

# DENSI-PROOF™

## TECHNICAL Memo: pH & concrete



THE NAME SAYS IT ALL

## Answer to a query on how Densi-Proof™ helps the pH values of concrete for the Floor Covering Industry from Protect Crete® Technical Division

Let me start by explaining that concrete, due to aging and other factors, loses its pH, or acidity value. Freshly poured concrete has a high pH value of 12, or higher. That high value can inhibit corrosion. There are several mechanisms that can change this value, but the most common are: moisture vapour (out gassing), chlorides and carbonation.

Moisture Vapour (out gassing) simply refers to water in a gaseous form trying to exit the concrete through the pore system and return to the atmosphere.

Chlorides (salt contaminates) enter into the concrete matrix and once the salt comes in contact with the steel, the cycle of deterioration begins.

Carbonation which causes corrosion of steel and the deterioration of the concrete is the chemical reaction of carbon dioxide with the concrete to produce carbonates. The reaction of carbon dioxide with alkaline hydroxides in the cement lowers the pH of the concrete environment around the steel, and accelerating the cycle of corrosion.

As the concrete ages, the pH will start to drop. When the pH value dips into the 8 to 9 range, there is potential for corrosion of the reinforcing steel.

An application of Protect Crete Densi-Proof™ effectively reduces the pH of concrete while at the same time protecting the internal steel from corrosion.

Most all floor covering manufactures require that moisture vapour transmission must be less than 5 pounds per 24 hours per 1,000 square feet. When you have a Moisture Vapour Rate of 5 pounds or more and a pH 10 or above, most all traditional floor covering adhesives will fail. Due to the environmental restrictions placed on the manufacturing of adhesives most adhesives can only tolerate a maximum pH of about 9.

Protect Crete Densi-Proof™ can greatly lower the high pH of concrete while at the same time reducing moisture emissions through the slab. As Protect Crete Densi-Proof™ is applied it immediately and readily passes through the concrete's surface and into its matrix. While Protect Crete Densi-Proof™ is still in its liquid state, it permeates into the concrete and begins making contact with its free (unbound) alkali. This internal action transforms from an almost nil solid into a 100% colloidal gel precipitate forming an insoluble permanent tiny-porosity barrier in the transition zone. This unique transformation does not generate heat, nor at anytime create internal pressures. This unique resilient barrier effectively reduces the levels of alkalinity and moisture. Protect Crete Densi-Proof™ provides the permanent protection needed to ensure the performance of the flooring installation.

I hope you find the above information helpful. I have attached two documents you may find of interest. Both documents explain the benefits that Protect Crete Densi-Proof™ provides to treated concrete. Also you may want to read "Densi-Proof™ and Restriction of Vapor Transmission", this document would also be relevant to "Densi-Proof™ and Moisture Vapor Transmission."

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