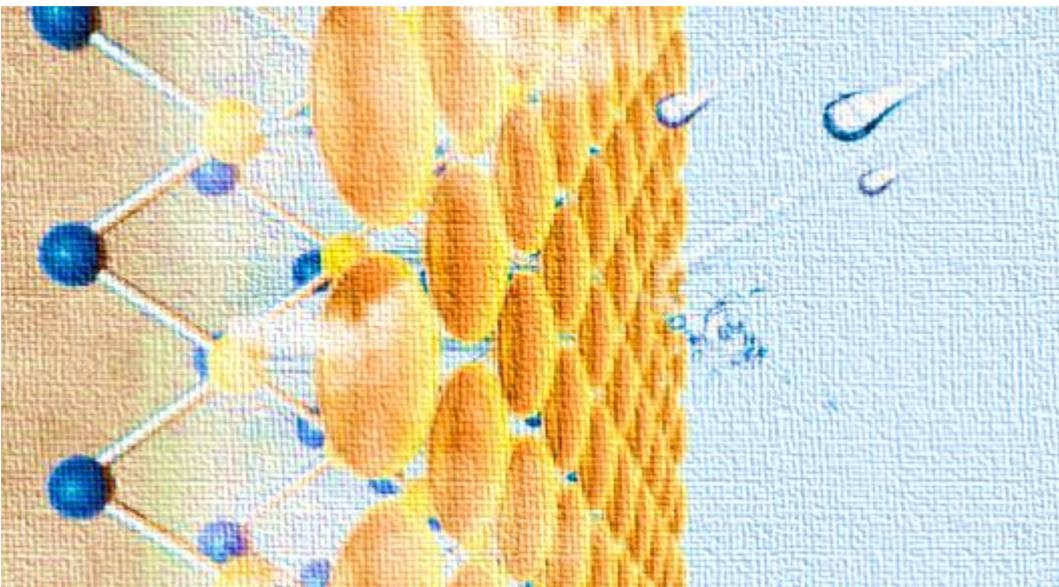


# HYDROPHOBIC IMPREGNATION ENHANCES CONCRETE'S DURABILITY



**Much of the damage caused by moisture can be prevented, or at least reduced or kept at bay for longer, by means of hydrophobic impregnation.**

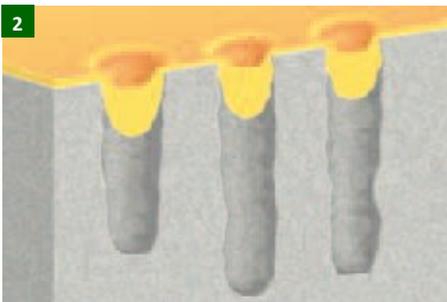
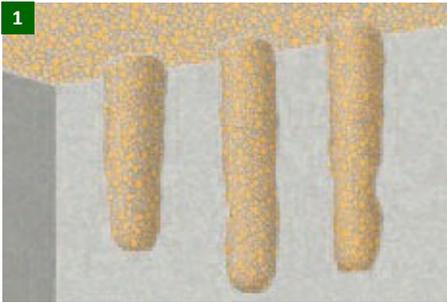
## Defense against Water and Harmful Substances

Absorption of harmful substances, which may lead to the structural damage described above, is usually the outcome of contact between the building material and water. This is an example of capillary water absorption, and also occurs when splashes of water land on de-icing salt. Forming a hydrophobic zone greatly reduces the amount of water and harmful substances which are absorbed. The building fabric remains drier as a result and is consequently less susceptible to the damage mechanisms described above.

## Silanes Can Rescue Concrete Structures

The most efficient way of protecting concrete is to prevent water uptake. The past decades have shown that silanes with long alkyl chains (e.g. iso-octyl) are the ideal product class for this. Their current dominance in masonry protection stems from their outstanding water-repellency and durability. Silanes outperform rival product classes in their resistance to physical, chemical and microbiological attack. Provided that the right product is chosen, impregnation with silane will preserve a structure for a long time.

# CONCRETE NEEDS EFFECTIVE AND LONG-LASTING PROTECTION



1 Water-repellent treatment - the capillaries remain open.

2 Film-forming coating - the capillaries are sealed.

Abolin has been working on developing and enhancing particularly long-lasting and cost-efficient concrete protection materials for over four decades. As hydrophobic impregnating agents, these target known sources of damage and fulfill the tough demands made on protective measures under difficult conditions.

