03 03 20	Maintenance of Concrete Reinforcing
07 19 16	Silane Water Repellents

MCI®-2018 / MCI®-2018 V/O and Modifications

DESCRIPTION

MCI®-2018/MCI®-2018 V/O is a 100% silane water repellent containing time-proven Migrating Corrosion Inhibitors (MCI®). MCI®-2018 penetrates deep into concrete providing corrosion protection to reinforcing steel from carbonation, chlorides, and other contaminants.

MCI®-2018 V/O is formulated for easier application on vertical and overhead surfaces.

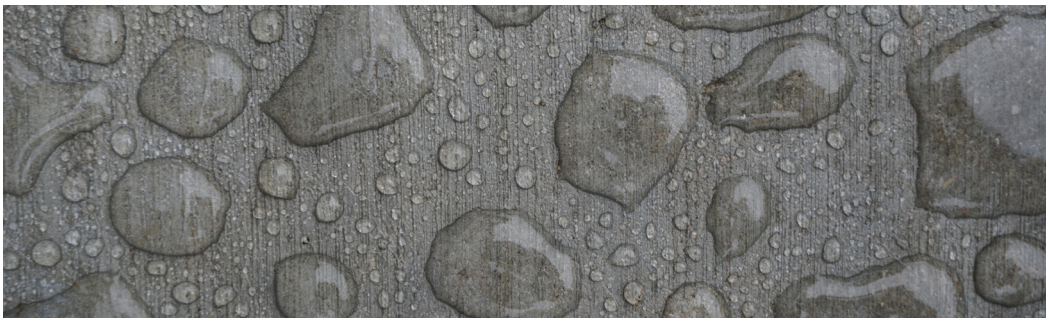
MCI®-2018 UFI: S830-20V9-X00H-TU0P

PACKAGING & STORAGE

MCI®-2018/MCI®-2018 V/O and Modifications are available in 5 gallon (19 L) pails and 55 gallon (208 L) drums.

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

Shelf life: 2 years



HOW IT WORKS

The silane component in MCI®-2018/MCI®-2018 V/O provides water repellency by chemically reacting with the cementitious substrate under proper application, decreasing the ingress of aggressive materials. The MCI® component penetrates deeper into the substrate, forming a protective, molecular barrier on embedded reinforcement to reduce the rate of corrosion at the rebar.

WHERE TO USE

- Commercial buildings
- Parking garages
- Bridge decks or bridge structures
- Tunnels
- Jetties/piers and other marine structures
- Offshore oil platforms
- Any other reinforced concrete structure

ADVANTAGES

- Certified under EN 1504-2 (2+ system) for superficial protection of concrete
- USBR M-82 Protocol confirms corrosion rate reduction independent of chloride levels/ high chloride threshold
- Certified to meet ANSI/NSF Std. 61 for drinking water system components
- Forms a monomolecular corrosion inhibiting layer on steel, inhibiting the electrochemical corrosion process between metal and chloride, oxygen, and moisture in concrete
- Treated substrates are hydrophobic and retain their original appearance
- Surfaces remain fully breathable and maintain their natural moisture-vapor transmission
- Blocks carbonation and chloride ion intrusion
- Extends the service life of structures
- Easy application by spray, roller, or squeegee
- Contains no nitrites, phosphates, or chromates
- No blushing, peeling, or yellowing
- Complies with Alberta DOT Standards for Type 1B and Type 1C sealers

MCI®-2018 / MCI®-2018 VO and Modifications

PHYSICAL PROPERTIES

MCI®-2018 (and modifications)

Appearance	Liquid (various colors)
pH	9-11(1% in water)
Density	7.3-7.7 lb/gal (0.87-0.92 kg/L)
VOC	3.1 lb/gal (350 g/L)
CARB VOC	50 g/L
Coverage Rate	125-175 ft^2/gal (3-4.3 m^2/L)
Density (both versions)	6.9-7.1 lb/gal (0.83-0.85 kg/L)

COVERAGE

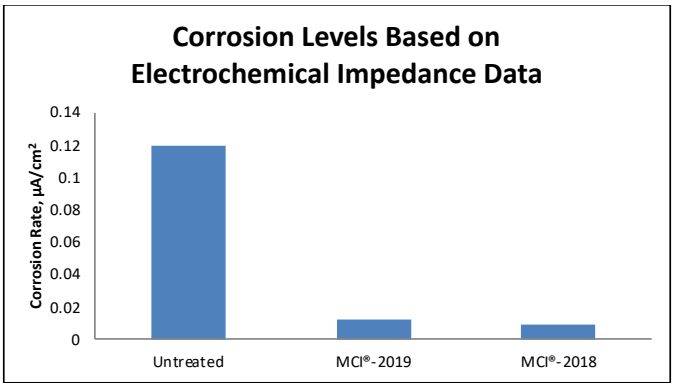
Application rates will vary depending on surface porosity and number of applications. Approximate coverage rate is 125-175 ft^2/gal (3-4.3 m^2/L). Before applying it is recommended that preliminary tests be carried out to determine dosing.

