

Tektoseal® Active

Environmental Protection with Active Geo-Composites

 **HUESKER**
Ideen. Ingenieure. Innovationen.

Global

Challenges

Environmental protection

Ecological issues are gaining ever-increasing prominence in society, politics and industry as a whole

Bioaccumulation

Contaminants enter the food chain due to their accumulation in organisms

Regulations

More stringent national environmental guidelines for industry, agriculture and infrastructure

Control

Stricter environmental enforcement, with prosecution in case of infringements



Water protection

Water quality and protection are subject to ever more rigorous guidelines and standards

Emerging contaminants

The number of substances classed as potentially harmful to human health or the environment is rising

Prevention

The prevention of contaminant migration is a growing priority at the macroeconomic level

Remediation obligations

Potential liability for cleanup costs and natural resource damages based on the "polluter pays" principle

Active Environmental Protection

Innovative Product Concept

The steadily growing requirements placed on contaminated site remediation and groundwater protection are fuelling the demand for new products and engineering solutions to support eco-friendly design and construction. Drawing on its global network, HUESKER has expended considerable resources in recent years on research into special Active Geo-Composites and the development of the Tektoseal Active product family.

- Multi-layer Geosynthetic Composites
- Active material layers for contaminant absorption, adsorption and as contaminant barrier
- Tailored product solutions to specific problems

