



# ENKA<sup>®</sup> SOLUTIONS

PRODUCT OVERVIEW

High Performance Geosynthetics



<b>Enka Solutions values</b>	<b>5</b>	<b>Drainage composites</b>	<b>30</b>
<b>Three-dimensional mats</b>	<b>6</b>	Enkadrain	32
Enkamat	8	Enkadrain Wide	34
Enkamat W	10	Enkadrain CK	36
Enkamat J	12	Colbondrain	38
Enkamat A20	14	<b>Geotextiles and special engineered products</b>	<b>40</b>
Enkamat R	16	Enka-Tex woven	42
<b>Geogrids</b>	<b>18</b>	Enka-Tex nonwoven	44
Enkagrid PRO	20	Enka-Force	46
Enkagrid MAX	22	Enka-Fix	48
Enkagrid G and M	24	Enka-Mattress	50
Enkagrid PLUS G and M	26	Enka-D-Tube	52
Enkagrid TRC	28	<b>Addresses and Low &amp; Bonar info</b>	<b>56</b>



# Engineering Nature

**Three fundamental values underpin Enka Solutions: expertise, reliability and responsibility.**

## **Expertise**

We began creating our knowledge and expertise base on our products and the industry way back in the 1950s, which means that today we have a multitude of project references worldwide. Coupled with extensive research conducted internally and externally with renowned universities and specialist organisations, our Research, Development and Innovation team is constantly working in conjunction with clients all over the world to develop new solutions to add to our range of products and applications. Our team of experienced engineers providing support across all market segments adds to this to make the numerous innovative solutions come into fruition. We see expertise both as the foundation of our business and as an ongoing process. Building on our already long-standing expertise is work that is never done.

## **Reliability**

It's our daily mission to be a reliable partner for our customers in order for them to grow their business in a sustainable way. Reliability covers a range of different areas and ensures peace of mind for our partners. As well as our wide, high quality product range, we offer technical and marketing support for all market segments. All our processes are ISO 9001 certified and every single

product is tested by our highly qualified laboratory staff. Furthermore, we hold specific product certifications in many different countries (e.g. Asqual, NorGeoSPec, Benor, HPQ, and BBA). Delivering what we promise is part of our nature.

## **Responsibility**

We take our responsibilities seriously. This is why you can also rely on our solutions being sustainable. We not only examine the full product lifecycle and its impact on the environment to make continual improvements in terms of environment, nature and soil, but also ensure we meet all legal requirements. We train and advise clients and stakeholders, and contribute to the establishment of new standards to help propel our entire industry forward into the future. It will therefore come as no surprise that safety is also a high priority for Enka Solutions. Safety is inherent to all our solutions and products, as part of our responsibility to care both for the people who use them on building sites, and our employees.

These values that are the core of Enka Solutions are reflected in our statement 'Engineering Nature', because not only is engineering in our nature, we also see ourselves as engineers delivering reliable solutions that respect nature.



# Three-dimensional mats

When naturally growing vegetation alone cannot prevent erosion, a three-dimensional open structure mat like Enkamat is the solution. The use of well-rooted grass for erosion control is a natural and attractive idea. But natural vegetation on its own has limited soil retention qualities. When there is a high risk of erosion, grass and other vegetation will be ruled out. With the help of Enkamat, vegetation can withstand these risks. Green and permanent solutions are thus created for places where otherwise erosion would have its way.

## Solid erosion protection

Enkamat is a strong three-dimensional polyamide (PA) mat with an open structure. It functions as a protective, reinforcing and integrated intermediate layer between natural vegetation and soil, enabling root systems to grow and gain a secure hold on the ground beneath.

## Always the right solution

Enkamat can be used effectively in many situations. Whether erosion control is required above, at, or below the water level or on dry slopes, a suitable Enkamat variant is available for any condition. Enkamat is also used as a grip layer to stabilize soil on rocky slopes or on smooth surfaces such as geomembranes.

## Why is Enkamat such a good solution for erosion related problems?

- Integrated and robust system
- Durable and environmentally friendly
- Immediate protection against erosion
- Fast growth of vegetation
- Easy to install
- Wide choice of thicknesses and structures
- No maintenance needed
- Economic in labor and material

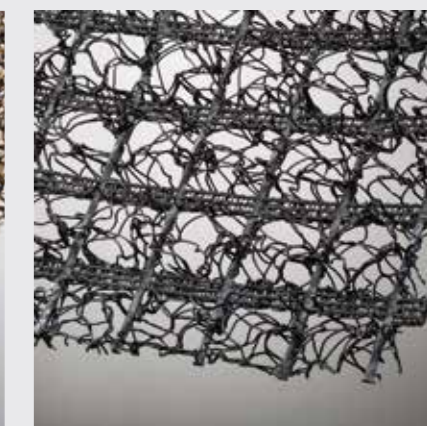
Enkamat®



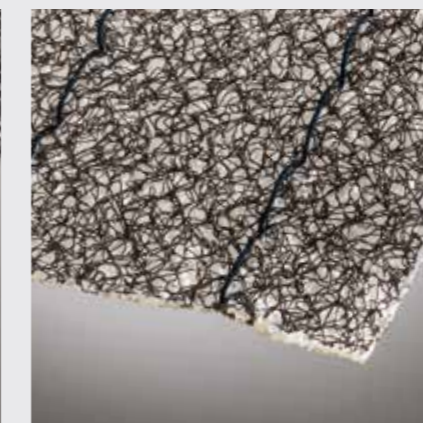
Enkamat® J



Enkamat® R



Enkamat® A20



Enkamat® W

## Enkamat product range

### Enkamat

- Structure – open top and bottom
- Particularly suitable for dry slopes
- Prevents soil erosion by wind and rain
- Up to 20 mm thick
- Creates artificial root structure, up to 2,980 m filament/m<sup>2</sup>

### Enkamat J

- Structure – open Enkamat sewn to a biodegradable backing
- Suitable for dry slopes where severe hydraulic loadings are expected within 3 to 4 months
- Prevents soil erosion by wind and rain – offers immediate protection for early hydraulic loadings
- Up to 10 mm thick
- Creates artificial root structure up to 1,810 m filament/m<sup>2</sup>

### Enkamat A20

- Structure – prefilled with a bitumen bound mineral filter of stone chippings
- Suitable for surfaces permanently subjected to water impact
- Offers immediate erosion protection from high velocities and small wave attack
- 22 mm thick, weight 20 kg/m<sup>2</sup>
- Water permeability of 30 mm/s at 100 mm head

### Enkamat W

- Structure – open Enkamat sewn to a reinforcing grid or woven fabric
- Suitable for slopes covered with a geomembrane and for steep and/ or rocky slopes
- Stabilizes soil and vegetation cover, stops weathering of slopes

- Up to 20 mm thick
- Up to 200 kN/m

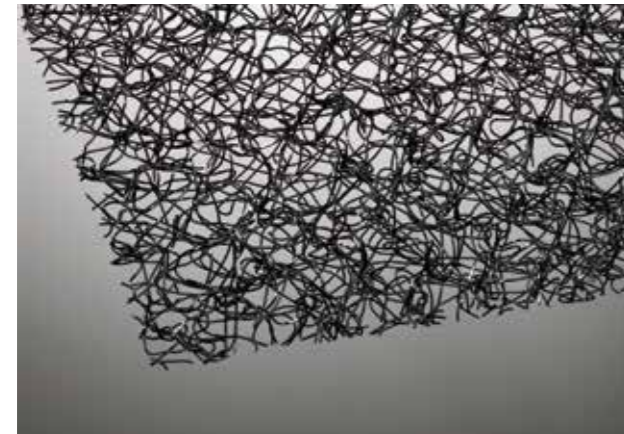
### Enkamat R

- Structure – open Enkamat fully integrated with a flexible high modulus polyester geogrid.
- Suitable to be used as reinforced griplayer to fix a layer of soil on waterproof liners of waste disposals, stormwater storage reservoirs, etc.
- Stabilizes soil and vegetation cover, stops weathering of slopes

# Enkamat®

## 3-dimensional mat for erosion control

Enkamat is a three-dimensional polyamide mat with an open structure. It prevents erosion on embankments, slopes and river banks, canals and reservoirs.



Enkamat functions as a protective reinforcing and integrated intermediate layer between natural vegetation and soil. It provides protection above and below the waterline thereby creating a permanent solution. Either seeded, filled with topsoil or mulched, Enkamat keeps the fertile soil in place and prevents the fill from being washed out. Vegetation soon establishes itself with root systems that are reinforced by Enkamat's special mat structure. Enkamat can be used in many areas where erosion takes place, such as watercourses, embankments, slopes and spillways.

Enkamat is available as an open mat for dry slopes, or as a 'flatback' mat (with a flattened underside) for wet slopes and for use below the waterline.

### Technical details

Enkamat is a strong, three-dimensional mat with an open structure, made from high quality polyamide (PA) monofilaments which are welded where they cross. It is available in thicknesses up to 20 mm. Enkamat is produced in rolls up to 4 m wide. It is also available with a 'flatback' for use with stone chip fill where it is permanently submerged below the water level. Enkamat creates an artificial root structure by its high filament density – up to 2,980 m filaments per m<sup>2</sup>.

Enkamat has been tested by many independent organisations.



