



**MIGRATING CORROSION INHIBITORS**  
FROM GREY TO GREEN

03.01.20	Maintenance of Concrete Reinforcing
07.19.16	Silane Water Repellents

## MCI®-2019/MCI®-2019 FD

### DESCRIPTION

MCI®-2019 is a 40% silane, solvent-based concrete water repellent containing time-proven Migrating Corrosion Inhibitors™ (MCI®). MCI®-2019 is a small molecule product that can easily penetrate into concrete, providing water repellency by chemically reacting with cementitious substrates under proper application. MCI®-2019 seals surface pores which prevents intrusion of chloride and carbonation and protects from the ingress of wind-driven rain. Treated areas retain their original appearance and are fully breathable – retaining their natural moisture-vapor transmission.

MCI®-2019 FD is a special version of MCI®-2019 containing a fugitive dye, which fades with time, to confirm application.

### PACKAGING & STORAGE

MCI®-2019 and MCI®-2019 FD are available in 5 gallon (19 L) pails, 55 gallon (208 L) drums and 275 gallon (1040 L) totes.

To ensure best product performance, store in original packaging, indoors, and out of direct sunlight at 40-100 °F (4-38 °C).

Shelf life: 1 year from date of shipment



### HOW IT WORKS

MCI®-2019 combines a silane water repellent with Migrating Corrosion Inhibitor™ (MCI®) action. The silane component penetrates into the surface, chemically bonding with the substrate to provide a high level of water and chloride ion screening. The MCI® component has been shown to penetrate to the depth of embedded, metallic reinforcement, forming a protective monomolecular layer on it. This protective layer delays the onset of corrosion and reduces corrosion rates after initiation, greatly extending the service life of structures.

### WHERE TO USE

MCI®-2019 and MCI®-2019 FD are recommended for use on exterior above-grade concrete, brick masonry, concrete masonry units, and some natural stones.

### ADVANTAGES

MCI®-2019 offers engineers, owners, contractors, DOTs, and government agencies a time proven corrosion inhibiting technology that will extend the service life of their reinforced concrete structures.

- Certified under EN 1504-2 (2+ system) for superficial protection of concrete
- VOC compliant to federal, California, and EU rules
- Protects against ingress of water, chlorides, and other aggressive contaminants
- Molecule size allows penetration into the smallest concrete pores
- Not a vapor barrier
- Enhances durability
- Reduces efflorescence
- Effectively delays onset of corrosion in new structures
- Effectively reduces corrosion rates on metals with existing corrosion
- Non-toxic; contains no nitrites, phosphates, or chromates
- No blushing, peeling, or yellowing
- Does not etch, stain, discolor, or otherwise harm glass or aluminum
- Helps protect against acid and chemical attack
- Easily applied by spray, brush, or roller

# MCI®-2019/MCI®-2019 FD

## PHYSICAL PROPERTIES

### MCI®-2019

Appearance	Light yellow liquid
pH	10-11 (1% in water)
Density	6.9-7.1 lb/gal (0.83-0.85 kg/L)

Shelf life is 12 months from date of shipment when stored in original, airtight containers at or below 77 °F (25 °C).

## COVERAGE

Application rates will vary depending on surface porosity and number of applications. Approximate total coverage rate is 125-175 ft<sup>2</sup>/gal. (3-4.3 m<sup>2</sup>/L). It is recommended to apply two coats, each at a coverage rate of 250-350 ft<sup>2</sup>/gal (6-8.6 m<sup>2</sup>/L). Before applying, it is recommended that preliminary tests be carried out to determine proper application, dosing, etc.

## PERFORMANCE DATA

### NCHRP - Series II

#### Weight Gain During Saltwater Soak

Testing on concrete (2-inch cubes, 21 day immersion in 15% NaCl, 5,000 psi concrete) showed a 75% reduction in weight gain.

#### ASTM C-156: Water Vapor Transmission

Water vapor transmission of coated samples is excellent. MCI®-2019 did not significantly alter water vapor transmission characteristics when coated samples were compared to uncoated samples.

#### ASTM C-1218: Chloride Ion Intrusion at 0.5-1" Depth

The chloride ion intrusion was determined by ponding 4% NaCl on top of panel for 21 days. The MCI®-2019 coated samples showed a 78% decrease in chloride ion penetration.