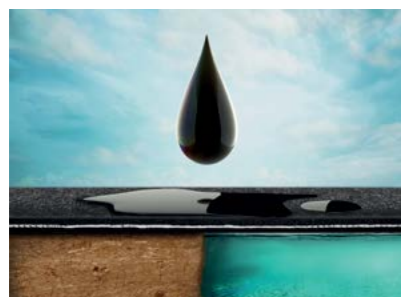
Applications



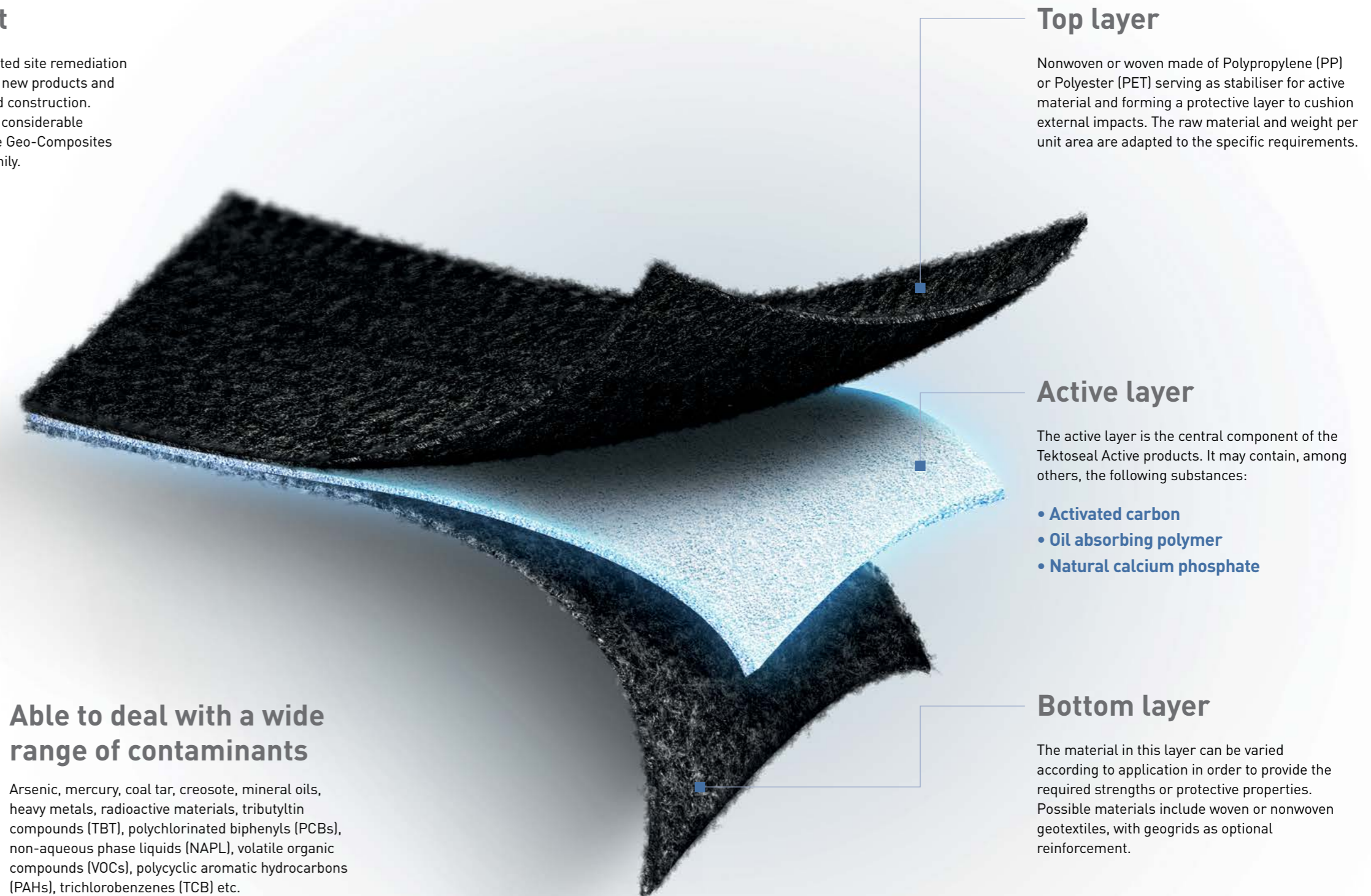
Contaminated site remediation



Groundwater protection



Oil absorption



Active Geo-Composites



BENEFITS

- Efficient contaminant absorption at point of infiltration
- Straightforward installation on land and in water
- Bond with geotextiles adds mechanical stability to active granular layer
- Constant layer thickness over entire installed area
- Tailored solutions through combination of active amendments

Tektoseal Active

HUESKER Environmental Engineering Innovation

HUESKER's Tektoseal Active is a highly innovative product concept that sets new benchmarks in eco-efficient design and construction for groundwater protection and contaminated site remediation.

The active Geo-Composite products are available in various types. Specifically for groundwater protection, we offer numerous barrier and filter products for applications involving contaminated surface water and leachate.

Tektoseal Active delivers a reliable geosynthetic remediation solution in cases where it is not feasible or cost effective to remove and dispose of the contaminated sediment or soil.

Groundwater Protection Applications

Tektoseal Active serves to prevent groundwater contamination wherever there is a risk of oil, petrol or other pollutants infiltrating into unsealed areas. The Geo-Composite binds the contaminants while remaining permeable to rainwater.

It can, for example, be used in track beds, as a base for temporary filling stations and parking areas, and for emergency clean-ups after accidents.

Tektoseal Active can also be deployed in water as an absorbent protective barrier. In emergencies, for instance, Tektoseal Active AS allows the rapid installation of an oil absorbing curtain in water or an oil barrier on the water surface. The Geo-Composite can be designed to float or sink per project specific requirements.

Remediation Applications

Tektoseal Active can also be installed as an active capping to limit the release of pollutants from contaminated sediments and to improve water quality. The products high mechanical stability and the uniform active layer thickness guarantee the formation of a reliable separating and filter layer.

As a containment solution for industrial wastelands or contaminated groundwater and soils, Tektoseal Active acts as an adsorption agent. Being able to bind a wide range of contaminants, the Geo-Composites of the Tektoseal Active family can retard contaminant migration through groundwater and soil.



