

Product Data and Test Information

PROTECTOSIL® BHN

Water Repellent

PRODUCT DESCRIPTION

Protectosil® BHN is a clear, penetrating, breathable VOC-compliant surface treatment for use on concrete. The unique 100% silane treatment (no solvent) penetrates the substrate and chemically bonds with silica to form a permanent attachment of the water repellent molecule. **Protectosil® BHN** creates a deep hydrophobic layer that prevents water and waterborne contaminants from entering the substrate and causing premature deterioration. By combining low surface tension with a tailored rate of reaction, **Protectosil® BHN** is able to move through the moisture boundary layer that lines the pore structure of the substrate. This permits the development of uniform gradient permeation — a consistent level of protection throughout the entire depth of penetration — allowing for longer treatment life, especially on wearing surfaces.

APPROPRIATE APPLICATIONS

For use on cast-in-place, precast, GFRC and high-strength concrete, to protect the reinforcing steel from corrosion due to the effects of water, deicing salts and other waterborne contaminants. For use on bridge decks where fast drying is needed to minimize lane closures. For treating heavy-traffic wearing surfaces or areas that receive high salt concentrations (piers, coastal buildings), to provide a high-performance, long-lasting chloride screen.

Can alleviate deterioration of concrete due to alkali-silica reactivity.

ADVANTAGES

Protectosil® BHN is a solvent-free, 100% active alkyltrialkoxysilane. **Protectosil® BHN** penetrates deeper than traditional silane and siloxane solvent- or water-carried systems. This deeper penetration gives a long-lasting, resistance against water and chloride intrusion.

Protectosil® BHN's breathable system greatly reduces the amount of water that enters a substrate, thus promoting a “drying out” of the substrate. It additionally reduces the deteriorating effects of water, such as alkali silica reactivity. By incorporating **Protectosil® BHN** into your integrated design, you can earn vital Leadership in Energy & Environmental Design (LEED) credits for both new and existing construction projects.

The main benefits of the product are:

- Excellent resistance to chloride ion ingress
- 100% Moisture vapor transmission
- Mitigation of AAR & ASR deterioration
- Deep penetration into substrate
- No change in surface appearance
- High resistance to alkali attack
- Long service life
- Excellent performance on wearing surfaces
- Quick dry time after application (1 hour)
- Keeps substrates cleaner

LIMITATIONS

Not intended for below-grade waterproofing. Should not be applied if the surface temperature is below 20°F (-7°C) or above 100°F (40°C), if rain is expected within 2 hours following application, or if high winds or other conditions prevent proper application. If rain has preceded the application, the surface should be allowed to dry for at least 24 hours.

TECHNICAL DATA

Protectosil® BHN is a liquid alkyltrialkoxysilane.

Color	water white
Active Substance	alkyltrialkoxysilane
Active Content	100%
Solvent	none
Flash Point	145.4°F
Density	7.3 lb/gal
VOC	385 g/l

TEST DATA

Alberta DOT Penetrating Sealers Type 1b	
Initial water repellency	80.7%
First abrasion cycle	89.3%
Second abrasion cycle	91.1%
Third abrasion cycle	86.3%
Fourth abrasion cycle	79.3%

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Alberta DOT Penetrating Sealers Type 1c (0.35 w/c ratio)	
Water repellency after heavy abrasion	87.3%
NCHRP #244 Series II	
Reduction in water absorption	
@125 ft ² /gal	88%
@250 ft ² /gal	86%
Reduction in chloride ion ingress	
@125 ft ² /gal	88%
@250 ft ² /gal	87%
NCHRP #244 series IV reduction in chloride ion	
@125 ft ² /gal	99%
@250 ft ² /gal	99%
Equivalent Thickness of Concrete Needed to Give Same Chloride Ion Protection as Treatments (150 days of salt exposure)	
Protectosil® BHN	3.5 inches
Methyl Siloxane	0.25 inch
iso-Octyl Siloxane	1.2 inches
iso-Octyl Silane/Siloxane	1.2 inches
AASHTO T 277 "Rapid Determination of the Chloride Permeability of Concrete"	
Untreated concrete	3800 coulombs
Protectosil® BHN	90 coulombs
Improvement	98%
ASTM G 85, G 53 "Accelerated Weathering"	
3500 hours	No change
Penetration, OHD L-34	
Concrete 0.5 w/c ratio	3/8 to 5/8 inch
Concrete 0.42 w/c ratio	3/8 to 1/2 inch

INSTALLATION

Substrate must be properly cured. Concrete should be cured to 80% of its design strength, which typically occurs within 14-20 days. Concrete repair and replacement must be completed prior to application of **Protectosil® BHN**. Patching materials, caulking, sealing materials and traffic paint must be fully cured before applying **Protectosil® BHN**. All

surfaces must be cleaned to remove all traces of dirt, dust, efflorescence, mold, salt, grease, oil, asphalt, laitance, curing compounds, paint, coatings and other foreign materials. Acceptable surface cleaning methods include shotblasting, sandblasting, waterblasting and using chemical cleaners. Check with your **Protectosil®** representative to verify that surface preparation is adequate.

Protectosil® BHN should be applied using low-pressure (15 to 25 psi) pumping equipment with a wet fan type spray nozzle. Alternate methods include using either a power roller with a 1" nap or a brush. Do not alter or dilute the material. Do not apply to a wet or damp substrate. A test patch should be applied to the substrate by a **Protectosil®** representative to verify coverage rate and application conditions.

On vertical surfaces, apply the **Protectosil® BHN** in a flooding application from the bottom up, so the material runs down 6 to 8 inches below the spray pattern. Coverage rates on horizontal concrete surfaces are between 100 and 350 ft²/gal. Coverage rates on vertical surfaces depend on the type of substrate to be treated. Your **Protectosil®** representative can give exact coverage rates for your particular project. Please refer to the "**Protectosil® BHN** Application Instructions" for more detailed information.

Precautions: Protectosil® BHN is a combustible liquid and should be kept away from heat, sparks, open flame and other sources of ignition. **Protectosil® BHN** containers should be kept closed when not in use and should be stored at temperatures between 0°F and 120°F (-18°C and 50°C), away from rain and standing water. When working in an enclosed area, an air respirator should be used. Please refer to the material safety data sheet for more detailed information.

AVAILABILITY

Protectosil® BHN is available in 5-gallon pails and 55-gallon drums. Shipped F.O.B. throughout the United States and Canada. Contact your local **Protectosil®** representative or your regional manager for specific cost information. You can obtain their contact information on our website, www.protectosil.com, or by calling us at 1 (800) 828-0919.

TECHNICAL SERVICE

Technical service engineers and scientists are available to answer questions about product performance, application methods and compatibility with other building materials. You can speak to one of our engineers or scientists directly by calling our toll-free number, 1 (800) 828-0919, and selecting option 1.

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MANUFACTURER

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PROTECTOSIL® PRODUCTS ARE MANUFACTURED AT THE EVONIK CORPORATION THEODORE, ALABAMA, PLANT UNDER A QUALITY SYSTEM CERTIFIED TO ISO-9001 AND ISO-14001 REQUIREMENTS.

For more information, SDS and the most updated product information, and to find your local representative, go to www.protectosil.com

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