### Functions

- Erosion control

### Application areas

- Lakes, river embankments, watercourses and secondary coastal applications
- Protection of new or repaired dry slope embankments
- Spillways

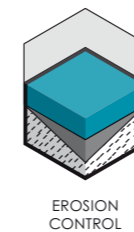
- A stabilisation grip layer on rocky slopes, smooth surfaces and geomembranes

### Features and benefits

- A permanent and green solution
- Open structure encourages swift vegetation growth
- Reinforces vegetation root systems
- Blends discretely into the landscape

- Remains locked to the ground by root systems
- Adapts easily to soil profiles
- Excellent bonding of individual filaments
- Over 90% voids
- Light, flexible and does not float in water
- High UV resistance
- Maintenance free

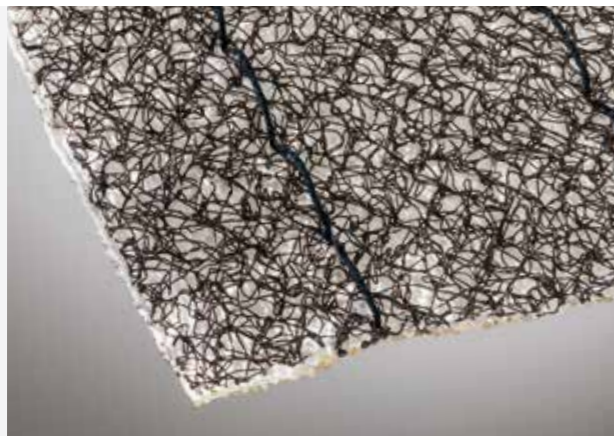
### Product functions



# Enkamat® W

3-dimensional mat backed with woven fabric for erosion control

Enkamat W is a three-dimensional polyamide mat sewn to a reinforcing woven fabric, created for the stabilisation of soil and vegetation on steep or rocky slopes, geomembranes or geosynthetic clay liners.



On steep and rocky slopes, Enkamat W functions as a grip layer in which soil is retained and seeds germinate easily. Enkamat W is pinned to ensure close contact with the ground.

### Smooth surfaces

Where geomembranes are used to cap landfills and line retention ponds or reservoirs, they need to be protected against UV and mechanical damage, usually by a layer of soil which is then vegetated. However, the friction between a smooth geomembrane and soil is too low, allowing the soil to slide off easily. In such cases, Enkamat W will provide the necessary friction and anchorage. A vegetation layer can then be established in areas where this would otherwise have been impossible.

### Technical details

Enkamat W is a three-dimensional, open structured polyamide mat which is sewn to a woven fabric reinforcement and is available in different strengths. Enkamat W is available up to 20 mm thick with tensile strengths up to 200 kN/m. The product can also be used with hydroseeding on steep slopes.

### Functions

- Erosion control
- Grip layer
- Protection

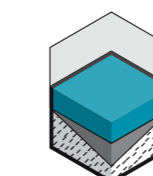
### Application areas

- Rocky slopes
- Steep slopes
- Geomembranes
- Geosynthetic clay liners

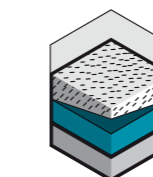
### Features and benefits

- Prevents soil from sliding on geomembranes
- Stabilizes weathering slopes
- No maintenance needed
- Used with hydroseeding on steep slopes
- An integrated and robust solution
- Open structure encourages fast vegetation growth
- Follows contours of uneven slopes
- Light and flexible
- High UV resistance

### Product functions



EROSION CONTROL



GRIP LAYER



# Enkamat® J

3-dimensional mat backed with biodegradable geotextile for immediate erosion control

Enkamat J is a three-dimensional polyamide mat with an open structure sewn to a biodegradable geotextile fabric. Enkamat J is used to prevent erosion on embankments, slopes and river banks.



Enkamat J retains the fertile soil by preventing rills forming in the soil structure and therefore allowing the vegetation to establish quickly. In this way the product provides immediate protection while also permanently reinforcing the root systems of the vegetation. On dry slopes, it provides immediate protection against erosion caused by rainfall and protection against hydraulic flow after vegetation is established.

### Technical details

Enkamat J is a three-dimensional mat made from high quality polyamide (PA) with an open structure. It is sewn to a biodegradable geotextile.

The three-dimensional mat of Enkamat J is 10 mm thick, creating an artificial root structure up to 1,810 m filaments per m<sup>2</sup>.



### Functions

- Immediate erosion protection
- Permanent erosion control
- Stabilisation

### Application areas

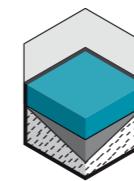
- Dry slopes
- Rocky slopes and surfaces
- Protection of new or repaired (river) embankments
- Road and railway embankments

### Features and benefits

- Permanent and green solution
- Immediate protection
- Prevents rills forming thus stopping erosion on slopes
- Prevents washout of soil allowing roots to establish
- Improves vegetation growth
- Flexibility allows close contact with the soil profile
- Product is locked to the ground by the root structure

- Blends unobtrusively into the landscape
- Lightweight, easy to install
- Maintenance free

### Product functions



EROSION CONTROL



# Enkamat® A20

3-dimensional mat filled with stone chippings for areas exposed to water

Enkamat A20 is a three-dimensional polyamide mat with an open structure prefilled with a bitumen bound mineral filter of stone chippings.



When laid on grass seeded soil slopes which are exposed to water, Enkamat A20 provides a permanent solution to issues caused by hydraulic stress in areas where natural erosion would otherwise have prevailed. The product allows the area to become fully vegetated with the appearance of a grass channel. Enkamat A20 offers immediate erosion protection from high water velocities and small wave attack.

## Technical details

Enkamat A20 is a strong, three-dimensional mat made from high quality polyamide (PA) with an open structure consisting of looped filaments welded where they cross. It is filled with a bitumen bound mineral filter of stone chippings of 2-6 mm.

Enkamat A20 is 22 mm thick, with a weight of 20 kg/m<sup>2</sup>. Water permeability is 30 mm/s at 100 mm head.



## Functions

- Erosion protection of water banks

## Application areas

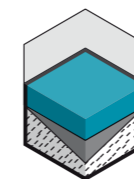
- Riverbanks
- Lakes
- Canals
- Reservoirs
- Channels
- Dykes
- Overflow protection zones
- Culverts

- Other surfaces permanently subjected to water impact

## Features and benefits

- A permanent solution
- Reinforces vegetation root systems
- Resists high water velocities
- Ensures no hydrostatic pressure build-up behind the protected slopes
- Faster to install than traditional protection systems
- An integrated and robust erosion solution
- Enables root systems to grow and green shoots to sprout through the mat
- Flexible, easily following the profile of the ground surface
- Ensures a natural aesthetic appearance
- No maintenance necessary
- Firmly locked to the ground by the root system

## Product functions



EROSION CONTROL

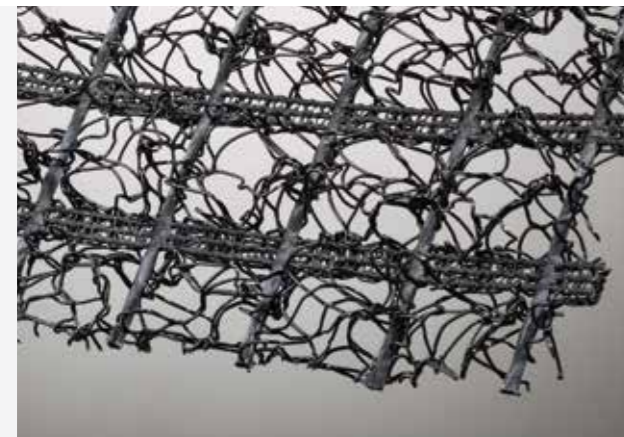




# Enkamat® R

## Grid reinforced 3-dimensional erosion control mat

Enkamat R is a unitized high-performance geosynthetic that incorporates a high tenacity polyester geogrid within the entangled filaments of the three-dimensional polyamide erosion control mat.



Enkamat R can be custom made to provide various levels of reinforcement to meet any design requirement but as standard is manufactured as R45 utilizing a 45 kN/m high tenacity polyester geogrid. Enkamat R is appropriate in many areas that are subject to erosion, such as stormwater channels, watercourses, embankments, steep slopes and spillways.

### Technical details

Enkamat is a strong, three-dimensional mat with an open structure, made from high quality polyamide (PA)

monofilaments which are thermally fused where they cross. Our breakthrough manufacturing process integrates the high-tenacity polyester geogrid within the thermally fused and entangled filaments to create a homogeneous three-dimensional structure – no loose fibers, threads or netting. Enkamat R creates an artificial root structure by its high filament density, up to 2,980 m filaments per m<sup>2</sup>. When fully vegetated Enkamat R has been tested to the extreme resulting in proven performance, resisting shear stresses of 0.96 kN/m<sup>2</sup> and flow velocities exceeding 6.1 m/s.



### Functions

- Erosion control
- Grip layer
- Superior and extreme turf reinforcement

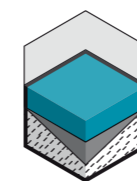
### Application areas

- Canal and shoreline protection
- Repair of slope failures
- Levee armoring
- Steep slope and channel stabilisation

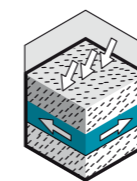
### Features and benefits

- A permanent and green solution
- Remains anchored by reinforced root system
- Provides maximum reinforcement at low elongations
- Withstands wheel loading and resists burrowing animals
- Unparalleled resistance to hydraulic shear stresses
- Withstands high flow velocities
- Ideal for designs using percussive driven earth anchors
- Over 90% open volume
- Robust reinforcement of vegetative root system
- Open structure enhances vegetation emergence
- Blends discretely into the local environment
- Flexible to adapt to any soil profile
- Remains locked to the ground by root systems
- Specific gravity >1 means it will not float
- High UV resistance
- Maintenance free

### Product functions



EROSION CONTROL



SOIL REINFORCEMENT





# Geogrids

**Soil is strong in compression but weak in tension. The addition of a geogrid helps to disperse the lateral strain generated in the soil by compressive forces. The tension within the geogrid is mobilised by a combination of skin friction and granular interlock and performs a reinforcing function which improves the mechanical properties of the soil, providing reinforcement to the soil mass.**

This reinforcement function assists in preventing the deformation and lateral spread of granular layers forming the foundation of working platforms and roads. It can be used on inclined planes to provide a grip layer preventing planar failures of sloping surfaces. It can be layered horizontally to enable steep sloping structures or retaining walls to be built.

