BECO BERMÜLLER

GEOSYNTHETICS

Product range

beco-bermueller.com

KEY ADVANTAGES
at a glance

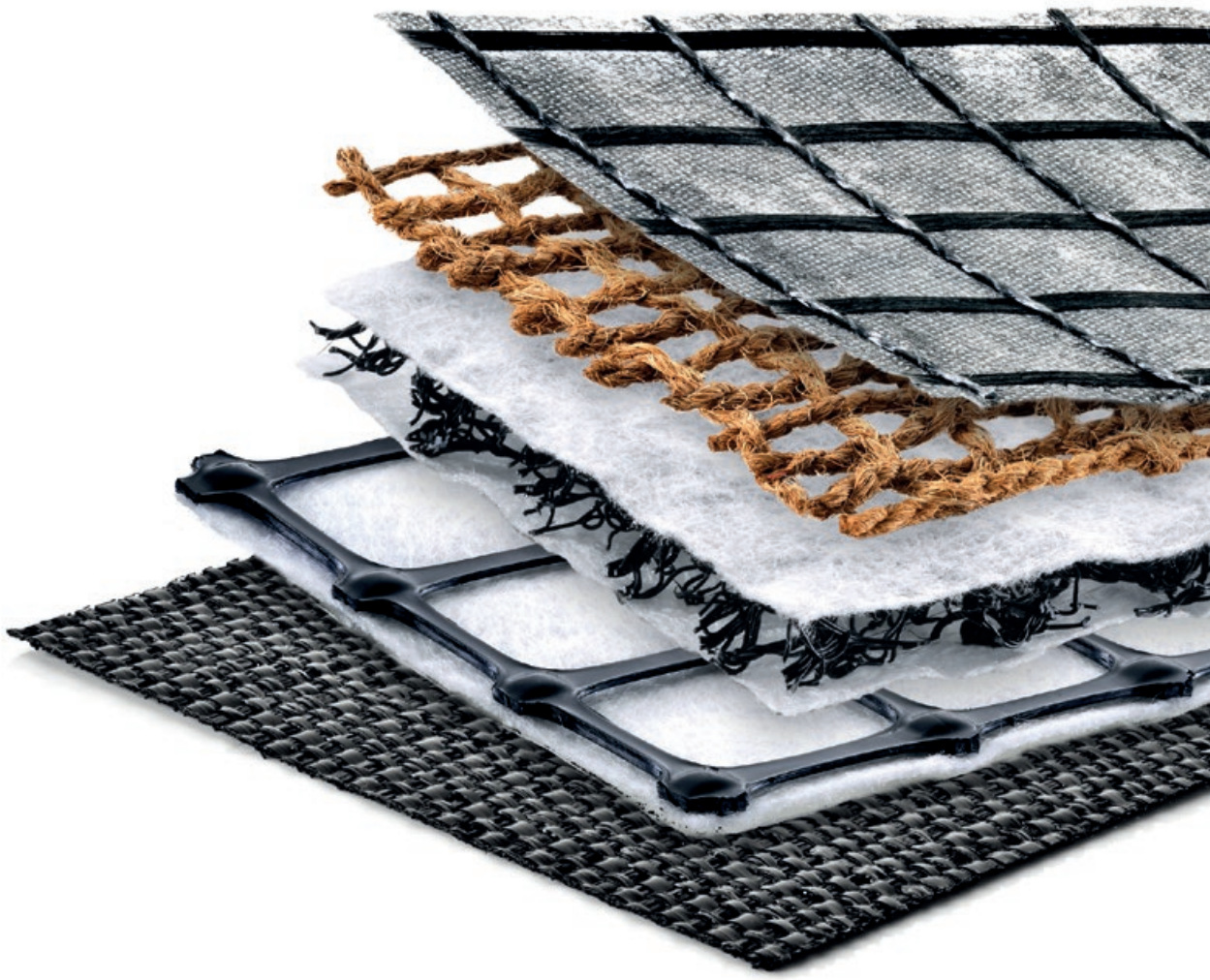
Technical advice – applications engineering
Our technical service provides detailed advice and develops proposals. This includes, for example, the dimensioning of structures based on the selected geosynthetics, proof of stability, hydraulic calculations etc.

Complete package
For larger construction projects, there is an increasing tendency to contract out the complete package (including laying). We are happy to meet these requirements, of course, and, on request, to lay our products on site and provide further services related to our geosynthetics.

Warehouse and logistics
As a supplier of a complete range of products, it is part of our job to make sure that we have all the standard non-wovens, drainage products, geogrids, bentonite mats etc. in stock, for quick delivery to our customers. With our nationwide delivery service, we generally reach every location in Germany within two working days. Furthermore, our local retail partners keep a standard range of our geosynthetics in stock. In cooperation with our logistics partners, we can also provide express deliveries within one day, if required.

Sustainability
Geosynthetics also make an ecological contribution. The overall energy balance of a structure can be considerably improved by using geosynthetics, so that valuable resources and energy are conserved and emissions reduced.

GEOSYNTHETICS
Product range



This edition of our catalogue provides an overview of our complete range of geosynthetics. Our business is based on quality products and comprehensive services for the benefit of our customers.

Detailed individual brochures, data sheets and technical certifications are also available for our products.

GEOSYNTHETICS
Applications

Today, geosynthetics are used successfully in almost all areas of construction, including in highway construction, civil and structural engineering, gardening and landscaping, and building construction. Geosynthetics have also become indispensable in particularly sensitive areas such as water engineering or landfill applications. Our modern industrial manufacturing methods enable consistently high quality standards to be maintained and thus provide the basis for technologically reliable and cost-effective construction methods.

The world of geosynthetics covers a multitude of innovative synthetic products used in the construction industry. Depending on the type of application, geosynthetics are used for separating, filtering, protecting, reinforcing, draining, controlling erosion, encasing and sealing. Many products perform several of these functions simultaneously.

Sealing

In civil engineering, “sealing” covers all applications where the flow of liquids or gases from one layer of soil to another needs to be prevented. A sealing layer is always a slightly permeable or impermeable medium that acts as a barrier for a more permeable soil layer.

Sealing layers are predominantly used in landfill construction and water engineering, but are also used in other areas of civil engineering where the groundwater needs to be protected. Typical products in the geosynthetics range include clay liners known as bentonite mats (GBR-C), waterproof polymeric geomembranes (GBR-P) made of various raw materials, and swelling agent geomembranes (QDB).

→ BENTOMAT Geosynthetic Clay Liners (page 18)
→ CONCRETE CANVAS Composite Mats (page 19)

Asphalt reinforcement

Asphalt reinforcement is introduced in the asphalt pavement layers. The reinforcement grids are able to absorb forces in multi-layer asphalt pavements and thus reduce or prevent the propagation of cracks (reflection cracks).

The asphalt inlay absorbs the forces at specific points and distributes them across the grid. This reduces stress peaks and point overloads. Various raw materials are used for these grids, including polypropylene (PP) and polyester (PET), but above all glass. It is important that the products have low elongation, to ensure direct activation of the reinforcement. To simplify installation, many products include a laying aid, such as a non-woven fabric or other types of mesh infill.

→ BEBIT Asphalt Reinforcement (page 15)

Concrete repairs

Concrete repair work is important in the maintenance of existing infrastructure. It involves the restoration of damaged and ageing concrete structures and surfaces. Various methods are used. These range from manual repairs through to injection procedures and overlay solutions aimed at preserving the damaged surface. In the field of geosynthetics, products in the category of concrete mats are used for this purpose.