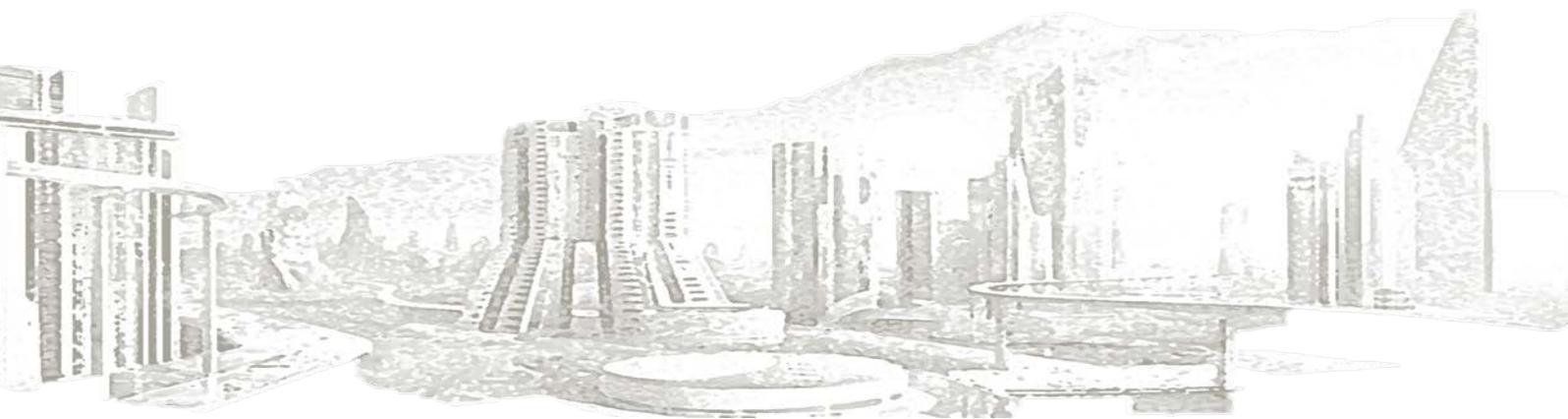
The concrete's pores remain open after water-repellent treatment, so that water vapor and gas diffusion are not measurably influenced. Thus, a concrete's natural properties are retained, and even when the surface is damaged (crack formation) it remains adequately protected. As a result, the water-repellent treatment has a significantly longer service life. These are clear advantages over film-forming coatings, which easily flake off as they don't allow water to pass out. Moreover, a damaged protective film quickly leads to concrete damage, as water and aggressive substances can then easily penetrate.

## Modern Water Repellents Achieve:

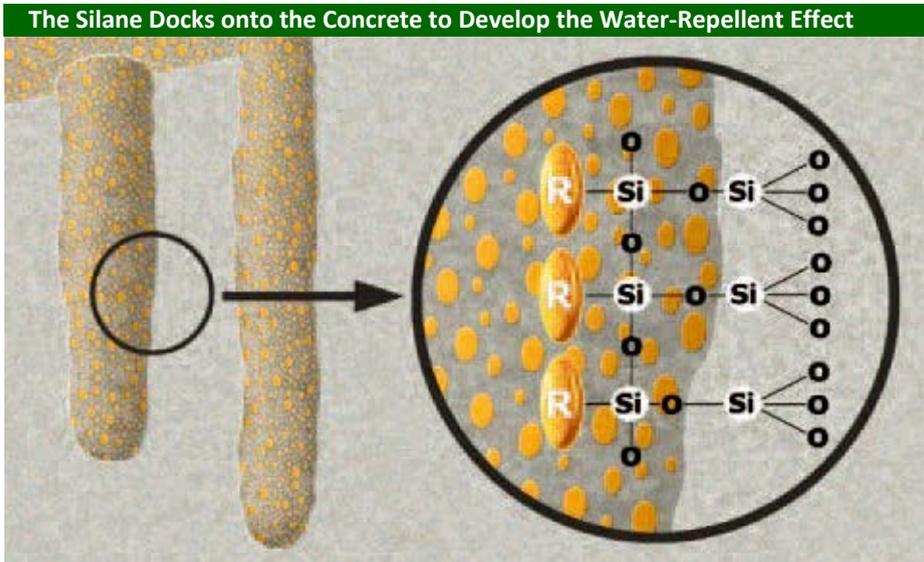
- Drastic reduction in water uptake
- Chloride barrier and thus protection against reinforcement corrosion
- Retention of high water-vapor permeability
- Extensive penetration
- High UV resistance
- Surfaces not rendered shiny or tacky, or caused to yellow
- Adequate resistance to alkalis
- Safe use
- Exemplary environmental compatibility

