

Protection All-Round the Line

Geosynthetic Solutions for Pipeline Construction

Meeting the Challenges of Pipeline Construction

Discover the numerous benefits offered by our geosynthetic applications

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Our Experience for Your Success

HUESKER has been delivering geosynthetic product solutions for efficient pipeline construction for over 20 years

Pipeline projects pose a wide variety of complex challenges. Our geosynthetics offer an effective means of stabilising and protecting pipelines, e.g. against buoyancy and uplift forces, mechanical loads or environmental actions. They are robust, durable, versatile in their application and easy to install.

Our range of systems for long-term pipeline protection is complemented by geosynthetic products for the rapid construction of haul roads, ground improvement for plant installations, slope stabilization and groundwater protection. Our solutions for all aspects of pipeline construction combine reliable performance with cost-effectiveness, sustainability and eco-friendliness.

Engineering excellence

Our outstanding feats of engineering are built on the ingenuity, many years of experience and interdisciplinary expertise of the HUESKER team. Our experts are happy to cater for your specific requirements and are on hand, worldwide, to provide advice and support.

We offer:

- Technical consulting and design
- Project-specific detailing and custom-manufacture
- Placement plans and support during installation

2004
Slope stabilisation,
Russia,
Baku-Novorossiysk,
oil pipeline



2009
Pipe encasement,
inverted siphon,
Germany, Essen,
gas pipeline



2014
Pipe encasement,
France,
Artère de l'Adour,
gas pipeline



2017
Pipe encasement,
Greece and Albania,
TAP, gas pipeline



1997
Pipe encasement,
inverted siphon, France,
River Luce,
gas pipeline



2006
Pipe cover,
France, gas pipeline



2013
Pipe warning grid,
France,
Chantier Loon-Plage,
gas pipeline



2015
Erosion control for
watercourse over pipeline,
France, gas pipeline

Speed and Reliability from End to End

The demands placed on pipeline construction are sometimes extreme: with linear structures, the entire site set-up has to move in tandem with the works. The route may cross impassable terrain and obstacles, such as rivers, would have to be negotiated. The task is further complicated by the challenging climatic and ground conditions that often prevail.

Whatever the requirements, HUESKER can deliver a suitable cost-effective solution:

- Easy to install solutions for protection and stabilisation of pipelines
- Base reinforcement to ensure stable ground conditions on site
- Straightforward groundwater protection throughout works
- Slope stabilisation with anti-slip reinforcement and erosion control
- GRS constructions for building steep slopes
- Ground improvement for safe installation of plant
- Certified, eco-friendly products that are used worldwide



Incomat® Pipeline Cover

Geotextile concrete formwork mattress with factory-fitted industrial zips for rapid pipe encasement.



HaTe® protective nonwovens

Nonwovens made from mechanically bonded staple fibres for straightforward pipeline protection.



Basetrac® Duo-C

Composite made from polymer-coated geogrid and non-woven providing reinforcement, separation and filtration for high displacement resistance in pipe trenches.



Incomat® Standard

Geotextile concrete mattress for rapid installation in watercourses, as a lining and for erosion control.



Fortrac® PipeGuard

Robust geogrid used as an early warning protection method during excavation.



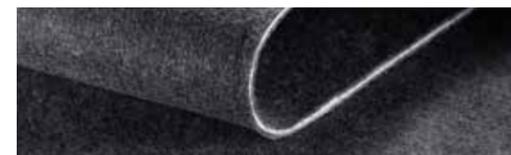
Basetrac® Woven

Polypropylene flat-tape woven for reinforcement, separation and filtration with tensile strengths of up to 100 kN/m for temporary base courses.



Basetrac® Grid

High-tensile woven geogrid for surface stabilisation, with high UV resistance thanks to polymer coating.



Tektoseal® Active AS

Active geocomposite for flexible oil absorption on site.



Ringtrac®

Geotextile-encased columns for construction of loadbearing surfaces in very weak subsoils.