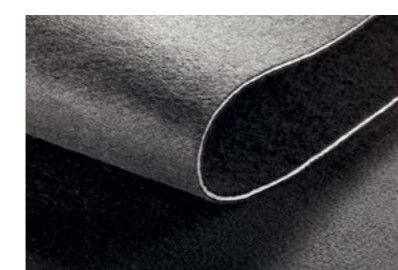
Tektoseal Active AS



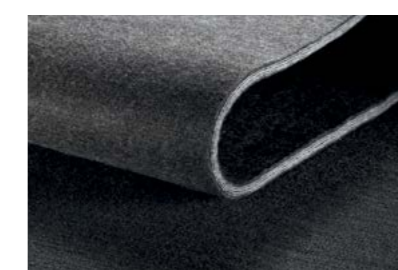
Tektoseal Active AC



Tektoseal Active CP



Tektoseal Active AS
Absorption mat for petrochemical products – oil, diesel, petrol and jet fuel etc.



Tektoseal Active AC
Multi-purpose contaminant adsorption mat for VOCs, TBT, PAHs, etc.

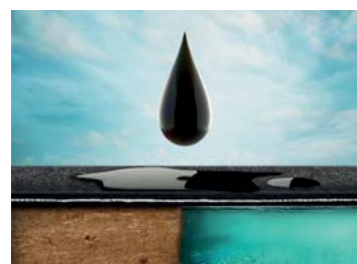


Tektoseal Active CP
Mat for binding of heavy metals and radioactive substances - Pb, Cd, U, Pu Cu, Zn etc.

BENEFITS

- High-performance oil absorbing mat with high mechanical strength
- Straightforward installation and removal
- Easy to cut to size on site
- Can be designed to either float or sink
- Certified oil binder in Germany

Tektoseal Active AS



Oil absorption



Oil barrier in water

Flexible Oil Absorption

Tektoseal Active AS is a mechanically reinforced oil absorption mat that reliably binds petrochemical products. The versatile Geo-Composite can be used in water, on water surfaces and on land. Many of the oil binding products currently on the market are unable to cope with external influences: granular absorption agents, for instance, can be carried away by wind and water. Nonwoven-based oil binders have only low stability, particularly after absorbing oil.

Tektoseal Active AS combines a high-performance, oil-absorbing polymer with the mechanical stability of geotextiles. Apart from extending the application range and service life of the constituent polymer, the resulting Geo-Composite can also be readily adapted to meet challenging project-specific requirements. Floating, sinkable or extra-stable products can, for example, be manufactured through the selection of suitable geotextiles. Typical applications involve facilities such as harbours, work yards, track areas, airports or temporary filling stations and parking areas. The product also offers protection in case of accidents and in many other situations.

The key advantage of Tektoseal Active AS is its ease of use. Being supplied in rolls, it is easy to install and subsequently remove for disposal. It can also be readily cut to size on site for fitting to the existing layout.

Applications

- Oil barrier in track beds, under temporary parking areas and mobile gas stations
- Oil absorbing curtain in water
- Absorption mat for workshops and machinery maintenance
- Oil barrier for traffic, transport and industrial accidents