Our Enkagrid range of products offers a perfect combination of geometry and polymers to create the optimum soil-grid interaction for all types of soil and deliver outstanding mechanical long-term durability.

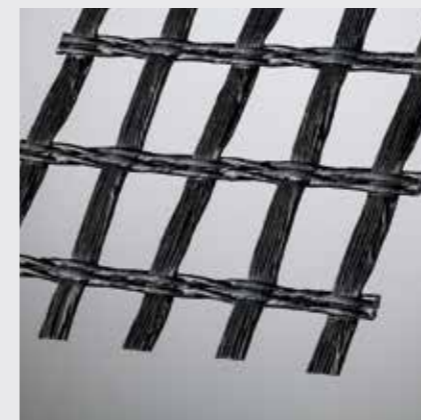
### Why is Enkagrid ideal for reinforcement of all soil structures?

- A perfect combination of geometry and polymers to create the optimum soil-grid interaction for all types of soil
- Excellent mechanical long-term durability based on high quality
- Ease of handling and installation
- A wide choice of products to suit your needs

Enkagrid® PRO



Enkagrid® G



Enkagrid® TRC



Enkagrid® PLUS G



### Enkagrid product range

#### Enkagrid PRO

- Rigid geogrid of extruded polyester straps
- Available in a number of different strengths
- PROfessional solution with unparalleled strength, performance and reliability
- Ideal for the reinforcement of slopes, walls and embankments
- Laserwelded polyester bars for powerful and dependable reinforcement

#### Enkagrid MAX

- A rigid geogrid of extruded polypropylene straps
- Available in a number of different strengths in both axes
- MAXimum cost-effective performance
- Ideal for subbase stabilisation beneath permanent and temporary roadway projects.

- Unique laser-bonded structure gives rigid junctions with consistent stress-strain performance throughout the matrix
- High-speed installation with long-term high performance due to high passive bearing resistance and optimum soil interaction

#### Enkagrid TRC

- Multifunctional geogrid composite with the same strength in both axes
- A unique combination of high-modulus low-elongation aramid fibers embedded in a nonwoven textile
- Reinforcement, separation and filtration in one easy to install product
- The nonwoven prevents mixing of fill and subsoil
- Ideal for paved roads, parking areas and platforms
- Reduces the required subbase thickness and increases road life

#### Enkagrid G and M

- Flexible woven geogrid ideal for soil reinforcement and stabilisation
- Made of high tenacity yarns with a PVC coating
- High pull out resistance
- Low creep values
- High tensile strength at lower strain

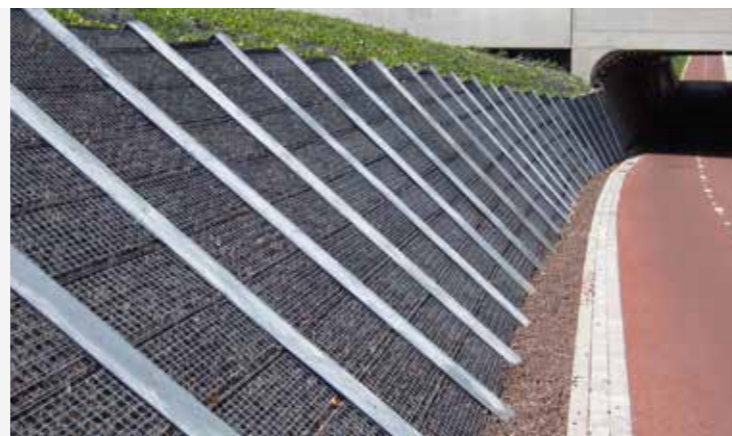
#### Enkagrid PLUS G and M

- Flexible knitted geogrid made from high tenacity yarns combined with a nonwoven textile
- High resistance to damage during installation
- Perfect adhesion with asphalt layers
- Reduces cracks significantly
- Provides filtration and separation functions

# Enkagrid® PRO

Uniaxial laser welded geogrid for challenging environments

Enkagrid PRO is a uniaxial high strength laser-welded geogrid for the reinforcement of slopes, walls, embankments, platforms and foundations.



The structure of highly oriented laser-welded polyester strips provides powerful and dependable reinforcement in demanding situations in civil engineering or building projects. Thanks to its superior mechanical properties, the long term performance of Enkagrid PRO is outstanding. The engineered structure of Enkagrid employs cutting edge manufacturing concepts such as the patented computer controlled laser-welding process. Using this laser technology, the quality of the junction bonds is precisely controlled during production. This creates consistently rigid joints throughout the geogrid without affecting the polymer orientation or stress strain performance of the extruded strips.

### Technical details

Enkagrid PRO is a uniaxial geogrid of extruded polyester strips available in a number of different tensile strengths for specific applications. The highly oriented strips are laser-welded for powerful reinforcement in demanding applications. Enkagrid PRO is available in 2.45 m and 5 m wide rolls.

### Functions

- Reinforcement
- Stabilisation
- Grip layer

### Application areas

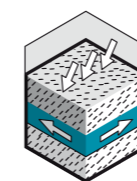
- Enkagrid PRO is specially designed for more demanding applications.
- Steep slopes
  - Retaining walls
  - Segmental block walls
  - Gabions
  - Bridge abutments
  - Embankments

- Platforms
- Foundations

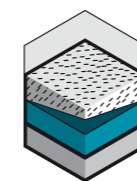
### Features and benefits

- Maximizes use of available space
- Reduces carbon footprint
- Redistributes shear forces within soil
- Limits differential settlements during consolidation
- Improves internal stability of soil block
- High stiffness and low creep properties maximize soil performance
- Excellent durability and long term performance
- Interacts perfectly with all granular soil types
- High resistance to mechanical damage
- High resistance to chemical and environmental influences
- Cost effective
- Fast installation with rolls up to 5 m wide
- Ease of handling on site

### Product functions



SOIL REINFORCEMENT



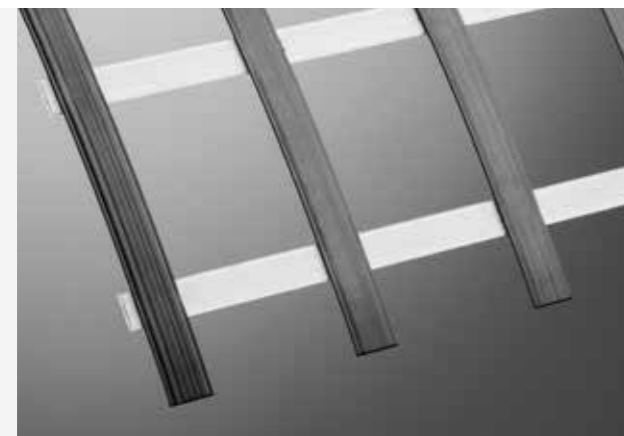
GRIP LAYER



# Enkagrid® MAX

Biaxial laser welded geogrid for challenging environments

Enkagrid MAX is a high performance and cost-effective biaxial geogrid used worldwide in civil engineering projects for subbase stabilisation, designed for achieving maximum bearing capacity and shear resistance.



Enkagrid MAX exhibits an optimum interaction with all granular soil types, making it ideal for subbase stabilisation. It is typically used for construction of roads or platforms on weak soils where it delivers extra stiffness and prevents differential settlements, thus prolonging the life expectancy of the project.

Decades of research and development have made Enkagrid the product of choice for demanding technical structures worldwide

### Technical details

Enkagrid MAX is a rigid, biaxial geogrid of extruded polypropylene or polyester strips with the same design

strength in both machine and cross-machine directions. Enkagrid MAX is available in different tensile strengths in rolls up to 5 m width.

The engineered structure of Enkagrid employs cutting edge manufacturing concepts such as the patented computer controlled laser welding process. Using laser technology, the quality of the junction bonds is precisely controlled during the production process. This creates consistently rigid joints throughout the geogrid without affecting the polymer orientation or stress strain performance of the extruded strips.

### Functions

- Reinforcement
- Subbase stabilisation

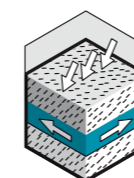
### Application areas

- Construction roads
- Permanent and temporary roadways
- Paved and unpaved roads
- Parking areas
- Airport runways
- Platforms

### Features and benefits

- Reduces the depth of subbase layer required
- Cost effective
- Absorbs dynamic loads generated by traffic
- Excellent mechanical long-term durability
- Consistent stress-strain performance
- Optimum interaction with all granular soil types
- Excellent resistance to mechanical damage
- High levels of UV resistance
- Chemically inert
- Fast installation with practical 5 m wide rolls
- Ease of handling on site
- Lower carbon footprint impact

### Product functions



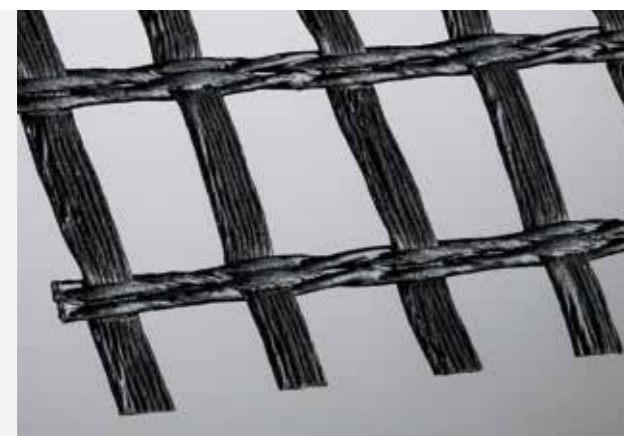
SOIL REINFORCEMENT



# Enkagrid® G and M

## Woven geogrid for soil reinforcement

Enkagrid G and M is a range of certified high performance woven geogrids for soil reinforcement. They are manufactured from high tenacity PET and PVA yarns with a PVC coating.