## Hydrophobizing and Film-Forming Measures

There are generally two methods available: hydrophobic impregnation and film-forming coatings. In both cases, protection against moisture is central since water plays a key role by transporting corrosive substances, e.g. road salts, as well as facilitating the corrosion mechanisms.



# SILANES STABILIZER FOR CONCRETE STRUCTURES



## Silanes as Ideal Water-Repellent Agents

Organosilicon compounds have a long track record as water-repellent agents. They feature excellent water repellency without significantly impairing the water-vapor permeability, and long durability, which stems from silanes' high resistance to external influences such as UV radiation, thermal stress, aggressive substances and microbes. This is due to extremely stable covalent bonds between the silane and the silicate matrix of the pores and capillary walls in the concrete.

Silanes for water-repellent treatment of concrete must possess two specific properties: they must penetrate well into the relatively dense concrete and resist degradation by the high alkalinity found especially in fresh concrete. The purpose of hydrophobic impregnation is to protect exposed exterior walls from moisture and associated damage by applying a colorless, non-film-forming agent that prevents capillary uptake of water and the aggressive substances dissolved in it. Because the capillaries remain open, the substrate retains its vapor permeability.

# SILANES & SILOXANES PIONEERS IN HYDROPHOBIC IMPREGNATION



Today, alkylalkoxysilanes such as iso-octyltriethoxysilane set the standard in terms of highly efficient penetration and excellent resistance to high alkalinity. They are colorless, low-molecular (and thus low-viscosity), highly penetrating liquids that are generally applied to concrete in undiluted form. There, they react with moisture, liberating alcohol, and form extremely stable bonds with the pores and capillary walls of the concrete.

After the reaction, the iso-octyl group juts out into the center of the capillaries and pores, which is the reason behind hydrophobic impregnation's high effectiveness.

## Optimum Silane Efficiency

Today's scientific findings confirm silanes' excellent and long-lasting effectiveness as concrete water repellents. However, for optimum effect, two points must be observed during processing:

- Liquid water repellents must generally be applied in several coats to achieve the required active concentration and penetration depth;
- On vertical and particularly overhead surfaces, the material could potentially run off before it penetrates into the concrete. In such cases, products with higher viscosity such as Cool Barrier Grip Creme are ideal for attaining an adequate contact time.

# Abolin Co

## The Silane and Silicone Expert in Masonry Protection



Abolin Co has is a leader in masonry protection with silicones based materials. Its broad series of masonry protection agents covers an extensive range of applications, from preservation of historic buildings to concrete protection. Ongoing product development ensures that products are continually adapted to meet market requirements.

Allow us to introduce our proven and reliable products for concrete protection, with which you can protect your building against moisture and associated further damage:

### PRODUCTS

COOL BARRIER GRIP CREME

COOL BARRIER GRIP SWR

COOL BARRIER GRIP SWR

COOL BARRIER GRIP IPS





#### **COOL BARRIER GRIP Creme – the Expert**

- Certified to EN 1504-2
- Water-repellent cream
- Aqueous
- Solvent-free
- Silane-based
- For concrete and reinforced concrete
- Use undiluted

#### **COOL BARRIER GRIP SWR – the All-Rounder**

- Certified to EN 1504-2
- Liquid water repellent
- Monomeric silane
- For concrete and reinforced concrete
- Use undiluted

#### **COOL BARRIER GRIP WWR – the Specialist**

- Certified to EN 1504-2
- Solvent-free silicone microemulsion concentrate
- Silane/siloxane-based
- Impregnating agent for concrete and reinforced concrete
- Impregnating agent for in-plant-manufactured building materials
- Use diluted in water

#### **COOL BARRIER GRIP IPS – the Generalist**

- Liquid general-purpose water repellent
- Liquid general-purpose primer
- Solvent-free silane/siloxane mixture
- For mineral and alkaline substrates
- Use diluted in solvent

# COOL BARRIER GRIP CRÈME –

## THE EXPERT IN HYDROPHOBIC IMPREGNATION OF CONCRETE

ABOLIN Products are Certified Products



Certified to  
EN 1504-2

COOL BARRIER GRIP CREME is an aqueous, solvent-free, water-repellent cream based on silane. It's a high-quality specialty product for the hydrophobic impregnation of concrete and reinforced concrete.

