MCI®

MIGRATING CORROSION INHIBITORS
FROM GREY TO GREEN

HIGH PERFORMANCE REPAIR SYSTEMS

HPRS®

REPAIR, REHABILITATION AND RESTORATION SYSTEMS FOR REINFORCED CONCRETE AND MASONRY BASED ON PATENTED MIGRATING CORROSION INHIBITORS (MCI®) TECHNOLOGY

ISO/IEC-17025 LABORATORY TESTING CERTIFIED

ENVIRONMENTAL ISO 14001 CERTIFIED SYSTEM REGISTERED

ISO 9001 CERTIFIED QUALITY SYSTEM REGISTERED

QUALITY EXCELLENCE®

CORTEC CORPORATION

Environmentally Safe VpCI®/MCI® Technologies

HPRS®

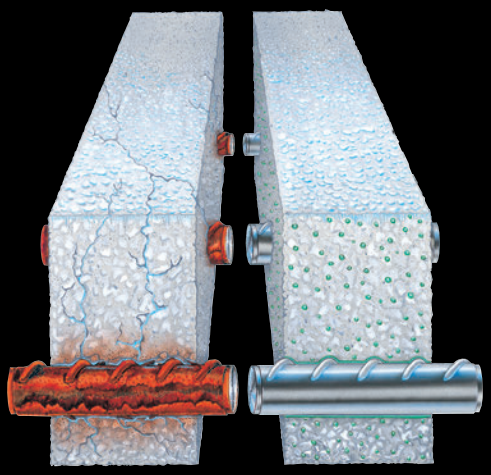
High Performance Repair Systems with Extra High Concentrations of MCI®

Complete multifunctional and compatible protection systems with very high durability for the repair of spalled reinforced concrete structures and surfaces. The HPRS® system maximizes the concentration of Migrating Corrosion Inhibitor (MCI®) molecules on embedded steel bars.

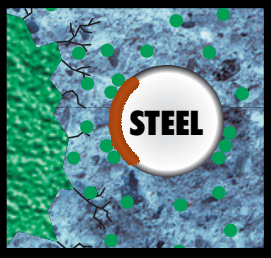
The MCI® Concept

The concept behind the migration of migrating corrosion inhibitors (MCI®) through concrete is simple:

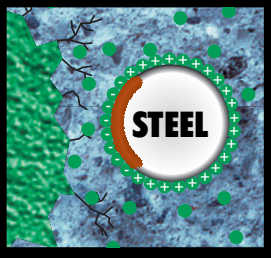
The migration process of MCI® molecules is based on their ability to diffuse in both vapor or liquid form. They penetrate into even the smallest pores and cavities; and are attracted to both anodic and cathodic areas of embedded metallic reinforcement. This physical adsorption onto metal surfaces provides a protective monomolecular layer that significantly reduces corrosion rates even on rusted surfaces, greatly extending the useful service life of the structure.



Remove Spalled Concrete – The first step in the rehabilitation process is the removal of spalled concrete from the deteriorating structure.



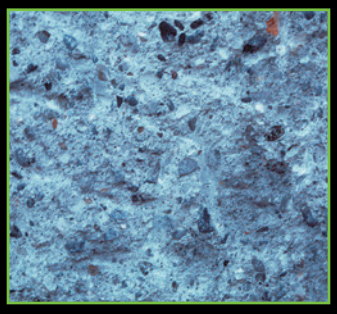
Cortec® MCI® migrates through concrete to protect steel – The inhibitor will migrate a considerable distance through the concrete to deposit itself on the internal bars.



Cortec® MCI® protects the steel from further corrosion – The inhibitor attaches to the steel reinforcement forming a thin, protective coating of MCI® molecules. This prevents a chemical reaction between the steel and oxygen, chlorides, or other contaminants in the structure, mitigating, further corrosion.