→ CONCRETE CANVAS Composite Mats (page 19)

Embankment protection

(Steep) slope stabilisation mainly refers to structural stabilisation concepts. These aim to create a composite body of soil and reinforcement elements and thus ensure sufficient stability for the slope.

→ TERRAMESH System Solutions (page 22)

Drainage

In poorly draining soils, drainage measures are required in order to prevent structural and civil engineering components from coming into direct contact with groundwater or to prevent softening of the soil layers. In this case, layers that have higher permeability can be installed to collect the water and drain it away in a targeted manner and, as far as possible, without any loss of pressure. A drainage system capable of maintaining its function in the long term comprises a highly water-permeable seepage layer, made of gravel or geosynthetic drainage elements that drain the water away into the drainage pipes, and a filtering non-woven layer that prevents fine particles from entering the drainage element and causing it to clog.

→ BEDRAIN Drainage Grids (page 16)
→ BEDRAIN Drainage Mats (page 17)

Erosion control

Erosion control or surface erosion protection is a function of geosynthetics that deals with the reduction or prevention of surface erosion. Erosion caused by precipitation and wind can result in severe damage to earth structures, especially in newly constructed embankment areas, but also in weathered or already eroded existing structures. Often the topsoil and parts of the upper layers of the structure are lost.

Existing vegetation provides natural protection against erosion. In new structures, however, there is no vegetation, which is why erosion control mats are often used to bridge the period until vegetation grows.

Erosion control products are usually characterised by a three-dimensional structure and an open surface. They retain the upper soil layers until the vegetation has established itself. For this purpose, both randomly arranged plastic filament mats are used as well as natural products such as jute, straw and coconut.

→ BEMAT Erosion Control Mats (page 20)
→ JUTE-/COCONUT-FIBRE Erosion Control Mats (page 21)

Filter layer

A filter layer is a layer that retains and prevents the flow of water-borne fine particles from the soil or the environment. The filter's aperture width and resistance to mechanical stress must be selected to suit the particular application.

→ BETEX TP Non-woven Fabrics (page 10)
→ BONTEC NW Non-woven Fabrics (page 11)

Protective layer

A protective layer is a layer that is durable and resistant to mechanical stress (especially perforation) and can therefore protect components susceptible to mechanical damage.

→ BETEX TP Non-woven Fabrics (page 10)

Base layer reinforcement

Base layer reinforcement or stabilisation involves the installation of a geosynthetic reinforcement layer (e.g. geogrid, geocomposite or geotextile) in the unbound base layers of a road pavement.

The stresses from the vertical traffic loading are transferred to the horizontal reinforcement material via the frictional bond between the geogrid and the sub-base material. Complete interlocking is the key to effective force transmission.

Woven, laid and raschel knitted grids have a different mode of action than stretched grids. Laid, woven and raschel knitted grids distribute the tensile stresses over the entire area of the grid, i.e. produce a kind of membrane effect. The rigid-node structure allows stretched geogrids to achieve a friction-locked bond with the base layer material. At the same time, the grids have a load-distributing effect, since their stiff ribs distribute the load over a larger area.

→ BEGRID TG Geogrids (page 12)
→ BEGRID FLEX Geogrids (page 13)
→ BEFORCE Woven Geotextile (Page 14)

Separating layer

A separating layer is a layer that separates two different soil types from each other and prevents the exchange of fine particles or physical mixing between the two.

→ BETEX TP Non-woven Fabrics (page 10)
→ BONTEC NW Non-woven Fabrics (page 11)

GEOSYNTHETICS
Product range

Our complete range includes the most widely used geosynthetics, such as non-woven fabrics, woven geotextiles, geogrids, asphalt reinforcement grids, drainage mats, drainage grids, erosion control mats, geosynthetic clay liners and polymeric geomembranes. In addition to these, we offer other specialised products such as composite materials, geocells etc. Our range of services also includes the implementation of customised solutions.

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BETEX TP
Non-woven Fabrics

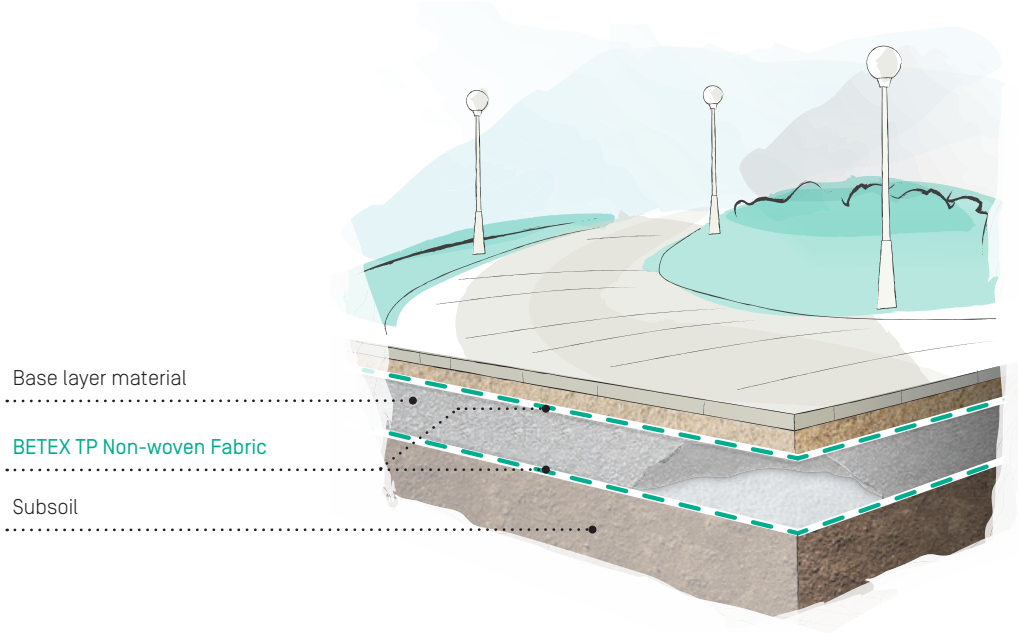
SEPARATION

FILTRATION

PROTECTION

The mechanically bonded Betex TP Non-woven Fabrics made of polypropylene staple fibres (PP) offer engineering solutions for an extremely wide range of applications in civil engineering, road construction, gardening and landscaping.
Betex TP Non-woven Fabrics act as filtering, separating and protective layers.

When used as filters in drainage systems in earthworks, they prevent the migration of fine soil particles. As a separating layer, BETEX TP Non-woven Fabrics prevent individual layers of soil from mixing. Heavier weight BETEX TP Non-woven Fabrics are used to protect sealing layers or pipes from mechanical damage. Non-woven fabrics can also be used to drain small quantities of water away at the geotextile level.

