

TECHNOLOGY THAT EXTENDS THE SERVICE LIFE OF CONCRETE STRUCTURES



MIGRATING CORROSION INHIBITORS
FROM GREY TO GREEN





MIGRATING CORROSION INHIBITORS
FROM GREY TO GREEN

Concrete Durability and the Problem of Reinforcement Corrosion

Concrete is one of earth's most widely used materials and will continue to be so as the population grows. Aside from its structural capacity, concrete's durability is a key property that makes it preferred for construction. However, concrete durability is affected by environmental conditions, including physical and/or chemical attack. A dominant form of concrete failure seen in most parts of the world is due to steel reinforcement corrosion.

What Is Cortec® MCI® Technology?

Cortec® Corporation's patented MCI® (Migrating Corrosion Inhibitor™) Technology protects reinforcing metal in concrete from corrosion. Often, corroding rebar in deteriorating concrete is the cause of costly repairs, financial losses, safety concerns, and negative environmental impact, but Cortec® has the corrosion solution.

MCI® greatly extends the service life of new and existing structures by proactively delaying the onset of corrosion and keeping rates low after initiation. Cortec® MCI® products help maintain structural integrity, rehabilitate vulnerable structures, and promote sustainable construction practices.



Click or scan here to see how corrosion happens and how MCI® can help!

How Does MCI® Technology Work?

MCIs are based on amine technology. They are classified as mixed inhibitors, meaning they affect both anodic and cathodic portions of a corrosion cell. MCI® is applied in many forms including concrete admixtures and topical treatments. It moves as a liquid through the concrete matrix via capillary action and migrates in a vapor phase throughout the concrete pore structure.

When MCI® comes in contact with embedded metals, it has an ionic attraction to it and forms a protective molecular layer. This film prevents corrosive elements from further reacting with the reinforcement and reduces existing corrosion rates, greatly extending concrete service life.

Durability and Sustainable Construction

Cement’s carbon footprint and its impact on the planet are global concerns. Building long-lasting structures that can withstand harsh environments will reduce the need for new cement production to repair and replace these structures.

Using MCI® solutions leads to improved corrosion resistance, enhanced durability, and therefore greater sustainability in construction. This is enhanced by the fact that some MCI® products contain biobased raw material, enabling users to earn certain LEED credits. MCI® is also an excellent addition to building projects around the world seeking to meet green building rating system requirements such as the Estidama Pearl and BREEAM systems. A further positive feature for end users and the environment is that many MCI® products are certified to meet ANSI/NSF Standard 61 for drinking water system components.

Cost Effective Service Life Extension

The Princess Tower in the United Arab Emirates used MCI®-2005 in the podium substructure, similar to the Burj Khalifa project. The addition of MCI® into the Princess Tower more than doubled the service life of the building at an investment of less than 1/10 of a percent of total construction costs.

Table 1: An example of MCI® investment cost vs. service life extension for the Princess Tower



ITEM	COST (USD)
Construction Cost	188,000,000
Construction Cost of MCI®-2005	136,000 (0.07%)
Service Life (Without MCI®)	48 years
Service Life (With MCI®)	103 years



Drinking Water
System
Component
ANSI/NSF 61
36 AL



MCI® Admixtures

Cortec® offers a range of corrosion inhibiting admixtures that meet the specific definition of corrosion inhibiting admixtures and pass ASTM C1582 requirements. MCI® chemistry is recognized in ACI 212.3R and has outperformed competing products that act as pore blockers or are limited by a chloride threshold. MCI® admixtures work independently of chlorides, protect even when cracks occur, and in some cases can delay set time for better workability. These admixtures do not detrimentally affect the physical properties of concrete when used at the recommended dosage rates. MCI® admixtures are among the most economical value-added solutions to address concrete durability concerns.

Independent Testing Results

MCI® admixtures have been tested according to many ASTM and European standards. MCI®-2005 NS and MCI®-2005 AL have been shown to meet ASTM C1582, including corrosion requirements under extended ASTM G109 testing. Treated samples did not even begin to show corrosion until approximately 20 cycles after the control began to corrode. In addition, MCI®-2005 NS admixture has shown superior corrosion protection compared to both CNI (calcium nitrite) and amine-ester admixtures when undergoing intense cycles of saltwater ponding on cracked concrete beams in modified ASTM G109 testing (cracked beam testing). MCI®-2005 passes ASTM C1582, including corrosion requirements under ASTM G180. It was also successfully tested according to EN934.