Top layer

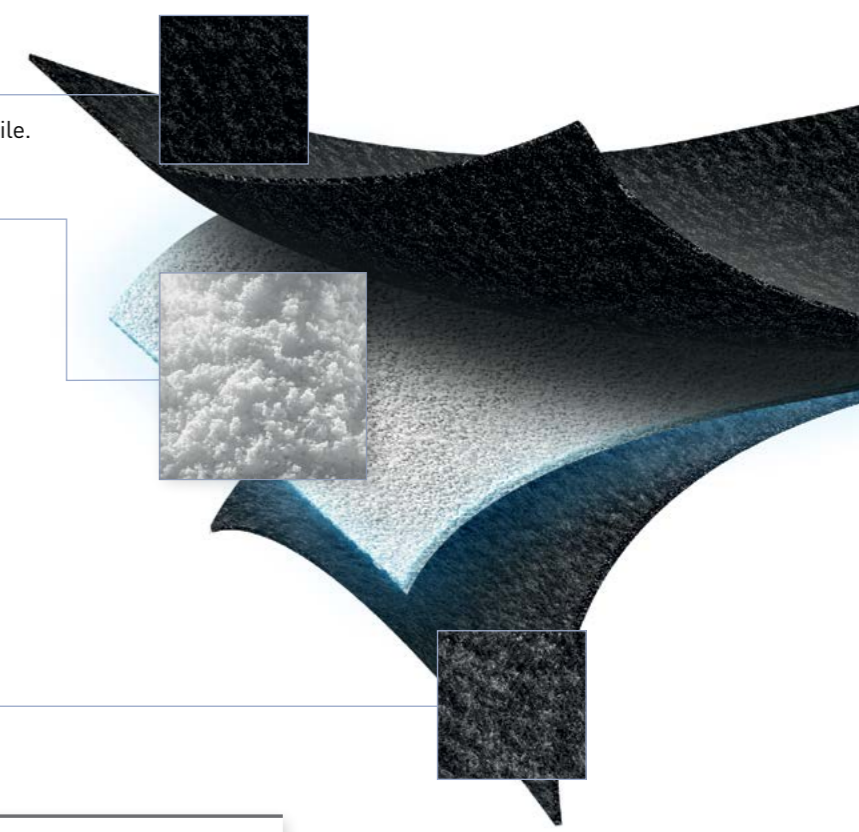
Polypropylene (PP) or polyester (PET) nonwoven geotextile.

Active layer

Oil absorbing polymer whose structure and surface properties make it particularly suitable for separating oil/water mixtures.

Bottom layer

The material can be varied according to applications in order to provide the required filtering, strength and protective properties. Either woven or nonwoven geotextiles can be used, with geogrids as additional reinforcement where required.



Tektoseal Active AS	
Function	Oil absorption
Contaminants	e.g. oil, diesel, petrol, jet fuel
Oil-binding capacity	1 m ² binds up to 7 ltr oil
Oil release under load	0 % up to 0.1 bar imposed load
Floating capability with PP nonwoven	≥ 99 % in both oil-free and soaked condition
Certification	official oil binding agent in Germany (LTWS)

BENEFITS

- Flexible use
- Mechanically stable, uniform active layer thickness
- Straightforward installation and removal
- Cost-effective compared to ex-situ treatment of contaminants
- Selection of different activated carbon types

Tektoseal Active AC



Active capping of sediments



Contaminated site remediation



Sludge lagoon remediation

Contaminant Adsorption with Activated Carbon

Tektoseal Active AC unlocks whole new areas of application for activated carbon – a widely and successfully deployed high-performance adsorption agent – as part of active Geo-Composite solutions.

Activated carbon has been used for drinking water treatment, in the chemical industry and sewage treatment plants. The many new options opened up by Tektoseal Active AC include the encapsulation of pollutants already present in the environment, the prevention of new contaminant migration at the potential source and the removal of contaminants from liquids or gases.

The mechanical stability of the active layer allows rapid and straightforward installation of the product. The active layer is, at the same time, fully protected against any erosion caused by currents or slopes.

As for all products in the Tektoseal Active family, another major benefit lies in the possibility of customising the manufacturing process, i.e. adapting the materials in the top, bottom and active layers to local requirements and conditions.

Applications

- Contaminant filter in soils (e.g. industrial wastelands and landfills)
- Leachate filter for infrastructure (transport routes, airports)
- Sludge lagoon remediation
- Active capping of sediments
- Contaminant filter in case of traffic, transport and industrial accidents



