WELCOME

BENFELT **BENTONITE LINERS**





GEOFELT GmbH Rainerstrasse 14 4020 Linz/Austria www.geofelt.com

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WE THINK IN SYSTEMS



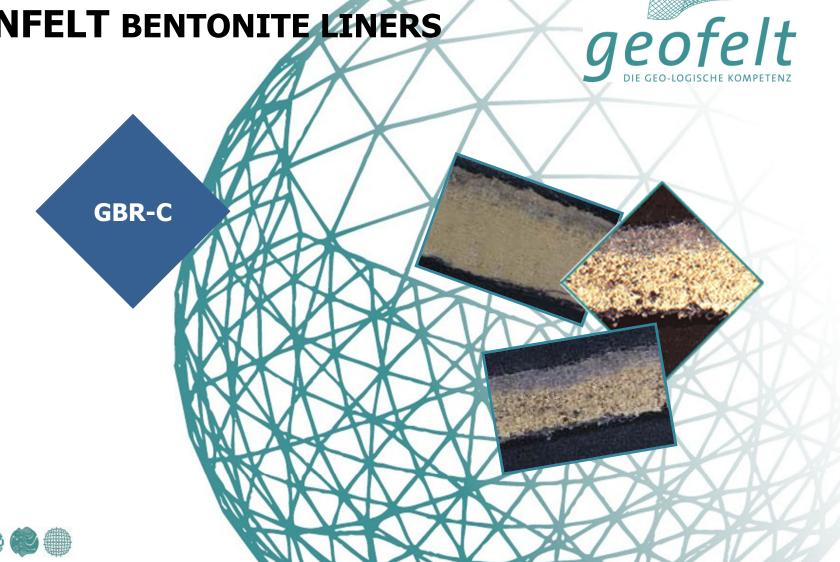
GEOFELT is the comprehensive supplier

in the geosynthetics market. This is our strength.

We use it quickly with flexibility and technical competence.



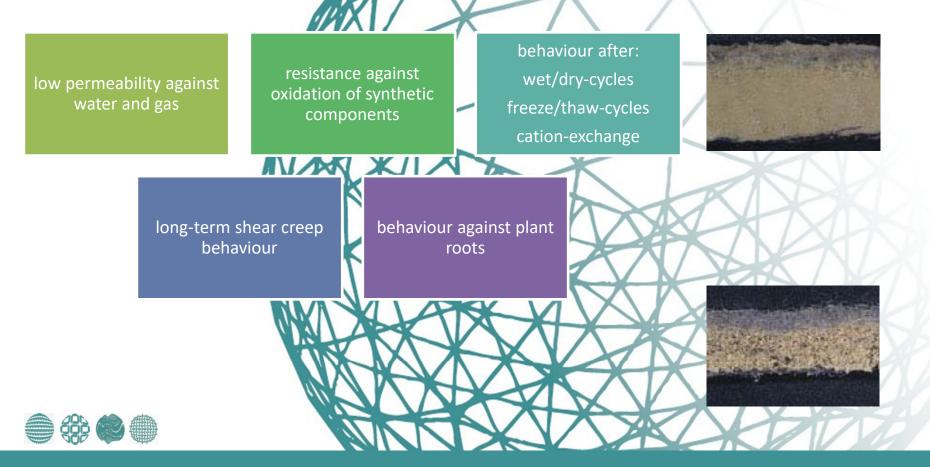
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REQUIREMENTS OF BENFELT BENTONITE LINERS



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T: +43 (732) 60 98 60 F: +43 (732) 60 98 608 geofelt@geofelt.com www.geofelt.com High technology for natural lining systems

BENFELT bentonite liners contain a high quality **bentonite clay** characterized by high swelling capacity and extremely low permeability. The bentonite clay in the liner absorbs water from the surrounding soil and hydrates.

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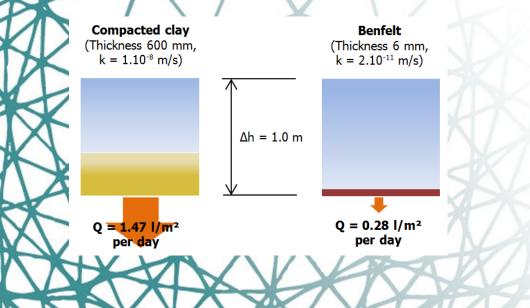
Free swelling of the bentonite, however, is confined by the structure of the bentonite liner as well as the confining pressure generated by the cover material that is to be placed on top of the liner.

The result is an **extremely tight liner** of comparably low thickness, which seals the structure securely.

BENFELT bentonite liners are primarily used as a substitute for conventional compacted clay liners providing superior technical properties, and significant advantages in cost, ease of installation and performance.

