SILICATES, SILICONATES AND FLUOROSILICATES EXPLAINED

Reactive sealers for concrete oors are available in man compositions. Although these products share a common end result a more durable surface their chemical mechanisms and intended uses can be quite different.

As concrete hardens, water reacts with cement to form calcium h droxide ($CaOH_2$) and calcium silicate h drate (CSH), the main strength producing component in concrete. Because it is relativel permeable, of low strength, and is susceptible to carbonation, the presence of excess $CaOH_2$ in concrete is undesirable.

There are several different t pes of liquid densi ers available toda . Silicate-based products improve a concrete surface b introducing additional silica that reacts with the excess calcium h droxide to form more CSH. This results in denser, harder concrete surfaces. Because the concrete is dr when the silicate is applied, this additional CSH formation takes place primaril in concrete surface capillaries. Filling these capillaries with CSH provides an additional degree of impermeabilit and densit to the surface, but the concrete retains its abilit to breathe , allowing water vapor to freel exit the slab surface. This is the silicate reaction:

S ca + $CaOH_2$ → CSH

Some products offer a blend of sodium silicate and siliconate. The silicate reacts with the concrete as described above, but the siliconate reacts a bit differentl . Siliconate applied to concrete undergoes a two pasrt process in which it rst reacts with carbon dioxide in the air to form an active silicone resin. The silicone resin then reacts with calcium construction project is impractical, unless a carbonated surface is expected. Euclid Chemical recommends a silicate/ siliconate blend like Diamond Hard as the best material to densif , dustproof, and seal new concrete oors.

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