Top layer

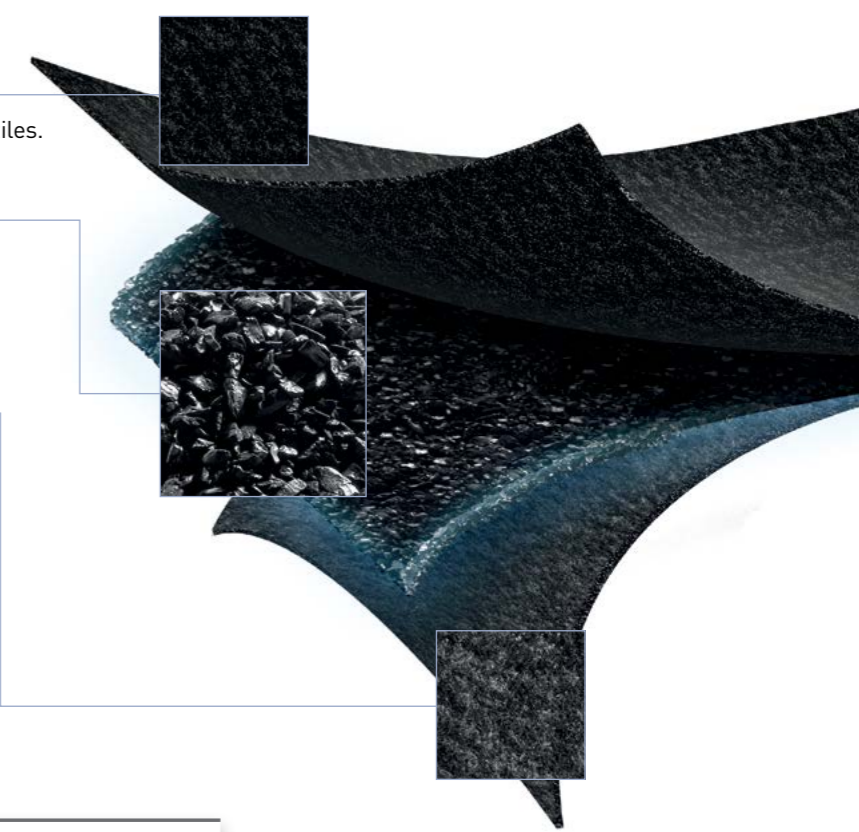
Polypropylene (PP) or polyester (PET) nonwoven geotextiles.

Active layer

Activated carbon which, due to its micro porous structure and accordingly large internal surface area, can adsorb a wide range of contaminants.

Bottom layer

The material can be varied according to application in order to provide the required filtration, strength and protective properties. Either woven or nonwoven geotextiles can be used, with geogrids as additional reinforcement where required.



Tektoseal Active AC	
Function	Adsorption of non-polar contaminants
Contaminants	e.g. VOCs, TBT, PAHs, PCBs

BENEFITS

- Removal of heavy metals from soil and waterbodies
- Buffers liquids at a pH value of 7
- Supports natural regeneration of contaminated soil
- Stable and permanent binding of metals > 1.000 years



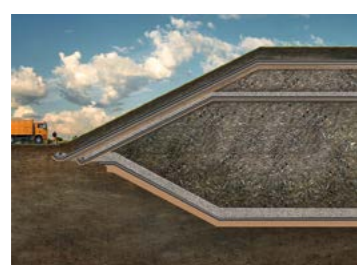
Tektoseal Active CP



Groundwater protection



Contaminated site remediation



Landfill construction

Long-Term Binding of Heavy Metals

Tektoseal Active CP combines geotextile products with an extra-high-performance, natural calcium phosphate that is able to remove heavy metals from soils and waterbodies. It outperforms all other tested active products (e.g. various phosphate rocks, mammal based calcium phosphate and charcoal manufactured out of it). The active material has already been used to remediate lead-contaminated soil on shooting ranges and to treat acid mine drainage. After application, it was possible for soil originally destined for a landfill, to remain on site, where it posed no further environmental risk.

Tektoseal Active CP filters pore water escaping from soil contaminated with heavy metals or radioactive nuclides, thereby preventing any further pollution of the environment. The reliable binding of contaminants in the active layer helps to reduce existing pollution levels and seal off any new contamination as close as possible to its source.

The main benefits of Tektoseal Active CP include the rapid contaminant binding, the capacity of the active material, the high long-term stability of the binding mechanism, the pH neutralisation of the pore water and the function as a phosphorus source which supports natural regeneration.