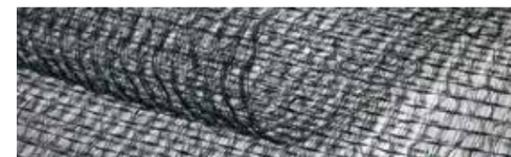
Stabilenka®

High-tensile polyethylene woven geotextile to meet extreme project requirements, with BBA (British Board of Agrément) certification.



Fortrac®

Extremely resilient, flexible geogrid with a proven track record in soil reinforcement, also in conjunction with GRS systems.



Fortrac® 3D

High-tensile anti-slip reinforcement with soil retention function and erosion control for steep slopes.

Pipe Encasement with Concrete Mattresses Incomat Pipeline Cover

Reliable protection against buoyancy, uplift and external actions

Incomat Pipeline Cover (IPC) is a geotextile concrete formwork mattress with factory-fitted industrial zips for rapid pipe encasement. The IPC system sets itself apart from concrete encasements installed with conventional formwork systems through its much faster, cost-effective application. Factory prefabrication of the geotextile formwork eliminates the need for any elaborate shuttering on site. At the same time, the straightforward installation of our tailored units and optimisation of concreting operations save valuable construction time and speed up the progress of the works. Thanks to their custom manufacture, our pipe encasement systems can also readily accommodate pipeline bends and varying pipe diameters. IPC has already underlined its credentials on numerous major projects, such as the Trans Adriatic Pipeline (TAP).



Incomat Standard



Up to
5 m
long concreting sections
< 10 min
filling time

Benefits

- No need for elaborate formwork assemblies around the pipe
- High precision prefabrication for virtually any pipe diameter
- Progress of works accelerated at relatively low cost
- Also accommodates pipeline bends and underwater applications
- No impairment of cathodic protection

Simple installation principle



1.
Fix to pipe section



2.
Zip up cover



3.
Fill with concrete via filler neck

Pipe Encasement with Nonwoven

Straightforward mechanical protection for all ground conditions

Our protective nonwovens are made from mechanically bonded staple fibres. They serve either a simple protective function or as an additional safeguard between the pipeline and other elements installed to prevent buoyancy or uplift. They guard the pipe coating against scratches and other damage. The materials are supplied in rolls and are easily cut to size, allowing fast, efficient installation.



HaTe nonwoven



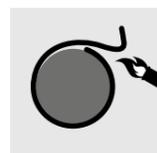
Benefits

- High thermal resistance
- No impairment of cathodic protection
- Suitable for use in soils with $3 \leq \text{pH} \leq 13$

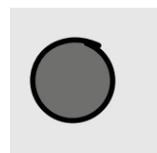
Simple installation principle



1. Wrap around pipe



2. Heat with gas torch



3. Join by pressing down

Geosynthetic-Reinforced Bedding Cushion

Protection against displacement in weak soils and for extra large pipe diameters

To prevent the displacement of pipelines, HUESKER's Basetrac geosynthetic products can be used for the rapid installation of reinforced soil cushions to create a reliable pipe bedding. By providing an efficient means of constructing a strong and sound base for pipelines, the Basetrac range helps to cut construction times and costs.



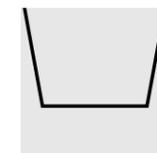
Basetrac Duo-C



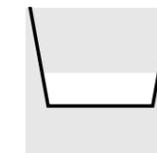
Benefits

- Reliable pipe bedding for heavy pipes in soft soils
- Lower excavation depth for pipe trench
- Savings on labour and material transportation
- Progress of works accelerated at low cost

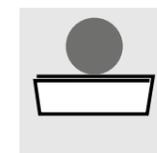
Simple installation principle



1. Place sheet in pipe trench



2. Fill with excavation material



3. Fold over and lay pipe

Top Pipe Cover with Geosynthetic Systems

Basetrac geocomposite ballasting

Factors such as large pipe diameters, high water tables and low soil cover make the job of installing or refurbishing pipelines particularly challenging. Where measures are needed to prevent pipeline buoyancy or uplift, then a simple geosynthetic overlay in conjunction with soil fill offers a sustainable and cost-effective solution. Our system comprises a wrapped-back Basetrac geocomposite that can be filled with locally sourced excavation material. Even in case of only shallow soil cover, this solution provides reliable protection against buoyancy and uplift.



