CONSTRUCTION MATERIALS

HYDROPHOBIC IMPREGNATION WITH SILRES® BS
THE THREAT – WATER DAMAGES BUILDINGS

Most structural damage around the world is caused by water and moisture. There are many different kinds of damage. But there is usually one simple remedy: preventive protection against moisture by means of hydrophobic impregnation.
HYDROPHOBIC IMPREGNATION

Hydrophobic impregnation of a facade reduces maintenance and repair costs. Cleanability is improved and the value of the property is increased, while heating costs can be cut. SILRES® BS hydrophobic impregnation combines high technical performance with ease of application.

Significant Reduction in Water Absorption
- Reduction of capillary water uptake by at least 80%. Low capillary water uptake is the most efficient protection against rain and humidity
- A hydrophobic impregnation reduces water uptake, without lessening water-vapor permeability

Durability
Extremely durable water protection due to:
- High penetration depth
- Sufficient resistance to alkalis
- UV stability
LESS ENERGY CONSUMPTION
AND HEALTHIER LIVING

Humidity Causes Energy Loss
Damp facades restrict thermal insulation. Consequently, 2% humidity leads to an energy loss of 20%. 4% humidity means that 50% of energy will be lost.

Effect of Humidity on Insulation Behavior

Hydrophobic Impregnation Saves Energy
A hydrophobic impregnation reduces water uptake by at least 80%, thereby keeping the thermal insulation performance of a wall at a permanently high level.

No Sealing of the Wall
At the same time, a hydrophobic impregnation with SILRES® BS retains water-vapor permeability. In this way, there is nothing to stop moisture from escaping through the wall, which helps create a healthy indoor climate.

Heating Energy:
Consumption by Building Element
Mineral construction materials are open-pored. Contact with water produces the capillary effect. Large volumes of water can therefore penetrate into the building material within a short time.

Using capillary-active forces to penetrate into the pores of the mineral building material, SILRES® BS is deposited on the pore walls. These siliconized pores are no longer wetted by water. Water-vapor permeability is unaffected.

Quartz is the basic material for the production of silicone resin. The molecular structure of the organo-modified silane and siloxane is compatible with the silicate matrix of a mineral substrate. This accounts for the extraordinary efficiency of hydrophobic impregnation.

Chemical Reaction
The organic groups are oriented toward the center of the capillaries and pores. The active ingredient reacts there with the silicate matrix of the building material and reduces the surface tension within the capillaries and pores such as to stop capillary activity. The result is long-lasting hydrophobicity.

Effects
• Low water uptake
• High water-vapor permeability
• Barrier against harmful water-dilutable salts
• Extremely high durability of the hydrophobic impregnation against cold and heat, and UV light

Strong bonding in the substrate for high durability
Excellent hydrophobicity and water-vapor permeability
Deep penetration of the material into the substrate
SILRES® BS: MILESTONES IN HYDROPHOBIC IMPREGNATION

SILRES® BS water-repellent impregnations are among the world’s most successful building protection agents and have achieved milestone after milestone in recent years.

The first silicone resins for building protection originated from WACKER laboratories. Today, we provide you with a time-tested portfolio that includes four product groups, each with specific advantages.

SILRES® BS CREME
SILRES® BS CREME reduces water uptake extremely effectively. It also ensures very good penetration depth and easy application. The product does not drip, and you can readily apply it overhead and see where the impregnation has already been applied.
- SILRES® BS CREME F

Water-Based SILRES® BS Grades
They are free of solvents and a perfect choice for absorbent substrates:
- SILRES® BS 1001
- SILRES® BS 3003
- SILRES® BS 4004

Solvent-Dilutable SILRES® BS Grades
They are very efficient on absorbent substrates and even on non-porous ones:
- SILRES® BS 290
- SILRES® BS 280

SILRES® BS Silicone Microemulsion Concentrate (SMK)
The concentrates save you transportation and storage costs. Diluted in water, the product yields extremely small particle sizes, which penetrate well.
- SILRES® BS SMK 1311

SILRES® BS CREME F is easy to apply and penetrates deep into the substrate.
## Product Overview

