

1. Product:

DENSIFIER FOR REBAR, a permanent waterproofer with an embedded steel preservative. Also formerly known as PROTECRETE-D+SPP Densifier plus Steel Preservative Penetrant.

2. Manufacturer:

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3. Description/Basic Use /Limitations:

Description: DENSIFIER FOR REBAR is a water-clear, odorless, non toxic, non flammable, non VOC, non VOS colloidal liquid which is environmentally neutral and user friendly.

Basic Use For Embedded Steel Corrosion

Protection: DENSIFIER FOR REBAR readily enters into bare Portland cement concrete, penetrating to extra-ordinary depths through its open paths of reticulation. DENSIFIER FOR REBAR permeates the concrete eliminating existing embedded steel corrosion conductive conditions which may exist, whether active or as yet inactive. This action prevents, arrests or at least significantly retards corrosive activity in areas treated with DENSIFIER FOR REBAR.

Generally, either water/moisture (H_2O) as electrolyte, or molecular oxygen (O_2) is necessary for corrosion to exist; i.e. (a) H^+ (aqueous hydrogen) ion strengthens /accelerates corrosive reactions; (b) certain kinds of metals retard or hinder corrosion while other types of metals accelerate it.

Since corrosion exists when the metal being corroded is iron and the corroding agent is oxygen, theories of how and why steel corrosion occurs are numerous. The observed facts are that H_2O and O_2 are necessary. H^+ (aq) speeds up the reaction; and strains (as are produced when the metals are bent) usually accelerate the reaction. An interpretation of these observations are:

(1) the iron (embedded steel) acts as an anode to give up two electrons and form Fe^{+2} (ferrous) ion: (2) the electrons are picked up by the H^+ ions to form transient neutral H atoms;

(3) the H atoms are immediately oxidized by O_2 to form H_2O ;

(4) the Fe^{+2} is oxidized by O_2 in the presence of H_2O to form rust.

Incidentally, rust is not a simple compound but seems to be and indefinite hydrate of Fe_2O_3 . Acids catalyze rust formation because they furnish H^+ to accept electrons from the iron (embedded steel), causing it to dissolve faster. Oxygen gas is necessary to oxidize Fe^{+2} to Fe_2O_3 . The presence of water facilitates migration of Fe^{+2} from the reaction site. The resulting reduction in Fe^{+2} concentration allows more to be formed. Subsequently, embedded steel corrosion can be prevented or greatly reduced, by simply cutting off or restricting the O_2 or H_2O supply.

DENSIFIER FOR REBAR does just that plus provides many other benefits to discourage steel corrosion. It neutralizes existing acids. It deaerates rust build-up (if present), providing an environment which allows steel's oxide layer to permanently posture itself in an Fe_2O_3 non corrosive mode.

DENSIFIER FOR REBAR's especially formulated, internally generated, very insoluble colloidal precipitate is also permanently deposited in the concrete's previously open paths of reticulation. It penetrates down to the embedded steel, causing corrosion to be permanently deprived of its necessary ingredient, which is electrolyte.

Basic use as integral sealer, densifier and waterproofer:

DENSIFIER FOR REBAR applied to Portland cement concrete integrally waterproofs, densifies and preserves concrete as well as its embedded steel. These attributes are beneficial to concrete of any age, old or new, at any point during concrete's useful lifespan. It

provides concrete with an effective chloride ion / contaminate barrier, reducing concrete's vapor transmission rate, diminishing its permeability factor. Actions which preserve integrity while also extending concrete's useful lifespan potential. It also further improves the concrete's abrasion resistance, as well as its acid/chemical potential damage resistance.

Applied to the surface of a concrete installation, it permeates to extraordinary depths. As DENSIFIER FOR REBAR permeates/penetrates while still in liquid form, it reacts with concrete's interior constituents. This reaction prolifically converts DENSIFIER FOR REBAR's extremely low solids colloidal liquid to a 100% solids C-S-H material. It becomes an integral part of the concrete itself. DENSIFIER FOR REBAR's integrally generated C-S-H will now occupy concrete's accessible pore spaces which were previously voids.

The internal C-S-H production does not generate heat during its liquid to solids conversion and will not ever generate internal expansion pressures.

Internally produced C-S-H precipitated from DENSIFIER FOR REBAR has its own pore network. It contains uniform pore sizes much smaller than treated concrete's microporosity. The C-S-H barrier remains resilient and allows the concrete to breath, expand and contract as it needs to.

A DENSIFIER FOR REBAR treatment does not deleteriously affect the surface traction quality. It even enhances the concrete's surface bond quality. Areas treated need only to be closed during treatment and can be open to traffic immediately after treatment.

NOTE: For more information see the DENSIFIER FOR REBAR data sheet.

Limitations: DENSIFIER FOR REBAR contacting glass should be removed before being allowed to air dry, since glass can become etched. DENSIFIER FOR REBAR may dull the shine on aluminum,

DENSIFIER FOR REBAR Continued

Technical Data

however, aluminum's integrity remains intact. Do not apply on frozen concrete or when ambient temperature is freezing or below.

4. Technical Data:

Physical: Liquid

Color: Water-Clear

Odor: None

pH: ± 12

Flammability: None

Hazardous Vapors: None

Cleanup Solvent: Water

5. Installation:

Note: In hot climates, mist-wet the surface with water and remove any puddles prior to application.

a. Use medium- to high-pressure airless sprayer complete with a 24-inch wand and a .019 fan tip spray jet.

b. Hold spray tip 6 inches from floor.

c. Apply to the point of concrete saturation twice in back-to-back applications. To do this, visually establish a start and finish point during the first application, then prior to relocating the spray equipment, apply to same area again using the start and finish points previously established.

d. Each application should be at the rate of 200 square feet per gallon with an overlapping spray pattern of approximately 10% to 15%. Therefore, estimate volume needed at the rate of 100 square feet per gallon.

e. Begin applying at the lowest level elevation. For example, walls and slopes should be applied side to side, from the bottom up.

f. Use overlapping patterns of north and south, east and west strokes.

g. Do not apply on frozen substrate or

when temperature is near freezing.

h. DENSIFIER FOR REBAR may etch glass or dull aluminum and can be difficult to remove from other surfaces once it dries. Take precautions to cover surrounding surfaces or rinse immediately if sprayed with product.

i. DENSIFIER FOR REBAR is completely safe to use and environmentally friendly. We do recommend use of a painter's mask during application. Refer to MSDS.