### The Formula for Deep-Pore Protection COOL BARRIER GRIP CREME

is characterized by:

- Excellent penetration
- Being solvent-free, aqueous and environmentally compatible
- Low volatility
- Optimum resistance to alkalis

The treated concrete exhibits the following lasting properties:

- Drastic reduction in chloride and water absorption
- Retention of breathability by the substrate
- High protection against freeze/thaw
- Good paint adhesion

COOL BARRIER GRIP CREME is thixotropic consistency is unique among water repellents and its properties are excellent for the hydrophobic impregnation of high-quality concrete and reinforced concrete. Unlike conventional liquid products, COOL BARRIER GRIP CREME can be applied to the required extent in just one or sometimes two steps. Depending on porosity and thus concrete quality, the silane active ingredient penetrates into the substrate within a short period of time (30 minutes to a couple of hours) and there it reacts, liberating alcohol with the silicate matrix of the capillaries and pores of the concrete. The creamy layer that was initially white disappears completely. Since the active ingredient is the same as in conventional liquid water repellents, water-repellent treatment with COOL BARRIER GRIP CREME also allows the pores and capillaries of the substrate to remain open, leaving the substrate breathable.

COOL BARRIER GRIP CREME is designed so that the active ingredient penetrates as deeply into the concrete as possible and thus optimally protects against the absorption of water and aggressive substances, as well as against damage from freeze/thaw.

### Applications

COOL BARRIER GRIP CREME is particularly recommended for the hydrophobic impregnation and priming of concrete and reinforced concrete in road, bridge and building construction. In general, COOL BARRIER GRIP CREME is suitable for all alkaline substrates that were conventionally treated with concentrated or undiluted water repellents such as alkoxysilanes.

### Comments

Comprehensive instructions are given in the appropriate material safety data sheets. These are available from our sales subsidiaries or can be printed from ABOLIN's website:

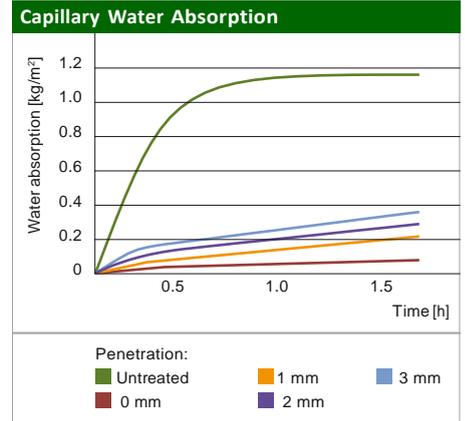
[www.abolinco.com](http://www.abolinco.com).



3 Freshly applied COOL BARRIER GRIP CREME

4 30 minutes after application.

5 Two hours after application.





# COOL BARRIER GRIP SWR –

## THE UNIVERSAL SILANE

ABOLIN Products are Certified Products



Certified to  
EN 1504-2

**COOL BARRIER GRIP SWR is a mixture of isomeric octyltriethoxysilanes with iso-octyltriethoxysilane as the main component. COOL BARRIER GRIP SWR is used in undiluted form for the hydrophobic priming and impregnation of concrete and reinforced concrete.**

### Special Features

#### COOL BARRIER GRIP SWR

is characterized by:

- Excellent penetration
- Being solvent-free and environmentally compatible
- Low volatility
- Optimum resistance to alkalis

The treated concrete has the following lasting properties:

- Drastic reduction in chloride and water absorption
- Retention of breathability
- High protection against freeze/thaw
- Good paint adhesion

After application to the concrete, COOL BARRIER GRIP SWR reacts initially with atmospheric moisture or the building material's pore water. In the zone where the impregnating agent has penetrated, the active agent formed greatly reduces the concrete's absorption, but without blocking the concrete's pores and capillaries. The impregnated building material retains its very high water-vapor permeability.

