Drainage Composites

GEOfabrics®

Quality Environment

Economical

High Performance Easy Installation

About Us

GEOfabrics Limited is a UK manufacturing company established in 1992. From the outset the objective was to manufacture high-performance drainage geocomposites to the highest quality standard.

The Company's ethos is to exceed the expectations of the customers with our products and support services. Product development is achieved by analysing the customer's application, determining the properties that are required, manufacturing the solution and testing it to prove it meets those performance criteria.

Today the company manufactures a diverse portfolio of world class leading geocomposites and geotextiles, supplied into a wide range of civil engineering and construction applications.

Drainage Composites

GEOfabrics manufactures a broad spectrum of multi layer Protexia geocomposites using a state of the art production facility. These are produced by bonding carefully selected components to form a multifunctional range of composite products.

GEOfabrics manufacture from optimum quality high density polyethylene, which is extruded into a range of different thickness HDPE membranes at our UK manufacturing headquarters.

These impermeable membranes are vacuum formed into geocuspated cores between 6mm and 25mm thick, depending on the mechanical and hydraulic properties required. This process allows us to control quality from polymer source through to finished cuspated drainage core.

Our standard range of drainage composites can be bonded to a large number of filter or protection geotextiles, on one or both sides, in order to achieve the correct balance of functions required.

Product properties can be further enhanced and improved through additional engineering solutions such as perforations or other features.

Within a modern construction industry 'value engineering' is a growing and important focus. GEOfabrics always manufacture with optimum performance in mind.

We aim to produce products based on maximum strength and durability, for the minimum cost, to meet the design requirements.

Our comprehensive drainage composite and gas venting material range is globally respected for its quality and performance. Known in the industry for consistency and reliability this prompts civils, geotechnical and construction designers to specify our products time and time again.

State of the art manufacturing line for maximised production efficiency.

Bespoke manufacturing capabilities for specific engineering applications.

Green Roofing

The construction industry has a growing responsibility to meet new environmental targets and to support the green agenda. This has led to an increase in green roofing installations which provide an aesthetically pleasing and environmentally friendly solution for roofing systems across the world.

Green roof design in urban environment using Protexia drainage composite.

Perforated 'reservoir board' used in green roofing system.

GEOfabrics manufacture a bespoke range of composites which provide a unique combination of properties and performance tailored for green roofing applications.

A typical green roof begins with an impermeable lining system encapsulating the roof. GEOfabrics composite solution incorporates a robust protection geotextile on the lower surface, which provides protection to the geomembrane on the base.

The core has excellent water retention capabilities carrying several litres per sqm of residual storage. This is constantly replenished with fresh water through infiltrating rainfall. Once the reservoir board is full this overflows through the perforations and drains away.

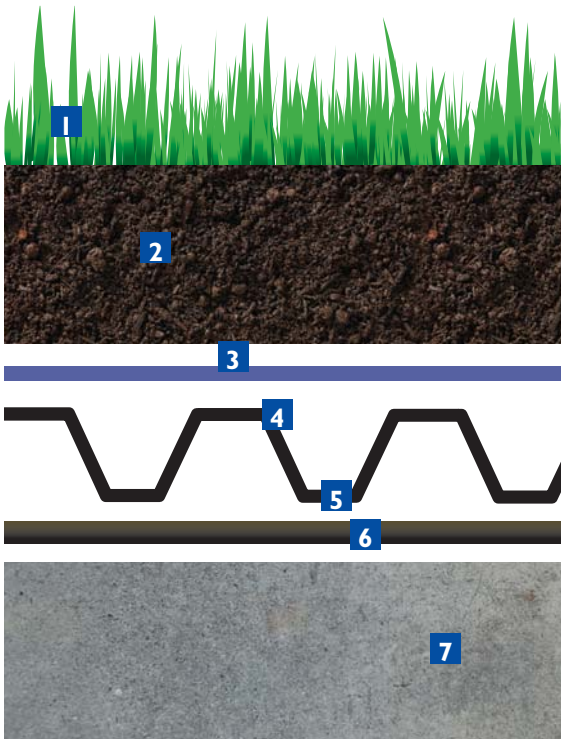
The filtration geotextile on the upper surface prevents the ingress of fines or soils into the drainage system, performing the role of 'sub soils' in a natural environment and preventing clogging.

