



# Repair and protection of bridges with **Protectosil®**

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**EVONIK**  
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# Today's challenges

- By the use of efficient surface protection the cost for repair of e.g. bridges can be reduced by up to 98%.
- **Protectosil®** materials have been proven to allow for an ecologically and economically sustainable repair and protection.\*
- Typical problems such as freeze/thaw attack, alkali-silica reaction, ettringite formation or corrosion of reinforcement can be prevented by a protection with **Protectosil®**.



\* Ch. Haag „Der ökologische Break Even“ in R. Baumann, F. Wittmann (Hrsg.), Technologie, Ökonomie und Ökologie, Herausforderungen an die moderne Bauchemie, Aedificatio Verlag Freiburg, 2002.

# Our solutions for the repair and protection of bridges

## Protectosil® BHN

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- Hydrophobizing impregnation for concrete
- Excellent performance and outstanding durability because of deep penetration, high alkaline stability and water vapor permeable protection

## Protectosil® CIT

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- Hydrophobizing impregnation of concrete
- To stop and prevent chloride induced corrosion
- Excellent performance and outstanding durability because of deep penetration, high alkaline stability and water vapor permeable protection
- Unique mode of action

## Both systems

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- Are supplied ready-to-use
- Are easily and very fast applied by airless-spraying
- Are suitable for all types of concrete, old and new



# Protectosil® BHN and Protectosil® CIT are certified systems



## Protectosil® BHN und CIT

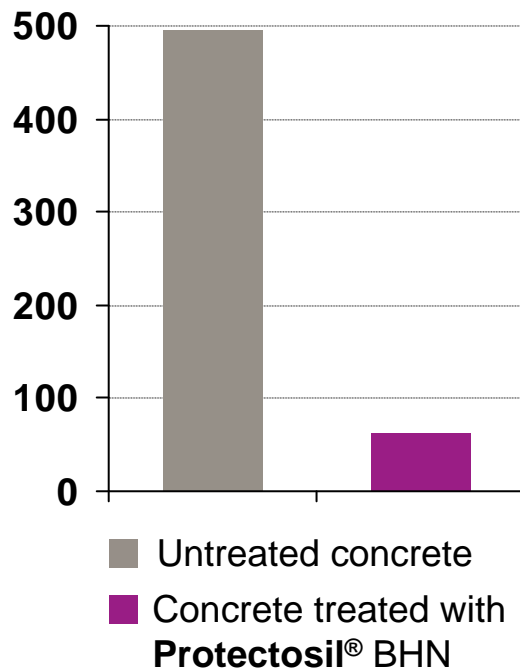
- Are controlled according to DIN EN 1504-2
- Have the CE-sign
- Are listed at the German Federal Highway Research Institute (BASt)


1119 Degussa AG, 79618 Rheinfelden 06
1119-CPD-610 EN 1504-2 <b>Protectosil® BHN</b> Hydrophobizing Impregnation
Storage conditions: -10°C up to +40°C; containers must be kept tightly sealed and protected from moisture; shelf life of closed containers 12 months
Penetration depth: Class II $\geq$ 10 mm
Water absorption and alkali stability: Absorption coefficient < 7,5 %, compared to the non treated sample Absorption coefficient < 10 %, after storage in alkali solution
Drying speed for hydrophobizing impregnation: Class II: > 10 Harmful substances: In accordance with 5.4

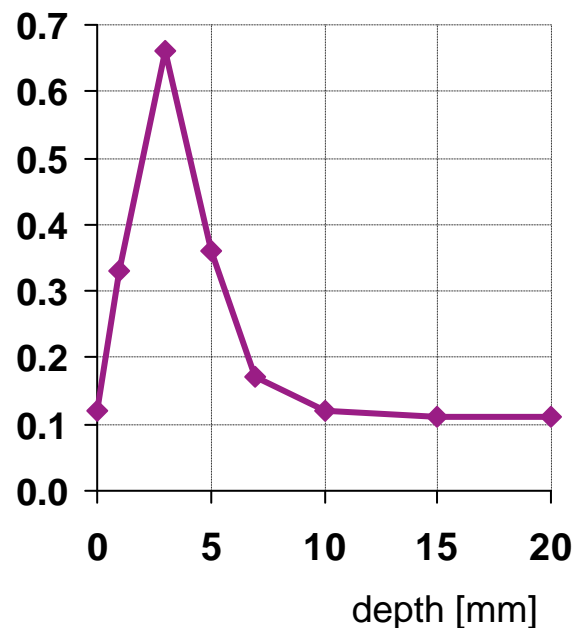

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# Storebelt West Bridge (DK)