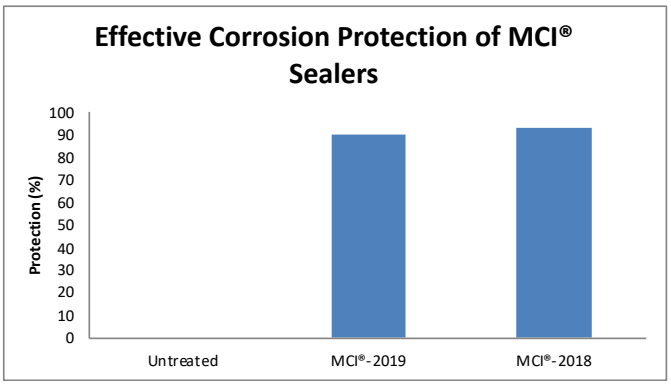
PERFORMANCE DATA

Test Method	Result	Harmonized Technical Specification
EN 13579:2003 Drying Test for Hydrophobic Impregnation	> 30%, Class I	UNE-EN 1504-2:2005
EN 13580:2003 Water Absorption and Resistance to Alkali for Hydrophobic Impregnation	Absorption ratio <7.5% compared to untreated specimen. Absorption ratio <10% after immersion in alkali solution.	
EN 13579 + EN 14630 Depth of Penetration	≥ 10 mm, Class II	

Performance Criteria	Test Method	Results
Concrete Sealer Testing	Alberta Transportation Specification B388	Meets Type 1B at 148.7 ft^2/gal (274.1 mL/m^2) coverage rate. Meets Type 1C at 169.1 ft^2/gal (240.7 mL/m^2) coverage rate.
Reduction in Chloride Ion Content	NCHRP Series II	Single coat application of 125 ft^2/gal (3.06 m^2/L) showed 88% reduction in chloride ion content.
Accelerated Weathering Tests	NCHRP Series IV, Southern Exposure	Single coat application of 125 ft^2/gal (3.06 m^2/L) had zero discoloration and reduced chloride intrusion by 98%.
Resistance to Chloride Ion Penetration	AASHTO T259	Treated samples showed 82.6% reduction in chloride ion penetration compared to control. Depths from 0.5-1 inch (1.25-2.54 cm) contained negligible amounts of chloride ions.
Water Absorption of Concrete	ASTM C642	Single coat application of 125 ft^2/gal (3.06 m^2/L) showed a 74% reduction after 50 days compared to control.
Water Repellency	Federal Specification SS-W-110C	Single coat application of 125 ft^2/gal (3.06 m^2/L) resulted in 0.39% water absorption, exceeding the 1.0% maximum allowed in spec.
Scaling Resistance of Concrete Exposed to Deicing Chemicals	ASTM C672	Results show little to no change after more than 50 cycles of freeze-thaw with the use of deicing salts on treated concrete samples.
Potable Water	ANSI/NSF Standard 61	MCI®-2018 is certified by Underwriters Laboratories to meet NSF Standard 61 requirements at recommended coverage rates.
Corrosion Protection	USBR M-82 Protocol	MCI®-2018 reduced corrosion of severely corroded rebar. Treatment of MCI®-2018 done after 10,000 coulombs of corrosion was reached, indicating treatment works independently of chlorides present or at a higher initial chloride content level.
Depth of MCI® Penetration	DART Analysis	Inhibitor in MCI®-2018 shown to penetrate up to 1-1/4 in (3 cm) in 5 weeks.

MCI®-2018 / MCI®-2018 VO and Modifications





APPLICATION

Surfaces should be free of standing water, dirt, dust, oils, grease, curing compounds, efflorescence, laitance, and other contaminants. MCI®-2018 and MCI®-2018 V/O may be applied to damp surfaces, although dry surfaces are preferred to achieve maximum penetration into the substrate.

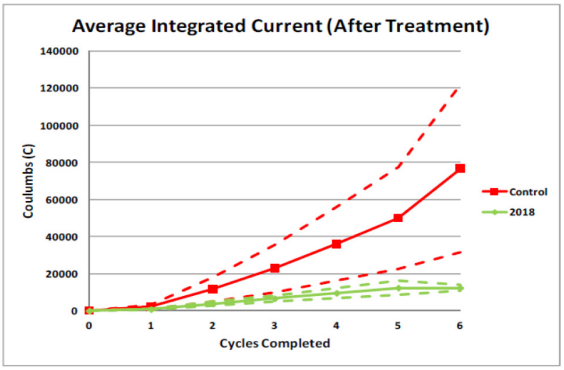
Application can be performed using airless or pneumatic sprayer, roller, or brush. Sprayers should be fitted with solvent hoses and gaskets. For best results, we recommend a two coat, wet on wet application technique; i.e., the surface is damp from first application but not glossy when the second coat (containing remaining recommended coverage rate) is applied. During application, precautions should be taken to protect the surrounding areas from overspray and runoff.

CONSIDERATIONS

Stir thoroughly before use
Should be applied to sound, clean concrete that is free of oils, dirt, sealers, coatings, paints, membranes, or asphalt
Should only be applied when temperatures are between 40-100 °F (5-37 °C)
Should not be applied on extremely windy days when evaporation of the solvent would be too rapid
Fresh concrete should be allowed to cure for 28 days before application; allow repair material to fully cure before applying MCI®-2018
If a coating will be used over MCI®-2018, a seven day waiting period is recommended before application of that coating; a compatibility test should be performed prior to application
Allow 24 hours for curing if a membrane will be applied over MCI®-2018
Should not be used on structures under hydrostatic pressure

US BUREAU OF RECLAMATION M-82 PROTOCOL

MCI®-2018 was shown to decrease the rate of corrosion on severely corroded rebar in a concrete slab. This can be seen by the slope of the curves in the graph below. This test concluded when 80% of the control rebar cracked the surface of the cement. At this time, the concrete slabs treated with MCI®-2018 were still clean and structurally sound.



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