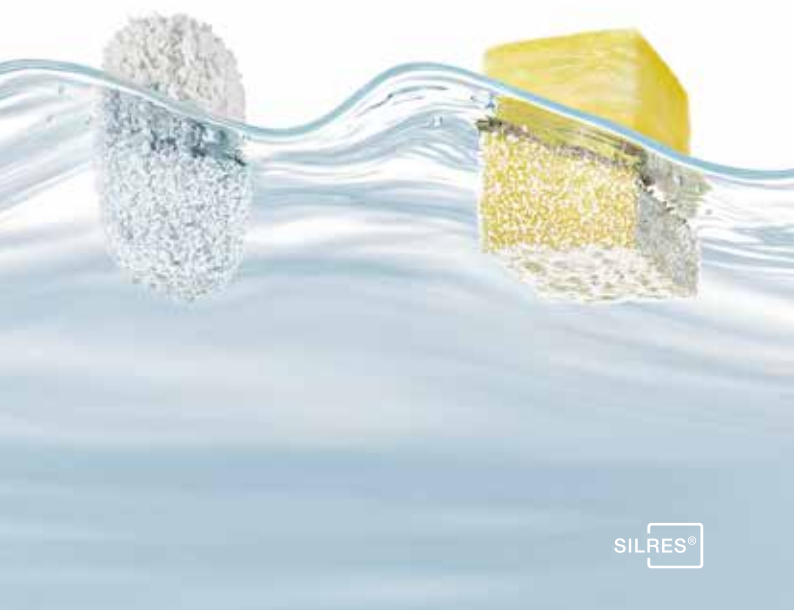


**WACKER**

CREATING TOMORROW'S SOLUTIONS



SILRES®

CONSTRUCTION | HYDROPHOBIZATION

WATER REPELLENCE –  
OPTIMIZE YOUR  
INSULATION MATERIALS!



## TODAY'S REQUIREMENTS

Improving insulation materials and upgrading to state-of-the-art technology reduces the energy consumption of buildings by an average of 30%. This is ideal for climate protection and gives an additional boost to energy-efficient construction. In this way, people can increase the comfort of their homes and lower heating or cooling costs.<sup>11</sup>

Correctly insulated exterior walls and roofs contribute significantly to enhancing a house's energy balance. An average detached house built in the 1980s, for example, loses around 72% of its thermal energy through exterior walls and so-called heat bridges.

So, effective insulation not only saves a lot of money, but also contributes to environmental protection, makes the house nice and cozy, and significantly increases the property's added value.

<sup>11</sup> Irrespective of the climate zone

# INSULATION MATERIALS – ONE DROP MAKES THE DIFFERENCE

## Mineral insulation materials provide basic properties like

- non-combustibility
- mold and mildew resistance
- minimum organic content
- water vapor permeability

Mineral Insulation Materials – Overview		
	Characteristics and Properties	Main Applications
Glass and stone mineral wool	Thermal conductivity $\lambda$ : 0.035-0.045 W/ (m·K)	<ul style="list-style-type: none"><li>• Insulation of residential, office and industrial buildings (roofs, walls, floors, EIFS)</li><li>• Technical insulation</li></ul>
Expanded perlite and vermiculite	Thermal conductivity $\lambda$ : 0.040-0.050 W/ (m·K)	<ul style="list-style-type: none"><li>• Insulating filler (packed beds or filled insulating structural bricks) for private homes</li><li>• Insulating panels (EIFS)</li><li>• Insulating plasters or mortars</li><li>• Absorbers for spilled liquids</li></ul>
Expanded clay	Thermal conductivity $\lambda$ : 0.090-0.160 W/ (m·K)	<ul style="list-style-type: none"><li>• Insulation of foundations (packed bed) for private homes</li><li>• Insulating filler</li><li>• Insulating concrete, plasters or mortars</li><li>• Lightweight concrete</li></ul>
Aerated lightweight concrete	Thermal conductivity $\lambda$ : 0.040-0.090 W/ (m·K)	<ul style="list-style-type: none"><li>• Insulating structural building blocks for private homes</li><li>• Insulating panels (EIFS)</li></ul>

# ENERGY LOSS AS A RESULT OF MOISTURE

All mineral construction and insulation materials exhibit a more or less hydrophilic character. Together with the large pore volume of construction and especially insulation materials, this leads to an increase in capillary water absorption of between thirty and several hundred percent.

## Why should mineral insulation materials be treated hydrophobically?

- Evaporative heat loss of wet construction or insulating materials
- Higher thermal conductivity  $\lambda$  of humidity compared to dry air
- Increased heat capacity of wet masonry

The thermal conductivity  $\lambda$  of a wet insulating material can easily be doubled compared to the same dry (hydrophobized) material! For modern high-performance insulating materials, this is a lot.

## Further demands from a construction physics point of view:

- Protection against mold and mildew growth
- Protection against corrosion and frost damage
- Protection against salt efflorescence

## Conclusion:

For high-performance insulating materials, water repellency is inevitable. Your customers expect long-lasting efficiency in practice.