Basetrac Duo-C

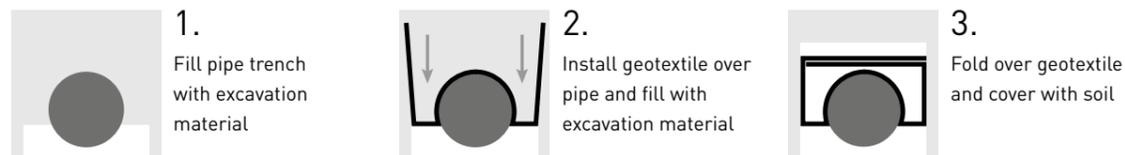


Benefits

- Suitable for all types of pipe and large diameters
- Protection against buoyancy/uplift and mechanical action
- Suitable for low soil cover
- Straightforward installation to speed up progress of works
- Easy to retrofit

Already used for
Ø 2.5 m

Simple installation principle



Incomat concrete mattress system

The Incomat concrete mattress can be used wherever protection against buoyancy, uplift and mechanical actions is required above the pipeline. Unlike conventional solutions, the formwork mattress can also be laid directly on top of the previously installed pipeline and filled with liquid concrete. The mattress ensures a constant concrete section. The unique manufacturing method, involving the incorporation of vertical ties, gives the geotextile encasement a unique dimensional stability. This dimensional stability guarantees a constant concrete cross section even under difficult installation conditions, e.g. with uneven bases or underwater applications. The concrete filled units, which are quick to install and custom-fabricated for each project, adapt perfectly to the shape of the pipeline and surrounding geometry.



Incomat Standard



Also underwater protection
against
anchor
impact



Benefits

- Protection against buoyancy/uplift and mechanical action
- Project-specific customisation
- Fast, resource-efficient installation
- Maximum dimensional stability for constant concrete cross-section
- Underwater installation possible