### Water uptake [g/m<sup>2</sup>]



### Silane concentration [%]



## Info Storebelt West Bridge:

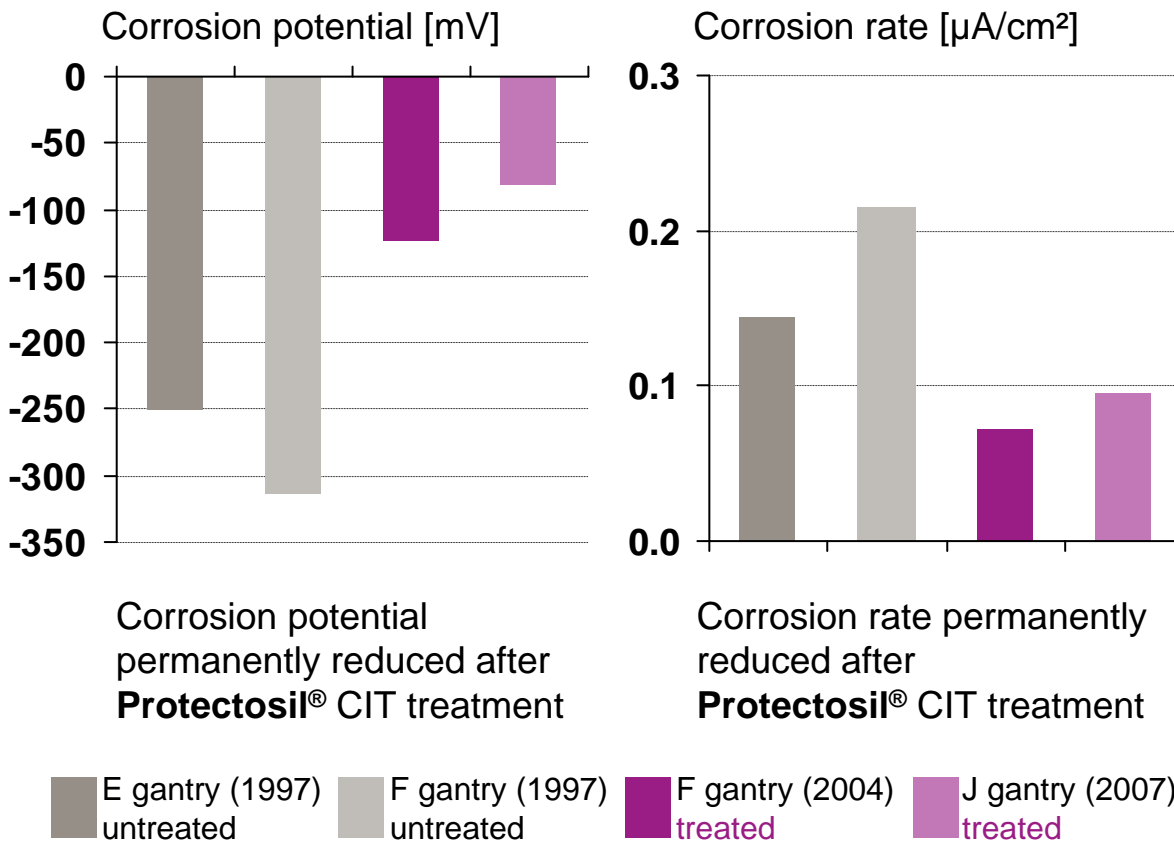
- Built in 1992-98
- Length: appr. 6,6 km
- Treated with **Protectosil®** BHN (150 g/m<sup>2</sup>) in 1993



A reduction of water uptake of appr. 87% together with a high penetration depth are the reasons for the long lasting protection offered by Protectosil® BHN

# Commodore Barry Bridge (USA)

## Long lasting protection from corrosion



## Info Commodore Barry Bridge

- Built in 1970
- Length: appr. 3 km
- Rebar corrosion caused by the ingress of chlorides
- Treated with **Protectosil®** CIT (400 g/m<sup>2</sup>) in 2001



# References Bridges (excerpt)



- 1 Kantonstraße, Kanton Uri (CH), 1983  
**Protectosil® BH**
- 2 Albert Bridge, Windsor (UK), 2003  
**Protectosil® CIT**
- 3 Alpebachtalbrücke, A4 (D), 1984/1985  
**Protectosil® BH**
- 4 Traneberg Brücke (S), 2005  
**Protectosil® BHN**
- 5 Tren Urbano (San Juan, PRI), 2000  
**Protectosil® CIT**
- 6 Hang Zhou Bay Bridge (CN), 2008  
**Protectosil® BHN und CIT**
- 7 Autobahn N5, Kanton Solothurn (CH), 2001  
**Protectosil® BHN and ANTIGRAFFITI**
- 8 A3 Biebelried, Rottendorf BW 300 (D), 2009  
**Protectosil® ANTIGRAFFITI PRIMER and Protectosil ANTIGRAFFITI®**

# Protectosil ANTIGRAFFITI® is highly effective



Concrete wall for test purposes at Gate 3 of Evonik Degussa's site in Rheinfelden

Sprayed paint does not adhere to surfaces treated with **Protectosil ANTIGRAFFITI®**







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