

Protectosil® for clay-based construction materials

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Basic introduction


Protectosil®



Content

- **Description**
- Basic product recommendation
- Application-/ Testmethods
- Performance data

Protectosil® upgrades clay-based construction materials such as roof tiles or bricks in durability and aesthetics

Key benefits of Protectosil®


Protectosil®



Reduction of water uptake

>90%

Long-term protection due to
high penetration depth, up to

2-25 mm

Long-term surface functionality
and aesthetic

- **1500 QUV hours**
- **reduction of white spotting**

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Product recommendation

Roof tiles

Protectosil® grade	Type of tile		Effect				Treatment		Process	
	Natural	Engobed*	Hydropho- bation**	Beading/ Flow Properties	Anti-greening	Consolidation	Spraying	Dipping	Production	On-Site
BHN	✓	✓	✓				✓			✓
WS 340	✓	✓	✓				✓	✓	✓	✓
WS 602	✓	✓	✓				✓	✓	✓	✓
WS 610	✓	✓	✓	✓			✓	✓	✓	✓
WS 808	✓		✓	✓		✓	✓		✓	✓
SC 60	✓	✓		✓	✓		✓	✓	✓	✓

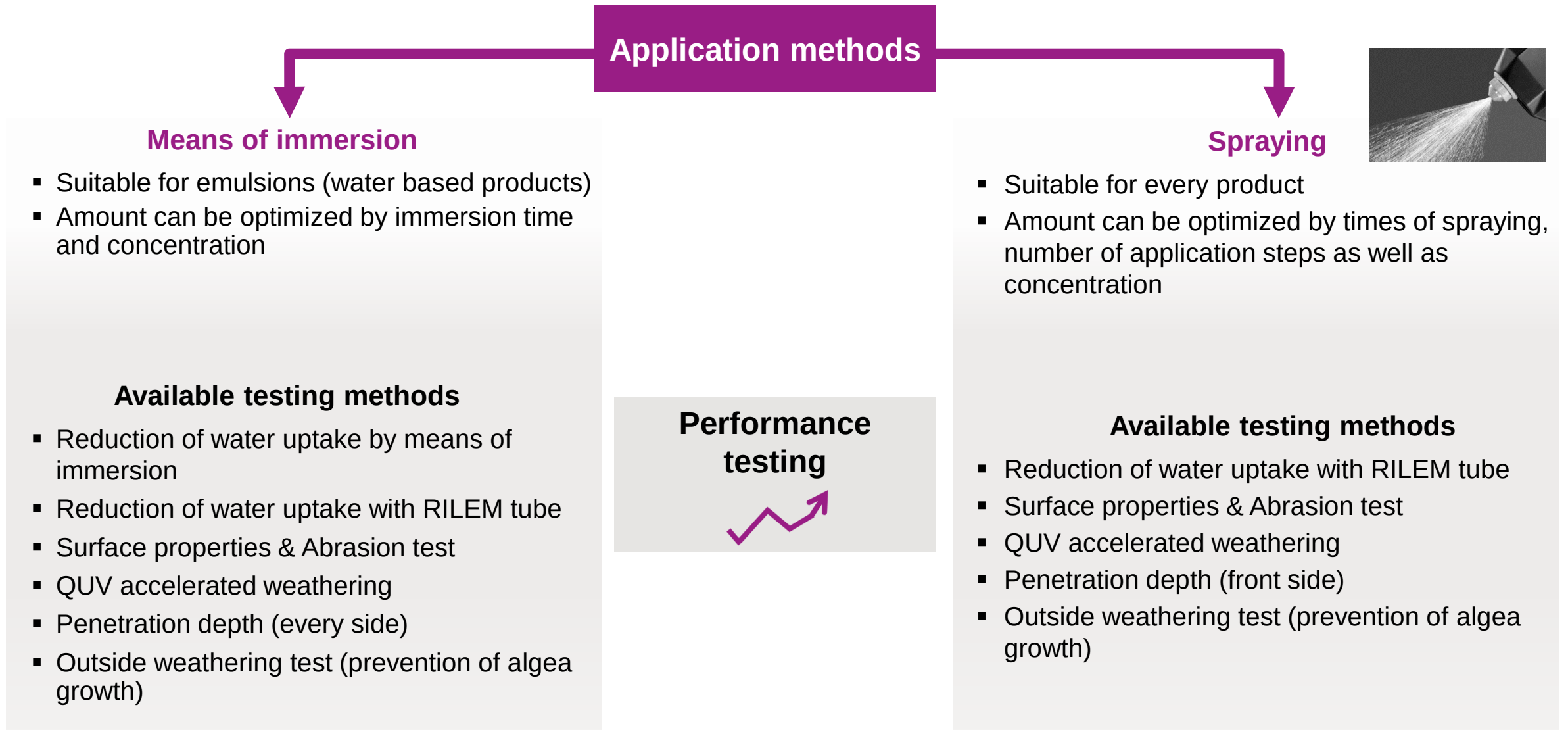
* Requires longer contact/immersion time