Applications

- Contaminant filter in waste containment
- Contaminated site remediation
- Run-off water from infrastructure (transport routes, airports)



Top layer

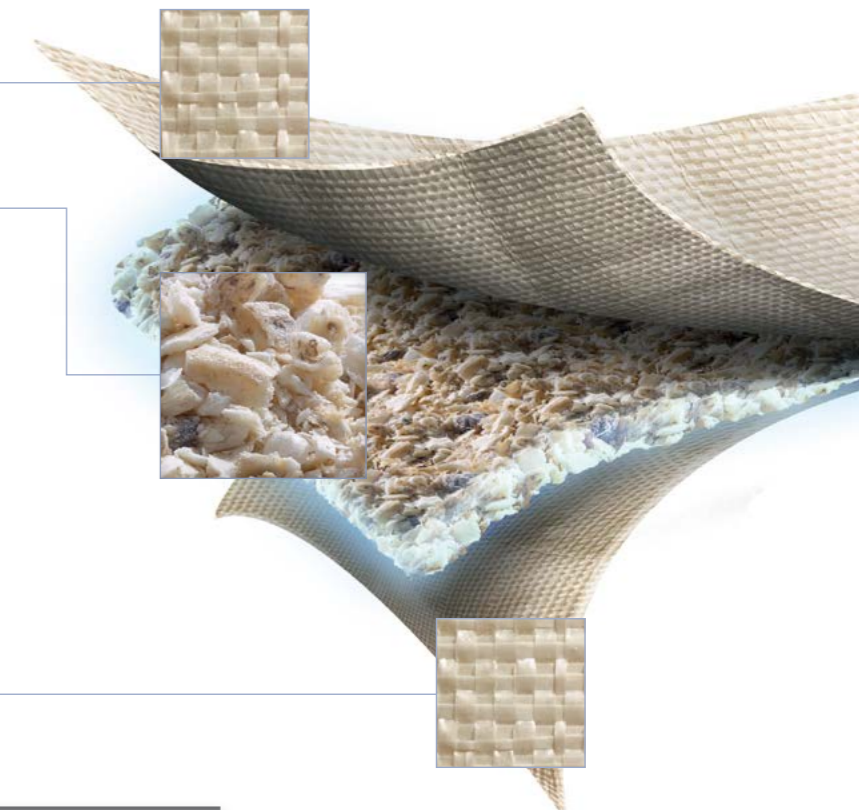
Polypropylene (PP) woven geotextile.

Active layer

Granular natural calcium phosphate: the active substance reliably and permanently binds dissolved heavy metals.

Bottom layer

Polypropylene (PP) woven geotextile.

