Deep Seal

Environmentally Safe

BENEFITS TO CONCRETE UNDER ACID / CHEMICAL AGENT ATTACK

AMERICAN MADE

The susceptibility of Portland cement concrete to adverse agent contamination generally results from three inherent characteristics: permeability, alkalinity, and reactivity. Degrees of permeability can vary in different concrete installations. Even extremely high quality concrete has some degree of permeability. Liquid penetration into concrete is often accompanied by a reaction with one or more of its constituents, such as cement, aggregates, or imbedded steel. Subsequent possible leaching of the concretes cement hydration compounds, or deposition of extraneous crystals, or crystalline reaction products can degrade concretes appearance, integrity, strength, and durability, ultimately causing its early failure.

The alkaline hydrated cement binder of concrete readily reacts with acidic substances. A reaction usually accompanied by extraneous formation or removal of concretes soluble reaction products, eventually resulting in its disintegration. The rate end extent of chemical attack are increased by an increase in aggressive agent concentration in solution. Dry non-hygroscopic solids do not attack dry concrete; however, wet or moist reactive solids will attack it, as will aggressive liquids and solutions. Temperature also effects the rate of chemical attack indirectly, since, as the temperature rises, moisture content of concrete becomes reduced, making it drier, but however, more permeable to additional fluids. As temperature falls, it can sometimes cause sufficient normal shrinkage to create small open cracks, which allow even greater penetration of contaminants into concretes interior.

The extent of chemical attack depends greatly on concretes permeability, the ease with which liquids can travel through concretes pore systems. If concrete is very permeable, so that liquids can travel right through its thickness, calcium hydroxide will be leeched out very quickly, leaving behind deposits of calcium carbonate, formed by reaction of calcium hydroxide with carbon dioxide. Calcium carbonate is whitish in color and, in most cases, makes its presence apparent by floating to the surface in the form of efflorescence. Efflorescence is generally not harmful; however, extensive leeching of calcium hydroxide leaves concrete more vulnerable to chemical attack, since its pore void percentage is increased, also making it progressively weaker.

Many agents can attack concrete and destructively alter its chemical composition by means of reaction mechanisms which are partly or incompletely understood; however, these agents have to be able to penetrate into concretes interior. **DEEP SEAL** prevents this. **DEEP SEAL**, where applied to a concretes surface, readily penetrates to its interior, to its surface porosity bottom and to its matrix top, where **DEEP SEAL** reacts with concretes internal constituents, producing a 100% solids, insoluble barrier, within just seconds following the **DEEP SEAL** application. Immediately following barrier formation, the concrete becomes protected against further contaminant penetration past its surface porosity. DEEP SEAL, while still in solution form, due to its special molecular make-up, is the only liquid capable of penetrating this special barrier. NOTE: This unique **DEEP SEAL** precipitated barrier should not be confused with temporary, soluble, weekly-linked, large pore, thixotropic gels, that are formed using sodium silicates, through free lime reactions, which has proven detrimental to long-range concrete integrity.

The unique barrier material produced from **DEEP SEAL** consists of distinct spherically-shaped particles containing pore sizes significantly smaller than the treated concretes microporosity, allowing concrete to still breathe, while not allowing free water, moisture, or other liquids to pass into its interior. Free water, already present inside the concrete, prior to treatment with DEEP SEAL becomes chemically tied up in the **DEEP SEAL** precipitated barrier, even participating in the barrier formation, rendering that internal water harmless to the concrete itself. Excess free water, if any, not utilized in barrier formation, is either purged out of the concrete or occupies the special barrier material porosity, where it is not free to migrate. Also, water which occupies the barrier porosity becomes postured in a stretched position due to the very small spine-shaped porosity of the specially formulated material. Since stretched water assumes density similar to that of ice, should a hard freeze occur, this already stretched water does not further expand; therefore, it will not cause freeze damage to the concrete.

Furthermore, the special barrier material is able to absorb and chemically tie-up water / moisture because its molecules are water saturated only on their inner side, in precipitate form, therefore possessing residual valences which attract only substances that are hydrophyllic, such as water or moisture, repelling hydrophobic substances, such as oil. **DEEP SEAL** precipitated barrier particles have a surface film of bound water which can only be released at abnormally high temperatures. Subsequently, water or moisture content of the barrier material, even under extremely dry conditions, will never get lower than 6.5% of its total water capacity, unless baked out at temperatures of 115°C, or higher. However, should the unlikely event of complete dehydration of the special barrier material occur, such as involvement in a fire, this special barrier material will readily rehydrate, upon exposure to water or moisture. Also, the **DEEP SEAL** precipitated unique barrier material is capable of dehydration without a significant loss of surface area inside concretes porosity, also should this material become filled with water to capacity, it becomes impervious to anything else, including water.

The most significant factor in the ability of **DEEP SEAL** to preserve concrete is that its barrier effectively hydrostatically stops liquids / pollutants (including undriven gases) from going into the **DEEP SEAL** treated concretes interior, eliminating major sources of reactant material that may eventually destroy the integrity of its matrix component, the main strength component of concrete. Not only does **DEEP SEAL** preserve concrete integrity, to extend its useful lifespan, but also works to preserve its imbedded steel. DEEP SEAL has the unique ability to significantly enhance Portland cement concrete without altering its physical characteristics, nor does **DEEP SEAL** impair surface traction or bond quality, making **DEEP SEAL** applicable to all concrete installations, whether traffic bearing or not. **DEEP SEAL** improves past carbonation effects, if any.

ACON PRODUCTS 5216 Hwy 53 #781, Braselton, Ga. 30517 Tel 770-380-6594 706-658-2727 Fax 706-824-0031 www.aconproducts.com