

Crystalline Technology vs. Silicate Technology

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In the current construction materials marketplace, crystalline waterproofing systems have been steadily gaining acceptance as a superior long term method of providing effective concrete waterproofing protection. The success of crystalline technology has led to a large quantity of “Silicate Densification Products” being marketed as crystalline technologies. This has resulted in questions as to how do differentiate crystalline technology (they contain no silicates or hydrophobic materials) from silicate densification technology (composed of a hydrophobic silicate base).

Cristex Technology vs. Silicate Technology

Cristex Technology	Silicate Technology
Hydrophilic	Hydrophobic
Catalytic	Reactive
Improves With Age	Deteriorates With Age
In-Depth Penetration	Initial Surface Penetration Only
Does Not React With Free Lime	Reacts With Free Lime
Self-Healing Capabilities	No Self-Healing Capabilities

Definition Hydrophilic vs. Hydrophobic

Hydrophilic, (Hydrophile, from the Greek hydros meaning water and philia meaning friendship) is in reference to the physical property of a molecule that can transiently bond with water. Given that Cristex technologies are hydrophilic in nature, water is used in the process of crystalline development.

Hydrophobic, (hydrophobicity, from the combination of water in Attic Greek *hydro-* and for fear *phobos*) is used in reference to the physical property of a molecule (known as a hydrophobe) that is repelled from a mass of water. In relation to waterproofing, Silicates are hydrophobic in nature and function by repelling water. Water is not used as part of the process of crystalline development.

Comparison of Cristex’s Catalytic Function versus Silicates Reactive Function

A Catalyst uses the process of catalysis (in which the rate of a chemical reaction is increased by means of a chemical substance). Unlike reactive chemicals such as silicate-based materials, a catalyst is not consumed in the reaction. Cristex (due to its function as a catalyst) may participate in multiple chemical transformations, provided there are un-hydrated cement particles and water present.

Silicates are consumed by a reactive process in which the silicates react with the free lime in concrete. This type of material is finite as eventually the reactive materials are consumed. When waterproofing a surface area with a reactive technology, the reaction is limited to the initial surface area as pores and capillaries near the surface are sealed. This inhibits the passage of further reactive materials into the concrete. Any excess reactive materials become wasted.

Cristex's unique crystalline technology requires cement particles, water and time to develop (functions with or without free lime being present). The process begins with the application of the crystalline materials, and continues to improve constantly until either there is no more cement particles or until there is no more water present. Since concrete has huge amounts (virtually unlimited for this process) of un-hydrated cement particles, the process will function until the water is no longer present. Should water become present in the future (due to increased hydrostatic pressure, micro cracking or some other cause), the catalytic nature of Cristex's crystalline process allows the waterproofing abilities to engage until the water has been stopped. Concrete treated with Cristex Crystalline systems are the worst they will be immediately after application and continually improve with age.

Silicate technologies begin reaction immediately and continue until either all the reactive materials have sealed all the initial pores and capillaries within the concrete stopping any further reaction from occurring or until the reactive process has been used up. What usually occurs in concrete is a combination, in which the reactive materials fill the pores and capillaries using up the reactive capabilities of the silicates in contact with the free lime. The excess silicates (should an over application be applied) sit dormant on the surface unable to penetrate into the concrete through the initial surface densification created by the reaction between the silicates and the free lime. These excess amounts result in an accumulation of metasilicate residue that may contribute to osmosis and flooring system failures. Silicate treated concrete is the best it can be shortly after application and will continually deteriorate with age.

The catalytic nature of Cristex's crystalline technology results in not only a permanent solution to water ingress into the pores and capillaries, but also results in the ability to self heal micro cracking as it occurs should water become present at a future date. As stated previously, it is the catalytic nature of the crystalline that allows it to always be present and to always be ready to perform, requiring only that water becomes present to re-initiate the process between the cement particles and the water.

Silicate technologies often claim self-healing capabilities as well. What is often not mentioned clearly is that these abilities are limited to the micro-cracks that are already in place. The reactive nature of Silicate will heal micro-cracking as the silicates penetrate into the micro-cracks during application, however once the reactive process has taken place the process is finished. Silicates do not possess the ability to reactivate in the future as only the reacted material (which has already been used up) remains. All excess silicates will have been wasted and eliminated over a short period of time.