<table>
<thead>
<tr>
<th>Product</th>
<th>Cream</th>
<th>Water-Based</th>
<th>Solvent-Based</th>
<th>SMK</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product</strong></td>
<td>SILRES® BS CREME F</td>
<td>SILRES® BS 1001</td>
<td>SILRES® BS 290</td>
<td>SILRES® BS 290</td>
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<tr>
<td><strong>Appearance</strong></td>
<td>White to yellowish cream</td>
<td>Milky, white</td>
<td>Colorless, hazy</td>
<td>Clear, yellowish</td>
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<tr>
<td><strong>Silicone base</strong></td>
<td>Silane/siloxane</td>
<td>Silane/siloxane</td>
<td>Silane/siloxane</td>
<td>Silane/siloxane</td>
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<tr>
<td><strong>Diluting agent</strong></td>
<td>Undiluted</td>
<td>Water</td>
<td>Solvents</td>
<td>Water</td>
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<tr>
<td><strong>Solids content</strong></td>
<td>25%</td>
<td>50%</td>
<td>100%</td>
<td>100%</td>
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<tr>
<td><strong>Shelf life (months)</strong></td>
<td>12</td>
<td>9</td>
<td>12</td>
<td>12</td>
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<tr>
<td><strong>Density (g/cm³)</strong></td>
<td>0.84</td>
<td>0.95</td>
<td>1.05</td>
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<tr>
<td><strong>Viscosity [mm²/s]</strong></td>
<td>12</td>
<td>12</td>
<td>4</td>
<td>25</td>
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<tr>
<td><strong>Flash point [°C]</strong></td>
<td>75</td>
<td>&gt;100</td>
<td>15–19</td>
<td>4</td>
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<tr>
<td><strong>Application Area</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clay brick</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Sand-lime brick</td>
<td>***</td>
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<tr>
<td>Sandstone</td>
<td>***</td>
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<td>***</td>
<td>***</td>
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<tr>
<td>Mineral plaster</td>
<td>***</td>
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<tr>
<td>Concrete*</td>
<td>**</td>
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</tr>
<tr>
<td>Porous limestone</td>
<td>*</td>
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<tr>
<td>Key characteristics</td>
<td>Easy to apply</td>
<td>Can be used as a primer (acrylate)</td>
<td>High efficiency</td>
<td>High efficiency</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Strong beading</td>
<td>Specifically for limestone</td>
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</tbody>
</table>

### Effectiveness on different Materials

- High efficiency
- Strong beading
- Specific for limestone

### Active ingredient in SILRES® BS products

- SILRES® BS products contain SMK technology.
The building-protection criteria to be met by a brick building in Amsterdam are not the same as those of a sandstone house in Bangkok. This is why we decided early on to set up regional technical centers that help you find the best solution for your individual needs. These technical centers carry out, on your behalf, standardized tests on regional building materials and provide you with comprehensive advice.
REFERENCES

SILRES® BS products have been applied around the world to protect buildings and to preserve them for future generations.

Monument to the Discoveries, Lisbon
The Monument to the Discoveries is located close to the sea with extreme exposure to salt water. It has been treated with SILRES® BS to prevent water damage.

Alte Pinakothek
Art Museum, Munich

Town Hall, Bruges

Kaiser Wilhelm Memorial Church, Berlin
THE WACKER ACADEMY
CONNECTING THE BEST

The global forum for learners, networkers, creators and discoverers. WACKER ACADEMY offers cutting-edge expertise for regional markets. Participants can meet and swap experiences with colleagues from similar areas – at 14 locations around the world.
CREATING TOMORROW’S SOLUTIONS

A Diverse Array of Products for Growing Markets
Our product portfolio ranges from silicones, binders and polymeric additives all the way up to bioengineered pharmaceutical actives. Rounding these out is hyperpure silicon for semiconductors and solar applications.

Innovations that Improve Quality of Life
As a technology leader focusing on sustainability, WACKER promotes products and ideas that offer a high value-added potential to ensure that current and future generations enjoy a better quality of life, based on energy efficiency and protection of the climate and environment.

Global Knowledge for Local Markets
When you work with WACKER, you have 100 years of chemistry expertise at your disposal, with access to the research findings and best practices of our experts throughout the world. Our knowledge base consists of a network of 23 technical centers, 14 training centers and our basic research center.

And most importantly: we are there wherever you need us – worldwide. Our local specialists know your markets and speak your language. Working with them, you will find innovative solutions that win over your customers and make you more competitive.

Follow us:
Find us on LinkedIn, YouTube and Twitter, and we’ll keep you up to date on the latest and discuss current issues with you.

All figures are based on fiscal 2019.
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