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PRESS RELEASE



Surface Applied Corrosion Inhibitors (SACIs): Comparing “Apples to Apples” vs. “Apples to Oranges”

When it comes to selecting Surface Applied Corrosion Inhibitors (SACIs) for concrete repair and maintenance, it is important for engineers to know how and why to compare “apples to apples” instead of “apples to oranges.” The International Concrete Repair Institute (ICRI) Technical Guideline No. 510.2-2019, “Guideline for Use of Penetrating Surface Applied Corrosion Inhibitors for Corrosion Mitigation of



Reinforced Concrete Structures,” provides a good place to start. From there, Cortec® Corporation helps engineers sort through the many varieties of “produce” on the market to help engineers compare “apples to apples” instead of “apples to oranges” and pick the product best suited to the job.

Sorting Out “Apples from Oranges”

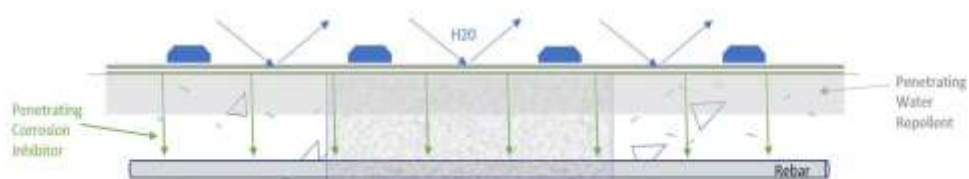
The ICRI guideline defines SACIs as liquids that penetrate concrete to the depth of embedded reinforcement and actively mitigate corrosion on the steel surface. These SACIs include amine-based corrosion inhibitors that travel in the vapor phase through the concrete pore structure and form a molecular protective layer on the rebar. Surface applied products that contain only water repellents do not qualify. Standard water repellents penetrate only millimeters into the concrete; SACIs must penetrate as much as several inches. Water repellents recognized in the ICRI document contain the addition of amine-based corrosion inhibitors that can penetrate deeper into the concrete to reach embedded reinforcing steel. The document also includes pure corrosion inhibitors (neat inhibitor in a solvent, generally water) that are not water repellents. The difference is also explained in the figures below.



Generally speaking, the amount of corrosion inhibitor is highest in pure SACI products, and lower in water-repellent-based SACIs (but these materials have the added water repellency feature that allows them to be used as a two-in-one material). Water-repellent SACIs generally have a corrosion inhibitor concentration ranging from 1-10%, depending on the manufacturer, whereas a pure corrosion

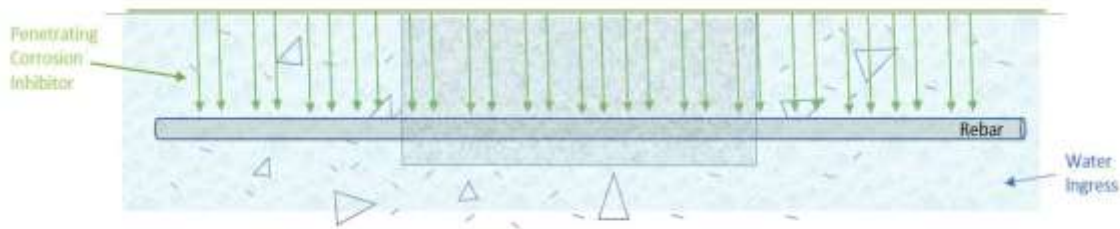
inhibitor with no water repellent typically ranges from 15-25% corrosion inhibitor concentration. Engineers who want corrosion protection at the level of the rebar, with or without water repellency, must be able to tell the difference between these products in order to specify the ones that will provide the most effective protection to the embedded reinforcement on the structures they are working on.

Water Repellent with Corrosion Inhibitor Applied to Concrete Surface



Blue dots and arrows represent water-/chloride-/contaminant-repelling features of this two-in-one product. Green arrows represent corrosion inhibitors available to reach the steel at only one-third to one-half the concentration offered by a pure corrosion inhibitor product.

Pure Corrosion Inhibitor Applied to Concrete Surface



In the pure corrosion inhibitor model, there is no water-repellent feature. However, the product has two to three times the concentration of corrosion inhibitor available to reach the steel.

Comparing “Apples to Apples” vs. “Apples to Oranges”



Once engineers understand the difference between individual SACI products for concrete surface applications, they will be ready to compare “apples to apples” materials for their specific scenario. For instance, parking structure and bridge repairs often include the application of a traffic deck membrane or other coatings that are impermeable to water, chlorides, and other contaminants, as part of a

protective “system” that also requires active corrosion inhibitors beneath the coating. In this scenario, the specifier might consider using pure SACI versus water-repellent-based SACI in order to get more penetrating corrosion inhibitor into the concrete while still protecting against ingress of contaminants with the topcoat system. In situations where a topcoat is not used, the specifier might prefer to recommend water-repellent-based SACI as a two-in-one solution. Specifying “apples to apples” would mean selecting pure SACI products as alternatives to each other, or water-repellent-based SACIs as alternatives to each other. “Apples to oranges” would mean specifying the use of a pure SACI as an alternative to a water-repellent-based SACI.

SACIs from Cortec® Corporation

Cortec® Corporation offers the following SACIs as part of its MCI® Technology line to extend concrete service life:

Full-Strength SACI, No Water Repellent

MCI®-2020 is a top-of-the line option for use where a pure, high concentration penetrating corrosion inhibitor is needed. It is also available as **MCI®-2020 V/O** (for vertical/overhead use) or **MCI®-2020 Gel** (for injection beneath surfaces that cannot be disturbed or properly prepared).

Two-in-One Water Repellent SACIs

- **MCI®-2018** (100% silane)
- **MCI®-2019** (40% silane)
- **MCI®-2021** (silicate)
- **MCI®-2022** (silane/siloxane blend)

Contact Cortec® MCI® to learn more:

<https://www.cortecmci.com/contact-us/>

Follow us on LinkedIn for more in-depth articles on SACIs forthcoming!

<https://www.linkedin.com/showcase/mci-migrating-corrosion-inhibitors-/posts/?feedView=articles>

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