Enkagrid G and M can be used for a variety of different applications. Typical areas of use include reinforcement of roads, railways and airports, embankments, foundations over poor ground, as well as retaining walls and slopes, noise barriers and landslide repair.

The product is flexible and easy to work with, and will lay flat and not spring back once laid out on the ground. Enkagrid G and M can be used together with other Enka Solutions products to enhance the natural appearance of slopes.

### Technical details

Enkagrid G and M are woven geogrid manufactured from high tenacity yarns with a PVC coating. The G type is made from polyester (PET) yarn; the M type from polyvinyl alcohol (PVA) yarns.

- Tensile strength range: 20 to 400 kN/m
- Available in uniaxial and biaxial tensile strengths
- Roll width: up to 5.2 m



### Functions

- Reinforcement
- Subbase stabilisation
- Grip layer

### Application areas

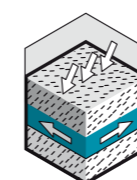
- Roads and railways
- Airports
- Piled embankments
- Shopping centres, industrial areas
- Retaining walls and steep slopes
- Landslide repair
- Noise barriers

- Stabilisation of sea, river and reservoir banks
- Landscaping

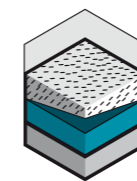
### Features and benefits

- High pull-out resistance
- Low creep values for long term stability
- High tensile strength at lower strain
- Easy installation and handling in all weathers
- High level of microbiological resistance
- High resistance to acids and alkalis
- Allows slopes to be increased beyond angle of repose – maximises site space
- Increases bearing capacity of embankments or platforms on weak soils
- Minimises effects of differential settlement
- Reduces the risk of bearing failure
- A green solution – reduced carbon footprint
- Cost-effective compared with traditional methods

### Product functions



SOIL REINFORCEMENT



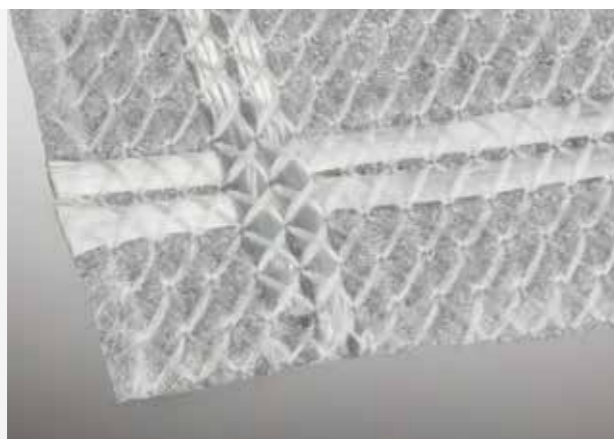
GRIP LAYER



# Enkagrid® PLUS G and M

Knitted geocomposite for reinforcement of asphalt pavements and soils

Enkagrid PLUS is a knitted geocomposite, comprising a geogrid made from high tenacity PVA or PET yarns combined with a nonwoven PET or PP geotextile. Enkagrid PLUS can be used for the reinforcement of asphalt pavements and soils.



Typical areas of application include asphalt pavement of new roads, road repairs, repairs to sections of access roads and junctions, landslide repair, and reinforcement of unstable foundations. Enkagrid PLUS considerably enhances the durability of asphalt layers in road surfaces, and exhibits low strain at high tensile strength (4% for PVA version). It will also reduce the formation of ruts in areas of high traffic loading.

### Technical details

Enkagrid PLUS is a combination of knitted geogrid manufactured from high tenacity PET (G type) or PVA (M type) yarns, and nonwoven PET or PP geotextiles.

- Enkagrid PLUS with PET yarns can also be used for soil reinforcement
- Enkagrid PLUS exhibits low strain at high tensile strength (4% for PVA in M type)

### Functions

- Reinforcement of asphalt layers
- Stress relief and interlayer barrier
- Separation and filtration
- Soil reinforcement

### Application areas

- Construction of new roads
- Repair of asphalt sections in roads and motorways
- Repair of asphalt sections in car parks, airports and access roads
- Extensions and widening of thoroughfares and highways
- Asphalt reinforcement at locations

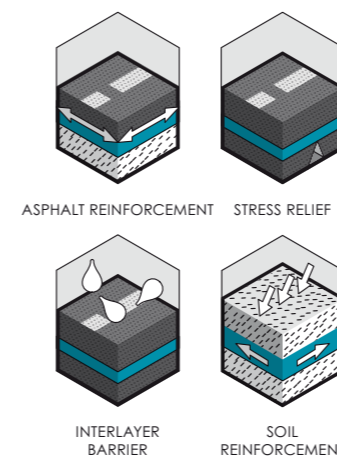
- exposed to intensive braking and acceleration
- Railway construction
- Landslide repair
- Reinforcement of unstable foundations, fillings and soil

### Features and benefits

- Higher resistance to damage from asphalt pavers and general installation damage compared with glass fibre based products
- Significantly reduces the occurrence of cracks
- Perfect adhesion with asphalt layers

- Heat resistant to 220°C
- Easy damage proof installation; no fixing nails needed
- Similar strain rates to bitumen
- Speeds up construction time, even in winter
- Increases the stability of fillings
- Provides filtration and separation functions
- Low creep values for long term stability
- Significantly lowers costs related to transfer of earth to the site
- Reduced carbon footprint compared with traditional methods

### Product functions



# Enkagrid® TRC

Aramid reinforced geocomposite for reinforcement, separation and filtration

Enkagrid TRC is a high strength composite of aramid mesh and a thermally bonded nonwoven combining reinforcement, separation and filtration functions in one product. It resolves a number of engineering issues in a single solution.



When no creep deformation is allowable in reinforcement or stabilisation layers, Enkagrid TRC is the solution. The high strength geogrid composite reinforces the base course beneath roads, runways, and foundations over weak subsoils. The nonwoven prevents fine particles from percolating up into the subbase, providing a layer for in-plane water flow during compaction of the subbase.

### Technical details

Enkagrid TRC is a multifunctional geogrid composite comprising a nonwoven geotextile combined with a coated aramid woven grid. It exhibits high modulus combined with a maximum strain value of just 3% at break. Enkagrid TRC has the same design strength in both machine and cross-machine directions. It is available in rolls of 5 m width.

### Functions

- Reinforcement
- Stabilisation
- Separation
- Filtration
- Stress relief
- Interlayer barrier

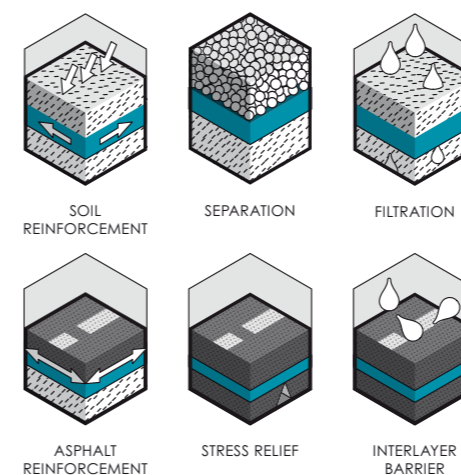
### Application areas

- Paved and unpaved roads
- Parking areas
- Embankment foundations
- Building foundations
- Platforms
- Runways

### Features and benefits

- Three functions in one product: reinforcement, separation and filtration
- Limits the propagation of cracks
- Reduces the required subbase thickness
- Prevents fine subsoil from penetrating into the road structure
- Increases the subbase strength on weak soils
- Outstanding mechanical properties; low creep
- Increases service life of roads with minimal deformation of the subbase
- Excellent durability and long term performance
- Fast installation with practical 5 m wide rolls
- Ease of handling on site

### Product functions





# Drainage composites

Groundwater can cause significant problems for civil engineering and building projects, both during construction and in service: 70% of all damage to buildings is water-related, with half of this due to insufficient or incorrect sealant and lack of drainage. A traditional drainage layer consists of granular material often more than 300 mm thick. However, the performance of such a drain can be inconsistent and decrease with time, due to deterioration of the boundaries and clogging of the material itself.

## World leading geocomposite drainage system

Enkadrain, a geocomposite material, offers significant advantages. The product is the number one brand in geocomposite drainage systems. Over the past 40 years, millions of square meters of Enkadrain have been installed worldwide.

All Enkadrain products are lightweight, strong, flexible, easy to handle and fast to install in one operation. They deliver high water flow capacity with consistent and uniform long-term performance. Every variant is based on the same basic concept of a three-dimensional composite that consists of a drainage core either

connected to one or sandwiched between two nonwoven fabrics. The drainage core is composed of tough, looped synthetic filaments that are fused together where they cross, forming an open structural material with over 90% voids. The resulting product is chemically inert and durable.