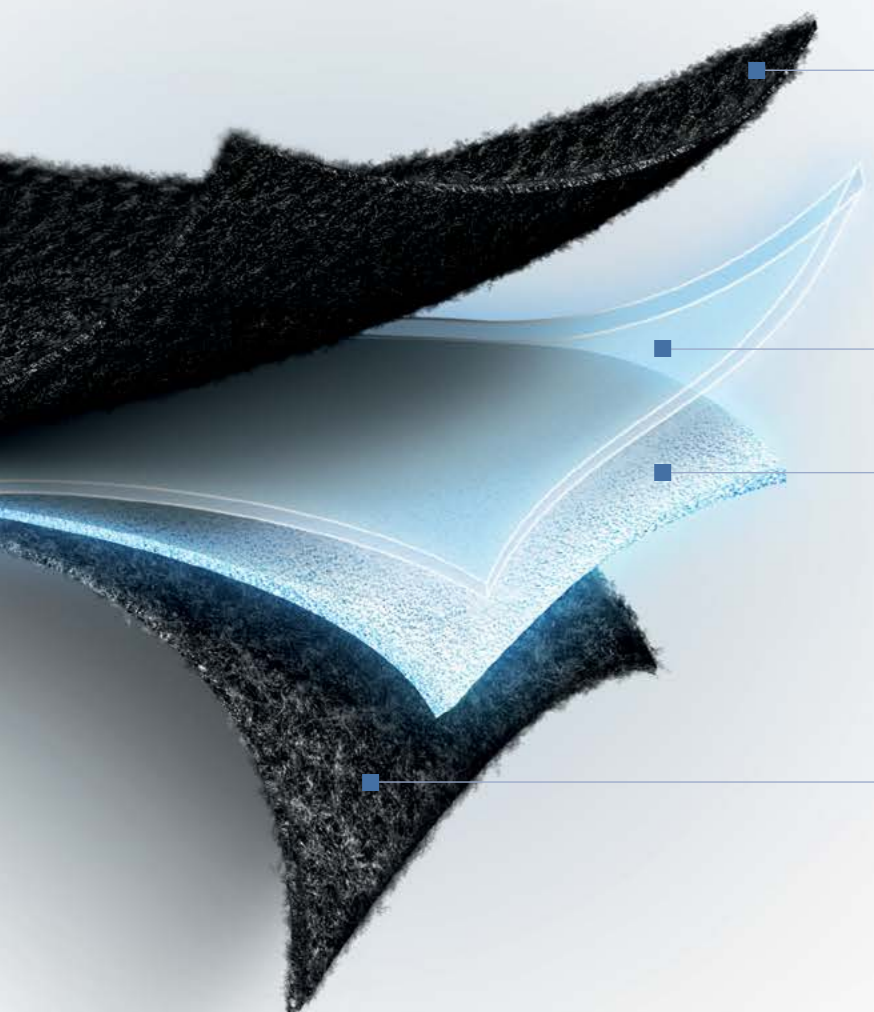


Tektoseal Active CP	
Function	Binding of heavy metals through four non-mutually exclusive mechanisms
Contaminants	Pb, U, Pu, Cd, Cu, Zn, Sr
Weight per unit area	Active layer: 3,6 kg/m ²

Customised Configuration

Tailored Solutions

Our engineers will analyse your individual requirements and provide you with a solution which is literally tailor-made to your needs. In addition to rolls up to 5 m width, we also supply large panels which, if necessary, can be stitched together on site.



Top layer



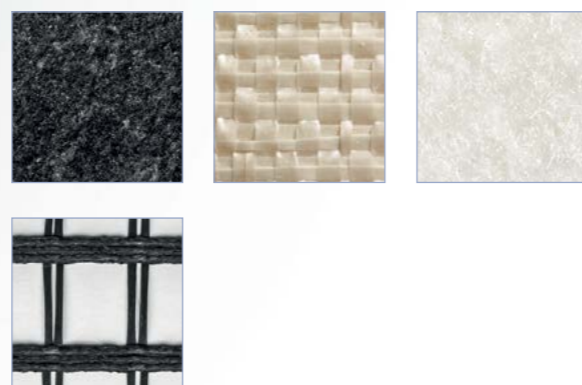
- Raw material
- Weight per unit area
- UV resistance
- Floating capability

Active layers



- Active material**
 - Oil absorbing polymers
 - Different types of activated carbon
 - Natural calcium phosphate
 - Organophilic clay
 - And many more
- Weight per unit area
- Additional active layer

Bottom layer



- Raw material
- Weight per unit area
- UV resistance
- Floating capability
- Additional geogrid