### Applications

COOL BARRIER GRIP SWR is recommended for the hydrophobic impregnation and priming of concrete and reinforced concrete in road, bridge and building construction.

### Comments

Comprehensive instructions are given in the appropriate material safety data sheets. These are available from our sales subsidiaries or can be printed from ABOLIN's website: [www.abolinco.com](http://www.abolinco.com).

# SPECIALTY

## COOL BARRIER GRIP WWR



**COOL BARRIER GRIP WWR is a water-dilutable, solvent-free silicone micro-emulsion concentrate based on a silane/ siloxane mixture. Diluted in water, COOL BARRIER GRIP SWR is a high-quality specialty product for the hydrophobic impregnation and priming of concrete and reinforced concrete.**

### Special Features

#### COOL BARRIER GRIP SWR

is characterized by:

- Proven penetration into the concrete
- Low volatility with low evaporation losses during application
- Dilutable with water; no solvent content
- High resistance to alkalis

The treated concrete has the following lasting properties:

- Drastic reduction in water and chloride absorption

After application to the concrete, COOL BARRIER GRIP SWR reacts. In the zone where the impregnating agent has penetrated, the active agent formed greatly reduces the concrete's absorption, but without blocking the concrete's pores and capillaries. The impregnated building material retains very high water-vapor permeability.

### Applications

COOL BARRIER GRIP SWR is recommended for the hydrophobic impregnation and priming of concrete and reinforced concrete in road, bridge and building construction.

### Comments

Comprehensive instructions are given in the appropriate material safety data sheets. These are available from our sales subsidiaries or can be printed from ABOLIN's website: [www.abolinco.com](http://www.abolinco.com).

# GENERAL - PURPOSE

## COOL BARRIER GRIP IPS

COOL BARRIER GRIP IPS a solvent based silicone concentrate based on a silane/siloxane mixture diluted with organic solvent. Diluted in this way, COOL BARRIER GRIP IPS is a high-quality general-purpose impregnating and priming agent for mineral and strongly alkaline substrates.

### Special Features

#### COOL BARRIER GRIP IPS

is characterized by:

- Good penetration
- Rapid drying, with no tackiness
- Effectiveness even on damp building materials
- High resistance to alkalis

The treated concrete has the following lasting properties:

- Drastic reduction in chloride and water absorption

After application to the concrete, COOL BARRIER GRIP IPS reacts with the atmospheric moisture or the building material's pore water.

In the zone where the impregnating agent has penetrated, the active agent formed greatly reduces the concrete's absorption, but without blocking the concrete's pores and capillaries. The impregnated building material retains very high water-vapor permeability.

### Applications

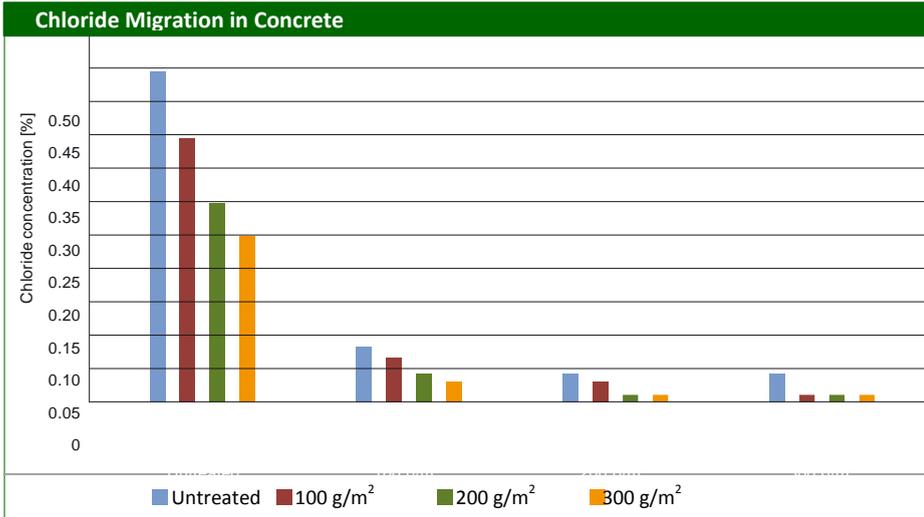
COOL BARRIER GRIP IPS is suitable for the water-repellent treatment of absorbent, porous mineral building materials such as:

