textile through the sodium bentonite using needling. This way, a composite is formed as a perfect layer to stop transferring fluids. ISOBENT is produced in the form of rolls with different length and width.

How ISOBENT WORKS?

Sodium Bentonite is a Solid material from the Clay category which is formed from volcano activities during 16 millions of years. This material will swell rapidly and forms a gelatin type of state if exposed to a fluid and stops gases and liquids from getting through it. This formed gelatin type of material is sandwiched between two layers of textiles and forms a sealing film with the thickness of 6 millimeters.

There is a unique specification in ISOBENT highlighting it from other products which is its self-healing specification. In other words, ISOBENT will cure itself in case it gets damaged during installation or thereafter.

Golgohar Copper Mine (Sirjan)

Zarshooran Mine (Takab)

Land Fill (Tabriz)

Land Fill (Tehran)

Why using ISOBENT:

A) - Protection of environment:

In order to avoid from pollution of soil, surface water and underground water, it is essential that polluted materials to be surrounded and conducted by means of protecting layers. It is recommended to use ISOBENT in the following cases:

- Mine heaps and tailing dams
- Landfills (sanitary garbage dumping cells)
- Wastewater lagoons
- Tank farms in oil projects
- Waste materials resulted from drilling of oil wells

Oil Tank Farm (Asalooyeh)

Sivin Soil Dam (Miyaneh)

B) -Water sealing :

- Dams and lake of dams
- Water transferring channels
- Artificial lakes
- Agricultural water storage pools
- Shrimp and fish pools
- Tunnels
- Road making
- Underground structures
- Deep foundation

Water Supplying Channels

Open Tranche Tunnel (Tehran-Tabriz)

Agricultural Water Storage pool

Baran Tower Foundation (Tehran)

Farmland

C) -Agriculture :

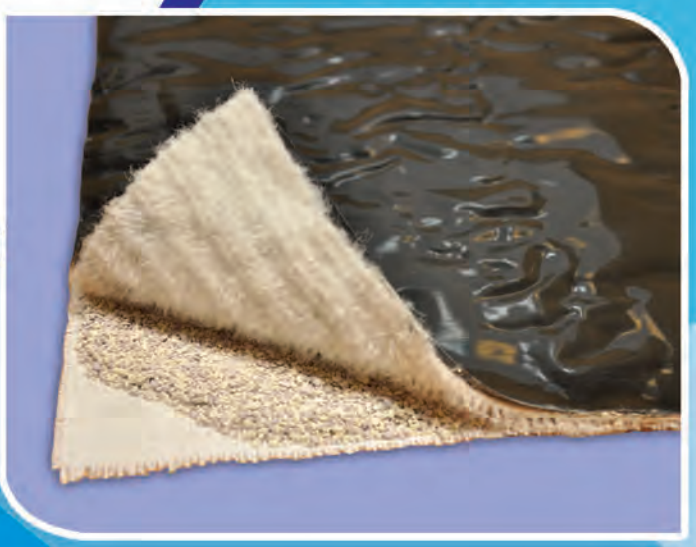
ISOBENT keeps water inside itself and it will stop water from wasting as well. Besides, the possibility of growing roots of plants inside ISOBENT can give a special advantage to this product. In arid and dry areas in which sandy soils and plants need a permanent moisture, the ISOBENT has a high usage .

ISOBENT Advantages:

1- It has very easy and fast installation and it does not have inspection costs
2- It is easy to install in non-smooth levels as a result of its high flexibility
3- It does not need costly foundation
4- It does not need welding in overlaps
5- Resistant in physical harms
6- Self healing ability in case of damages
7- Excellent ability to bonding to concrete
8- Excellent substitute for one-meter compact clay (CCL)
9- Easiness in waterproofing pipes , columns and edges
10- No need to additional equipment in windy areas while installation
11- Appropriate substitute for two layers of textile and one layer of membrane
12- Cheaper than other geo-synthetic waterproofing systems due to its low cost in installation
13- Environment friendly

ISONENT Membrane (GCL-Membrane)

The production line of Mokarrar Composite Company has the ability to install a layer of membrane with the thickness of 500 micron on the ISOBENT. In addition to the all advantages of ISOBENT (GCL), the resulted product has the following extra specifications:



1- More chemical resistance
2- Possibility of installation in non-appropriate atmospheric conditions
3- Appropriate substitute for
CCL + Geotextile + Membrane + Geotextile designs as a single layer
4- Very low cost of installation
5- Very fast installation
6- Production of laminated product (GCL + Membrane) in the form of factory type and deleting the installation errors

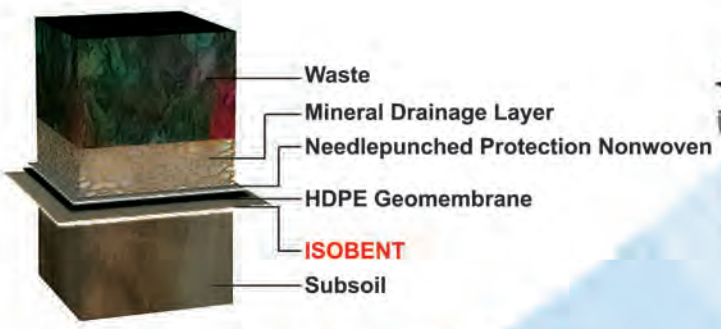
Quality Control of Product

The IGS organization (International Geo-Synthetic Society) has defined one of the most important global standards of GCL production and has introduced it as GRI-GCL3.
The Mokarrar Composite's products are produced based on this standard and have been verified by CTT Groupe laboratory in Canada. Besides, Mokarrar Composite Company has accomplished several research projects with Amir Kabir University for special applications.