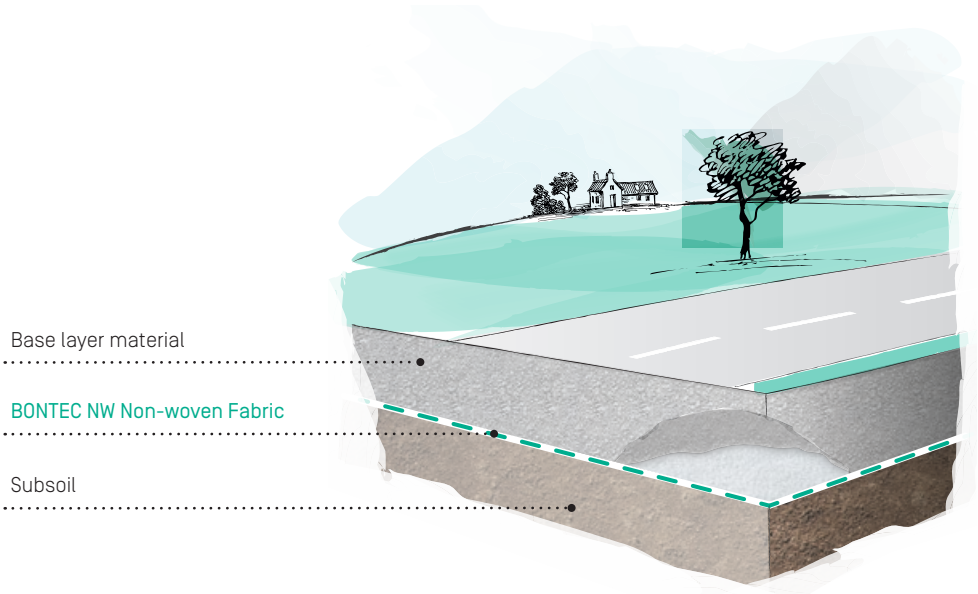


BONTEC NW
Non-woven Fabrics

SEPARATION FILTRATION

BONTEC NW Non-woven Fabrics are manufactured from high-quality polypropylene (PP) spun fibres. The fabric is mechanically bonded and thermally treated to produce geotextiles that comply with robustness classes GRK 3 to 5. Thanks to their outstanding mechanical and hydraulic properties, BONTEC NW Non-woven Fabrics meet the exacting requirements placed on geotextile filtration, separation and protection layers for use in civil engineering, road construction and transport infrastructure.

In addition, the thermal surface treatment of BONTEC NW Non-woven Fabrics results in particularly compact package dimensions. Existing storage space can be used much more effectively and transport costs are optimised.



BEGRID TG
Geogrids

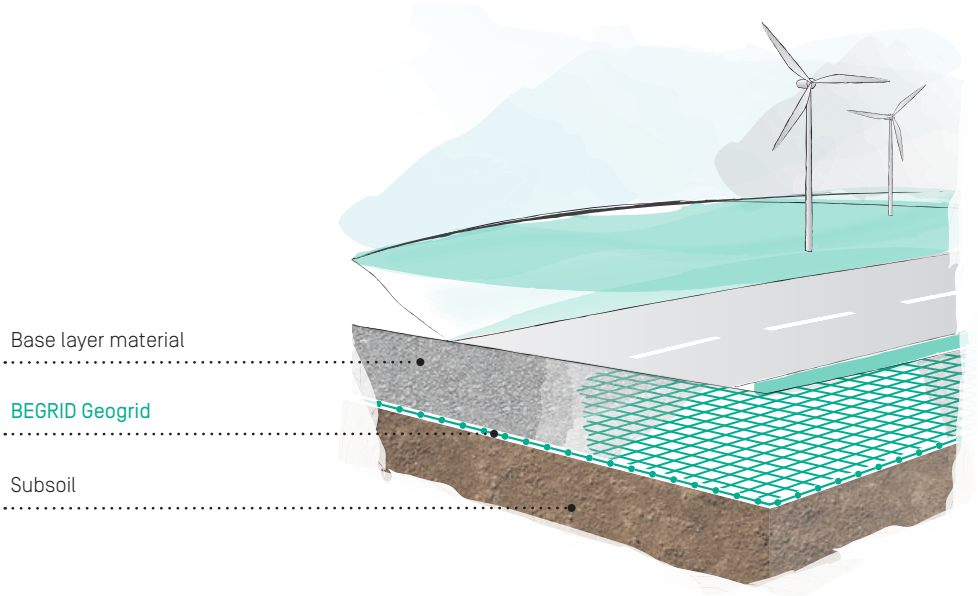
REINFORCE-
MENT

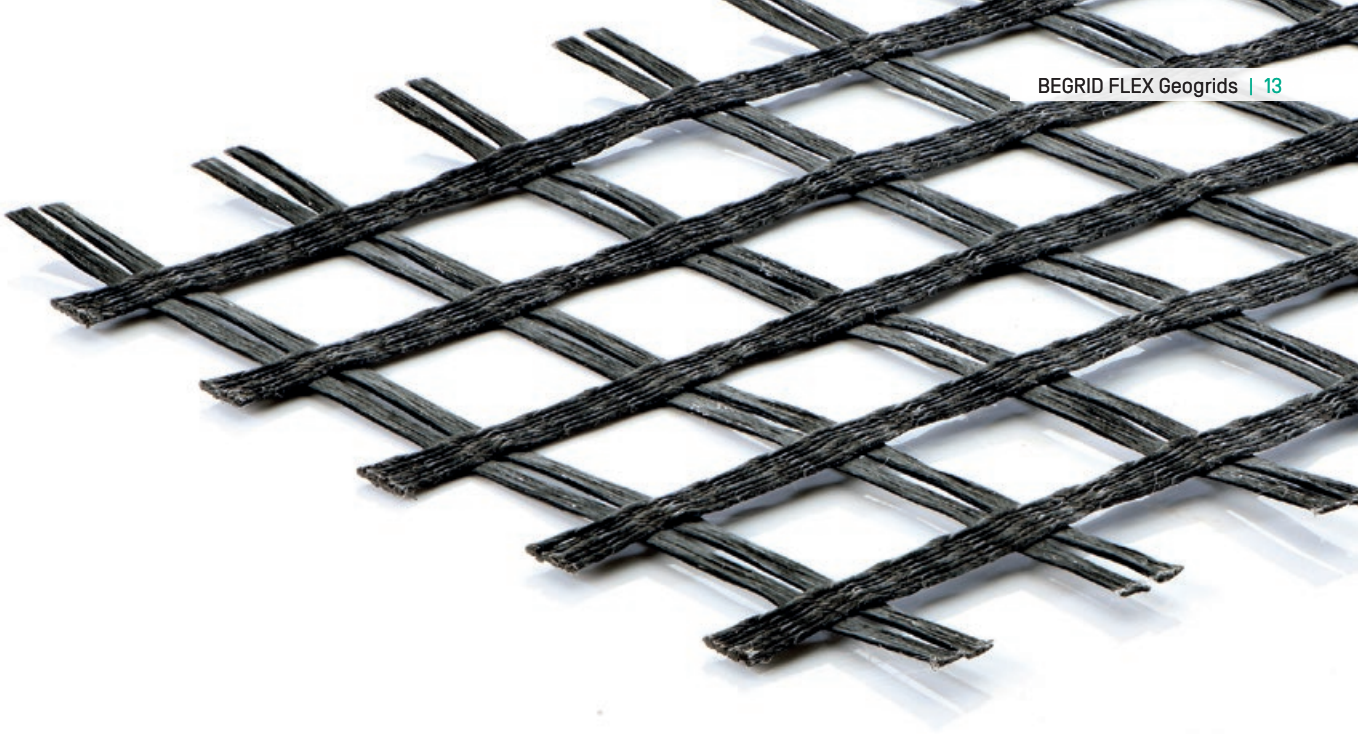
SEPARATION

FILTRATION

Also available as BEGRID TGV (geogrid with non-woven fabric) to perform the functions of reinforcement, separation and filtration in a single product.

The geogrids in the BEGRID TG range are made of high-quality polypropylene (PP). They are monolithic, biaxially stretched and have rigid nodes. This structure makes BEGRID Geogrids extremely robust and resilient. The aperture widths of the geogrids are designed to ensure that the grains of commonly used sub-base materials interlock in the grid openings and are thus kept securely in position. This interaction between the BEGRID TG Geogrids and the sub-base material creates a practically homogeneous unit, through which externally acting loads are distributed and transferred over a large area. BEGRID TG Geogrids are particularly suitable for providing base layer reinforcement that allows simple and cost-effective construction on subsoils that have a low load-bearing capacity. Conventional soil replacement measures can thus be reduced or even completely eliminated.



