

Technical note

Efflorescence on concrete surfaces - page 1

Introduction:

Sometimes marks or a white haze, colloquially referred to as “efflorescence”, appear on freshly produced concrete blocks even after a short time. An undesired and annoying characteristic, which however usually disappears on its own over time.

For the most part, concrete paving stones are made up of cement, rocks and water. And the components of these raw materials themselves are natural products.

The limestone used for cement production is the catalyst for efflorescence.

When the concrete hardens, not all of the limestone is bonded in the paving stone. For this reason, water can penetrate into the capillaries of the stone when it rains or when the ground becomes waterlogged and dissolve the non-bonded limestone. After the chemical reaction with the carbon dioxide in the air, the slightly soluble limestone deposits on the surface of the concrete paving stone remain as unpopular white marks. The weather is an influencing factor for efflorescence. More or less severe efflorescence appears depending on the weather. Virtually every concrete mixture has excess limestone. As a result, efflorescence is part of the natural process of concrete paving stone production.

And as much as the cause of efflorescence can be found in nature, so, too, can be the solution. Over time, the effects of the weather, such as rain, snow, etc. make the appearance of efflorescence gradually disappear. This natural removal through weathering, however, takes significantly longer than the production.

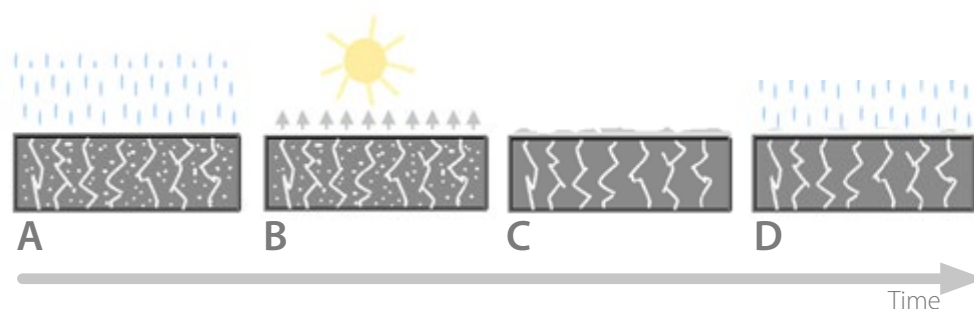
After a few years (approx. 2-4 years), the efflorescence generally disappears completely and no new marks tend to appear.

Note:

According to the European Paving Block Standard DIN EN 1338, efflorescence does not constitute a technical defect, as functionality is maintained.

How is efflorescence formed?

- Penetrating water dissolves non-bonded limestone.
- The water-based limestone moves upwards in the pores.
- A limestone layer remains once the stone is dried.
- The limestone marks are dissolved and washed away by rain and effects of the weather.



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General remarks: To improve the appearance of concrete surfaces in a timely manner, efflorescence can be removed or alleviated by treating the surface with a heavily diluted acid or other suitable commercially available products (e.g. cement residue remover). Always observe the manufacturer's instructions for use.

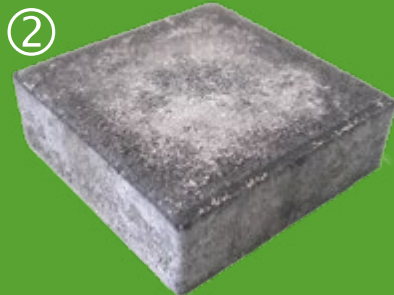
Please avoid cleaning the concrete paving stones using a high-pressure washer, as this can cause the pressurized water to penetrate the stone.

Packaged concrete paving stones must always be stored in a covered storage area. If packaged stones on pallets are subjected to the weather, the rain and subsequent solar radiation can otherwise lead to "exudations" between the block layers. This reinforces the efflorescence effect. If packets are stored outside on the building site, stones should be covered with a waterproof cover (e.g. plastic sheet).

Stages of development:



After production



Efflorescence after approx. 3-9 months



After weathering of limestone efflorescence