This composite provides a platform for the growing substrate which promotes the medium for plant growth taking into account air, water and nutritional requirements.

Natural plant communities are selected based on the project requirements and environmental conditions, such as sedum matting or 'plug plants' to promote a wide degree of biodiversity.

GEOfabrics Green Roofing System

GEOfabrics specialist green roofing system forms a critical and integral part of any successful green roof installation. The system is extremely lightweight, essential for a roofing solution and quickly installed. Most importantly our Protexia composite system provides an essential 'life line' to all green roofs through proper water retention, drainage and growth support for an array of sedum matting, grasses and wildflowers. Protexia is specifically designed to support your own roof based ecosystem.



Typical cross section through standard green roofing system using multifunctional drainage, storage and protection geocomposite.

1. Carefully selected plant or sedum communities are chosen in line with project requirements, system design and the environmental conditions.
2. The 'growing substrate' has a tailored composition to the chosen plant communities and provides the nutritional requirements to support long term growth.
3. The filtration geotextile is designed to permit free movement of fluid but prevent ingress of fines, avoiding long term clogging of the drainage and storage board and preventing nutritional loss from the growing substrate.
4. Perforations in the drainage core allow overflow from the reservoir board removing excess water and avoiding soil saturation.
5. The reservoir board provides a constant source of fresh water to the root network through capillary action. This is constantly replenished with fresh infiltrating rainfall.
6. GEOfabrics HPS protection fleece prevents damage to the impermeable geomembrane roof lining.
7. Waterproofed roof construction provides the platform for the Protexia green roof composite system.

Green Roof benefits

- Environmental and ecological benefits.
- Sound attenuation and reduction.
- Sustainable Urban Drainage (SUDS) and storm water management.
- Building insulation and thermal properties to reduce energy costs.
- Improved air and water quality 'carbon footprint' reduction.

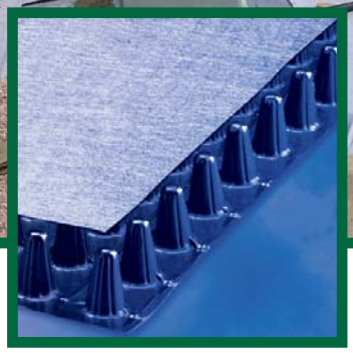
Completed architects roofing project incorporating Protexia.

Construction

Underground Reservoirs

With climate change presenting an ever growing challenge to water authorities and regulators across the globe, there has been an increasing demand for appropriate storage facilities.

Springs Mire reservoir project, using FC25 for reservoir encapsulation, preventing contamination.



FC25 High flow composite with a filtration geotextile bonded to one side of the drainage core to prevent clogging.

Seasonal and regional variations in rainfall and groundwater aquifers creates a more difficult climate in which to manage and provide consistent and sustainable water services.

Underground reservoirs provide one method of storage during periods of low rainfall to service public and industrial water requirements all year round.

Such reservoirs require a multifunctional composite solution which provides encapsulation and protection to the reservoir construction, as well as peripheral drainage on the outside of the reservoir. This helps to minimise structural degradation over the service life.

Importantly, such a system alleviates pore water pressure build up around the structure, removes infiltrating fluids through cover soils or backfill against the walls and helps prevent contamination of the reservoir itself.

Horizontal Drainage

Geocomposites support a drive towards value engineered design and innovative solutions which provide construction cost savings and improved performance.

Dartford football club improvement plans incorporate FC12 for structural waterproofing and drainage.

FC12 high compressive strength composite.

GEOfabrics composite drains directly replace traditional primary resources such as aggregate based drainage solutions. Using composites reduces carbon footprint and the impact on the environment by replacing granular drainage blankets meaning reduced quarrying at source, less haulage to site, reduced excavation and a quicker installation phase. A GEOfabrics composite drain provides the equivalent flow of up to 1m of standard 10-20mm well rounded gravel and at a fraction of the cost.

Installations include:

- Runoff from runways, aprons and forecourts
- Underneath floor slabs and basements
- Earthworks and capillary breaks
- Sustainable Urban Drainage Systems (SUDS).