Enkadrain®



Enkadrain® Wide



Colbondrain®

## Why is Enkadrain an ideal solution to avoid drainage issues?

- Protects waterproof coatings and membranes from damage during backfilling
- Prevents silting up of the collector drain
- High discharge capacity due to its open structure
- Forms an insulating air gap between wall and soil
- Lightweight, flexible, easy to cut and install
- Can be installed under all weather conditions
- Negligible waste
- Rot-proof, no risk of pollution of the subsoil
- Unaffected by chemicals commonly occurring in the soil
- Fire resistant

## Enkadrain product range

### Enkadrain

- Suitable for non-specific applications with excellent price performance
- Packaged in small rolls with laying guide included for ease of handling and on-site installation
- Suitable for smaller projects where detail design may not be required

### Enkadrain Wide

- Used for waste containment and draining poor quality fills
- Used for constructing embankments
- Core and filters tailored for specific application

### Colbondrain

- Durable vertical drain
- Designed primarily to accelerate the consolidation of soft soils before construction

- Solid polymer core
- Strong filter fabric thermally bonded to both sides of the core
- Patented hydraulically-designed core
- Profile for maximum water flow capacity

## Multifunctional Enkadrain

### Enkadrain CK

- For specialist applications in building and civil engineering including tunneling
- Suited to fulfill vibration damping and drainage functions
- Supplied with various types of laitance tight layers on one side so suitable as lost shuttering



# Enkadrain®

## Geocomposite for drainage

The Enkadrain product family consists of a range of drainage composites comprising a polymer drainage core connected to a protective and filtering nonwoven on one or both sides. Enkadrain can be used in a variety of horizontal and vertical applications, combining drainage, protection and filtration in one product.



Enkadrain's extensive range includes a large number of product types, each having properties tailored for specific applications. Although the primary application is drainage, some Enkadrain types have also proven themselves as a cost-effective vibration control layer, as well as for hydrostatic pressure relief.

### Technical details

Enkadrain is a range of drainage composites that consist of a polymer drainage core which is thermally bonded or

spot welded to a protective and separating nonwoven filter on one or both sides. The core can be v-shaped or consisting of looped filaments fused where they cross. Properties regarding stiffness, discharge capacity or tensile strength vary per product type, as do the properties of the fleece.

Thickness varies between 4 and 22 mm. The standard Enkadrain is available in rolls of 1 and 2 m width. The range includes fire retardant types.



### Functions

- Drainage at various gradients
- Protection
- Filtration
- Vibration damping
- Hydrostatic pressure relief
- Capillary layer

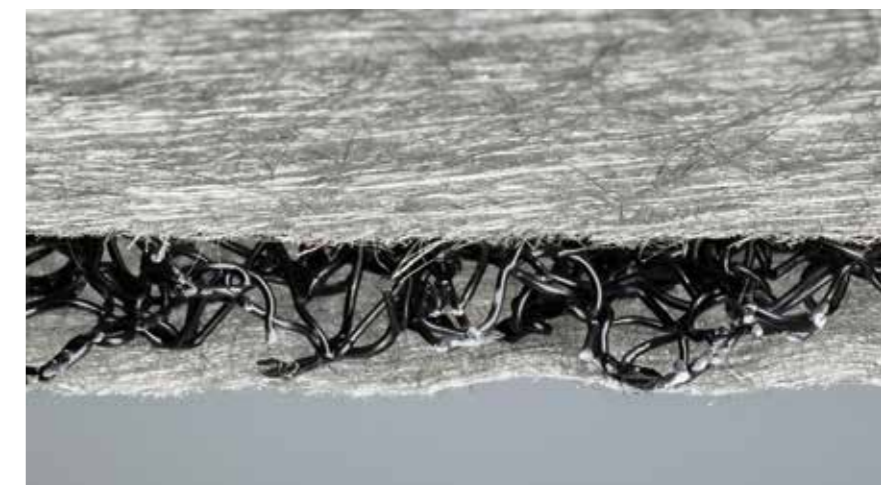
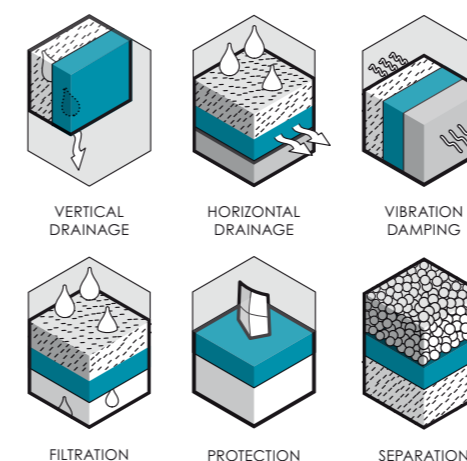
### Application areas

- Basement walls
- Retaining walls
- Bridge abutments
- Artificial sports fields
- Concrete slabs
- Embankments
- Tunnels
- Parking decks
- Green roofs

### Features and benefits

- Leading drainage composite for over four decades
- Combines drainage, protection and filtration in one product
- Various discharge capacities and compressive strengths available
- Eliminates clogging of the drainage core
- No deterioration of the boundaries associated with traditional drainage methods
- Will not degrade over time and will not pollute the subsoil
- Excellent durability and long-term performance
- The product is lightweight, strong and easy to install in all weathers
- Supplied in small rolls for ease of handling and installation
- Can be disposed of and recycled safely after service life
- Reduces carbon footprint compared to more traditional drainage methods

### Product functions



# Enkadrain® Wide

## Drainage for landfills and large infrastructure areas

Enkadrain Wide consists of a 5 metre wide three-dimensional monofilament drainage core with either a thermally bonded or needle punched nonwoven or woven fabric stitched to it. The product is a versatile and reliable geocomposite for landfills and large infrastructure projects.



For waste containment purposes, Enkadrain Wide is used as a drainage layer on top of the capping membrane and as the gas venting layer below the capping liner, as well as for leachate drainage.

Enkadrain Wide is available in different product types, one of which has a 100 year predicted durability reflecting the long service life that can be expected from this high performance product range. The fabric of this high quality geocomposite can be stitched to either one or both sides of the core.

### Technical details

The Enkadrain Wide core consists of a unique V-shaped zigzag structure. The thermally bonded or needle-

punched nonwoven is stitched to the core at closely spaced intervals longitudinally, on either one or both sides. This core is thermally pre-formed in a V-shape configuration, making it optimally pressure resistant. All Enkadrain Wide product types are manufactured in 5 m width.

Enkadrain Wide production is subject to stringent internal and external monitoring. Enkadrain ZB-350 offers >100 years predicted durability, assessed by BAM. Individual test reports and opinions have been conducted or assessed by independent organizations and authorities. Independent inspectors are monitoring the product's use at numerous landfills.



### Functions

- Landfill drainage
- Landfill gas venting
- Landfill leachate drainage
- General drainage on large areas
- Drainage on membranes

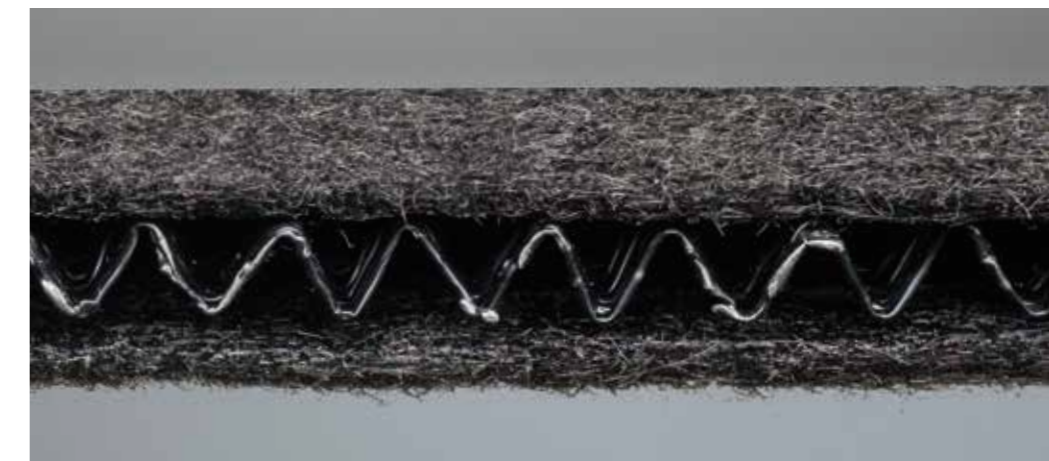
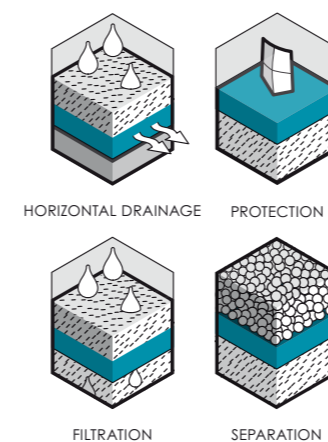
### Application areas

- Landfills
- Large embankments
- Rooftop gardens
- Parking decks
- Foundation slabs

### Features and benefits

- Benchmark as leading drainage composite for over four decades
- Excellent performance under high loads
- Long term performance proven by numerous laboratory tests and landfill excavations
- Good internal shear resistance
- Protects waterproof coatings and membranes from damage
- Open structure means high discharge capacity
- High flow transmission even at low gradients
- Is inert and will not degrade over time
- Non-toxic
- Large rolls (5 m x 100 m) for ease of installation on site
- Lightweight and easy to cut
- Can be installed in all weather conditions
- Cost efficient solution
- Can be disposed of safely or recycled after service life

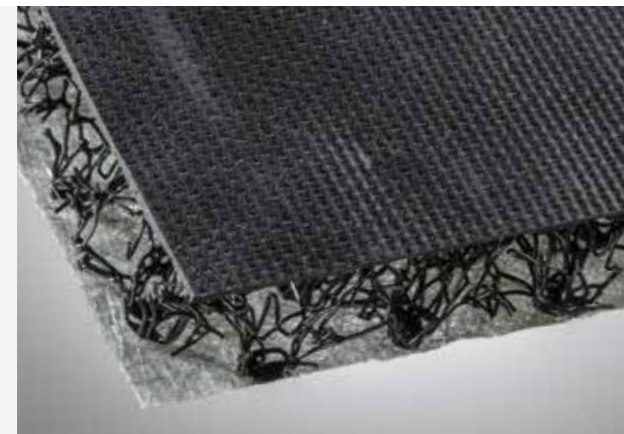
### Product functions



# Enkadrain® CK

## Multifunctional geocomposite for drainage, lost shuttering and vibration damping

Enkadrain CK is a multifunctional geocomposite with a cavity-rich polyamide core featuring on one side either a PVC layer or coated filter, and on the other side a nonwoven fleece. Enkadrain CK is developed for a range of specialist applications, for instance tunneling and complex formwork.