**Significant long-term reduction of water uptake leads to reduction of efflorescence and freeze thaw damages

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Application methods for Protectosil® and possible tests



Applied test methods

Our service

Reduction of water uptake - I



A modified **DIN EN 13580** is used to evaluate the performance of the water repellent treatment. The water uptake is measured by total submersion of a hydrophobized sample and the reduction of water uptake is calculated in comparison to the untreated reference sample.

Samples are covered with about 2.5 cm of water. After 24 h of submersion, water adhering to the surface of each sample is gently wiped away with a paper cloth and the samples weighed to the nearest 0.1 g.

Reduction of water uptake - II



The **RILEM Test Method II.4** is used to evaluate the performance of the water repellent treatment. For this purpose a measuring tube is affixed by interposing a tape of putty between the flat, circular brim of the pipe and the surface of the material to be tested. Water is then added through the upper, open end of the pipe until the column reached the "0" gradation mark. The quantity of water absorbed by the material after 0.5 h, 2.0 h, 6.0 h and 24.0 h is read directly from the graduated tube in regular intervals.

Penetration depth



Treated test samples are split with a hammer and chisel. A water based ink is then applied onto the fracture surface to visualize the penetration depth. The inner part of the roofing tiles where the concentration of the water repellent is not high enough to repel the water will become colored, while the outer part near the substrate's surface will not absorb the colored water.

The penetration depth is measured with a vernier caliper from the surface of the sample to the colored area at two different points on each of the 4 sides. The average penetration depth is then calculated from the 8 values obtained

Applied test methods

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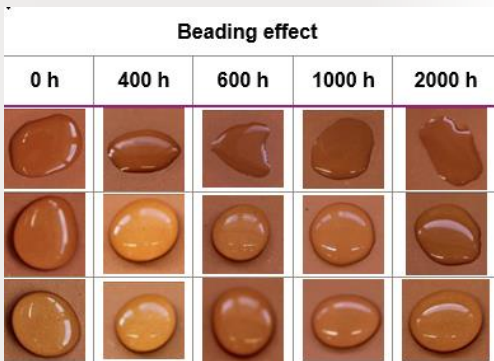
QUV accelerated weathering



In order to determine the durability of the Protectosil® products treatment, the protected roof tiles are placed into a QUV accelerated weathering machine. Subsequently the samples are subjected to cyclic UV-irradiation and water spray according to **EN ISO 11507**. After certain time periods the samples are taken out of the QUV machine and the reduction of water uptake, beading effect and flow property is determined.

300 h of QUV accelerated weathering correspond to about one year of outside weathering in climatic conditions found in Southwest Germany.