Simple installation principle



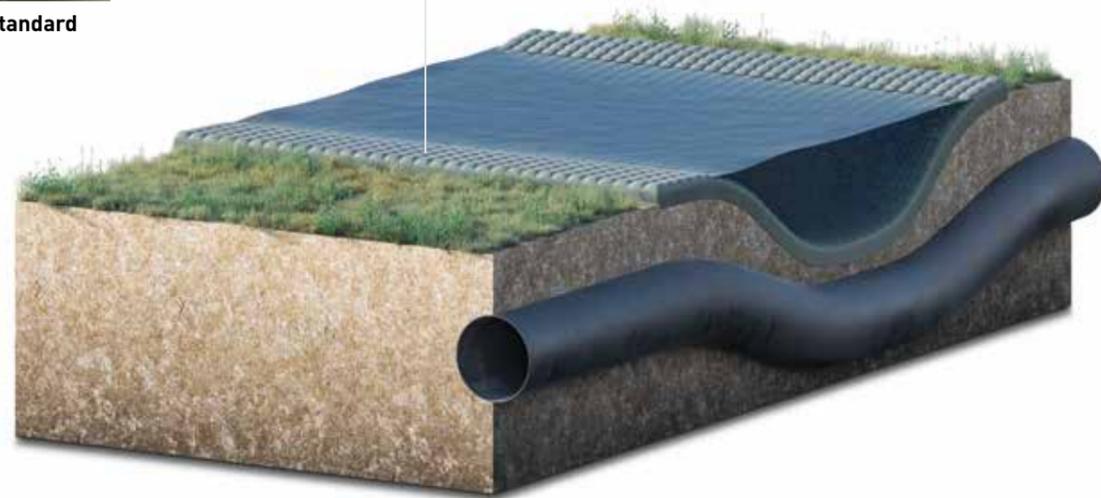
Erosion Protection for Waterbodies

Incomat concrete mattress system

Where pipelines run below waterbody beds that are susceptible to erosion, it is advisable to take measures to prevent their exposure and the consequent risk of damage. Incomat concrete mattresses offer an easy, reliable and quick-to-install solution for lining and sealing watercourses, even under operating conditions. By preventing the gradual erosion of riverbeds, the mattresses provide lasting protection for pipelines. The HUESKER range includes both permeable and near-impermeable, certified mattresses. Plantable solutions are also available to provide a safe and natural looking form of erosion control on slopes. Here too, HUESKER offers custom-fabricated products to meet project-specific requirements.



Incomat Standard



Benefits

- Fast, resource-efficient installation
- Constant concrete cross-section, also on uneven base
- Underwater installation possible
- Reliable protection, even against anchor impact

Simple installation principle



1. Spread out panels



2. Fix and, if necessary, join up panels



3. Fill panels with fluid concrete

Manufactured thickness up to

56 cm

Warning System over Pipelines

Fortrac PipeGuard

Pipelines running through built-up or agricultural areas require robust and conspicuous warning safeguards to prevent damage, e.g. from excavators or farming equipment. Here, HUESKER's flexible, high-tensile Fortrac PipeGuard geogrid offers an uncomplicated and reliable solution. This biaxial geogrid can be supplied in project-specific widths and with country specific warning messages. The special polymer coating guarantees high durability in virtually all soil types. Delivery in rolls and the product's flexibility make the installation process far more straightforward than with PE-HD warning panels. The grid is simple to transport and unroll. Long grid sections can be easily joined, leaving fewer overlaps and fewer material offcuts.



Fortrac PipeGuard



Benefits

- Maximum protection thanks to high tensile strength
- High durability in virtually all soil types
- Easy handling to speed up installation
- Project-specific product configuration

Simple installation principle



1. Unroll over pipeline



2. Join up the sections

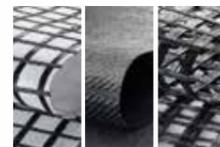


3. Cover over the material

Temporary Base Reinforcement

Basetrac base course solutions

Base course reinforcement measures are typically required to ensure the trouble free progress of works by heavy plant on ground that is inadequate or difficult to negotiate. The Basetrac product family caters for such applications with a range of geosynthetics that offer maximum resistance even to high mechanical loads. They facilitate the fast and straightforward construction of haul roads, pipeline crossings, storage areas and working platforms. Use of the robust materials allows the base course thickness to be significantly reduced while simplifying the logistical effort and shortening construction times. The installed base course construction is also easy to remove. With the BaseCalculator, which is available free of charge on the HUESKER website, only a few clicks are needed to calculate project-specific base course thicknesses and to select suitable products.



Basetrac product family

Flexible Groundwater Protection

Oil absorption with Tektoseal Active AS

As for other types of work, the progressive tightening of groundwater protection requirements placed on pipeline construction is fuelling the need for more effective and economical product solutions. The active geocomposite Tektoseal Active AS combines a high-performance, oil-absorbent polymer with mechanically stable geotextiles. The oil-absorbent mat binds petrochemical products while remaining permeable to rainwater. Tektoseal Active AS can be utilised in all unpaved areas where there is a risk of oil or petrol infiltration into the groundwater zone, e.g. at temporary machinery locations, in parking and maintenance areas, and in conjunction with transportable tanks. The product is supplied in rolls, is easy to store and can be readily cut to size on site, thus allowing fast installation and removal.



