

EnkaGrid® MAX C

Reinforcement, separation and filtration

Handling and installation guidelines

EnkaGrid MAX C in base reinforcement applications

EnkaGrid MAX C geogrid composite exhibits an optimum interaction with almost all granular soil types, making it ideal for subbase reinforcement and stabilization. It incorporates also a nonwoven fleece with superior mechanical resistance and filtration characteristics makes the geocomposite perfect for separation and filtration functions.



Product description

EnkaGrid MAX C is a high performance and cost-effective biaxial geogrid composite used worldwide in civil engineering projects for reinforcing granular base courses and separating different soil layers. It is designed for achieving maximum bearing capacity and shear resistance. The incorporated fleece ensures long-term filtration stability and provides ideal separation of different soils ranging from clay to coarse granular fill.

Description of application

For roads, railways or airports, embankments and working platforms built over poor subgrade material it is possible to utilize geosynthetics to reinforce the subbase material in order to produce a stable surface and reduce the rutting depth on unpaved roads or minimize deformation in any structure. This high performance reinforcement geocomposite is used also to ensure the segregation of the subgrade and subbase.

Areas of application, foreword

To achieve maximum performance and avoid damage of the EnkaGrid MAX C geocomposite basic installation procedures should be respected. Correct handling of the product on site and during installation is of great importance. This manual gives guidance and recommendations to the installer of this product to ensure that long term performance is secured. Please inform your contact from Low & Bonar directly to get technical assistance in case any deviations to the described steps below.

The information in this instruction reflects the experience gathered over time by Low & Bonar. The actual installation procedure must be aligned to fit to site-specific circumstances and available working equipment.

Transport, storage and handling

The rolls are packaged for normal transport and offers sufficient protection against normal weathering impact. The rolls must be handled with care during unloading and transport on the construction site:

- the rolls of the product must be stored on a dry, clean and even surface;
- the stack of product should not be more than four rolls high, and they must not be burdened with any additional loads;
- the package should be opened only before the immediate use of the material (should product then be left uncovered then temporary exposure shall not exceed the declared time in the declaration of performance and/or technical datasheet of the product, acc. to the EN 12224 standard);
- large rips or torn areas of packaging foil should be covered.

Preparation of the subsurface

All networks (gas, sewer, water, etc.) must be built and finished before the product is laid, so that there is no need to excavate and potentially damage the reinforcement geocomposite layers. Before installation of EnkaGrid MAX C product, the subbase surface must be prepared as follows:

- the existing surface should be cleaned of items which could damage the product by either tearing or puncturing (for e.g. sharp stones, tree branches, etc.), consequently affecting its functions negatively;
- larger cracks or potholes have to be filled with local soil or any suitable soil to achieve a smooth surface;
- the subsoil has to be compacted properly (acc. to local rules or standards).

Installation of the product

The placement and direction of the unrolled geosynthetic must be clearly determined within the construction design. The location of the geosynthetic must be identified by stakes or other indicators. The geosynthetic must be evened out, stretched and anchored by “U” or “J” shaped steel clamps or a small portion of filling material (at least in every 3 m) to remove any folds and waves, immediately safeguarding proper interaction between the product and the soil.

No vehicle should traffic directly on the geocomposite surface at any time.

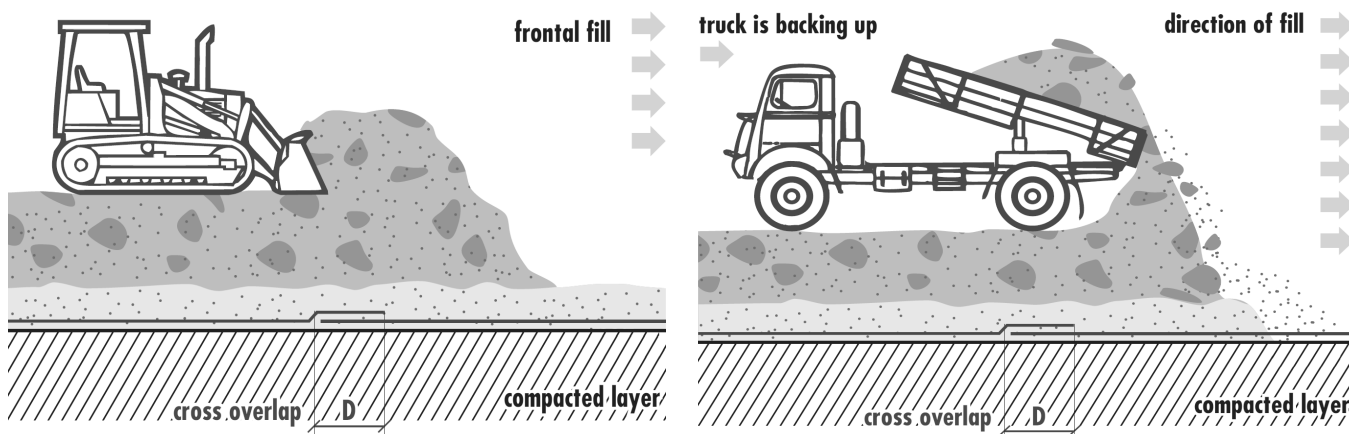
When dealing with reinforcement, separation and filtration of unbound supporting layers in road or railway construction, the overlap must be:

- in case of surface with moderate load bearing capacity ($\text{CBR} > 3\%$): 30 cm;
- in case of uneven surface with soft load bearing capacity ($1\% < \text{CBR} < 3\%$): 50 cm;
- in case of subsurface with very soft bearing capacity ($\text{CBR} < 1\%$): 100 cm.

Over very soft or uneven soils these overlaps may need to be further increased. Please contact our office for further advice. Should special circumstances identify a need for a mechanical joint then further details may be obtained from our office.

Installation of the fill material

After installation, the product has to be prevented from being directly driven on. A 20 cm thick layer of subbase material must be installed and compacted in front-spread method before the surface can be exposed to traffic.



Spread the aggregate

Backfill the aggregate

The particle size distribution curve of the fill should be well graded and aligned with the selected reinforcement layer to reach an optimal compaction level and interaction between the product and the fill material.

High water content of the soil layers should be expected, especially in case of seasonal fluctuation of high ground water levels in cohesive subsoils. Accordingly, the proportion of fine components (< 0.063 mm) should be restricted to no more than 5 % of the weight, in order to enable smooth water drainage without significant pressure. This requirement must be defined to an even stricter degree when dealing with recycled construction materials and recycled construction material mixtures.

Preferred fill type

Preferred type of granular material is well graded crushed stone or sandy gravel consisting of rounded grains with maximum 56 mm (possibly 63 mm) particle size. Moreover, it is advisable to keep the amount of grain size (< 0.063 mm) under 5 % to achieve optimal interaction. The aperture size of EnkaGrid MAX geogrids is approximately 40 mm, so in optimal case the grain content of 32 mm sized particles does not exceed 35%, and the d_{60} is between 4-28 mm.

Special treatment is advised in case the fill has more than 5 % of a grain size larger than 32 mm. In certain cases a protective layer of finer graded soil (of approx. 20 cm) should be installed first.

Compaction of the fill material

The water content of the fill should be optimal to ensure a proper compaction level of the fill. To immediately activate the reinforcement effect, it is advisable to start the compaction process in the middle of the structure and to then work outwards to the edges. The thickness of the individual fill layers must be in line with the sub-base/sub-structure, the type of fill material and the equipment available for compaction.

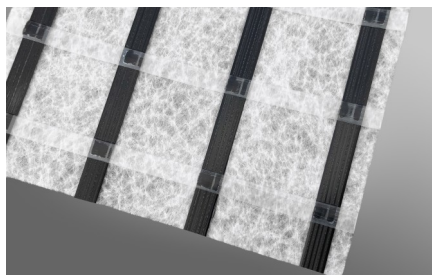
Installation damage

Should the geocomposite be damaged during fill placement then the surrounding fill material should be removed and a second geosynthetic layer placed over the damaged area. A minimum overlap of 1500mm should be provided between the edge of the damaged area and the outside edge of the patch. Fill placement should then continue as before.

Summary

Reinforcement of earthwork constructions using geosynthetics is a well-accepted, economic and ecological alternative to traditional construction solutions. In some areas, it has even become a standard construction method. However, one must not neglect the fact that the installation of geosynthetics requires a certain care and that the standards and regulations for earthwork must be adhered to. These installation instructions can only cover the most important points. In case of questions regarding the above or related items, we will be pleased to be of assistance at any time.

Product picture



EnkaGrid® MAX C

Biaxial laser-welded geogrid geocomposite for soil reinforcement, stabilization, separation and filtration

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