Flow property and beading effect



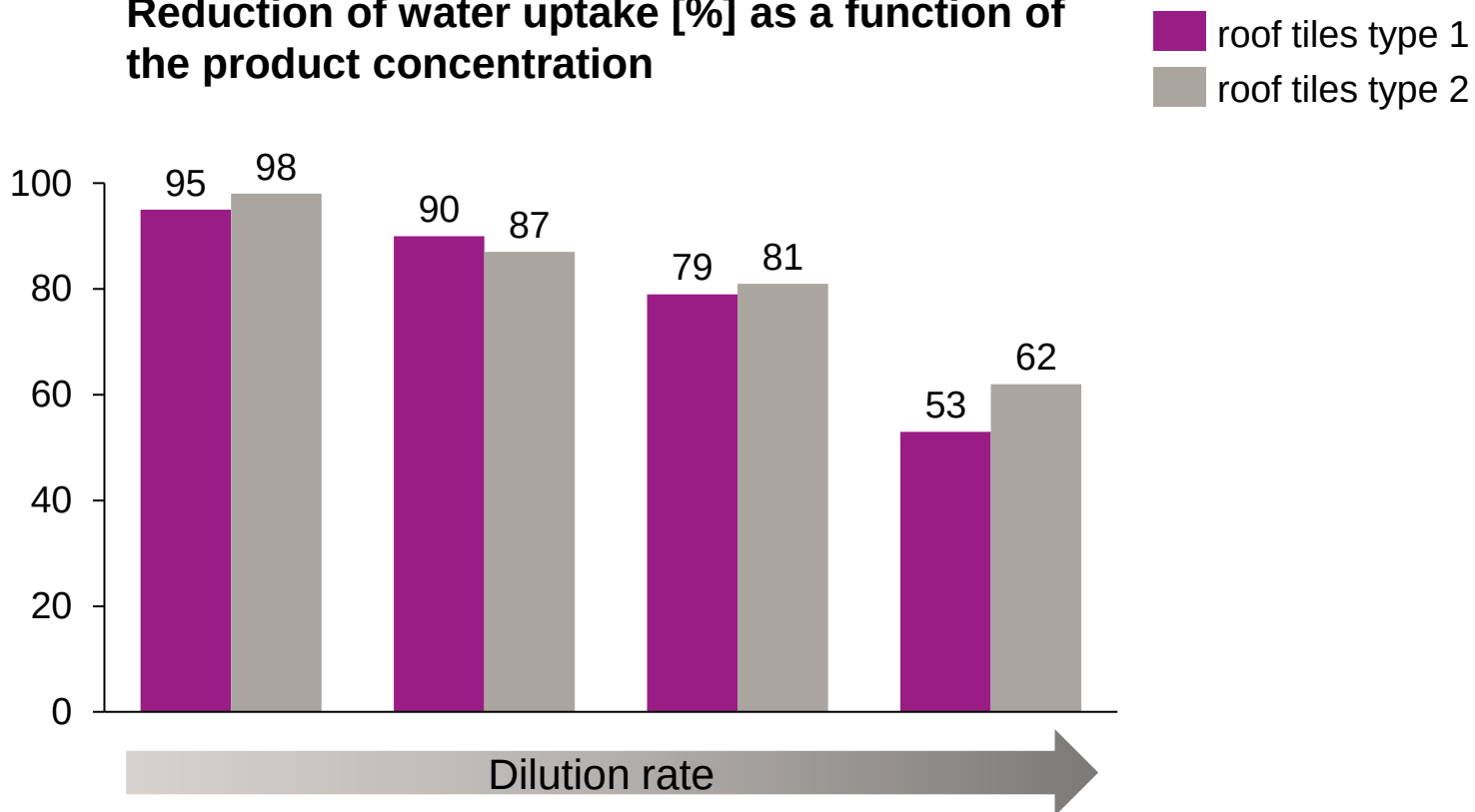
The flow property of a water droplet on the treated surfaces, as well as the degree of wetting after 10 min is evaluated visually according to defined criteria.

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Protectosil® WS 602 on different types of roof tiles (excerpt)

Reduction of water uptake [%] as a function of the product concentration



With increased dilution of Protectosil®, the reduction of water uptake decreases

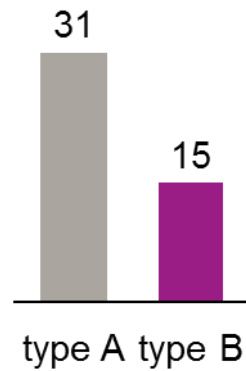


Protectosil® WS 602 on different types of clinker bricks (excerpt)

Spray application

- Protectosil® WS 602 (1:4 dilution in water)
- Consumption rate: ~400 g/m²

Penetration depth [mm]

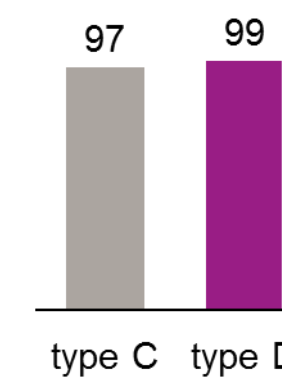
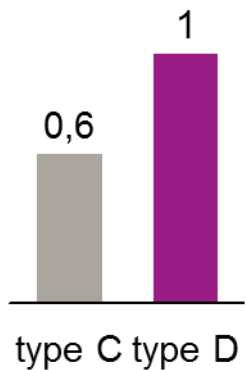


Reduction of water uptake* [%]



Application via immersion

- Protectosil® WS 602 (1:4 dilution in water)
- Consumption rate: ~400 g/m²



* after 24 h under water storage

**Talk to our experts to
receive your
individualized product
recommendation**

We are happy to support you




Protectosil®



EVONIK

Leading Beyond Chemistry