Sequence of HPRS® Application:

step 1



Preparation of the Base

Carefully scarify and remove all spalled, loose, and deteriorated concrete according to International Concrete Repair Institute (ICRI) Technical Guideline No. 310.1R–2008 Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion (formerly No. 03730), or other engineering guideline.

sequence

step 2

Product – VpCI®-426 or CorrVerter® Rust Primer

Remove rust from all exposed reinforcement by sand blasting, wire brush, or by using Cortec® VpCI®-426 rust remover. Alternatively, Corrverter® Rust Primer can be used. Corrverter® Rust Primer is a primer that modifies surface rust into a hydrophobic passive layer. Loose rust is removed from the metal by wire brushing and then Corrverter® Rust Primer is applied to convert the rust and prime the surface for subsequent repair steps. Corrverter® Rust Primer is applied by brush or sprayer at a thickness of 3-5 wet mils (75-125 micron).

step 3

Product – MCI®-2023

MCI®-2023 is a protective, passivating, anti-corrosion, two-component grout containing MCI® molecules. Brush on MCI-2023 to achieve 40 to 80 mils (1-2 mm) wet film thickness on any exposed rebar or metal as soon as possible after removal of loose rust. Two coats are recommended at 40 mils (1 mm) per coat.

step 4

Product – MCI®-2039, MCI®-2701, or MCI®-2702

MCI®-2039 is a single component, fiber reinforced repair mortar containing MCI®. Apply a base coat of MCI®-2039 with a stiff brush at a thickness of 0.4 inches (10 mm), at which the mortar has a coverage rate of 14.4 ft²/55lbs bag (1.35 m²/25kg bag). The thin coat of MCI®-2039 acts as a bridge for any loose particles and aggregate and provides a solid substrate to apply the repair mortar. For trowel applications, use MCI®-2702. For vertical and overhead applications, use MCI-2701.

step 5a

Product – MCI®-2039, MCI®-2701, or MCI®-2702

MCI®-2039 is also a full-depth, repair mortar. MCI®-2039 has a high resistance coefficient to carbon dioxide, chloride and sulfate penetration, high mechanical strength, and a low elastic modulus. Build up the area of repair by troweling MCI-2039 in to the repair area. It can be applied in thicknesses between 0.4 and 2.4 inches (10-61 mm) per layer. Multiple lifts of MCI®-2039 SC can be applied to reach a maximum thickness of 12 inches (30 cm). For trowel applications, use MCI®-2702. For vertical and overhead applications, use MCI®-2701.

step 5b

Product – MCI® Mini Grenade®

Alternatively to step 5a, Cortec MCI® Mini Grenades can be added to a repair mortar of choice. MCI Mini Grenades® are a corrosion inhibiting admixture packaged in a water soluble, PVA bag. The Mini Grenades® are proportioned to be dosed in 0.5 ft³ (0.0015m³) of mortar. To dose simply add one MCI Mini Grenade® to the mortar mix water. The bag and powder are readily dissolvable in water. Once dissolved, mix according to the mortar manufacturer's suggestions. After the mortar is placed, the migrating inhibitor in MCI Mini Grenades® will penetrate to embedded reinforcement and protect from corrosion.

step 6

Product – MCI®-2020

MCI®-2020 is a topical, water-based formula containing MCI®. The MCI® molecules are formulated to penetrate through concrete and will attach to the surface of embedded reinforcing steel. Apply MCI®-2020 at a rate of 150 ft²/gal (3.68 m²/L) by low pressure spray, brush or roller to the surface after the repair mortar has cured. Allow MCI®-2020 24 hours to be absorbed before top coating with other coatings or sealers.

step 7

Product – MCI® EcoRainbow® Architectural Coating

MCI® EcoRainbow® Architectural Coating is a water-based, acrylic coating designed for the final finish. Available in a transparent or colored finish, it provides resistance to the penetration of carbon dioxide as well as good water vapor transmission properties. It also provides resistance to ultraviolet light and all climatic conditions, including industrial pollution and marine environments. Apply at a thickness of 4-7.5 mils (100-187.5 microns) wet film thickness via spray, brush or roller. The coverage rate at 4 mils is 150-200 ft²/gal (3.68-4.9 m²/L).

other color options:

Simple, Economical and Effective HPRS® System:

Before

After

Before

After

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