

Advantages of
SECUTEX® Soft Rock
Geotextile sand-filled containers, bags and tubes



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Scour protection, coastal protection structures and erosion control

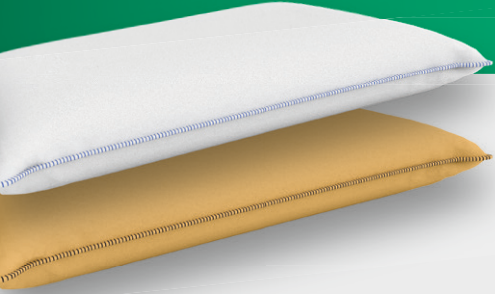
SECUTEX® SOFT ROCK

Material science - Engineering - Innovation



SECUTEX® SOFT ROCK

Secutex® Soft Rock are geotextile sand-filled bags, containers, or tubes that are manufactured from needle-punched Secutex® filter nonwoven geotextiles. For coastal structures, dune security and scour protection, Secutex® Soft Rock provides an alternative to conventional rock materials such as riprap, gravel filters and other hard armour and aggregate solutions.



- ✓ Versatile, sand-filled, soft and flexible construction elements for marine, coastal, river and waterway structures
- ✓ Use of different fill materials, depending on the application
- ✓ Excellent tensile strength and elongation characteristics during hydraulic-geotechnical interactions
- ✓ Different sizes, weights and fill capacities available
- ✓ Proven 20-year, long-term performance for scour protection
- ✓ Compared to woven geotextile containers: higher interface friction and higher, proven structural stability
- ✓ Long-term abrasion and robustness performance
- ✓ Single or double-layered nonwovens with or without additional protection layer for covered or uncovered applications
- ✓ Supported by decades of seaming and manufacturing experience
- ✓ Very high-quality control standards
- ✓ Trouble-free disassembly of the scour protection system after the end of the service life

Conventional scour protection solutions can only be installed in large depths or at high flow rates with big and expensive efforts, and they typically do not stay in position. In the past scour protection was constructed with mineral aggregate or a geotextile filter under heavy armor rock. A durable and effective alternative is Secutex® Soft Rock scour protection.

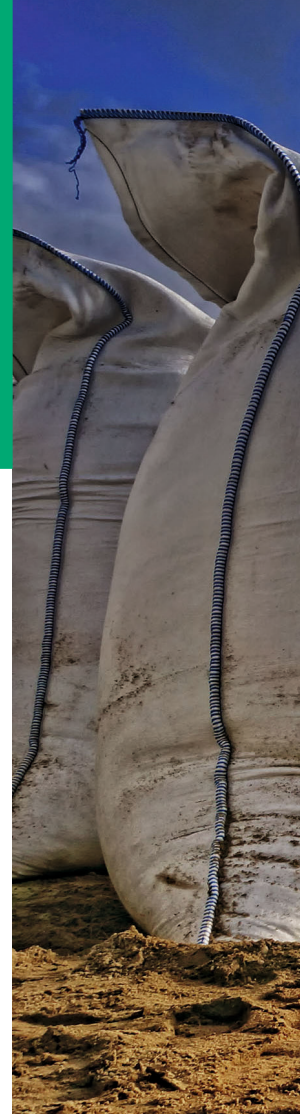
The placement of the filter and armor rock layer creates numerous difficulties in large water depths and at high flow velocities and does not provide permanent scour protection. For this reason, more often sand-filled geotextile nonwoven containers have been installed as a more effective solution.

The dynamic interaction between waves and waterfront soils and structures complicates hydraulic engineering. Beachfronts require long-term protection, and the solutions sought must be flexible, durable, and minimise impact on marine environments. Lightweight, robust nonwoven geotextiles enable these engineered installations to encapsulate sand (including local fill) for the creation of long-term performing bags, containers and tubes.

The impact of a sand container solution made of Secutex® Soft Rock with respect to the lifecycle consideration is only a fraction of the impact of a conventional solution in an offshore scour protection system.

Secutex® nonwovens are filter-stable and extremely robust. A special two-layered nonwoven composite is available, which features an integrated surface protection layer made from rough fibres for exposed or covered designs.

The available sizes and mass per unit area of Secutex® nonwoven geotextile containers enable flexibility in fill selection and installation methods. Bag size and arrangement is dependent on the application and expected hydrodynamic conditions. Secutex® Soft Rock standard design approaches are available.





ADVANTAGE 1

Secutex® Soft Rock can be installed simply with lighter equipment while the transport of heavy rock is avoided. The ingenuity of Secutex® Soft Rock construction rests on the ability to fill them with locally available sand. The filter-stable nonwovens provide robust, flexible construction elements that are similar to the natural coastal and marine environment but with greater erosion control.