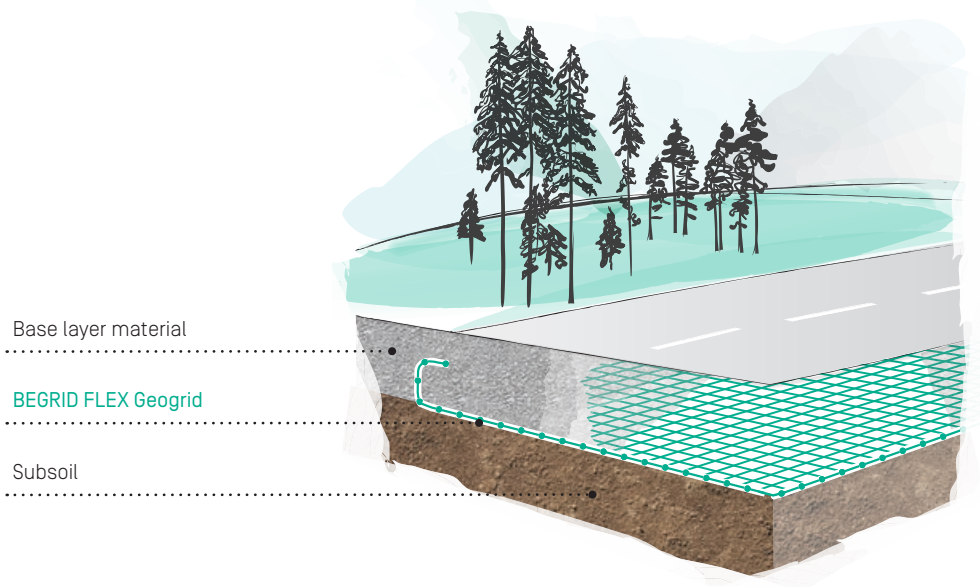


BEGRID FLEX
Geogrids

REINFORCE-
MENT

Woven geogrids made of low-creep polyester yarns are used in situations where the construction of durable solutions using conventional earthwork methods would not be feasible or would only be possible at great expense.

The flexible geogrids are particularly suitable for reinforcing retaining structures (geosynthetic-reinforced earth systems) and steep slopes, for constructing back-tied interlocking concrete-block walls, for reinforcing the base layer of roads, and for reinforcing the foundations of dam structures. BEGRID FLEX Geogrids are thus a safe and reliable solution for many applications where soils need to be reinforced. Thanks to their rapid installation, BEGRID FLEX Geogrids enable short construction times and thus provide the basis for technically optimal and extremely economical construction methods.



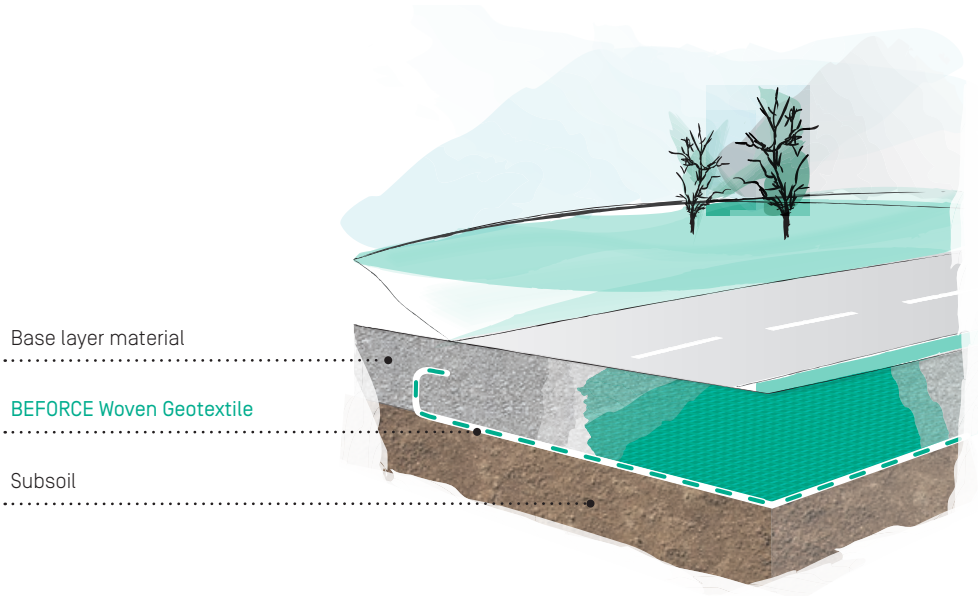
BEFORCE
Woven Geotextiles

SEPARATION

REINFORCE-MENT

BEFORCE Woven Geotextiles are used wherever soil reinforcement is required in addition to separating and filtering. These woven tape fabrics are the preferred option for surface stabilisation and for increasing load-bearing capacities in highway and traffic route construction.

Since BEFORCE Woven Geotextiles combine the functions of separating and reinforcing in a single product, they offer a cost-effective solution when it comes to creating a stable foundation for bound and unbound base layers.



