TECHNICAL ADVISORY 11.01

KRYSTALINE WATERPROOF CONCRETE

Krystaline 1 Slurry Overview

What is Krystaline 1?

Krystaline 1 is a penetrating crystalline technology waterproofing slurry used to waterproof existing concrete by reacting with the un-hydrated cement particles to grow millions of needle-like crystals **deep** into the concrete mass. Over a period of weeks and months, these crystals grow, filling the naturally occurring pores and voids in concrete, and permanently blocking the pathways for water and waterborne contaminants. Later, if cracks form due to settling or shrinkage, incoming water triggers the crystallization process and additional crystals begin to grow, filling cracks and ensuring that the structure's waterproofing barrier is maintained and protected.

Krystaline 1 Requires Cement, Water and Time!

Cement: Krystaline technology is designed specifically for waterproofing concrete and cement-based applications. Use it only on applications that have a cement base.

Water: While most waterproofing products require a dry surface for application Krystaline 1 requires water as part of the crystalline development process. Pre-soaking the concrete is important. Wet curing after application is also important.

Time: Developing crystalline growth within the concrete requires time for the process to activate and grow. Over time the crystals continue to form and expand the C-S-H within the concrete. Once waterproofed the concrete application will automatically regenerate crystalline growth upon the presence of water.

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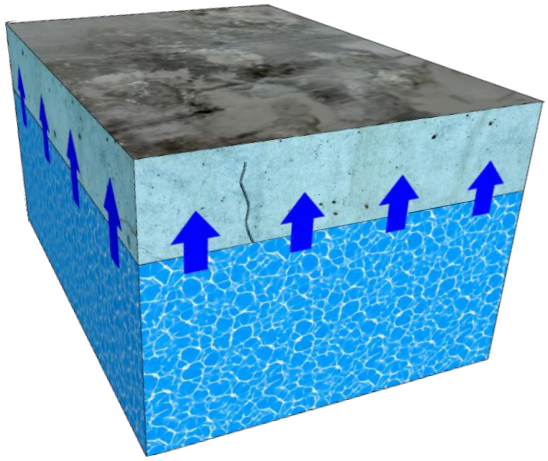
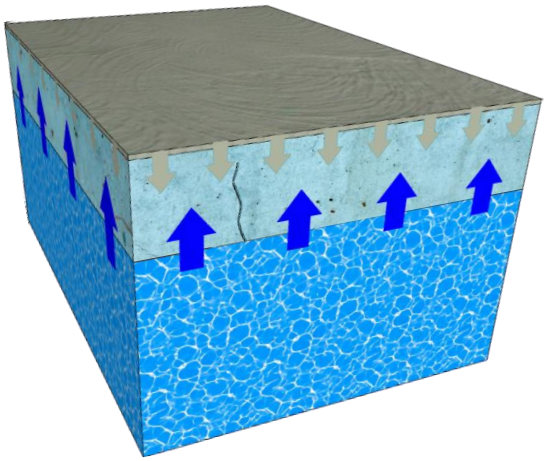
How does it Work?

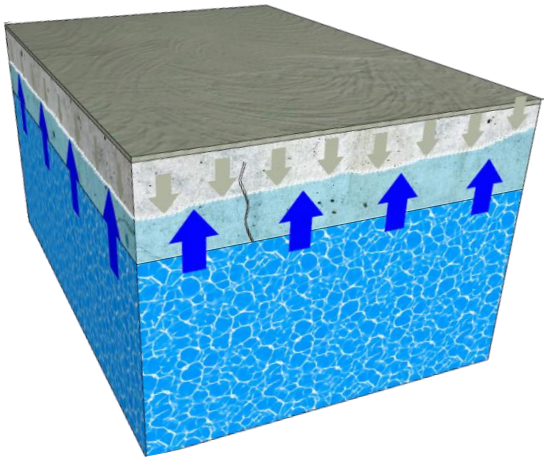
1. Wet untreated concrete



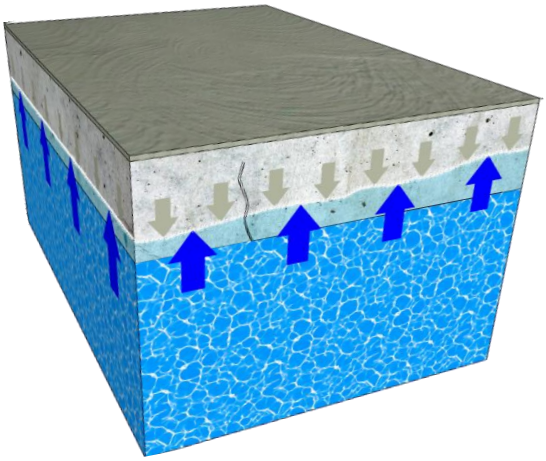
2. Cleaned and treated surface application