Vertical Drainage

GEOfabrics drainage composites are a robust lightweight range of materials and consequently easy to install in a diverse range of vertical drainage applications.

FC12 is a lightweight product easily handled and installed in vertical applications using small fixing plugs.

Robust FC12 is resistant to damage during the installation process.

Installations include:

- Isolating contaminated land and cut off walls
- Highway fin drains to replace aggregate French drains
- Wall cavities
- Tunnel lining
- Reducing hydrostatic pressure from backfill on foundations or retaining structures
- Bridge abutments.

Gas Venting

With an increase in 'brown field' development and regeneration, engineers are experiencing a growing challenge to build on contaminated land.

Environmental legislation requires consideration to the engineering risks presented by bulk soil based hazardous gases. Such gases include methane, carbon dioxide/monoxide, hydrogen, hydrogen sulphide and radon, all of which present a high risk to occupants and require gas venting solutions in place, for remediation.

GEOfabrics Protexia cuspated gas venting composites are specifically designed to overcome the problem of high levels of gas concentrations underneath buildings, paving, hard standings and general construction applications.

When dealing with VOC (Volatile Organic Compounds) our venting solutions form an integral part of both passive and active systems designed to deal with the problem of contaminating gas through dilution to safe levels.

Protexia 25mm composites have been developed and tested extensively in line with the 'DETR Partners in Technology Report – 1997' and is an integral part of venting design used in BS8485 code of practice and various Ciria guidelines including C665 and the forthcoming RP938.

A passive gas venting system using durable and robust Protexia 25mm composite which is highly resistant to chemical or biological degradation.

High gas flow capability within the composite core void space.

The design of the primary gas protection layer and complete venting system is determined by gas type, concentrations and emission rates and is marked by a points system.

GEOfabrics offer a fast efficient delivery service for our gas composites, supported by professional technical support to ensure the correct system is installed efficiently, effectively and functionally.

Key benefits

- Lightweight and easy to lay with a simple butt jointed core and overlap filter geotextile to maximise the speed of installation.
- Substantial construction cost savings compared with traditional solutions, replacing aggregate based venting layers in blanket form and perforated pipes in strip form.
- Protexia composites utilise a substantially lower volume than granular solutions resulting in reduced excavation and less contaminated spoil being removed from site and disposed of at a cost.
- Protexia is manufactured from polypropylene, polyester and polyethylene polymers which are chemically and biologically inert, offering long term durability and performance in conjunction with the most aggressive gases.
- High levels of flow to reduce gas below 0.25% across the footprint and high crush resistance up to 500KPa to perform under the heaviest of static loads.
- Extremely flexible product range to deal with difficult installations and cope with variable settlement underneath floor slabs etc.
- Compatible with a wide range of fixtures and fittings available through our specialist distributors.

Landfill and Contaminated Land Capping

With over 20 years experience in landfill engineering GEOfabrics have extensive expertise in the supply of specialist composite materials for landfill capping systems.

FC6 geocomposite manufactured up to 5.75m wide roll widths.

GEOfabrics have an extensive portfolio of drainage and protection products, including a range of FC6 and GPT geocomposites, for landfill and contaminated land capping systems.

Modern day landfill requires the construction of a fully encapsulated cell for waste containment and gas extraction.

The landfill industry is heavily regulated to a high standard of construction by the Environment Agency and equivalent governing bodies in other regions, to ensure suitable environmental remediation is provided.

GEOfabrics specialist drainage composite range meets these rigorous standards by providing multifunction's and specific properties designed to deal with this problem.

FC6 cuspates and GPT composites also provide protection to the impermeable membrane system lining the cell, through high levels of puncture resistance, at minimum cost.

They are also specifically designed to control rainfall run off and stabilise the cover soil (above the liner) by avoiding soil saturation.

Our textile encapsulated composites generate high levels of interface friction resistance which is of particular benefit when used with roughened membranes for slope stability.

Our composite range has high levels of mechanical strength to resist damage during installation and throughout service life.

We manufacture wide widths for minimum overlap (Up to 6m wide) and bespoke roll lengths saving on wastage and increasing the speed of installation.