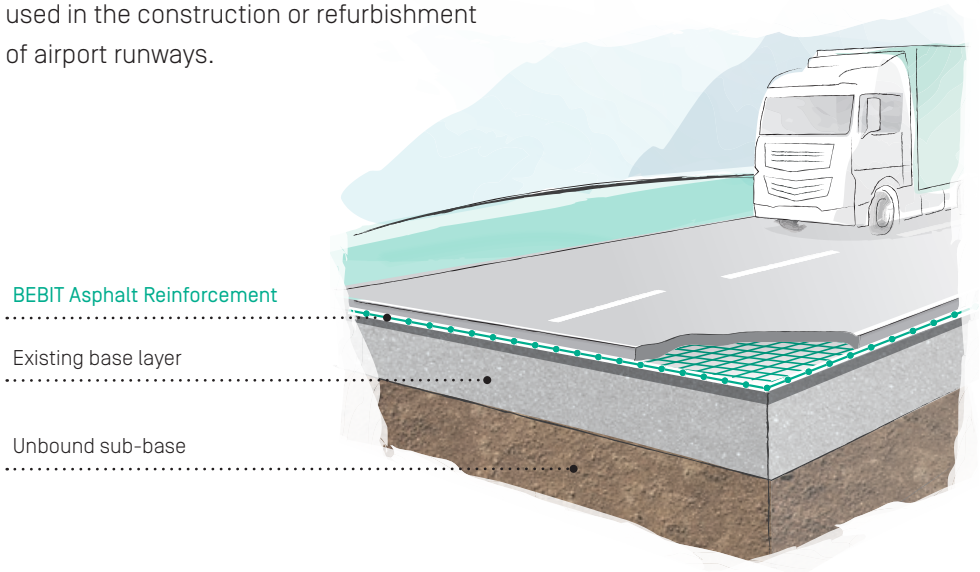
BEBIT
Asphalt Reinforcement

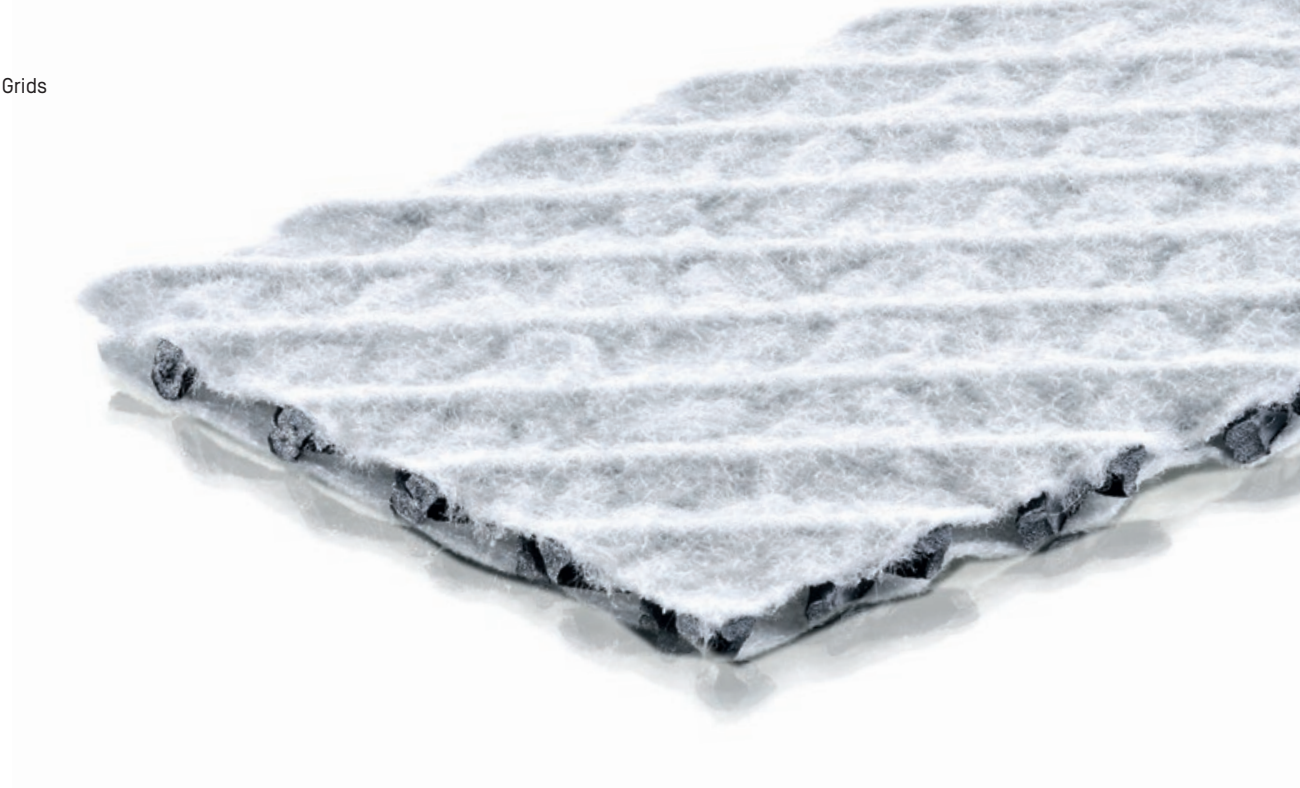
REINFORCE-
MENT

As a result of high traffic loads, moisture, freeze-thaw cycles, and expansion and shrinkage caused by temperature changes, asphalt roads suffer extensive damage in the form of reflection cracks, wheel ruts and potholes. BEBIT Asphalt Reinforcement Grids have proven effective, over the course of many years, in preventing such damage in the long term.

BEBIT Asphalt Reinforcement Grids are high-tensile, flexible grids made of glass fibres that have a melting point higher than 850°C. Their low elongation allows them to absorb stresses occurring within the asphalt pavement at an early stage and to distribute them across a large area.

The main areas of application are road surface reinforcement, road widening, road reinstatement and wheel rut reduction. The grids are also used in the construction or refurbishment of airport runways.





BEDRAIN
Drainage Grids

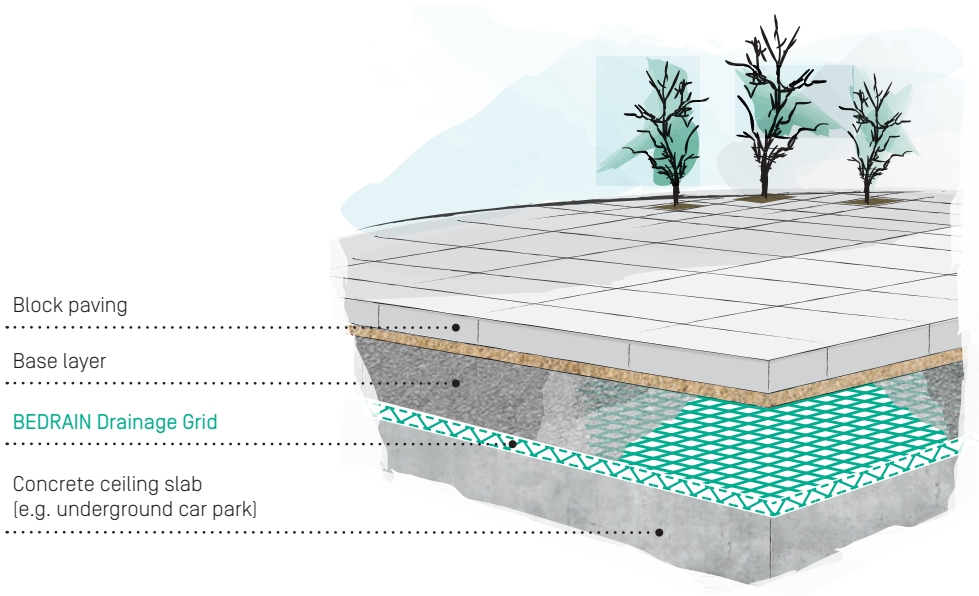
DRAINAGE

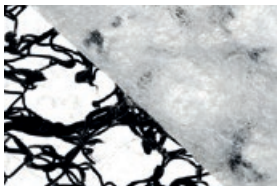
FILTRATION

PROTECTION

BEDRAIN Drainage Grids are pressure-resistant drainage grids made of high-density polyethylene (HDPE) with a non-woven fabric bonded on one or both sides, specifically for use in drainage applications under high compressive loading. The drainage capacity is only slightly reduced even under high loading. The material is also characterised by its high fracture resistance and tear resistance with low elongation.

The high performance of BEDRAIN Drainage Grids makes them especially effective in drainage applications where height restrictions apply, such as multi-storey car parks, green spaces above underground car parks, and under patios and paved areas. Other applications include landfill sites, retaining structures, bridge abutments and foundation wall protection.





BEDRAIN
Drainage Mats

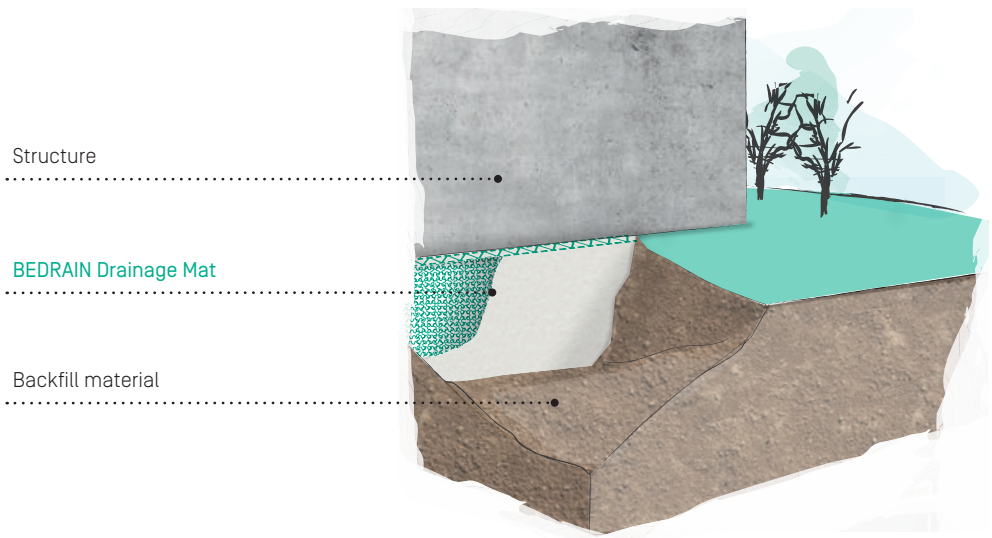
DRAINAGE

FILTRATION

PROTECTION

The core of BEDRAIN Drainage Mats comprises a three-dimensional random arrangement of polypropylene (PP) monofilaments. A sheet of high-quality non-woven geotextile is bonded to one or both sides of this core to ensure long-term filter performance. The non-woven fabrics are bonded to the filament core across the entire surface.

