

## Durable concrete covers

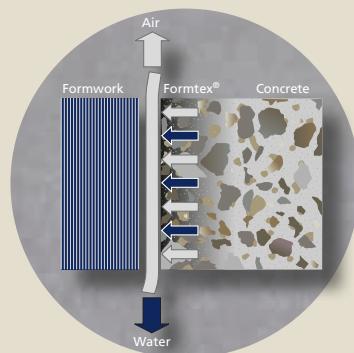
- Bridges and tunnels
- Water treatment plants
- Drinking water tanks
- Dams and sluices
- Bridge edge beams
- Marine structures
- Pre-cast concrete units



# Concrete surface enhancement with Formtex®



Formtex® drains surplus water and air, providing for a denser concrete cover layer without blowholes. The result is increased resistance to degradation from penetration of chloride, water, carbon dioxide and frost/thaw.

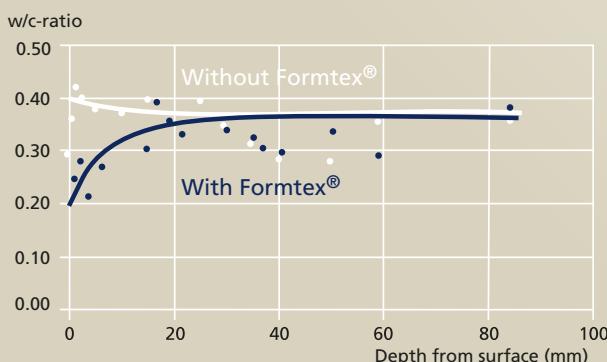


## Formtex® – how it works...

Formtex® is a two-layer Controlled Permeability Formwork (CPF) liner consisting of a drainage layer allowing water and air to escape and a filter layer with pore size designed to retain cement particles.

The main function of the Formtex® CPF liner is to drain surplus water and air from the surface of freshly poured concrete during compaction. When water is drained, the water/cement (w/c) ratio in the concrete cover is reduced, providing for denser and stronger concrete, which improves the durability of the concrete considerably.

## Concrete quality test comparison



### Tensile strength of the concrete surface

Max. strength stress, MPa BS 1881

With Formtex®	3.1
Without Formtex®	1.6

### Water penetration

Penetration depth, mm DIN 1048

With Formtex®	15
Without Formtex®	61

### Frost resistance

Scaled material, kg/m<sup>2</sup> CD 1977

With Formtex®	0.01
Without Formtex®	2.21

### Chloride diffusion coefficient

Diffusion coefficient, 10<sup>-13</sup> m<sup>2</sup>/sec 28 days, 16% NaCl, 40°C

With Formtex®	6.6
Without Formtex®	12.9

## Formtex® – the advantages

### Long lifetime of concrete structures

Laboratory and field testing has proved that the use of Formtex® CPF liner significantly increases the lifetime of concrete structures, while at the same time significantly reducing maintenance costs. Theoretically, the time until initial steel corrosion is potentially doubled.



### No release agents

Formtex® is certified by Hygiene-Institut des Ruhrgebiets to reduce microbial growth on materials that come into contact with drinking water according to DVGW Technical Standard W 270.



### Graffiti "easy to remove" surface

The dense and strong concrete surface reduces the penetration of graffiti media, making it easier to remove.



# Formtex® liner

## - for tensioned mounting, glued or self-adhesive

### Formtex® is available in two versions

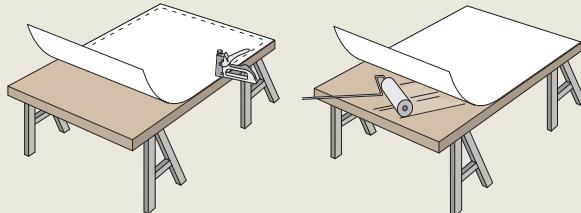
**Formtex® PSA** is self-adhesive, providing for fast and easy mounting. The self-adhesive backside is covered with a siliconised plastic foil, making it possible to place the Formtex® liner on the form and remove the foil without tensioning or misplacing the CPF liner, thus preventing folds or poor joints.

**Standard Formtex®** is mounted using stapling on the back of the form in one end and using a tensioning device on the other end. Alternatively, special glue is available for manually gluing the CPF liner to the form. Gluing generally provides for easier mounting without folds and poor joints.