Table 2: ASTM G109 Test Results for MCI®-2005 NS

MCI®-2005 NS					
	Control	MCI®-2005 NS	Relative to Control	ASTM C1582 Requirements	Results
Average Integrated Current, C	155	29	n/a	≤50 C when control is 150 C	Meets requirements
Average Area Corroded, in ² (cm ²)	8.93 (57.61)	2.36 (15.23)	29%	≤1/3 of control	Meets requirements
Critical Chloride Content, ppm	2861	2898	101%	≥Critical control	Meets requirements

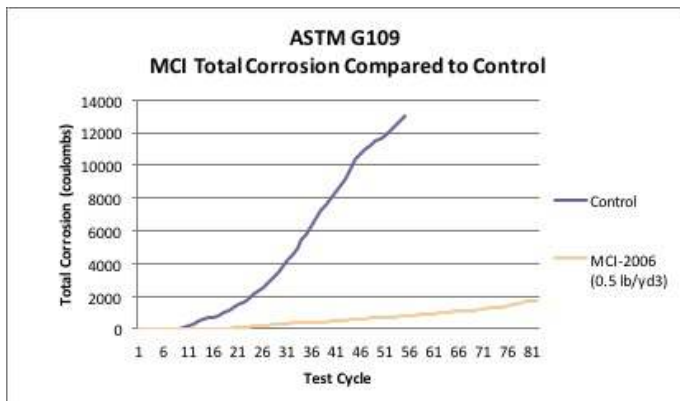


Figure 1: MCI®-2006 Performance under ASTM G109

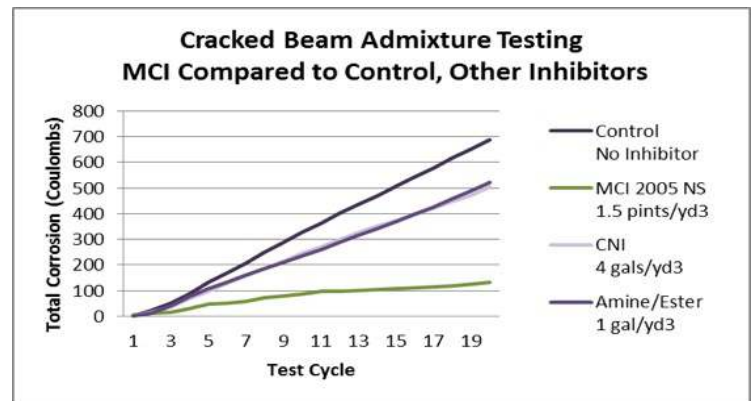
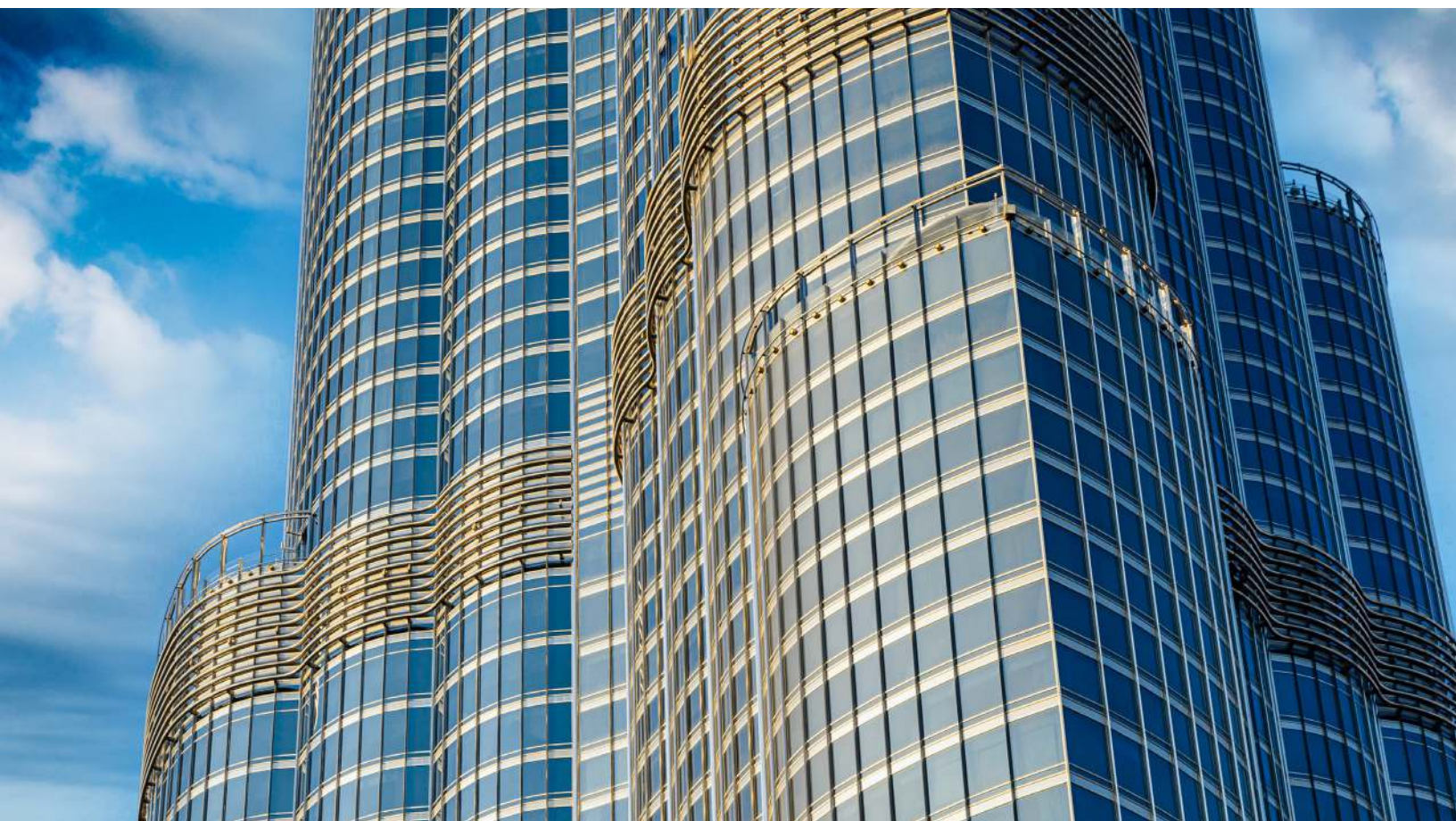


