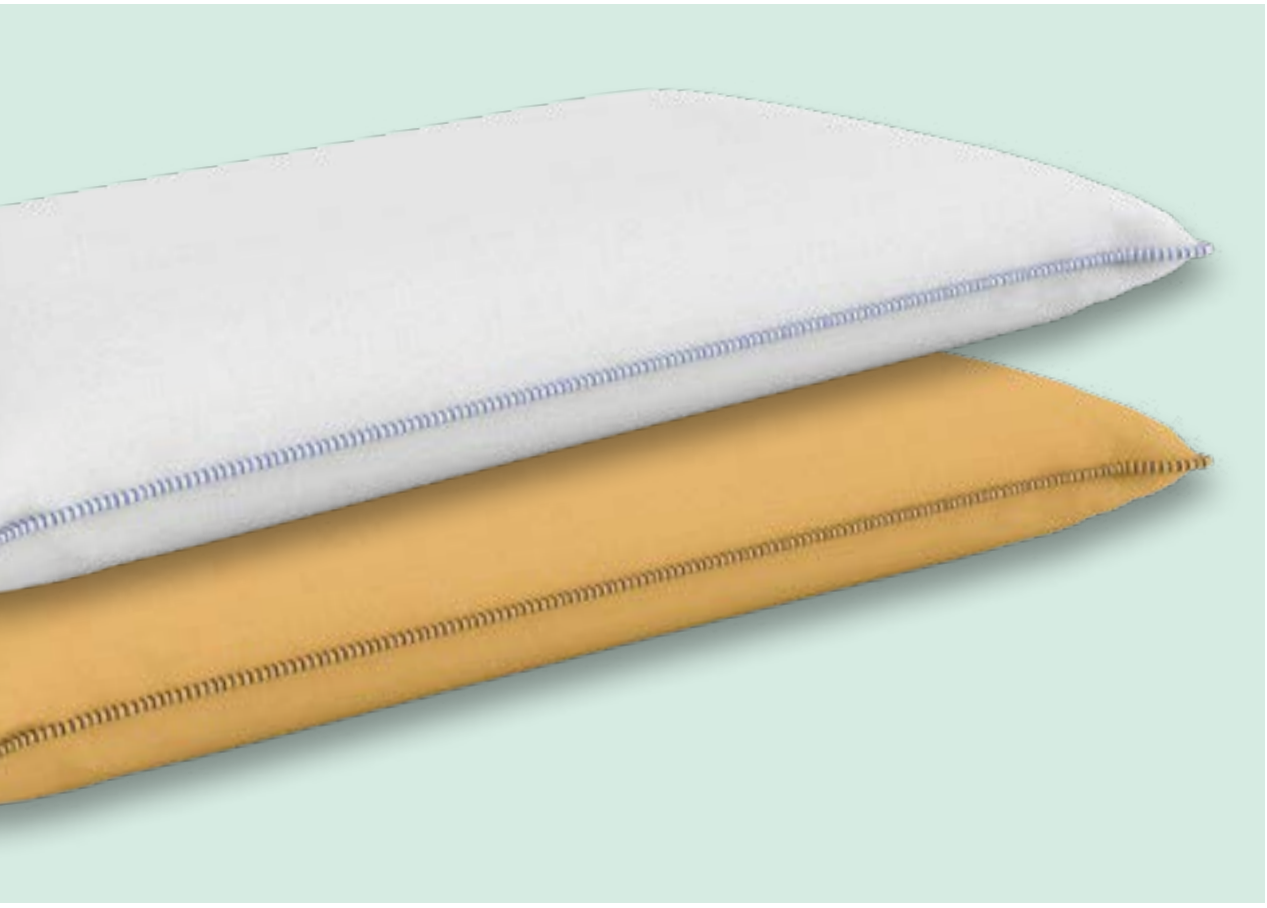
Secutex®
Soft Rock

Geotextile sand containers

Naue



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Building on sustainable ground.

Secutex® Soft Rock are geotextile sand bags or containers manufactured from needle-punched Secutex® nonwoven filter geotextiles. Geotextile sand containers (GSC) are made for encapsulating granular material and are used as building element.

In addition to single-layer nonwoven GSCs for covered applications, double-layer nonwoven GSCs are available. They have an integrated surface protection made of rough fibres for exposed conditions and are visually well suited for a sandy environment.

TYPICAL APPLICATIONS FOR SECUTEX® SOFT ROCK

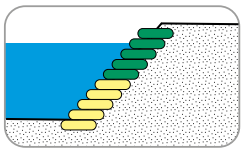


Figure 1:
Erosion/river bank protection

River bank protection

Secutex® Soft Rock sand containers provide an alternative solution to conventional erosion control systems or revetments made of rocks or concrete. With the use of GSCs and an underlying filter nonwoven Secutex® H an effective erosion protection system can be achieved. Secutex® Soft Rock sand containers made of single or double-layered nonwovens can be applied with or without an additional protection layer for covered or uncovered applications.

Application advantages of Secutex® Soft Rock

- Long-term abrasion resistance and robustness for a long service life
- Soft and flexible construction elements adopt very well to surrounding conditions
- More economical and ecological solution in comparison to conventional revetment systems made of stones

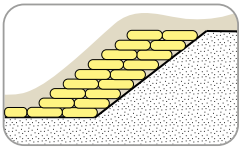


Figure 2:
Coastal and dune protection

Coastal and dune protection

Secutex® Soft Rock is installed in front of or above soil materials in order to retain the soil material behind or underneath while providing sufficient resistance to hydraulic loads. In consideration of their soft and adaptable properties, GSCs are best suited for coastal protection systems, for example inside sand dunes or in front of steep coasts.