### NCHRP - Series IV

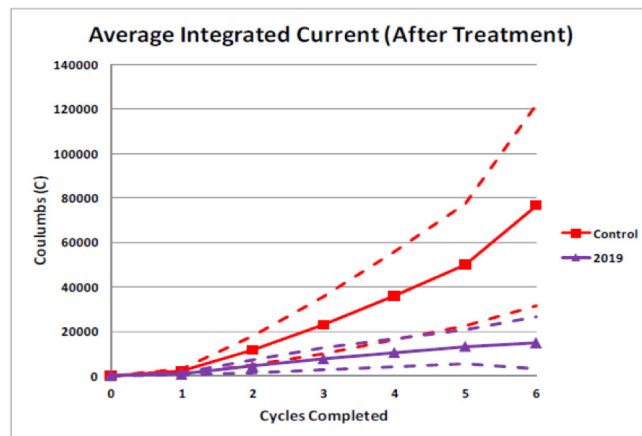
#### Accelerated Weathering Tests

24 weeks of accelerated weathering testing included salt water exposure, ultraviolet light exposure, and wetting and drying cycles. The test results show that a single coat at 125 ft<sup>2</sup>/gal (3 m<sup>2</sup>/L) reduced the average chloride ion intrusion into the concrete by 99% when compared to uncoated control specimens. The performance exceeds the 90% limit suggested in the NCHRP report No. 244.

#### ASTM C-672: Standard Test Method for Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals

Test results indicate little or no change after 50 cycles of de-icer freezing and thawing using air entrained concrete specimens whereas the control had moderate to severe scaling.

## US Bureau of Reclamation M-82 Protocol



## SURFACE PREPARATION

Surfaces should be clean, dry, and free of dirt, oil, grease, efflorescence, mold, salt, laitance, coatings, membranes, and asphalt. Acceptable cleaning methods include shotblasting, sandblasting, or waterblasting. Surfaces should be superficially dry with no visibly damp areas.

## APPLICATION

Stir thoroughly before use. Apply MCI®-2019/MCI®-2019 FD by using an airless sprayer, roller, or brush. When a brush or roller is used, repeated applications should be made until the surface remains moist for a few minutes. If an airless sprayer is used, application should continue until the substrate is thoroughly saturated. Sprayers should be fitted with solvent resistant hoses and gaskets.

For best results, MCI®-2019 should be applied in two coats using a wet on wet technique where the second coat is applied when the surface is wet, but not glossy from the first coat. During application, precautions should be taken to protect the surrounding area from overspray and run-off. MCI®-2019 may be applied to damp surfaces, although dry surfaces are preferred to achieve maximum penetration into the substrate.

If a coating will be used over MCI®-2019, a 7-day period is recommended before coating. An adhesion test should be performed to verify compatibility.

Please refer to MCI®-2019 Product Specification for more detailed instructions.

## CONSIDERATIONS

# MCI®-2019/MCI®-2019 FD

- MCI®-2019/MCI®-2019 FD should be kept away from heat and open flame
- MCI®-2019/MCI®-2019 FD should not be used on structures under hydrostatic pressure
- Do not apply when temperature is expected to be at or below 5 °C (40 °F) or on extremely windy days when evaporation of solvent would be too rapid
- MCI®-2019 will not penetrate water repellents, coatings, paints, membranes, or asphalt
- Fresh concrete should be allowed to cure for 28-days before application; repair work should be completed at least 3-days prior to application of MCI®-2019/MCI®-2019 FD

Contact Cortec® Technical Service for further guidance if necessary.

## EN 1504:2 Performance Testing Table

Essential Characteristics	Performance	Test Standard	Harmonized Technical Specification
Drying Test for Hydrophobic Impregnation	DRC (%)	UNE-EN 13579:2003	EN 1504-2:2005
	66.3		
Water Absorption and Resistance to Alkali for Hydrophobic Impregnation	AR (%)	UNE-EN ISO 7783:2012	
	6.4		
	AR <sub>ALK</sub> (%)		
	7.5		
Depth of Penetration	11.0 mm	EN 13579 + EN 14630	



4119 White Bear Parkway, St. Paul, MN 55110 USA  
Phone (651) 429-1100, Fax (651) 429-1122  
Toll Free (800) 4-CORTEC  
info@cortecvci.com  
<http://www.cortecvci.com>  
<http://www.cortecmci.com>



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