The Safe Choice for a Safe Future

Geosynthetics for Earthworks and Foundations
Geosynthetics which endure – like our promises.
As geosynthetic specialists, with a 150-year-plus track record, we have helped to shape the history of earthworks and foundations engineering.

Our engineers, customer consultants and manufacturing staff are all equipped to tackle projects which impose a wide diversity of requirements. However complex the project, we have always abided by the principle of delivering no-nonsense solutions that are closely tailored to our customers’ specific needs.

We are conscious that the many physical tonnes of soil carried by our in service geosynthetics quite literally constitutes a heavy burden of responsibility. Every single square metre of HUESKER products used by our customers must guarantee 100 % performance.

This high standard of reliability is achieved, first and foremost, by our expert workforce committed to the consistent quality of our products. As an additional safeguard, HUESKER’s geosynthetics are also subjected to continuous quality testing at our in-house laboratory as well as by independent bodies.

Our geosynthetic products offer the key to eco-efficient design solutions with proven sustainability credentials. Finding answers to your every need – and nothing less – is our definition of a job well done.
HUESKER geosynthetics for Earthworks and Foundations meet all the requirements of:

- DIN EN ISO 9001
- DIN EN ISO 17025
- DIN EN ISO 14001
- DIN 18200
- CE marking
- IVG (German Geosynthetics Industry Association)
- and other certification systems
Needless to say, your projects are absolutely safe in our expert and experienced hands. Yet we fully understand customers who prefer to apply the “Trust But Verify” principle.

Our geosynthetics are subject to a continuous process of research, development and testing. The quality of our products and services is assured by a comprehensive monitoring, certification and external surveillance regime.

Our high-performance, state-of-the-art production lines enable us to respond promptly and flexibly to customers’ wishes, while maintaining the very highest of standards. The quality features of HUESKER products are validated by compliance with the official, certified benchmarks specified in CE and/or ISO standards. HUESKER’s quality management system is certified to DIN EN ISO 9001. Our in-house test laboratory is likewise certified to DIN EN ISO 17025 under the DAP (German Accreditation System for Testing).

Ongoing factory production is monitored both by our own test laboratory and by official material testing institutes, and is also subject to the stringent provisions of DIN 18200. Many of our products, e.g. Fortrac® geogrids, have also been endorsed by other recognized certification authorities.

Guaranteed quality – a solid foundation for safety and stability.
Located in the region of Trento/Italy, the village of Lases nestles picturesquely in a valley flanked by granite slopes. Yet, until 2006, these same slopes posed a serious threat.

In particular, the hillside areas overlooking the lake had been destabilized by quarrying. This problem was compounded by a fault directly below the unstable ground and significant groundwater infiltration. The slope was thus in danger of slipping into the lake and causing a gigantic flood wave, which could potentially engulf Lases.

This risk was eliminated by construction, at the foot of the slope, of terraces incorporating several hundred thousand cubic metres of rock fill and reinforced by HUESKER Fortrac® geogrids. Capitalizing on the supreme quality features of the Fortrac® geogrid, the team of geologists and HUESKER engineers managed to bring the complex and large-scale project to a successful conclusion.

“Trento” project:
Reaching dizzying heights with Fortrac® geogrids.

KEY DATA

- 60 m high geogrid-reinforced slope
- Use of Fortrac® 110/30-20 geogrids, with tensile strength of 110 kN/m in main direction of tension
- Use of Fortrac® 45/20-20 geogrids, with tensile strength of 45 kN/m in main direction of tension
- Hydoseeding with special mix of grass seed, water, fertilizer and adhesive compound
The original B114 national road linking the municipalities of Trieben and Hohentauern in the Austrian Province of Styria was built in the 1960s. Over the years, the heavily trafficked section between Trieben and Sunk became so badly damaged that normal repair work was no longer feasible. Any attempt to find a technical solution was severely complicated by the local geological conditions, which exhibited adverse jointing in this area.

After extensive investigations, the Province of Styria as client opted to build a new road on Geosynthetic Reinforced Soil (GRS) on the opposite side of the valley. Fortrac® geogrids were specified for the construction of these slopes on either side of the road. The fill was placed using the “wrapped-back” method in a multiple 60 cm thick layers.

The resulting, up to 28-metre-high GRS structures imposed stringent technical requirements on the chosen geogrid. Thanks to its inherent flexibility – which facilitated the wrapping-back operation – as well as its favourable stress-strain behaviour and durability, Fortrac® delivered a comprehensive all-round solution.

“Trieben-Sunk” project: Enjoy a safe and pleasant drive on the B114, courtesy of HUESKER.
The Gröbers project necessitated the stabilization of a mining site from which, up to a few decades earlier, coal had been extracted at a depth of only 30 m below ground level. Now it was to house a major railway junction with seven parallel tracks, two of which were reserved for high-speed trains running at up to 300 km/h. The German national railway company Deutsche Bahn AG singled out Fortrac® geogrids as the best solution for the critically important task of protecting the railway junction against possible sinkholes and excessive settlement, while accommodating a computer-assisted monitoring system.