The long-term stability of the mat under loading is ensured by the special structure of the drainage core. The high void ratio and the bonded non-woven geotextile make BEDRAIN Drainage Mats suitable for both vertical and horizontal drainage applications. BEDRAIN Drainage Mats are used to drain water from structures that are in contact with the soil, for surface drainage, in green roof systems, for foundation wall protection and in landfill and tunnel construction.



BENTOMAT
Geosynthetic Clay Liners

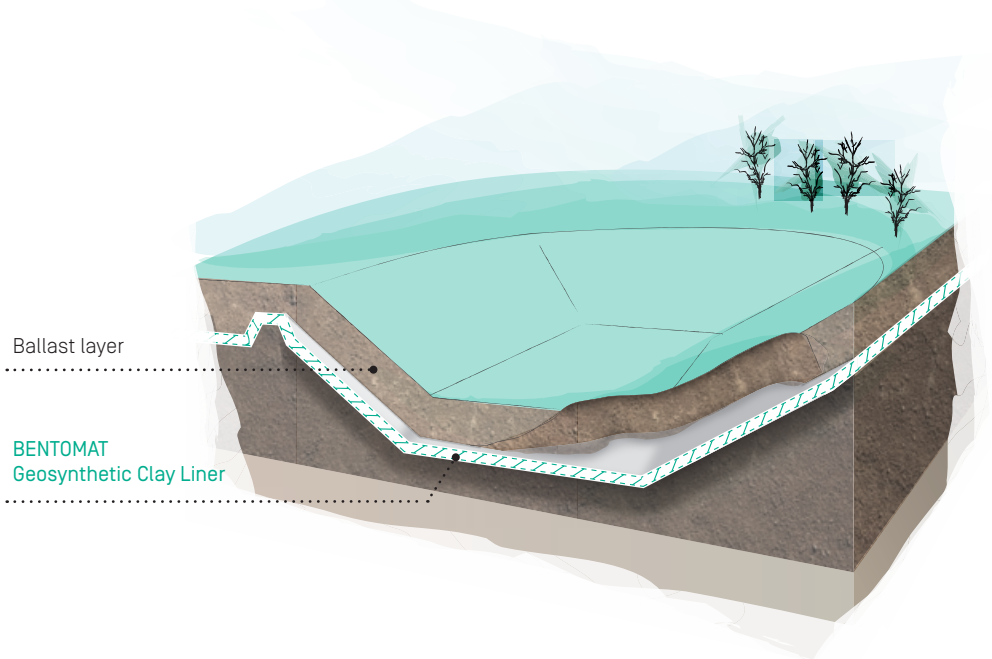
SEALING

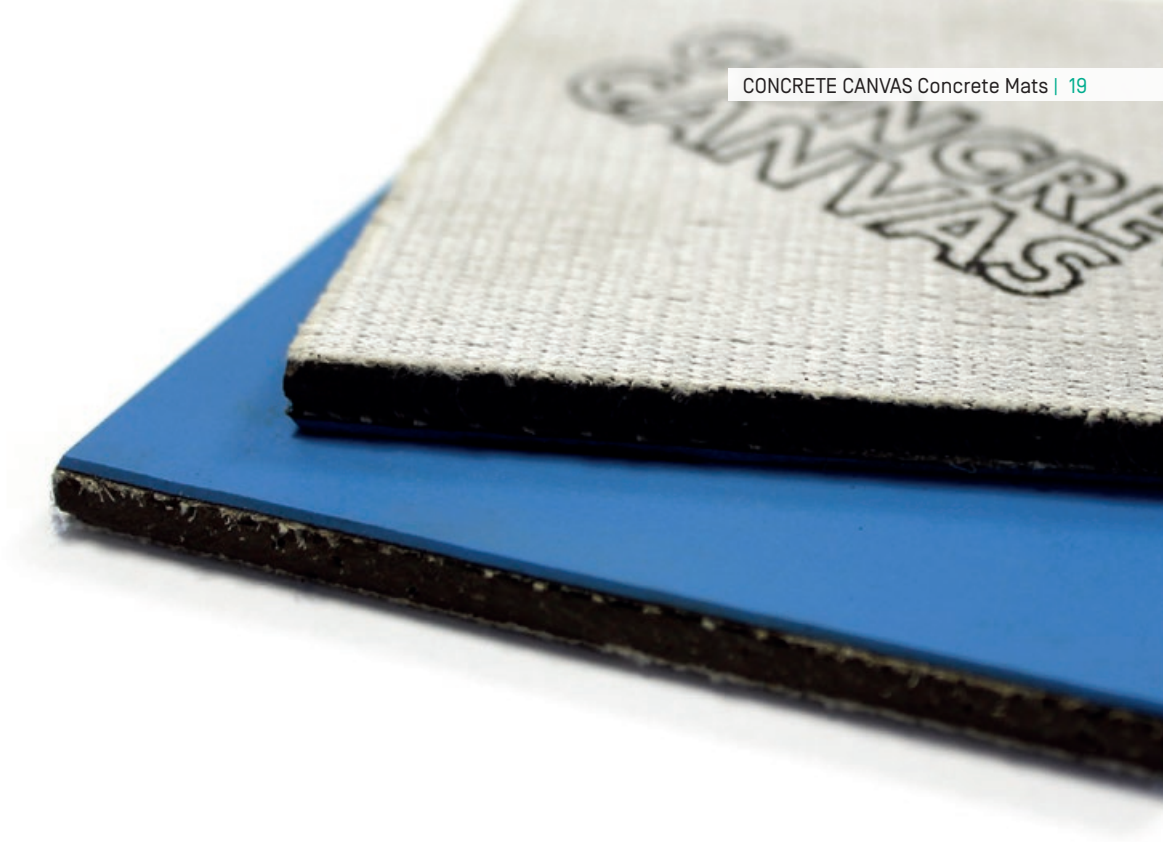
Also available as BENTOMAT CL with a bonded geomembrane

Bentonite mats (geosynthetic clay liners – GCL) are geotextile composites that have been in use for many years as a successful natural sealing method.

BENTOMAT Liners are normally made up of three components: geotextile top layer – bentonite granules – geotextile base layer. All BENTOMAT Geosynthetic Clay Liners are mechanically bonded by needle-punching over their entire area to create a homogeneous product.

BENTOMAT Geosynthetic Clay Liners are used in landfill construction, tank installations, water engineering, lakes and ponds, road construction, dyke structures, dam construction and rainwater retention basins.