### Drainage

Enkadrain CK is used as a protective drainage layer between existing structures, new structure walls and in tunnels. Thanks to its flexibility it easily adapts to the most complex geometries. Enkadrain CK is suitable for drainage at great depth.

### Lost shuttering

When used as lost shuttering, the PVC layer or the coated nonwoven layer on Enkadrain CK will prevent cement milk from entering the core. The concrete can be applied directly, without any loss of space.

### Vibration damping

Enkadrain CK decouples or dampens structure- or soil-borne vibrations that can be caused by various sources such as road and rail traffic, construction

operations, transmissions between neighbouring buildings or machinery and power plants. Enkadrain CK provides an effective and cost efficient solution for vibrations that would otherwise result in structural damage or negative environmental impact.

### Technical details

Enkadrain CK is a multifunctional geocomposite with a cavity-rich core featuring on one side either laitance tight PVC layer or coated filter, and on the other side a protective fleece. Its core comprises looped polyamide filaments that are fused together where they cross. Both the PVC layer and the nonwoven filter extend 10 cm beyond the core on opposite sides. This ensures that the joint is covered when lanes of Enkadrain CK are laid adjacent to one another. Enkadrain CK has a roll width of 1 m.



### Functions

- Drainage
- Protection
- Separation
- Lost shuttering
- Vibration damping

### Application areas

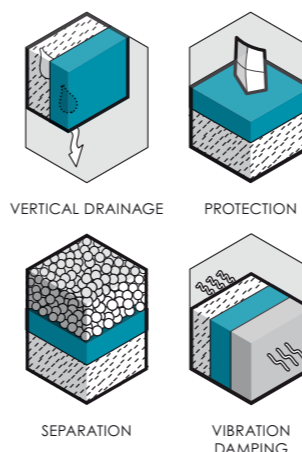
- Complex formwork
- Deep drainage
- Neighbouring constructions
- Tunnelling

- Underneath concrete ground slabs
- Road, rail and other vibration impacted areas

### Features and benefits

- Multifunctional product
- Reduces environmental impact
- Cement milk proof
- Cuts excavation volume
- Flexible and suitable for complex geometries
- Matches any substrate
- Resists ground movements
- High compressive strength
- High flow capacity
- Consistent long term performance
- Compact lightweight rolls
- Quick and easy to install in all weather conditions
- Frost resistant
- Can be disposed of safely after service life

### Product functions



# Colbondrain®

## High quality Prefabricated Vertical Drain (PVD)

Colbondrain is a high quality Prefabricated Vertical Drain (PVD) which is usually installed with a purpose built installation rig mounted on a hydraulic excavator. Colbondrain was developed in partnership with leading European consultants, laboratories and geosynthetics specialists to create a highly effective solution for a major engineering challenge. The design of Colbondrain is based on a unique extrusion and shaping technique which creates a tough geocomposite.



It can take up to 25 years to achieve 90% consolidation of soils and soft clays such as can be found in marshland areas. Colbondrain assures a significant acceleration of the consolidation of soft soils before construction, reducing this timescale to months rather than years, improving safety and drastically reducing cost. Colbondrain forms an upward path for excess pore-water created by the overburden. Water is drained off to the surface resulting in a stable subgrade on which construction can take place

### Technical details

Colbondrain is a Prefabricated Vertical Drain which should be installed with a purpose built installation rig

mounted on a hydraulic excavator. If the compressible clay is very deep and/or contains gravel bands, special techniques such as vibrators and heavy mandrels may be required.

- Colbondrain is 10 cm wide with a robust polymer core, covered on both sides with a strong and permeable filter fabric
- The outer filter fabric of Colbondrain is bonded to the core structure over its entire surface to form a homogenous geocomposite
- Rolls come in lengths of 280 linear metres



### Functions

- Vertical drainage

### Application areas

- Soft clays
- Weak soils
- Marshland areas

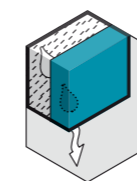
### Features and benefits

- Unique combination of patented core structure and nonwoven filter bonded to core increases water flow capacity

- Core: hydraulic channel profile (core) ensures laminar flow for optimum performance
- Nonwoven filter layers deliver optimum filtration, permeability and strength.
- Can be used to depths up to 100 m
- High tensile strength allows usage on all installation rig types
- Suitable for use in all soil types
- Roll length of 280 m reduces number of connections on site
- Efficient packaging allows high

- transport loads and reduced storage time on site
- Thermal bonding of the filter to the entire surface of the core structure ensures that the filter is kept taut across the flow channels
- Filter cannot tear or become separated from the core when passing over the pulleys at the top rig or during soil consolidation

### Product functions



VERTICAL DRAINAGE





# Geotextiles and special engineered products

Geotextiles are well-known as solutions for separation and filtration functions in a wide array of civil construction applications. Next to the classic applications, geotextiles are also used more and more in other specific situations. The standard geotextiles are in such cases engineered into a solution that can fulfill extra functionalities.

## Geotextiles

Beside the classic functions, woven geotextiles will also be used as reinforcement in cases where fine soil needs to be strengthened (e.g. clay, loam, fine sand), or in situations where separation and filtration needs to be combined with reinforcement of the soil. Next to separation and filtration in applications, nonwoven geotextiles are commonly used when protection is required, for example to prevent damage to waterproof membranes which seal landfills.

## Special engineered products

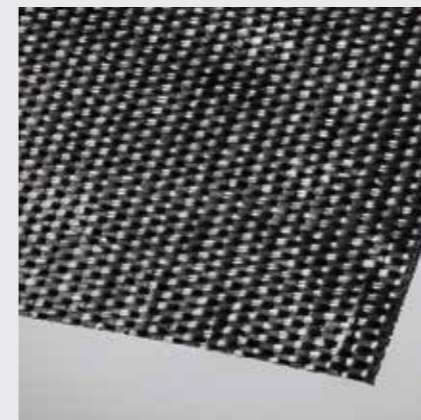
By weaving two specially designed fabrics into each other, by means of filter points or connection threads, we create a lost shuttering for concrete structures. Enka-Mattress combines a ballast function with an erosion control system for the protection of embankments, water ways and marine structures.

Enka-Fix is a durable woven geotextile upon which loops are tufted which serves as a connection between fabric and concrete

blocks. In this way a flexible concrete structure acts as an erosion control system. In one product, a ballast function is uniquely combined with a separation and filtration function. This enables fast and easy installation.

Enka-D-Tube dewatering tubes, which are made from special engineered woven fabrics, combine high tensile strength and high permeability. They are used to create a 'cake' which enables sludge, or any other non-water soluble material to dewater. This process can be speeded up by means of flocculants.

Enka®-Tex woven



Enka®-Fix

## Geotextile product range

### Enka-Tex wovens

- Long life expectancy when used in permanent structures
- Mechanical properties offer maximum strength at minimal cost
- Great mechanical strength

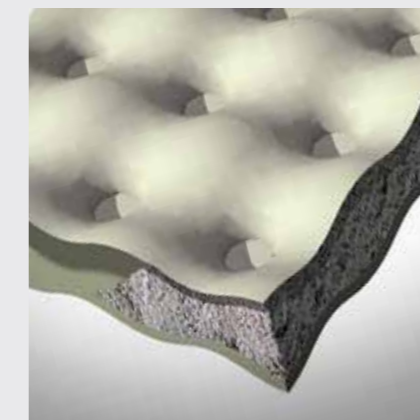
### Enka-Tex nonwovens

- Thermally and non thermally bonded nonwovens available
- A range of consistent aperture sizes to accommodate different soils
- Excellent durability, mechanical robustness and hydraulic properties
- High elongation

### Enka-Force

- Low creep characteristics
- High tensile strengths at low corresponding elongations
- Ability to carry high tensile loads for many years

Enka®-Tex nonwoven



Enka®-Mattress

## Special engineered product range

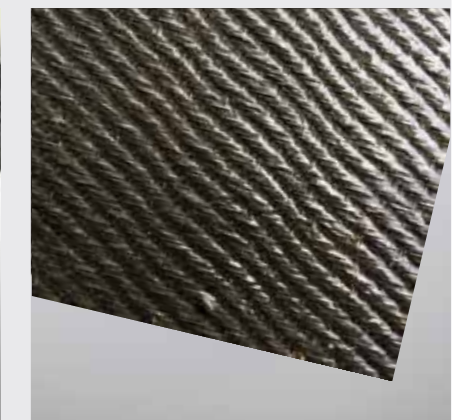
### Enka-Fix

- Forms a flexible erosion control system when used as base layer for a concrete block mattress
- Easy and fast installation (all-in-one go)
- Durability up to 100 years
- Cheaper solution than rock revetment