Figure 2: MCI®-2005 NS Compared to Other Corrosion Inhibitors in Modified ASTM G109 Test

MCI® admixtures not only reduced total corrosion to less than 20% compared to the control in ASTM G109 testing, but also did so at lower dosage rates than other corrosion inhibitor chemistries. Multiple MCI® admixtures have also shown very similar behaviors to the control in shrinkage testing. Furthermore, MCI® admixtures have shown significant protection against carbonation induced corrosion and sulfate attack.

Table 4: Comparison of Select Cortec® MCI® Admixtures to Other Inhibitors

Feature	Cortec® MCI® Admixture	Calcium Nitrite	Amine Ester
Low environmental impact, derived from renewable resources, biobased	TRUE	FALSE	FALSE
Used in small quantities—less than 1.5 pints/yd ³ (1 liter/m ³)	TRUE	FALSE	FALSE
Dosed independent of chloride exposure	TRUE	FALSE	TRUE
Able to migrate through concrete in vapor phase at ambient temperatures	TRUE	FALSE	FALSE
Does not increase shrinkage compared to a control	TRUE	FALSE	TRUE
Does not require adjustments to concrete mix design (chemical or water)	TRUE	FALSE	FALSE
Does not accelerate concrete set time	TRUE	FALSE	TRUE
Has UL certification to meet ANSI/NSF Standard 61 (for drinking water system components)	TRUE	FALSE	FALSE
Meets ASTM C1582 requirements and ACI's definition of a corrosion inhibitor	TRUE	TRUE	UNDETERMINED
EN 1504 certified	TRUE	FALSE	FALSE
Does not significantly affect concrete resistivity	TRUE	FALSE	UNDETERMINED
Compressive strength behavior	Similar to control	Initially more; long-term strength gain is less	Less than control



MCI® Surface Treatments

MCI® offers unique solutions and proven longevity in repair and rehabilitation applications when compared to alternative or conventional systems. MCI® not only slows the rate of corrosion in deteriorating structures, but also discourages the troublesome ring anode/insipient anode effect that often follows concrete repairs.

MCI® solutions include a wide range of surface applied corrosion inhibitors (SACIs)—from pure corrosion inhibitors for maximum protection with the highest corrosion inhibitor concentration on the market, to a variety of water repellents containing MCI® for different project considerations. MCI® is easy to add to concrete repair mixtures and can be used as a topical treatment on existing surfaces.

Several MCI® SACIs have been tested according to the U.S. Bureau of Reclamation M-82 Protocol. The MCI® materials were applied after test slabs reached 10,000 coulombs of corrosion. This criteria is used if the performance of the surface applied repair does not depend upon the amount of chloride present at the reinforcing bars, or if protection at a higher initial chloride content level is to be demonstrated. All materials tested were found to significantly reduce corrosion and cracking at a high level of chloride exposure. The underlying MCI® chemistry of these SACIs is recognized in ICRI Guideline No. 510.2-2019. MCI®-2018 and MCI®-2020 are certified to meet ANSI/NSF Standard 61 for drinking water system components. Both MCI®-2018 and MCI®-2021 have been certified by Applus to obtain CE marks for their specific chemistries.