CONCRETE CANVAS
Composite Mats

SEALING

EROSION PROTECTION

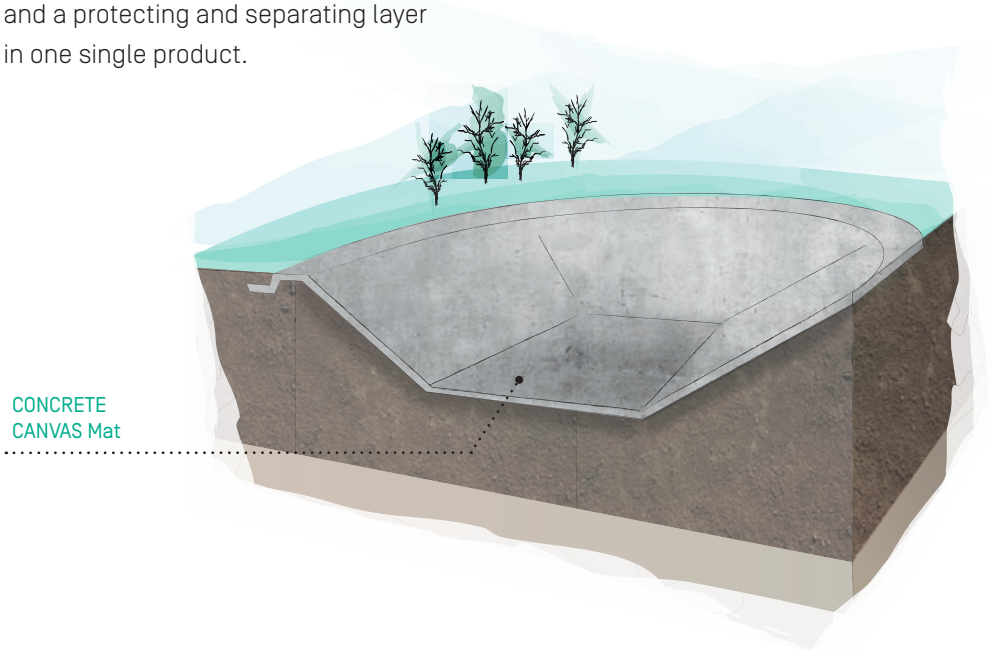
PROTECTION

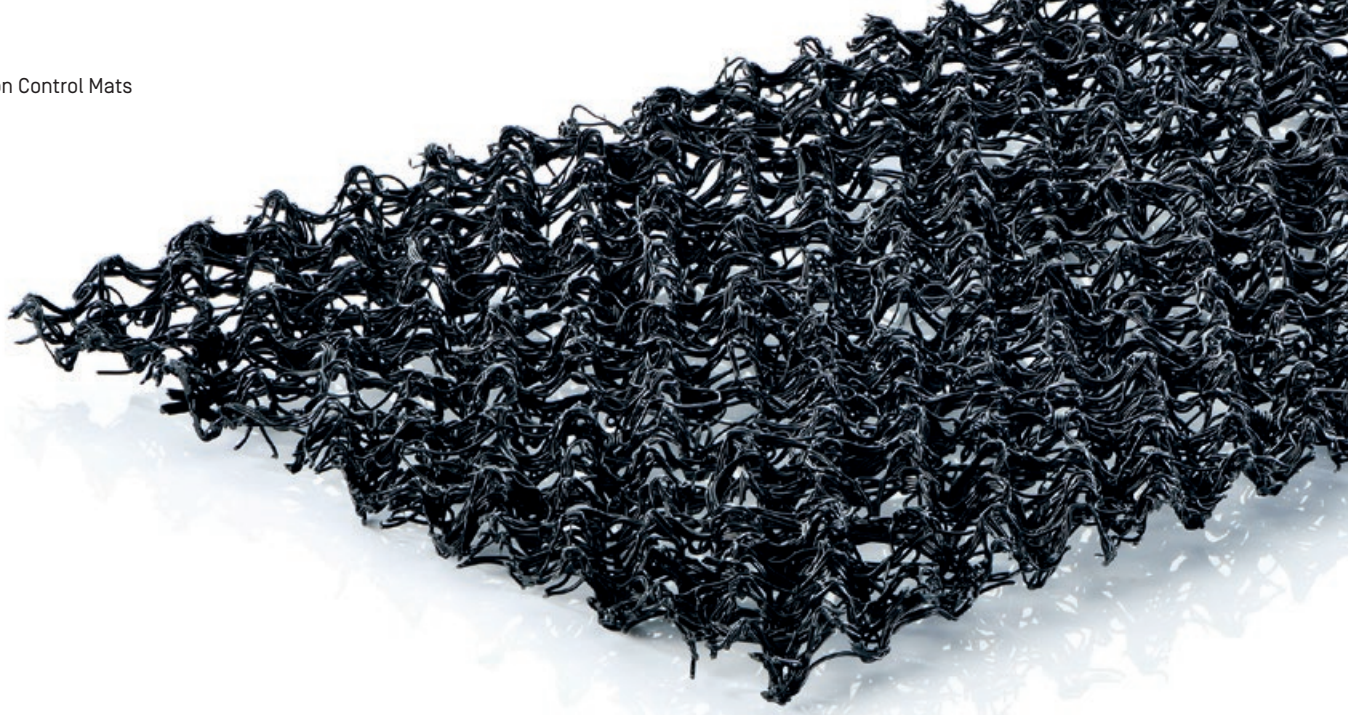
VEGETATION SUPPRESSION

Also available as CONCRETE CANVAS HYDRO with an additional bonded sealing membrane

CONCRETE CANVAS mats are flexible composite mats made up of various components. The mat has a water-permeable top layer, comprising a woven polyester geotextile, and a water-impermeable base layer with a PVC coating. Between these layers lies a dry concrete mix embedded in a fibre matrix. A special processing technique is used to keep the concrete mix in place.

The concrete composite thus combines the advantages of geosynthetics with the robust properties of concrete. After the mat has been watered, the product hardens, achieving 80 % hardness within 24 hours. The resulting concrete surface is characterised by excellent robustness and good resistance to abrasion, fire and root penetration. CONCRETE CANVAS combines erosion protection, sealing, and a protecting and separating layer in one single product.



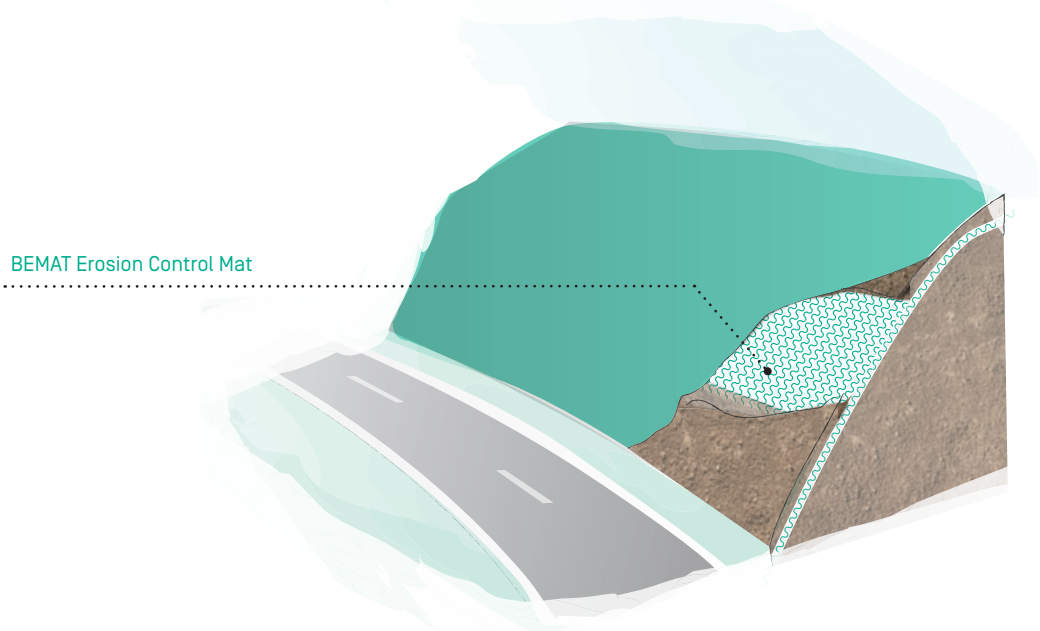


BEMAT
Erosion Control Mats

EROSION PROTECTION

BEMAT Erosion Control Mats are three-dimensional mats comprising a core made from randomly arranged UV-resistant polypropylene (PP) monofilaments. BEMAT Erosion Control Mats are used wherever the growth of permanent, thick vegetation cannot be ensured and where a rot-proof erosion control system is therefore required.