# OPTIMIZE INSULATING MATERIALS WITH SILRES® BS



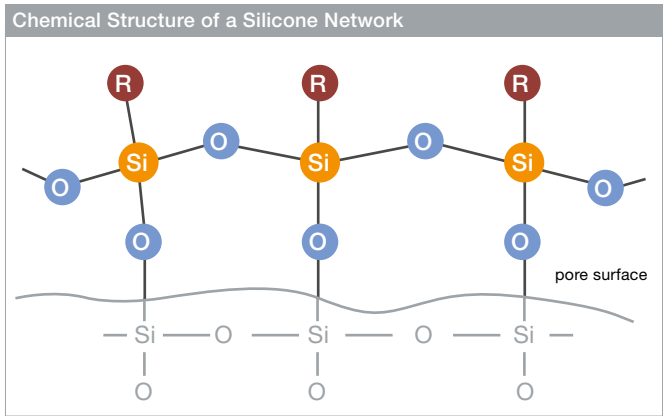
## Impregnation with SILRES® BS offers the following benefits:

- Maximum reduction of capillary water uptake
- Minimal reduction of water-vapor permeability due to open pores
- Extensive penetration depth
- Adequate resistance to alkalinity
- Resistance to UV light as well as high or low temperatures
- Surfaces not rendered shiny or tacky, or caused to yellow
- Environmentally compatible
- Long-lasting

## Environmental benefits:

- Energy savings
- Reduction of CO<sub>2</sub> emissions
- More comfortable indoor climate
- More sustainable use of construction materials due to longevity and durability

# THE “SECRET” LIES IN THE FORMATION OF A SURFACE-BOUND HYDROPHOBIC SILICONE NETWORK



Application Recommendations	
Material	Industrial Application (Siloxane Prod. Type)
Glass wool or stone mineral wool	Spraying during fiberizing (emulsion)
Perlite or vermiculite	Spraying after expansion (emulsion/solution)
Perlite or vermiculite composites	Spraying or dipping (emulsion/solution)
Aerated concrete	Integral treatment (pure, mass hydrophobation)
Expanded clay	Spraying or dipping after firming (emulsion/solution)

# SILRES® BS PRODUCTS

Application Recommendations	
Product	Product Characteristics
Glass or Stone Mineral Wool	
SILRES® BS 1042	Water-based siloxane emulsion
SILRES® BS 5137	Water-based siloxane emulsion (optimized for phenolic and starch (Green) binders)
White Blowing Wool	
SILRES® BS 46	Water-based polymethylhydrogensiloxane emulsion
SILRES® BS 1052	Water-based siloxane emulsion
Expanded Perlite, Vermiculite and Clay	
SILRES® BS 1042	Water-based siloxane emulsion
SILRES® BS 16	Water-based silicate solution
Expanded Vermiculite	
SILRES® BS SMK 1311	Self-emulsifying silane/siloxane concentrate
SILRES® BS 97	Water-based siloxane emulsion
Aerated Concrete	
SILRES® BS 5350	Water-based siloxane emulsion

## Safety Notes

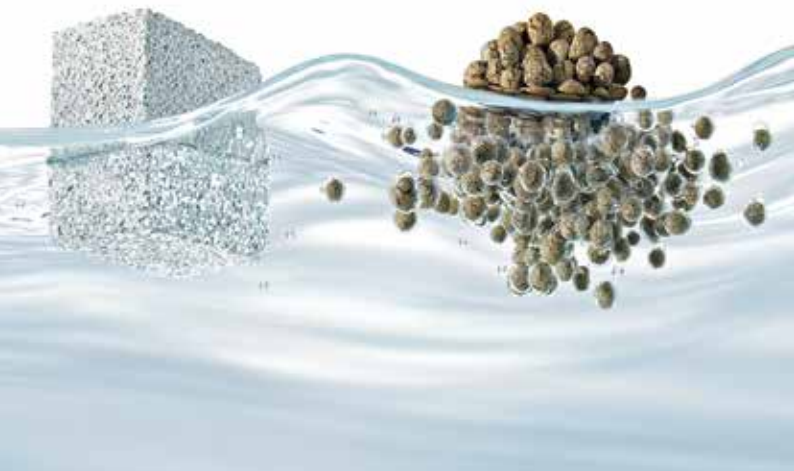
Comprehensive instructions are given in the corresponding Material Safety Data Sheets. They are available on request from WACKER subsidiaries or may be printed from WACKER's website <http://www.wacker.com>

## Conclusion:

- The thermal conductivity can be permanently kept at a "realistic" minimum
- Insulation and construction materials are protected from moisture-based damages
- The capillary water absorption can be drastically reduced
- Water vapor permeability – accidental water ingress can evaporate

## Remember:

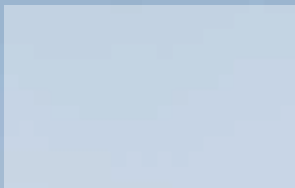
It's not only about the insulation, it's about the whole construction.



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