- Aerated concrete
- Sand-lime brick
- Cement fiberboards
- Mineral plasters
- Mineral-based natural and composite stone
- Mineral paints
- Brickwork

### Comments

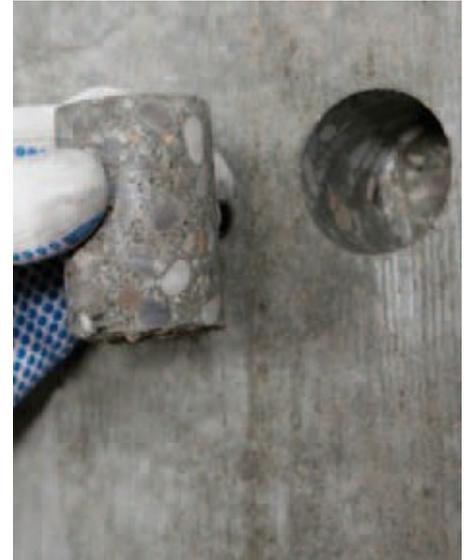
Comprehensive instructions are given in the appropriate material safety data sheets. These are available from our sales subsidiaries or can be printed from ABOLIN's website: [www.abolinco.com](http://www.abolinco.com).

# PREVENTIVE CONCRETE PROTECTION – THE PERFECT PRODUCT FOR EVERY APPLICATION



Application rate of COOL BARRIER GRIP CREME

Depth: 0 – 9 mm    10 – 19 mm    20 – 29 mm    30 – 39 mm



Chloride migration in concrete (strength class C35/45). Untreated specimens and those treated with COOL BARRIER GRIP CREME. Specimens conditioned for 10 days in 10% NaCl solution.

## Hydrophobic Impregnation Agents – Test Results – DIN EN 1504-2

Actives	Type	Use	Applications				
			Drying rate coefficient	Absorption ratio	Absorption rate after exposure to alkali	Freeze-thaw salt stress test	Depth of penetration
			DIN EN 13579	DIN EN 13580	DIN EN 13580	DIN EN 13581	DIN EN 14630
COOL BARRIER GRIP CREME	Silane	Ready to use	Class I	+	+	> 20	Class II
COOL BARRIER GRIP SWR	Silane	Ready to use	Class I	+	+	> 20	Class II
COOL BARRIER GRIP WWR	Silane/siloxane	Dilute to 25% actives	Class I	+	+	Not tested	Class I
			Class I: > 30%	< 7,5%	< 10%	Cycles treated vs. control	Class I: < 10 mm
			Class II: > 10%				Class II: ≥ 10 mm

## Hydrophobic Impregnation Agents – Test Result

Actives	Type	Use	Applications			
			Absorption ratio	Absorption rate after exposure to alkali	Freeze-thaw salt stress test	Depth of penetration
COOL BARRIER GRIP IPS	Silane/siloxane	Dilute to 20% actives	+	+	Not tested	Class I



# HYDROPHOBIC IMPREGNATION

## OF CONCRETE — WORLDWIDE PROJECTS BENEFITTED FROM SILANES





Deutsches Museum, Germany



Stonecutters-Bridge, Hong Kong



Monument to the Battle of the Nations, Germany



Three Gorges Dam, China

Abolin Co Greece  
Galaxia 18 Str.  
12462, Athens  
Tel. +30 210 5575568  
abolin@abolinco.com

**[www.abolinco.com](http://www.abolinco.com)**

The data presented in this brochure are in accordance with the present state of our knowledge but do not absolve the user from carefully checking all supplies immediately on receipt. We reserve the right to alter product constants within the scope of technical progress or new developments. The recommendations made in this brochure should be checked by preliminary trials because of conditions during processing over which we have no control, especially where other companies' raw materials are also being used. The information provided by us does not absolve the user from the obligation of investigating the possibility of infringement of third parties' rights and, if necessary, clarifying the position. Recommendations for use do not constitute a warranty, either express or implied, of the fitness or suitability of the product for a particular purpose.