### Enka-Mattress

- Can be installed on steep slopes without any difficulty
- Easily adapts to the curves and contours of the subgrade and as a result reduces the potential for scour
- Economical alternative for the more conventional methods (riprap, gabions, concrete slabs,..)
- Installation under water possible

Enka®-Force



Enka®-D-Tube

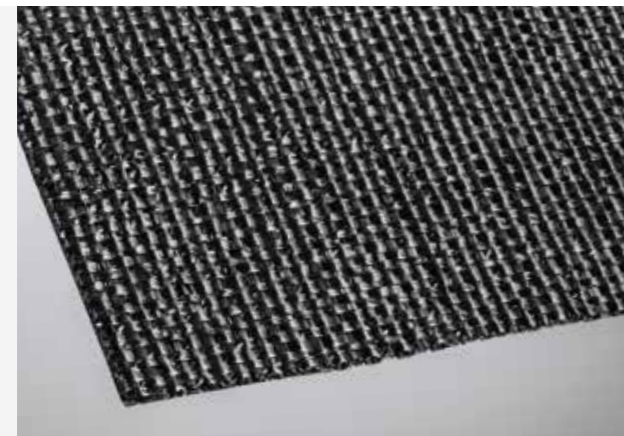
## Enka-D-Tube

- Cost efficient way of dewatering and transporting non-water soluble materials
- Enables a strong volume reduction of the material
- Significant lower carbon footprint versus other, classical solutions

# Enka-Tex<sup>®</sup> wovens

## Woven geotextile for separation and reinforcement

Enka-Tex woven geotextiles offer the perfect cost-effective solution for separation, soil stabilisation, reinforcement and filtration. Enka-Tex woven geotextiles are manufactured from polypropylene or polypropylene/polyethylene tapes.



This range is used in areas such as access roads and hard standings, roadways, car parks and coastal defence projects. One of its primary uses is in separation applications where there is a requirement to prevent intermixing of soft in-situ soils with good clean granular fill. A range of aperture sizes is available for Enka-Tex SG and PP woven geotextiles.

When a high permeability is required combined with a small aperture size the HF range can easily answer this demand. The HF fabric uniquely combines a polyethylene monofilament with a tape which gives the woven its extreme high permeability.

### Technical details

Enka-Tex woven geotextiles are manufactured from highly durable polypropylene or a combination of polypropylene and polyethylene.

- Tensile strengths from 15 to 200 kN/m
- CBR puncture strengths ranging from 1.8 to 18 kN
- Available from stock in rolls of 4.5 m and 5.25 m width as standard or other widths to order
- Roll length 100 m



### Functions

- Separation
- Filtration
- Soil stabilisation
- Soil reinforcement

### Application areas

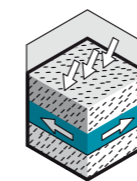
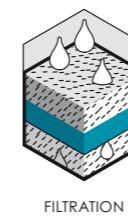
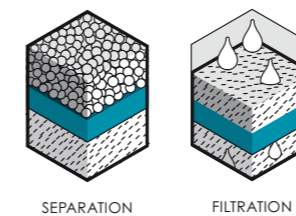
- Site access roads
- New roadways
- Hardstandings
- Car parks

- Industrial units
- Coastal defence projects

### Features and benefits

- Service life of minimum 100 years available within the range
- Mechanical properties offer maximum strength at minimal cost
- Greater mechanical strength per unit weight compared to comparable nonwovens – perfect for separation
- Enables water flow rates normal to the plane greater than those stipulated in the design
- Significantly reduced carbon footprint compared to traditional methods
- Significant cost saving compared to traditional methods
- Resistance to acids and alkalis at ambient temperatures
- High biological resistance

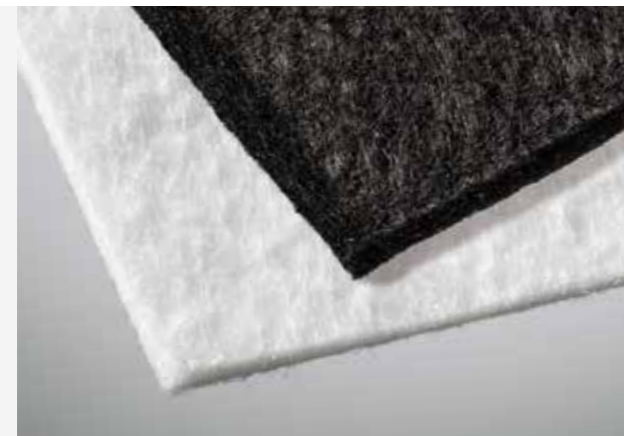
### Product functions



# Enka-Tex<sup>®</sup> nonwovens

## Needle-punched geotextile for protection, separation and filtration

Enka-Tex nonwovens are a range of needle-punched and thermally bonded geotextiles that offer the highest levels of engineering performance and quality standards. It incorporates products with superior puncture resistance compared with other needle punched nonwoven products of comparable weight. The range is used in various applications including site access roads, hard standings, road and railways, drainage blankets, car parks, landfills and coastal engineering.



Enka-Tex nonwoven geotextiles lend valuable qualities to numerous groundwork construction applications. In railtrack maintenance for example, these geotextiles minimise potential track failure which can be caused by pumping (ie the upward movement of fines from the underlying formation into the ballast).

The hydraulic properties of Enka-Tex N nonwovens stimulate the build-up of a natural soil filter in the adjoining soil to ensure long term filtration stability. The superior products within the range offer a perfect balance between a reduced thermal treatment and needlepunching providing more elongation without compromising the strength. They are the perfect choice for the protection of impermeable membranes in landfill and reservoir construction, as well as for

coastal protection from erosion below rock and concrete defences.

### Technical details

Enka-Tex nonwovens are a range of polypropylene needle punched and thermally bonded nonwoven staple fibre geotextiles.

- CBR puncture strengths from 1 to 18 kN
- Available in weights of 100 to 1,300 g/m<sup>2</sup>
- Uniform tensile strengths in all directions throughout the rolls up to 80 kN/m
- Standard widths 5.25 (white nonwovens) or 5.0 and 5.5 m (black nonwovens)
- Special types available with higher weights, tensile strengths or widths.



### Functions

- Separation
- Protection
- Filtration
- Stress relief
- Interlayer barrier

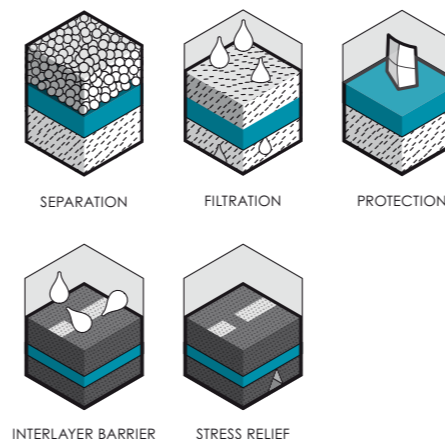
### Application areas

- Roadways
- Temporary roads
- Railways
- French drains
- Reservoir and coastal engineering
- Granular drainage blankets
- Car parks
- Landfills
- Pipelines
- Groundworks
- Green roofs

### Features and benefits

- Thermal and mechanical bonding process ensures superior performance at lower weight
- Enables water flow normal to the plane which is usually several times greater than required by the design
- A range of consistent aperture sizes to accommodate different soils ranging from clay to coarse granular fill
- Excellent durability, mechanical robustness, and hydraulic properties even in extreme site conditions
- High elongation
- Resistance to acids and alkalis at ambient temperatures
- High biological resistance
- Significantly reduced carbon footprint compared to traditional methods
- Significant cost saving compared to traditional methods

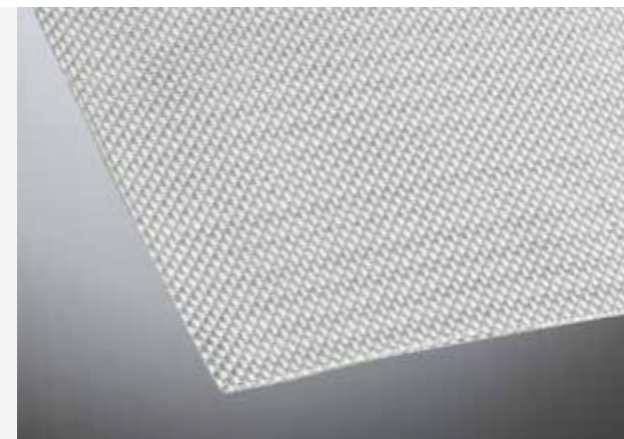
### Product functions



# Enka-Force®

## High strength woven geotextile for reinforcement

The high modulus multifilament yarns used in the production of Enka-Force fabrics offer excellent creep characteristics, making them the perfect choice for use in soil reinforcement applications. The range has been specifically designed to exhibit high strength at low elongation.



Typical areas of application include reinforced soil walls, embankments and load transfer platforms. During use, the stresses are transferred into the plane of the reinforcement by friction between the soil and the reinforcement fabric. The product's hydraulic properties make it suitable for use in most soils and granular fills.

Enka-Force woven geotextiles can be used in the construction of vertical walls, steep slopes and embankments over soft ground. As soil is very strong in compression but weak in tension, Enka-Force geotextiles will provide tensile resistance within the soil mass, allowing to significantly increase the possibilities of creating stable structures with soil.