Tektoseal Active AS



Benefits

- Safe accommodation of high loads
- High deformation resistance
- Separation of base course material and subgrade
- Reduction in required base course thickness
- Fast installation and removal

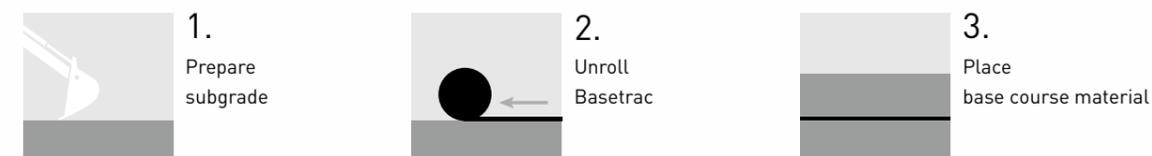
Roll width
up to
5 m

Binds
7 ltr
oil over 1 m²

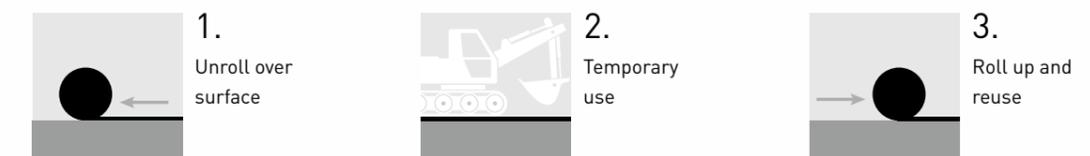
Benefits

- Reliable oil absorption over full area
- Straightforward, flexible installation
- Small rolls allow on-site storage in container units
- Oil binder certified in Germany

Simple installation principle



Simple installation principle



Geosynthetic Reinforced Soil Construction

Reinforced retaining structures for steep slopes using Fortrac

Plant installations, such as compressor stations, that need to be built on or near steep slopes require a sound and cost-effective construction concept. In such cases, GRS systems can be used to build extra steep, low settlement and settlement resistant slopes. This inexpensive method excels by its fast and simple construction. Layers of geosynthetic reinforcement are installed perpendicular to steep slopes or vertical walls at constant intervals in conjunction with soil material for the purpose of creating a stable composite structure. Thanks to its extremely high strength, the Fortrac geogrid serves to increase the bearing capacity of the structure, even for very steep inclinations. Another attractive feature of the system is the wide variety of landscaping options for the slope face, which include natural vegetation, gabions and prefabricated panels.

Benefits

- Construction of extra steep, reinforced slopes
- Rapid installation and cost effective site operations
- Provision for slope inclinations between 30° and 90°
- Planting possible for inclinations not exceeding 70°



Fortrac

Slope inclinations up to **90°**

Geotextile Encased Columns

Reliable ground improvement for weak soils with Ringtrac

Particularly at sites with difficult ground conditions and extremely weak soils or in earthquake regions, reliable ground improvement measures are frequently required to provide a strong base for oil tanks and similar structures. The Ringtrac foundation system takes the form of a regular arrangement of columns comprising noncohesive material placed inside a geosynthetic casing. The structural action of the geotextile casing transforms granular columns into high-capacity loadbearing elements. The columns can be installed more or less independently of the level of lateral support provided by the soft strata to create a ductile structural system. The horizontal reinforcement above the columns, provided by the Stabilenka geotextile woven, facilitates the transmission of structural loads to the columns and promotes global structural stability.