### Roll dimensions for Formtex® and Formtex® PSA

Formtex®		Formtex® PSA	
Width	Length	Width	Length
1.25 m	50 m	0.70 m	50 m
2.75 m	50 m	1.30 m	50 m
3.20 m	50 m	2.00 m	50 m
4.00 m	50 m		

### Three methods – ready-to-use



#### Fast: Formtex® – tensioning or gluing

Formwork panels must be dry and free from dust and form oil. Fleecy side must face the formwork.

Formtex® is fastened to one end of the formwork and tensioned at the other end, thus ensuring proper joints and no folds.

Leave 5 cm overhang on all sides of the formwork for drainage.

Alternatively, glue is sprayed or rolled onto the formwork and its sides. When the glue has changed colour, the Formtex® is mounted. Joints are made by overlapping and cutting.

**General:** An on-site mock-up test may be advantageous to ensure the high quality of the finished concrete surface and the practical mounting and handling of the CPF liner. Formwork is cleaned using soap and water or a special cleaner available.

### Cost-effective solution

Formtex® CPF liners typically increase initial construction costs. However, the initial costs are offset by:

- No need for release or curing agents.
- Significantly reduced need for cosmetic repairs of the concrete after the form is removed.
- It has been documented that Formtex® CPF liners can be reused without loss of effect.
- Use of higher w/c concrete is possible, providing for better workability during pouring and compacting of the concrete.
- Lower grade plywood forms may be used.
- Total costs reductions from extended life time and reduced maintenance costs.



#### Even faster: Formtex® PSA – self-adhesive

Formtex® PSA is a ready-to-use adhesive CPF liner providing for faster mounting, eliminating the risk of misplacements and folds during handling of the formwork panels.

Formtex® PSA is especially advantageous for complex forms and inclining forms.

The special siliconised plastic foil used to protect the self-adhesive impregnation provides for easier and safer mounting. The procedure for overhang, joints and cleaning is similar to that of the glue method.

### Reduced repair of concrete surfaces

Formtex® significantly reduces blowholes and other blemishes on the concrete surface to be repaired after the form is removed. The strong and dense concrete cover without dust and use of release agents provides for an ideal base of further surface treatment – or provides an ideal base for coatings.



### Easy to use

Formtex® CPF liners are tensioned or glued to vertical or inclined surfaces. Once attached, concreting is performed as usual. CPF liners easily debond from the concrete during formwork striking. Reuse is normally possible.



### Certified and technically proven

Formtex® CPF liners have been proven through more than 25 years of experience. Extensive documentation, certificates and references are available on request.



# Formtex® cases – and the motivation

**Water tank\*, Grossglattbach, Germany**



Formtex® CPF liner provided for a denser and smooth concrete surface without the use of release agents. Reduced risk of microbial growth could be documented and cleaning of the tank was simplified.\*

\* DVGW Certified for use in drinking water applications

**Crash barrier, Zürich, Switzerland**



The complex structure with inclining surfaces typically results in many blowholes and surface blemishes requiring extensive repairs after the formwork is removed. Formtex® CPF liner provides for an almost blowhole-free surface with increased resistance to chloride ingress and frost/thaw degradation.

**Container Terminal No. 9, Hong Kong**



Courtesy of Scott Wilson

The very large and heavily reinforced structure exposed to high chloride, high carbon dioxide and high moisture levels as well as a hot environment required a dense, yet workable concrete. Formtex® CPF liner provided for a faster and safer workflow. Further, the increased lifetime and lower maintenance costs of the container terminal were decisive factors.

**Hangzhou Bay bridge, China**



The lifetime and maintenance costs of this prestigious project were decisive for the choice of Formtex® CPF liner.

Formtex® CPF liner provided for documented effects to improve the overall quality of the concrete cover layer. Fewer blowholes and improved resistance to ingress of gasses and liquids made Formtex® CPF liner a cost-effective choice.

**Waste water treatment plant, Canada**



The requirement for a smooth concrete surface resistant to penetration of aggressive substances and cleaning procedures using high pressure water cleaning was met by using Formtex® CPF liner. Typically, the ingress of chlorides, moisture and frost/thaw degradation is reduced by more than 50% with Formtex® CPF liners.

**Sheikh Zayed bridge, Abu Dhabi, UAE**



Formtex® CPF liner provided for a smooth and resistant concrete cover layer, increasing the lifetime and reducing the maintenance costs of this beautiful bridge. The ability to provide extensive documentation of the CPF effects was in focus.

## Contact Fibertex for further assistance:

- Documentation
- Product data
- Specification and work procedure text
- Nearest distributor
- Technical service
- Training and education (on site)



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