BENFELT bentonite liners are:

- environmentally friendly
- easy to install
- consistent quality
- defined and uniform hydraulic properties



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BENFELT - a composite made of two or more layers of geotextiles and bentonite, a clay mineral with excellent swelling characteristics.This combination of fibers and a naturally clay mineral gives the ultimate sealing layer with high long term shear strength.BENFELT is an effective barrier against liquids, vapour and gases.

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BENFELT C®

BENFELT®





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Applications

BENFELT can be used to seal all types of constructions, such as:

- base and surface seals of waste disposals (landfill caps)
- roads leading through protected areas
- canals and storage reservoirs
- tunnel and building sites, dams, canals and water sources

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- filtering and storage reservoirs
- tank storage sites
- biotopes
- run-off basins
- composting plants
- and many more.

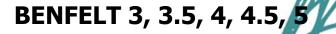


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BENFELT BENTONITE LINERS STANDARD



Geosynthetic clay liner based on bentonite placed between two layers of geotextiles.

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Bentonite absorbs water and swells, its expansion is impeded by layer pressure.

That forms a highly light layer which provides sealing to construction.



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BENFELT BENTONITE LINERS STANDARD

BENFELT 3, 3.5, 4, 4.5, 5

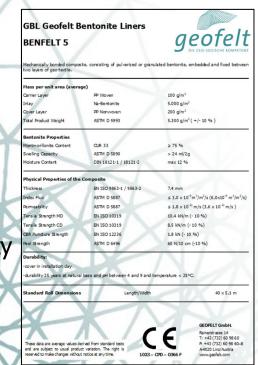
ADVANTAGES OF BENFELT:

- Small mass minimizes cost of transport and is harmless for the environment
- Quick and easy installation does not require highly qualified personnel, expensive welding or use of heavy sealing equipment
- High sealing performance with predefined permeability
- Self-restoring capability in case of small perforations, due to swelling properties
- Width up to 5,10 m reduces loss on connections
- Verified quality enhances constructions safety



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BENFELT BENTONITE LINERS BENFELT C

BENFELT C

Fully needle-punched composite, consisting of pulverized or granulated bentonite, embedded and fixed between two layers of geotextile for **application between concrete wall and charge**, which guarantees impenetrability of bentonite mats.

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The mat absorbs water from surrounding soil, but its expansion is impeded by layer pressure. In consequence this leads to the formation of a highly tight layer that **provides sealing to construction elements**.

BENFELT C is delivered to the building site at different dimensions. Widths from 1,25 m to 5,10 m and roll lengths from 5,10 m to 40 m.



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BENFELT BENTONITE LINERS BENFELT CS



BENFELT CS

Is an isolation, waterproofing system which consists of two complementary components:

- Geosynthetic barriers: PE, PP, PVC permanently protects against penetrating water and toxic substances
- Geosynthetic clay liner: water causes the bentonite to hydrate and thus renders the GCL impermeable, based on:
 - Nonwoven as cover layer
 - Bentonite
 - Woven as carrier + reinforcement layer



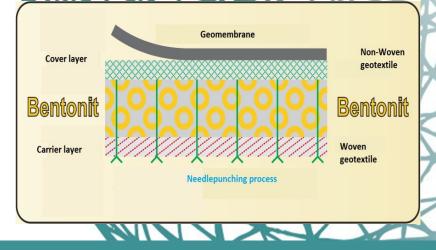
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BENFELT BENTONITE LINERS BENFELT CS



BENFELT CS product is made through the process of:

- Needling process a woven material is catched by special needle, hooked through bentonite and nonwoven layer, which gives very tight product.
- Gluing process is based on connection of the needled bentonite mat with geosynthetic barrier





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BENFELT BENTONITE LINERS BENFELT CS

BENFELT CS – has additional ADVANTAGES:

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- Upgraded mechanical parameters
- Extremely tough
- Double lining system
- Self healing properties
- Puncture resistance
- Environment safety
- Verified and proven quality



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BENFELT BENTONITE LINERS **BENFELT CS - ACCESSORIES**



BENFELT STRIP – bentonite sealing strip

Used for the sealing of dilatation joints in the building engineering and water structures. Has the power to expand at contact with water and to increase its volume up to 200 % what creates safe protection against water action even from the point of view of pressure.

BENFELT PASTE MQ 100 Master – bentonite paste

Bonding and sealing product manufactured on the base of bentonite. Eliminates unevenness of the bed, ensures perfect contact with the concrete surface and the sealing strip. The outstanding feature is a high elastic adhesive power and ability to expand at contact with water up to 90 % of its volume.