All voids identified during the site investigations were injected with grout. The embankment was then built on top of a special overbridging system comprising a Fortrac® reinforced gravel cushion and cement-stabilized soil. The first step was to create a 0.4 m thick cement-stabilized base layer. A mineral mix (0/16 and 0/32) was then placed in conjunction with the electronic warning system and two layers of Fortrac® aramid geogrids, installed perpendicular to each other, with a short-term tensile strength of 1,200 kN/m in the roll direction. The thickness of the reinforcement totalled 0.95 m.
Finally, a further cement-stabilized bearing layer was placed in successive operations. This was then covered by a HaTe® FB 350 nonwoven separation geotextile prior to installation of the frost blanket course and formation, in accordance with the relevant Deutsche Bahn AG guidelines.

In the event of any sinkholes developing, the electronic warning system is able to indicate their exact position. Any such failure electronic simultaneously activates the Fortrac® geogrids and a solid arch forms in the upper cement-stabilized bearing layer. This unique system not only permits long-term, computer-assisted monitoring, but above all guarantees the permanent safety of the railway junction.
The project to extend the Hamburg production plant for the new Airbus A 380 necessitated the reclamation of some 140 hectares of land in the River Elbe estuary. The challenges posed by the sheer magnitude of the scheme were overcome by an engineering tour de force, involving the use of 60,000 Ringtrac® Geotextile Encased Columns.

To provide a foundation for the 2.4 km long perimeter dike, 4 to 14 m long geotextile encased sand columns were installed in the extremely soft and weak subsoil. Comtrac® geocomposite was then laid over the column heads to reinforce the base of the dike and ensure its long-term stability.

Compared to the alternative proposals, the solution with HUESKER products allowed enormous savings: 35,000 tonnes of sheet piling, 1.1 million m³ of sand fill and 8 million litres of fuel. It also cut the construction time by over a year while yielding an extra 15 hectares of land.
After abandoning plans for a high-speed, magnetic levitation (maglev) rail link between Hamburg and Berlin, the German national railway company Deutsche Bahn AG opted for a further raft of improvements to some of the existing track sections. The biggest challenge was posed by the weak, peaty subsoil along a 14.5 km stretch of track between Paulinenaue and Friesack, on the Spandau-Neustadt line.

The first step involved a thorough preparation and pretreatment of the subsoil and existing vibro-concrete columns. The base of the new embankment was then formed by placing a 20 cm thick layer of mineral fill. To achieve the required bearing capacity, three layers of Fortrac® PVA geogrids (type R 200/200-30 M) were installed at 30 cm intervals. The Fortrac® geogrids were laid perpendicular to the track direction over a width of 14 m, with a 1 m lap between adjoining sheets. The delivery of cut-to-size geogrids allowed offcut waste to be minimized.

The rail section is now in service and meets all operational requirements. Control measurements have confirmed the success of HUESKER’s high-grade engineering solution. The recent improvement scheme now allows Intercity-Express (ICE) trains to reach peak speeds of 230 km/h, thereby cutting the journey time between Hamburg Central Station and Berlin Zoo Station to 100 minutes.
Whatever ground stabilization challenges you face, HUESKER will supply you with products that embody decades of experience and expertise.

In developing our geosynthetics, we have always endeavoured to combine straightforward installation with flexible application. Longevity is a further key issue in production. Ever since the company was founded, over 150 years ago, our manufacturing processes have been subject to continuous, across-the-board technical optimization so as to furnish our customers with premium-quality products at all times. Sustainability and environmental friendliness are also given top priority at HUESKER.

We view our role not only as a supplier of high-grade geosynthetics, but also – and primarily – as a partner with a wealth of know-how and experience that provides you with targeted support in the implementation of your construction schemes. Not only is this close involvement key to the success of all projects, however complex, it also inspires the development of products that offer fundamental benefits.

HUESKER offices worldwide

For further details, please visit www.HUESKER.com.
**Embankments on Soft Soil**
- Ensures global and local stability
- Shortens waiting times for consolidation
- Allows steeper slopes (smaller base width, lower volume of fill)
- Accommodates differential settlement

**Embankments on Piles**
- Allows larger pile grids and smaller pile caps
- Obviates need for raked piles at perimeters due to accommodation of lateral spread by reinforcement

**Geotextile Encased Columns**
- Ensures column integrity in extremely soft ground, thereby providing a stable foundation for embankments
- Columns act as “mega-drains” and considerably reduce consolidation times
- Lowers burden on soft soils, thereby reducing creep settlement
- Columns are permeable

**Geosynthetic Reinforced Soil**
- Allows creation of extra-steep slopes
- Resistant to settlement
- Flexible design
- Straightforward and rapid construction
- Various landscaping options available for slope face
- Low-cost construction

**Bridging of Sinkholes**
- Temporary and permanent protection of sites prone to sinkholes
- Due to their extra-high tensile strengths and stiffnesses, HUESKER products can also protect against larger sinkholes
- Low-cost alternative to reinforced-concrete solutions

Fortrac®, Fortrac 3D®, HaTelit®, Robutec®, Comtrac®, Fornit®, DuoGrid®, Ringtrac®, NaBento®, Incomat®, HaTe®, SoilTain® and Stabilenka® are registered trademarks of HUESKER Synthetic GmbH.