The range of landfill composites can be used for:

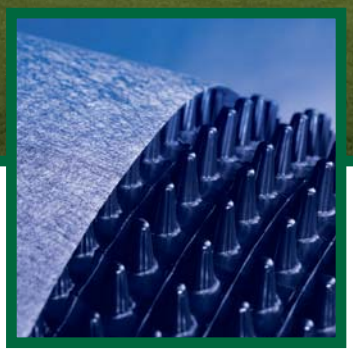
- Landfill cap drainage
- Landfill cap protection
- Gas collection underneath the cap
- Groundwater drainage to relieve pore water pressure
- Leak detection systems.

Sports Ground Drainage

GEOfabrics offer a comprehensive range of sports drainage solutions for football, golf and a wide range of other synthetic and natural sports surfaces.

Earthworks and ground preparation is critical. Fully wrapped fin drain is installed in linear drainage ditches often in an interconnected herringbone system.

Finished football training ground with a high quality well drained playing surface.



GEOfabrics composite is used in thin widths of 150-300mm wide for shallow drainage networks.

Managing sub surface drainage is an essential part of generating the optimum quality playing surface by removing excess water, avoiding ground saturation and dealing with ground compaction.

This is essential for sites located on low permeability soils or with abnormal ground conditions which are regularly soaked, such as low lying pitches with a susceptibility to flooding.

Our drainage composites are installed quickly and efficiently in shallow linear cut narrow trenches often in an interconnected 'herringbone' layout. These are channelled 'down slope' towards a 'soak away' or peripheral extraction point.

GEOfabrics drainage composites:

- Are quickly and easily installed by competent personnel without heavy plant requirements and at minimum cost
- Removes the need for quarried primary aggregate drainage blankets and under pitch drainage pipes
- Results in reduced excavation, earthworks and import costs.

All of the above minimises variability in sub base quality or compaction, meaning ground improvement is rarely required at formation level.

In summary, the high levels of flow make our sports drainage range a high performance solution at the lowest possible cost, to ensure the best quality playing surface.

Quality / Development

Geofabrics continue as one of the main geosynthetic innovators in the industry with our highly active Research and Development department.

GEOfabrics has an extensive laboratory and test facilities. We have a wide range of UKAS accredited tests used for quality control and research and development.

In plane flow equipment testing to EN ISO 12958 standard, to demonstrate water transmissivity.

Our continued success in new products is as a result of an experienced team and our ongoing relationships with an expanding list of professional clients who partner with us to produce bespoke geosynthetic solutions.

GEOfabrics priority is to manufacture a high quality end product that provides the exact needs of our customers, in line with function, durability, value and in accordance with all current legislation and design standards.

Key Mechanical & Hydraulic Properties of Drainage Geocomposites

- CBR – GEOfabrics use the 'California Bearing Ratio' to measure the materials' ability to resist puncture and damage during service life.
- Thickness – Provides a degree of proportionality with flow rates and protection efficiency.
- Crush Resistance and Compressive Strength – Ensures product performance under long term static load with minimal compressive creep.
- Transmissivity – In plane flow to meet and exceed design requirements.
- Shear Strength – High bond strength minimises the risk of delamination and ensures product integrity and stability on slopes.
- Tensile Strength – High modulus filter to minimise ingress into the drainage core. The composite provides lateral strength but allows for settlement.
- Cone Drop – Ensures resistance to dynamic point load avoiding damage during installation.
- Waterflow – Normal to the plane, allowing infiltration into the drainage core itself.

Long Term Durability

GEOfabrics manufacture from high density polyethylene, polyester and polypropylene polymer and fibres. Such polymers are generally considered chemically and biologically inert, in all but the most aggressive environmental applications.

GEOfabrics composites are resistant to chemical and biological clogging, have UV stability to prevent degradation when exposed to sunlight and provide long term strength without reduction in performance or function.

GEOfabrics®

Global Supply Network

GEOfabrics Limited supply a world class range of engineering products for a diverse set of applications, across the UK and international markets. We pride ourselves on building strong, long term and mutually beneficial partnerships with our agents and distributors, in order to provide a quality technical supply service to our clients.

UK EUROPE MIDDLE EAST NORTH AMERICA AFRICA ASIA

Further literature, in the form of case studies, design guides, installation procedures, product data sheets and model specifications **can be downloaded from www.geofabrics.com**

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