In the early stages of vegetation growth, the mats prevent erosion channels from forming, since they fix the soil in place and secure it as far as possible against leaching. In order to ensure stability on very long or steep slopes, erosion control mats with an inlaid geogrid have been developed to absorb the tensile forces.

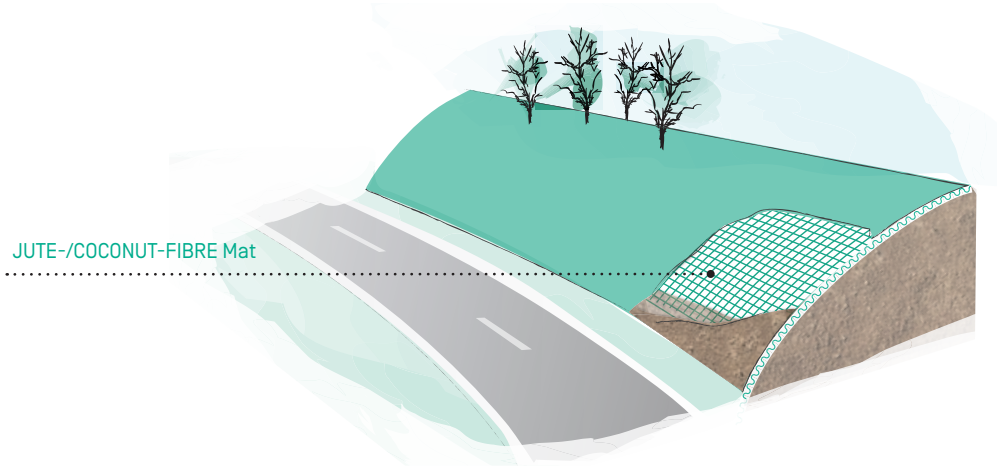


JUTE-/COCONUT-FIBRE
Erosion Control Mats

EROSION PROTECTION

JUTE- and COCONUT-FIBRE Mats are natural erosion control mats. The grid structure made of 100 % jute or coconut fibres ensures the reliable growth of permanent vegetation on embankments, river banks and shore areas. The mats provide effective protection against the undesirable erosion of soil, caused by the effects of wind and water, until a natural erosion protection layer of vegetation has established itself. The temperature variations that are harmful to seeds are evened out by the JUTE- and COCONUT-FIBRE Mats, and this has a positive influence on germination. The mats also store water and thus prevent the soil from drying out.

JUTE- and COCONUT-FIBRE Mats are completely biodegradable and have a service life of one to two years (JUTE-FIBRE Mats) or three to five years (COCNUT-FIBRE Mats) depending on the environmental and weather conditions.



TERRAMESH

Steep Slope Protection Systems

EROSION PROTECTION

Geosynthetic-reinforced earth systems provide an ecological and economical option for the construction of embankments with attractive facings.

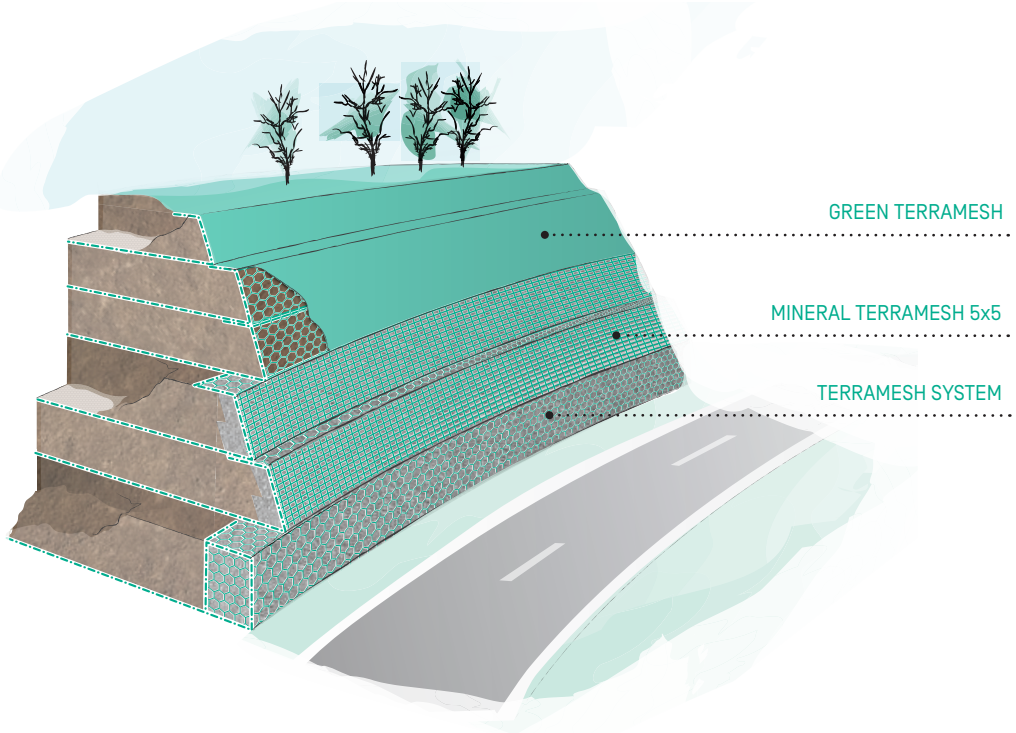
Because the TERRAMESH systems are pre-assembled, rapid progress is made on site, with minimal deployment of personnel and machinery.
The elements are so easy to handle that they can be installed easily and cost-effectively even in locations where access is difficult.

GREEN TERRAMESH – the rear-anchored steep slope reinforcement system that is suitable for planting: The system is installed using the fold-over principle. The steel wire mesh encases the layer of soil laid on top of it. For inclinations up to 70°.

MINERAL TERRAMESH 5x5 – the rear-anchored steep slope reinforcement system that is filled with stone. For inclinations up to 85°.

TERRAMESH SYSTEM – back-tied gabions: Here, the steel wire mesh forms the rear-anchored tail, the base, facing and lid of the gabions. For inclinations up to 90°.

TERRAMESH DUO – the system solution that has fold-up facing elements on both sides and is laid in layers to create a wall. For inclinations up to 80°.



GEOSYNTHETICS
The advantages

- → Geosynthetics – environmentally-friendly and resource-conserving
- → Durable and robust materials
- → Inexpensive and economical solutions
- → Time savings and shorter construction times
- → Project-specific consulting
- → Customised solutions for your project

We are happy to supply current data sheets, specifications, certificates and technical verifications on request.
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