### Technical details

- Different types of Enka-Force woven geotextiles are manufactured from either polyester (PET), polyvinylalcohol (PVA), polyamide (PA) or a combination
- Tensile strengths from 60 kN/m to 1,200 kN/m in primary load carrying direction
- Roll width 5.2 m, roll length 100 m



### Functions

- Reinforcement

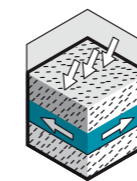
### Application areas

- Reinforced soil walls
- Embankments over soft soil
- Load transfer platforms
- Areas prone to subsidence

### Features and benefits

- Low creep characteristics
- High tensile strengths at low corresponding elongations
- Ability to carry high tensile loads for many years
- Significantly reduced carbon footprint compared to traditional methods
- Significant cost saving compared to traditional methods

### Product functions



SOIL REINFORCEMENT

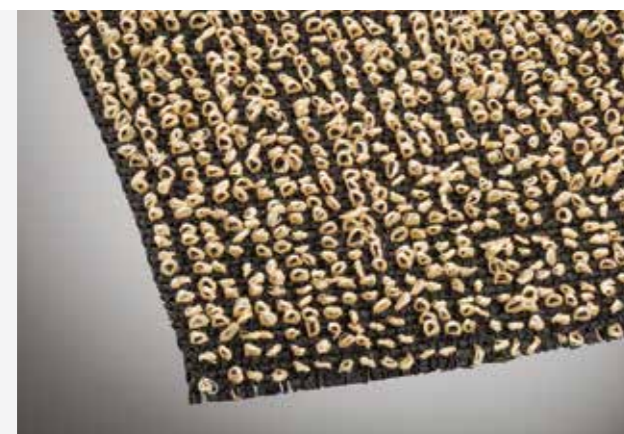




# Enka-Fix®

## 3-dimensional woven fabric

Enka-Fix forms the base layer of a concrete block mattress. During the casting process the LPF's loops penetrate into the base on the fluidized (vibrated) concrete mix and, after adequate curing, provide the required bonding strength between the concrete blocks and the fabric base layer.



Concrete block mattresses are mostly used for marine applications such as coastal protection, shore protection and river bank protection. Due to the nature of these applications, long-term durability is an essential requirement. The product combines a ballast function with separation characteristics, no transport of fines are possible which ensures the stability of the slope, and with filtration properties, no hydraulic pressure is build up behind the whole system due to the permeability of the fabric between the blocks.

### Technical details

- Enka-Fix is a three-dimensional woven fabric consisting of:
- a tape woven polypropylene fabric which forms the base fabric
  - a large number of loops standing perpendicular on the base fabric

The woven fabric contains low-leach anti-oxidants and UV-stabilizers to ensure its durability in marine environments. The loops are made of stabilized PP fibrillated tapes which form a strong connection between the woven fabric and the concrete blocks. The strength of the product, which is 80 kN/m, is engineered in such a way that it can hold the weight of the complete concrete block structure.



### Functions

- Immediate and permanent erosion protection

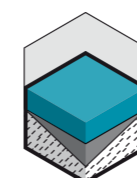
### Application areas

- Embankments
- Harbours
- Coastal protection
- River bank protection
- Reservoirs
- Pipeline protection

### Features and benefits

- Flexibility after curing of the whole structure allows the structure to adapt itself in case of scour
- Interaction of blocks allows for thinner solution compared to rock revetments.
- Offers a unique combination of ballast and filtration in one product
- Easy and fast installation (all-in-one go)
- Durability up to 100 years
- Cheaper solution than rock revetment (depending on availability of rock)
- Better alternative for articulating block mats, gabion mats

### Product functions



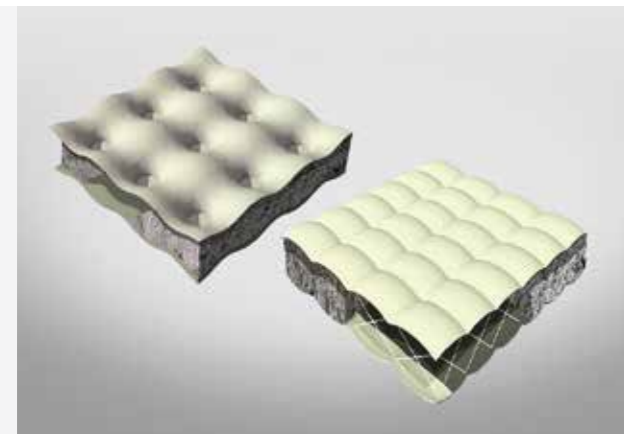
EROSION CONTROL



# Enka-Mattress

## Tailor made solution for specific erosion control applications

Enka-Mattress is a two layer geotextile mattress filled with fine aggregate concrete after installation. The mattress acts as a shutter till the concrete is cured.



The specific hydraulic characteristics of the fabric allow a slow evacuation from the concrete mixture water and limit the fine cement particles from getting through the fabric. Both result in a concrete which gives high strength, density and abrasion resistance whether constructed above or below the water. The two layers are connected in order to control the thickness of the mattress.

### Two types of Enka-Mattress

- Permeable concrete mattress with filter points
- Impermeable concrete mattress with connection threads

### Enka-Mattress with filter points

The mattress is woven together at regular intervals to form the so called filter points. These filter points acts as filters along water can drain off and release water pressure behind or under the mattress. The fine pore size of the filter points prevents the transport of fine soil particles.

### Enka-Mattress with connection threads

The mattress has internal connection threads. The specific length of the connections threads controls and provides a constant thickness after filling up with concrete. Due to the structure of the mattress, once hardened it forms an impermeable protection layer.



### Functions

- Erosion control

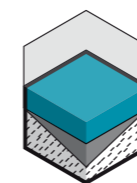
### Application areas

- River and canal slope protection
- Ponds en reservoirs
- Bypass sections at hydropower stations
- Scour aprons at berth areas
- Sealing and repairs of irrigation canals
- Repairs of piles
- Supporting and covering of pipelines

### Features and benefits

- Thinner solution than rock revetment
- Can be installed on steep slopes without any difficulty
- Easily adapts to the curves and contours of the subgrade during filling and as a result reduces the potential for scour
- Easily adapts to complicated geometric shapes
- Perfect controlled thickness of mattress, no matter the slope
- The undulating surface of the filter point mattress, breaks the hydraulic energy, reduces the water velocity and as a result reduces wave run-up
- The slightly cobbled surface of the impermeable mattress gives low hydraulic resistance
- Industrial zippers ensure the fastening of adjacent panels in an efficient way
- Simple to install
- Economical alternative for the more conventional methods (riprap, gabions, concrete slabs,...)

### Product functions



EROSION CONTROL



# Enka-D-Tube

A simple, economic and efficient dewatering system

Enka-D-Tube dewatering tubes are fabricated from high strength woven fabrics, with special engineered filtration specifications, forming tubular structures which are filled via inlet ports.



The highly permeable fabric allows rapid dissipation of water during filling, whilst the small pore size retains fines. They are available in a variety of sizes, depending on volume and space requirements. Volume reduction can be as much as 85%; this makes removal and disposal very easy and much more economic. The fabric is engineered in such a way that it combines the above characteristics with a high tensile strength needed to contain. Enka-D-Tube MAX is used for major projects where efficiency and volume of pumping is key. Enka-D-Tube FLEX is a lighter version but with extreme permeability, well-suited for smaller tubes and projects.

### Technical details

#### Enka-D-Tube MAX

- Fabricated from PP tapes
- Offers tubes with maximum circumference of 28 lm with max pump height of 2.5 m depending on filling material

#### Enka-D-Tube FLEX

- Manufactured from PP tape combined with PE monofilaments
- Will offer a highly permeable alternative with a slightly lower pump height.



### Functions

- Dewatering of all sorts of non-soluble materials

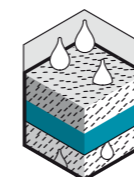
### Application areas

- Waste water treatment projects
- Dredging of lakes and ponds
- Agricultural ponds
- Aquaculture facilities
- Pulp and paper mills
- Industrial lagoons

### Features and benefits

- Cost efficient way of dewatering and transporting non-water soluble materials
- Dewatering tubes enable a strong volume reduction of the pumped material
- Significant lower carbon footprint versus other, classic solutions

### Product functions



FILTRATION







The Enka Solutions product range is manufactured by Low & Bonar who is a global leader in high performance materials selling in more than 60 countries worldwide and manufacturing in Europe, North America and China. Low & Bonar designs and manufactures components which add value to, and improve the performance of, its customers' products by engineering a wide range of polymers using in-house manufacturing technologies to create yarn, fibres,

geosynthetics, industrial and coated fabrics and composite materials. These materials contribute to a more sustainable world and higher quality of life.

Low & Bonar is listed on the London Stock Exchange.

The quality systems of Low & Bonar facilities have been approved to the ISO 9001 Quality Management System Standard. Certificates are available on request.

#### CONTACT US FOR A FREE SAMPLE KIT OR TO DISCUSS YOUR SPECIFIC REQUIREMENTS

Belgium T +32 52 457 487  
Czech Republic T +420 518 329 113  
China T +86 21 6057 7287  
France T +33 1 57 63 67 40  
Germany T +49 6022 812020  
Hungary T +36 49 886 200

Netherlands T +31 85 744 1300  
Slovakia T +421 37 6556010  
United Kingdom T +44 1482 863777  
USA T +1 828 665 5050  
Or contact your local distributor  
[www.enkasolutions.com](http://www.enkasolutions.com) / [info@enkasolutions.com](mailto:info@enkasolutions.com)

#### Disclaimer

All information and product specifications provided in this document are accurate at the time of publication. As the Low & Bonar Group follows a policy of continuous development the provided information and product specifications may change at any time without notice and must not be relied upon unless expressly confirmed by a relevant member of the Low & Bonar Group upon request. No liability is undertaken for results obtained by usage of the products and information.

PO-ENG-ES-08/2016