Applications



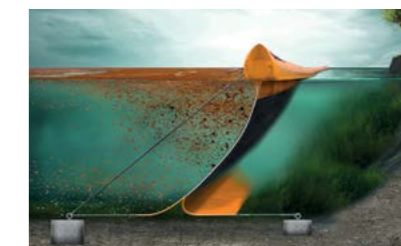
Contaminated site remediation



Groundwater protection



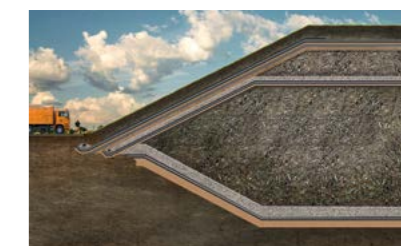
Oil absorption



Oil barrier in water



Active capping of sediments



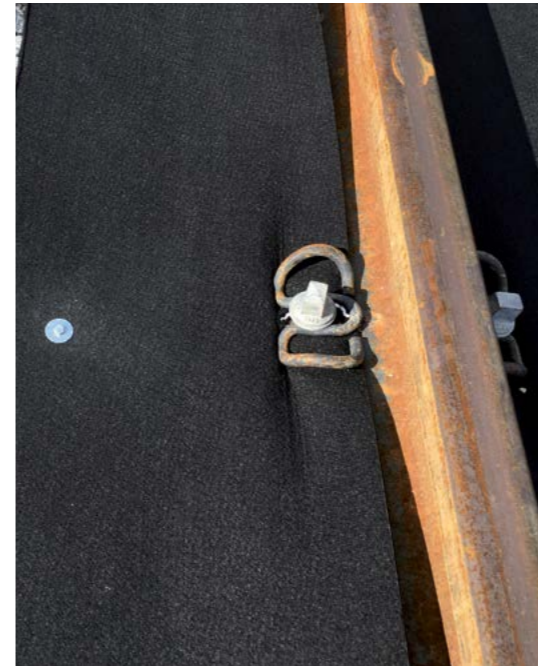
Landfill construction

Contaminants

- Arsenic
- Mercury
- Mineral oils
- Heavy metals
- Radioactive materials
- Tributyltin (TBT) compounds
- Polychlorinated biphenyls (PCBs)
- Volatile organic compounds (VOCs)
- Trichlorobenzenes (TCBs)
- Light Non-aqueous phase liquids (LNAPL)
- Polycyclic aromatic hydrocarbons (PAHs)
- Coal tar, creosote etc..

We are pleased to provide you with technical support!

Application Examples



Groundwater protection for track areas



Capping of contaminated sediments



Oil absorbing curtain in water

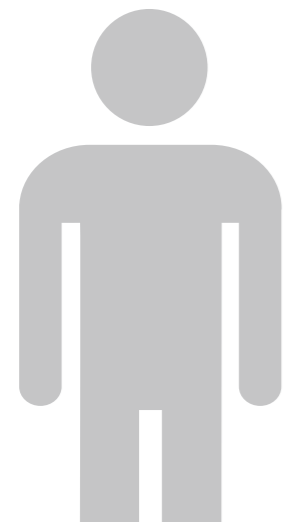


HUESKER Services

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, ecologically sound and economically viable project solutions.

Services provided by our engineers

- **Geotechnical design**
Our engineers assist design practices by performing verifiable design calculations in accordance with international codes of practice.
- **Technical consulting**
We will recommend the appropriate product types for your specific requirements.
- **Project-specific installation recommendations**
We will provide site specific installation and placing recommendations to aid with your design.
- **International knowledge transfer**



At HUESKER, every
7th employee is
an engineer

Product Services

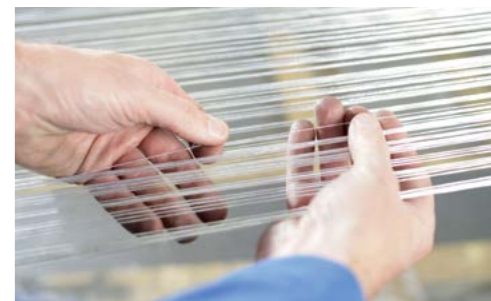
- **Custom-designed product solutions**
We will partner you in developing custom-fabricated products to meet your particular requirements
- **Alternative solutions**
We will propose alternative design solutions as well as recommendations for adjustments and optimisations.

Documents

- **Certificates**
Our products have numerous certifications. Depending on the product type, for example, BAM, BBA, IVG, EBA und SVG.
- **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 can offer installation assistance related to the specifics of product installation.
- **Installation aids**
We can offer you practical installation aids to facilitate the application of our products.
- **Training**



Tektoseal® is a registered trademark of HUESKER Synthetic GmbH.
HUESKER Synthetic is certified to ISO 9001, ISO 14001 und ISO 50001.



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