BENFELT PASTE MQA 150 - bentonite paste

A one-part permanently plastic sealing with high elastic adhesive power to numerous materials, such as plastics, wood, metal, rubber, building materials, etc.



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BENFELT BENTONITE LINERS CERTIFICATES

NOTIFIED BODY No. 1023 Institute for Testing and Certification, Inc., Zlin, Czech Republic

Certificate of Factory Production Control No. 1023 - CPD - 0366 F

issued in the compliance with the Directive 89/106//EEC as subsequently amended, whose ra-quiroments are implemented by the Czech Government Order No. 1902002 Coll, in the working of subsequent momentanets, contilise that the construct on product

BENFELT - Geosynthetic Barriers, type "GBR-C"

introduced on the market by company **GEOFELT GmbH**

Rainerstraße 14, A-4020 Linz, Austria NIP: ATU22930700

and produced in the factor Code: P/884-26-51-736

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This Certificate remains valid as long as the reterred harmonized standard, manufacturing conditions or the FPC are not modified. The validity of the <u>Certificate</u> is also contingent on the positive results of the CE

(me) Ems RNDr. Radomir Čevelik Issued in Zlin, on September 16" 2011 1023 Representative of the Notified Body No. 1023

ITC

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DIE GEO-LOGISCHE KOMPETENZ

NOTIFIED BODY No. 1023 Institute for Testing and Certification, Inc., Zlin, Czech Republic

Certificate of Factory Production Control No. 1023 - CPD - 0367 F

issued in the compliance with the Directive 89/106/EEC as subsecuently amended, whose re-quiements are implemented by the Czech Government Order No. 190/2002 Coll, in the wording of subsequent amendments, corfies that the construction product

BENFELT CS - Geosynthetic Barriers, type "GBR-C" completed with sheet for waterproofing

introduced on the market by company GEOFELT GmbH Rainerstraße 14, A-4020 Linz, Austria

NIP: ATU22930700

and produced in the factory Code: P/884-26-51-736

Code: P/884-26-51-736 is summitted by the manufacture to initial type-lessing and to the lactory production control (FPC) and to the further resing or samples taken at the factory in accordance with a prescribed last plan and lines use filled all provisions constronging from sumagement and attaction of FPC. a thirty are stand in and lines use filled all provides control of the samples of the samples of the samples and the samples CSN EN 13361-61.2007 "Geosynthetic barriers — Characteristics required for use in the construction of resomation barriers — Characteristics required for use in the construction of resomation barriers — Characteristics required for use in the construction of accessible barriers — Characteristics required for uses as a CSN EN 13461-61.2007 "Geosynthetic barriers — Characteristics required for uses as a CSN EN 13462-61.2007 "Geosynthetic barriers — Characteristics required for uses as a CSN EN 13462-61.2007 "Geosynthetic barriers — Characteristics required for uses as a CSN EN 13462-61.2007 "Geosynthetic barriers — Characteristics required for use as a CSN EN 13462-61.2007 "Geosynthetic barriers — Characteristics required for use as a CSN EN 13462-61.2007 "Geosynthetic barriers — Characteristics required for use as a CSN EN 13462-61.2007 "Geosynthetic barriers — Characteristics required for use as a Construction of liquid waste disposal sites, transfer stations or secondary construction of liquid waste disposal sites, transfer stations or secondary

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Tirana East Gate Shoppin, Mall/Albania BENFELT Bentonite Liner Application: Building Construction geofelt DIE GEO-LOGISCHE KOMPETENZ



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Reservoir TGV Avignon/France

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BENFELT Bentonite Ling

Application: Reservoirs & Cana



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Golfpond GC Juliana/Germany

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BENFELT Bentonite Liner

Application: Pond Constructi



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L235 Pinkafelder Landesstraße/Austria "Sixtina Well" to the Secretarbach Ground Water Protection BENFELT CS Bentonite Liner Application: Canal Construction geofelt DIE GEO-LOGISCHE KOMPETENZ



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Reservoir Nördlingen/Germany

BENFELT Bentonite Ling

Application: Reservoir Construction

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Landfill Copper Mine Rubit Albania BENFELT Bentonite Liner geofelt DIE GEO-LOGISCHE KOMPETENZ

Application: Landfill Construction



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Landfill Crkviste, Pakrac/Croatia BENFELT Bentonite Liner Application: Landfill Construction geofelt DIE GEO-LOGISCHE KOMPETENZ



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Ash Landfill Tuhkamäki – Maantali/Finland **BENFELT Bentonite Line**

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DIE GEO-LOGISCHE KOMPETENZ

Application: Landfill Construction



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geofelt geosynthetics invisible but everywhere



NE THINK IN SYSTEMS

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