

How Densifier for Rebar removes agents which corrode imbedded steel

A technical explanation of how PROTECRETE's Densifier for Rebar stops or virtually prevents the corrosion of imbedded steel

The most common and frequent forms of corrosion of Portland cement concrete's imbedded steel is caused by a flow of electric current, usually, but not necessarily, generated within the concrete itself. Electrical potential differences can occur in various areas throughout concrete containing imbedded metals for several diverse reasons; variable moisture content, oxygen concentration, electrolyte concentration, or contact of dissimilar metals, etc. Inside reinforced concrete prior to corroding, a corrosion cell may be formed along imbedded steel through the formation of an anode where corrosion occurs and a cathode where no corrosion occurs. However, for corrosion cells to become active there has to be electrolyte present. Electrolyte can be any liquid which is capable of conducting electrical current through ionic flow, such as rain water, etc. The electrolyte acts as a sink for steel's electrons, the higher concentration of ionized substances. Chlorides from salt or calcium cause the electrolyte to be more potent or stronger. This allows even more electron flow from the steel, further accelerating corrosive activity rates.

Electrolyte activated corrosion cells subsequently produce pits in the corroding imbedded steel. However, the integrity loss due to pitting/corrosion is of much greater consequence in concrete utilizing prestressing cables than in concrete with reinforcing bars. A catastrophic failure may occur in stressed cables as the cable's cross section becomes reduced or weakened sufficiently by corrosion or embrittlement due to hydrogen evolution caused by the corrosive processes. On the other hand, concrete surrounding the imbedded steel reinforcement bar is often cracked as a result of corrosion's expansive forces from a load bearing standpoint long before the loss of steel's integrity becomes critical. In such cases, repairs are often necessary due to concrete bond loss, cracks, or spalling, making corrosion, in either instance, very costly.

Now there is an effective alternative to helplessly allowing this corrosive destruction to run rampant. The alternative is in the form of a non-toxic, environmentally and user friendly solution, PROTECRETE Densifier for Rebar. It is spray-applied to the concrete's surface as a remedial (apparent corrosion taking place) treatment or as a preventative treatment (no visible signs of corro-

sion as yet). It readily penetrates deep into the concrete being treated. As a remedial treatment, PROTECRETE Densifier for Rebar arrests or greatly retards destructive corrosion activity through subsequent removal of electrolyte, oxide (scale) deaeration, and oxygen deprivation at the steel's surface. Also, as a side benefit, PROTECRETE Densifier for Rebar diminishes water soluble chloride content to varying degrees, depending on pore accessibility, permeability, chloride content, and etc.

Where imbedded steel is not yet corroding, PROTECRETE Densifier for Rebar works to prevent corrosive processes from commencing by neutralizing acids (if any) which are mainly responsible for pitting, oxygen deprivation, and conversion of steel's protective oxide coating from a two valence oxide to a three valence one.

Following an application, the internally generated insoluble residue subsequently left in PROTECRETE Densifier for Rebar's penetrating reticulation route permanently deprives treated areas of their main ingredient for corrosion, which is electrolyte.