Application advantages of Secutex® Soft Rock

- Stability under dynamic load (wave run-up, wave overflow, etc.)
- Erosion stable encapsulation of the fill material in the GSC
- Long-term abrasion resistance for durable applications
- Long-term filter function leads to the prevention of water pressure developing behind the structure

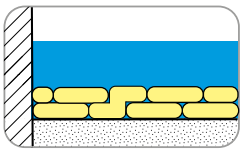


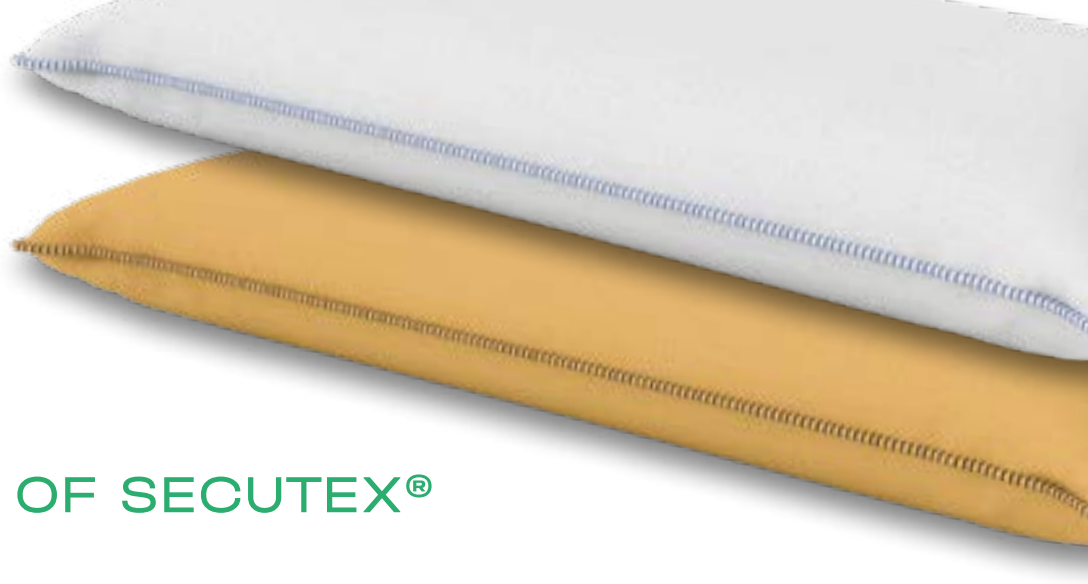
Figure 3:
Scour protection

Scour protection

GSCs are installed as scour protection system in the water around structures, e.g. offshore wind turbine foundations or bridge foundations.

Application advantages of Secutex® Soft Rock

- GSCs provide the function of a filter and a ballast in one element
- No additional cover layer required
- No scouring during construction phase as installed prior to monopile installation



ADVANTAGES OF SECUTEX® SOFT ROCK

Secutex® Soft Rock is the first choice when looking for soft and adaptable erosion and scour protection systems. Secutex® Soft Rock GSCs provide the filter and ballast function in one element. Secutex® Soft Rock GSCs, made from filter-stable nonwovens, are robust, flexible construction elements that resemble the natural coastal and marine environment and provides an excellent erosion protection. They are an alternative solution to conventional revetment systems with granular filters, rip-raps and/or armourstones.

In-situ soil as fill material

A convincing advantage of Secutex® Soft Rock constructions lies in the ability to fill them with locally available sand. This can result in significant cost savings compared to conventional revetment solutions due to reduced construction time, lower material costs and shorter transport distances.

Stability under hydraulic load

The dynamic interaction between waves and/or currents and the soils and structures at the water‘s edge makes the selection of a suitable protection system difficult. Coastal sections or banks (e.g. with buildings close to the coast) must be protected from erosion in the long term. The solution must be flexible and durable, and the impact on the marine environment must be minimal. Lightweight, robust nonwovens make it possible to encapsulate the local sand and thus create efficient geotextile containers for erosion control measures in the long term.

Secutex® Soft Rock as building material

The roughened surface of the needle-punched nonwovens of Secutex® Soft Rock offers a better friction behaviour than comparable systems made of woven fabrics. Thus, Secutex® Soft Rock reduces the sliding between stacked sand-filled containers or bags when subject to currents and waves. In addition, sand and sedimentation are embedded in the nonwoven structure, providing a natural protection layer for the nonwoven.

CO_2 reduction

Geosynthetics can replace the use of conventional construction materials such as armourstone, gravel or sand. This means that fewer stones or soil must be removed and transported and thus, less CO_2 is produced and emitted.

Product type	Theoretical fill volume	Enviroment of the application
Secutex® Soft Rock R 601	1,0 m³	Covered
Secutex® Soft Rock R 801	1,0 m³ 1,5 m³	Covered
Secutex® Soft Rock RS 801a	0,43 m³ 1,0 m³	Covered
Secutex® Soft Rock RS 1201*	1,0 m³ 1,5 m³ 2,0 m³ 2,5 m³	Uncovered
Secutex® Soft Rock RS 1601	2,5 m³	Uncovered

*Special equipment is required for filling and transport.

Table 1: Typical Secutex® Soft Rock sizes

Figure 4: Advantages of Secutex® Soft Rock GSCs

Approvals for the Naue Group

Bentofix® BFG 5000
Bentofix® X2 BFG 5300

Secugrid® Q6 and R6

Secugrid® HS R6

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