ADVANTAGE 2

The roughened surface of the needle-punched nonwoven geotextiles of Secutex® Soft Rock offer better frictional behavior than comparable systems made of woven fabrics; thus, Secutex® Soft Rock reduces the sliding between stacked sand-filled containers or bags when subjected to currents and waves. Additionally

sand and sedimentation embeds itself within the Secutex® nonwoven structure, which gives it a natural protection layer.

ADVANTAGE 3

Secutex® Soft Rock replaces granular filters and rock armour for scour protection of offshore wind turbine foundations. The sand-filled Secutex® Soft Rock containers provide highly efficient, long-term protection due to the geotextile's robustness, filtration qualities and weight. There is no need for further granular layers.

Installed in advance of monopiles, the system eliminates the risk of erosion during construction. And, the ability to drive piles through the geocontainers enables quicker, more dependable construction that provides valuable savings to a project.

Figure 1
Advantages of
Secutex® Soft
Rock GSC

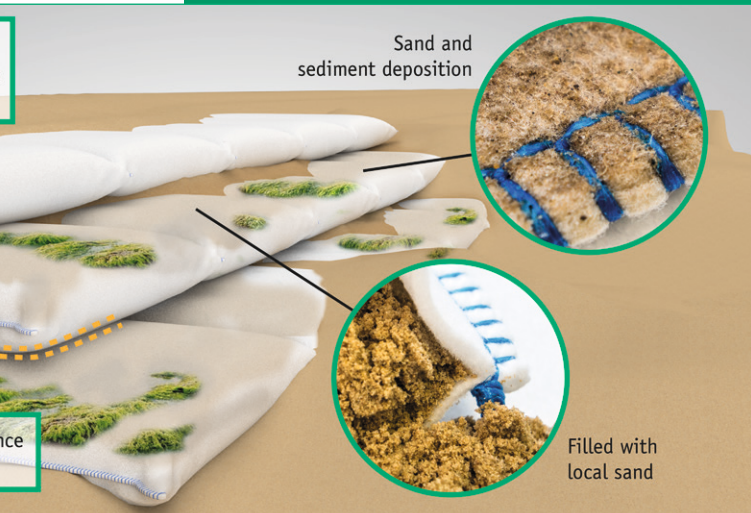
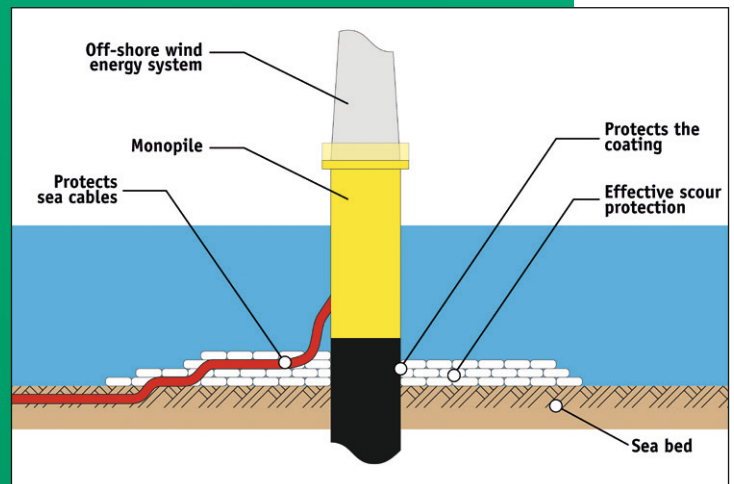


Figure 2
Secutex® Soft Rock
scour protection for
offshore wind turbine
foundations (mono-
pile driven through
Soft Rock)

The Soft Rock
solution does not
cause any damage
to foundation struc-
tures, other techni-
cal details or the anti-
corrosion coating
during installation



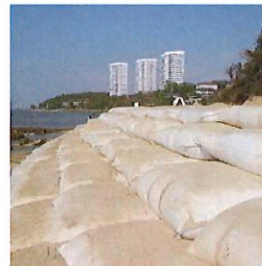
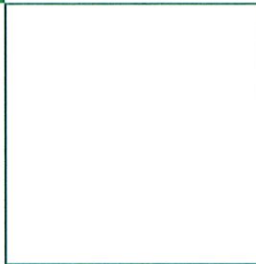
SECUTEX® SOFT ROCK



Order free of charge
Secutex® Soft Rock
information

Secutex® Soft Rock Applications:

- Sea walls, beach and dune revetments
- Groynes
- Submerged breakwaters and jetties
- Scour protection for waterfront structures, walls, bridge piles and offshore wind turbines
- Offshore cable protection
- Erosion control in flowing waters
- Filling of washed out material in dams
- Soil stabilisation in dams



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