Benefits

- Adaptability to local conditions and loads
- Use of locally sourced soils as column fill
- Almost all settlement takes place within the construction period
- Full loadability immediately after completion
- Globally established and implemented installation method



Ringtrac



Stabilenka

Also permissible under EBGE0 in soils with $C_u < 3 \text{ kN/m}^2$



Slope Stabilisation Made Easy

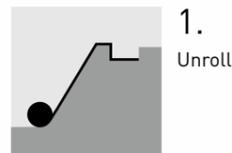
Anti-slip reinforcement and erosion control with Fortrac 3D

Slopes over which pipelines are routed require the best possible protection against erosion and soil slippage. The same applies for earthworks built over pipelines, where measures are also needed to support durable vegetation. Here, HUESKER's flexible, high-tensile Fortrac 3D geogrid delivers the prime solution. Driving forces are accommodated and diverted, thereby preventing slope veneer soil slippage. The 3D mesh structure ensures good soil retention and promotes plant growth on slopes by offering strong and permanent support for roots. Fortrac guarantees high stability even under heavy rain events. Soil loss is reduced by approximately 80% on unplanted slopes exposed to rain intensities of 50 mm/m².

Benefits

- Excellent soil retention, even under high intensity heavy rain events
- Allows construction of steep slopes, with high UV resistance
- Durable vegetation for long-term stability
- Fast and straightforward installation with no memory effect

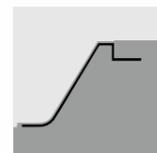
Simple installation principle



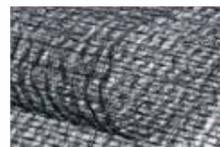
1.
Unroll



2.
Secure, if necessary with soil nails



3.
Cover over and plant



Fortrac 3D



When planted, withstands extreme overflow velocities

7.3 m/s

for short periods

HUESKER Services

HUESKER services begin with providing the customer with initial advice and end with supporting the realisation of the project on site. What we provide are safe, customised, economically viable and ecologically sound project solutions.



Engineering Services

- **Technical consulting**
We will recommend the appropriate product types for your specific requirements.
- **Technical design**
Our engineers will be delighted to assist you by performing verifiable design calculations and checks in accordance with recognised methods.
- **Project-specific placement plans**
We will prepare installation and placing recommendations plus installation diagrams.
- **Sharing of our extensive knowledge**
Best-practice solutions and techniques from our global network.

Product Services

- **Custom designed product solutions**
We will assist you in developing custom-fabricated products to meet your particular requirements.
- **Alternative solutions**
We will propose alternative design solutions as well as recommendations for adjustments and optimisations.

Documents

- **Certificates**
Our products have been issued numerous certifications, for example, by BAM, BAW, BBA, EBA, IVG and SVG, depending on the product type.
- **Installation guidelines**
Technical guidelines will help you to ensure the best-practice installation of your product on site.
- **Tender documents**
We would be happy to provide you with proposals for your specification texts.

On-The-Spot

- **On site instruction**
Where required, our application technicians are ready to offer assistance, even directly on site.
- **Training**
Product and application specific instruction.



For further information and services, please visit us at our website or on Facebook, LinkedIn or YouTube.

Application Examples



Trans Adriatic Pipeline (TAP)
Greece/Albania: protection of pipe against buoyancy, uplift and mechanical actions with Incomat Pipeline Cover.



Loop Epe-Legden (LEL) natural gas pipeline, DN 1100
Germany: base reinforcement for continuous haul road alongside pipe trench and storage areas.



Val de Saône, DN 1200
France: protection of pipe against buoyancy, uplift and mechanical actions with Incomat Pipeline Cover.



Artère des Hauts de France, DN 900
France: early warning system and excavation protection for gas pipeline with Fortrac PipeGuard geogrid.



Modernisation of gas compressor station
Italy: construction of extra-steep, low-settlement and settlement resistant slopes using geosynthetic reinforced soil method.



Ruhr inverted siphon, DN 1400
Germany: protection of pipe against buoyancy, uplift and mechanical actions with Incomat Pipeline Cover.



Ballasting of pressure sewage pipe
Netherlands: protection against buoyancy and uplift with Basetrac Duo-C geocomposite.



Ground improvement for oil tanks
Spain: construction of safe, ductile foundation system in very soft soils with Ringtrac geotextile-encased columns.

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HUESKER Synthetic is certified to ISO 9001, ISO 14001 and ISO 50001.



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