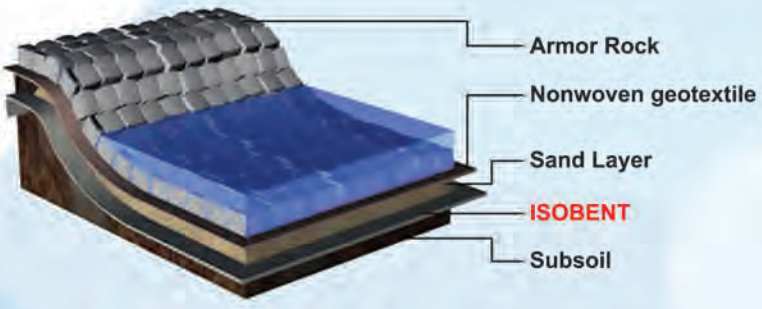
Mokarrar Composite Company's Laboratory
Equipped with all Testing Equipment

TECHNICAL DATA SHEET ISOBENT

Property	Test Method	Frequency	Unit	ISOBENT®
BENTONITE				
Swell Index	ASTM D-5890	50 Tonnes	ml/2g	>27
Fluid Loss	ASTM D-5891	50 Tonnes	ml	< 16.2
Non-Woven Geotextile				
Type		Polypropylene		
Mass Per Unit Area	ASTM D-5261	20,000 m^2	g/m^2	300
Woven Geotextile				
Type		Polypropylene		
Mass Per Unit Area	ASTM D-5261	20,000 m^2	g/m^2	135
GCL				
Mass Per Unit Area	ASTM D-5993	4,000 m^2	g/m^2	5000
Thickness	EN ISO 9863-1	20,000 m^2	mm	6
Moisture Content	ASTM D-5993	4,000 m^2	%	8
Tensile Strength-MD	ASTM D-6768	20,000 m^2	kN/m	6.6
Peel Strength	ASTM D-6496	4,000 m^2	N/m	700
Permeability	ASTM D-5887	25000 m^2	m/s	1×10^{-11}
Index Flux	ASTM D-5887	25000 m^2	$m^3/s\text{-}m^2$	1×10^{-8}
Permeability against $Cacl_2$ permeate				
At 35 KPa	ASTM D-6766	Yearly	m/s	8.3×10^{-10}
At 500 KPa	ASTM D-6766	Yearly	m/s	1.5×10^{-11}
Supply Specifications				
Roll Dimension - Width		5 , 4	m	
Roll Dimension - Length		25 , 30 , 40 , 50	m	

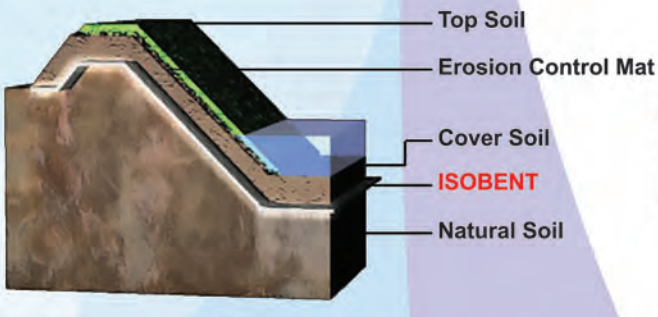


Schematic Picture of Municipal and Industrial Land fill

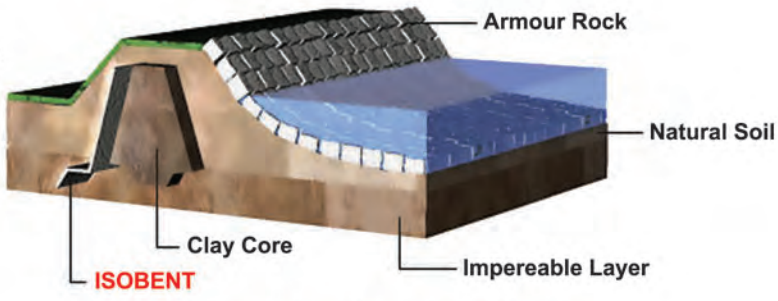


Sealing of Channels Schematic Picture

ISOBENT Installation Procedure



Lake Sealing Schematic Picture



Dam Sealing Schematic Picture

Solmax Membrane

The Mokarrar Composite company is the agent of one of the most famous manufacturers of membrane in the world (Solmax of Canada). Solmax company manufactures its membrane sheets based on GM13 standard which is the highest global standard in this field. These sheets are 8 meters in width and 0.75 to 3 millimeters in thickness in the form of non-smooth and smooth with different colors.

Mokarrar composite company has been successful to perform tens of big projects in industries such as oil , gas , petrochemical, chemical , water supplying , wastewater treatment lagoons , sanitary garbage disposal sites and isolation of underground structures such as metro and underground storages .

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Mokarrar Engineering Materials

Mr . Mohsen Golpour is acknowledged as an individual Member in good standing of the International Geosynthetics Society for

Peter E. Stevenson
Secretary
International Geosynthetics Society

SOLMAX GEOSYNTHETICS INSTALLATION TRAINING PROGRAM

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شرکت کامپوزیت مکرر

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