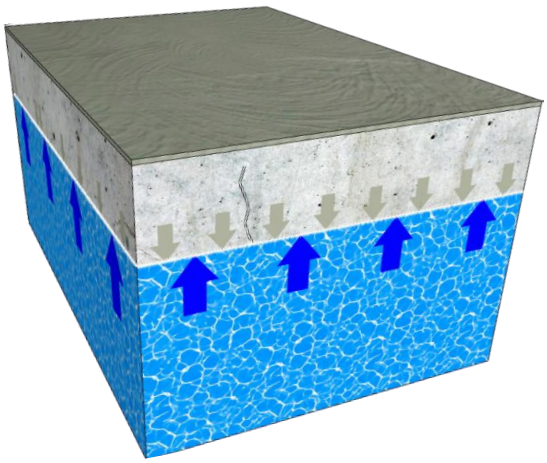


3. Penetration into Concrete Begins



4. Penetration into Concrete Continues





5. Penetration only stops when there is no more water or concrete

The process will continue as long as water and cement particles are present.

The penetration depth of the crystals is subject only to the availability of water and cement particles.

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Practical Examples

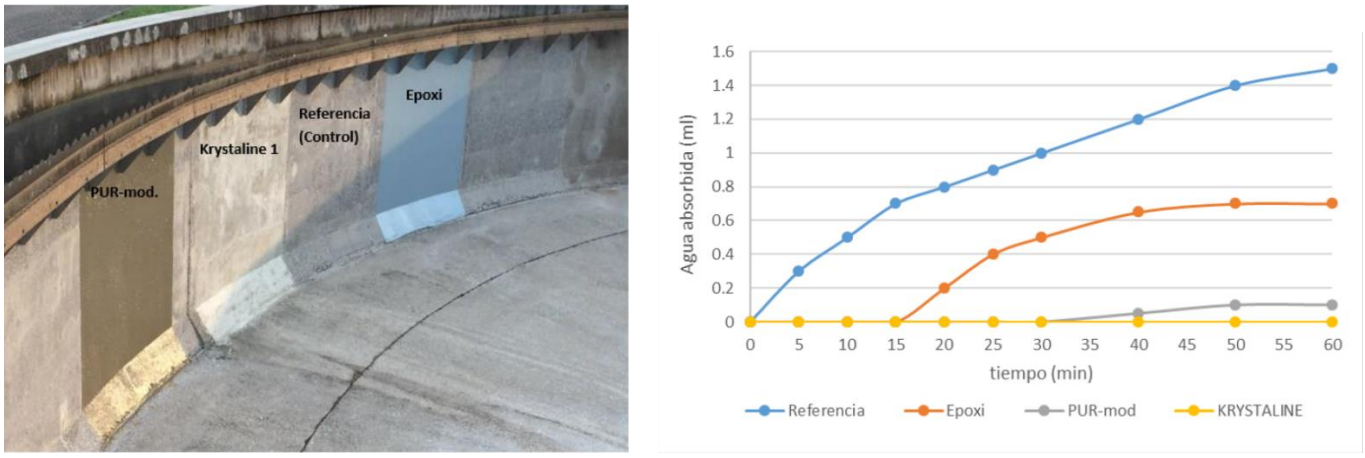
Example 1:

The core samples below are part of a repair project from a below grade parking garage in the Netherlands. Krystaline 1 was applied to the surface area of a leaking parking garage floor. After six weeks, core samples were taken. As can be easily seen with the naked eye, Krystaline 1 has penetrated and C-S-H crystals have filled the area of the crack to the depth of 6 cm.

Core samples from slab treated with Krystaline 1 demonstrating penetration and crack self-healing six weeks after application

Example 2:

The photos and data presented here are from the 2020 report “Increasing wastewater treatment infrastructure durability with advanced coatings”. The study compared the long-term effectiveness of a PU system, an Epoxy system and Krystaline 1 for use inside the secondary clarifier tank of a waste water treatment facility. The application was made and the tank was in operation for 2 years, after which it was drained and the 3 systems were checked for water penetration.



Test area of inside of waste water clarifier tank and permeability test results after two years of use

Krystaline's C-S-H technology was the only application to completely stop water penetration. Over time, the PU and epoxy systems will continue to deteriorate while the Krystaline 1 system will continue to improve.

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A Few Types of Krystaline 1 Projects

Water treatment plants in Slovakia

Dams in the Peruvian mountains

Below Grade in India

Water reservoirs in Ireland

Underground carparks in Hong Kong

Swimming pools in Kenya

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