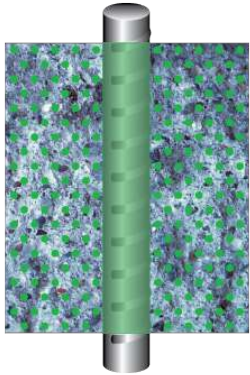
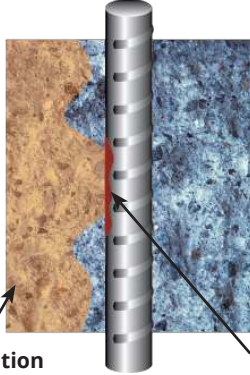
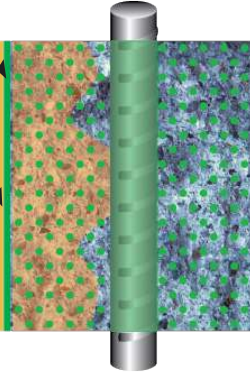
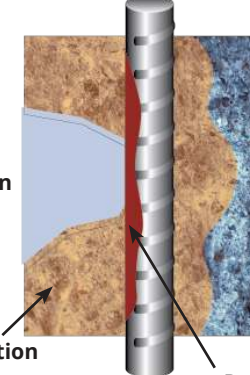
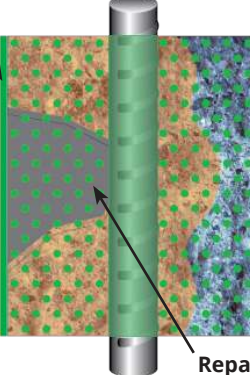
Table 5: Pure MCI® Inhibitors vs. MCI® Water Repellents and Products under Each Category

	Pure MCI® Inhibitors	MCI® Water Repellent
Description	Surface applied penetrating corrosion inhibitors migrate through cementitious materials to reach and protect steel reinforcement. MCI® surface treatments can be applied on vertical and overhead surfaces, as well as horizontal surfaces. MCI® pure inhibitors do not contain water repellents but provide extra-strength corrosion protection to embedded rebar through a powerful dose of MCI® inhibitors. These pure inhibitors work at the rebar level to effectively protect reinforcing metal from corrosive elements with or without the use of sealers.	MCI® water repellents combine water repellency and corrosion protection for enhanced durability. These MCI® surface treatments line surface pores, protecting against carbonation, water ingress, chlorides, and other aggressive contaminants. Below the surface, MCI® penetrates to the depth of embedded metallic reinforcement to provide corrosion protection.
Products	MCI®-2020 Series	MCI®-2018 and its variations MCI®-2019 and its variations MCI®-2021 and its variations MCI®-2022 and its variations MCI® POWR Series





MCI® Product Application Guide

	Condition of Structure	Objective & Requirements	MCI® Protection
STAGE 1 New Concrete	 <ul style="list-style-type: none"> • Aggressive environment • Insufficient concrete cover 	<ul style="list-style-type: none"> • Extend useful service life • Protect from premature corrosion • Preserve the natural appearance of the concrete 	 <ul style="list-style-type: none"> • MCI®-2005 Series admixtures can double to triple the time to corrosion initiation, and once corrosion starts, they can cut rates by more than 5 times compared to a control
STAGE 2 Existing Structures, No Visible Corrosion Damage	 <ul style="list-style-type: none"> • Concrete structures without protective coatings • Aggressive environment • Initiation of corrosion • No spalling or cracking 	<ul style="list-style-type: none"> • Slow the rate of corrosion • Protect against possible concrete damage • Protect against further corrosion due to carbonation and/or chloride penetration 	 <ul style="list-style-type: none"> • Application of MCI®-2020 Series surface applied product by spray, brush, or roller • Followed by application of an anticarbonation coating such as MCI® EcoRainbow® Architectural Coating OR application of a sealer such as MCI®-2018, 2019, 2021, or 2022
STAGE 3 Existing Structures, Visible Corrosion Damage	 <ul style="list-style-type: none"> • Concrete surface with visible corrosion damage (i.e., spalling and cracking), repairs are necessary • High level of chlorides at depth of reinforcement 	<ul style="list-style-type: none"> • Repair of damaged surfaces • Long-term protection against future exposure of contaminants • Enhanced protection against the continuing damage of latent corrosion • Reduced risk of ring-anode (insipient anode) effect 	 <ul style="list-style-type: none"> • Cleaning of exposed reinforcement with Cortec's VpCI®-423, or use of Cortec's CorrVerter® MCI® • Application of Cortec® MCI®-2039 or MCI®-2040 repair mortars • Application of Cortec® MCI®-2020 to entire surface area • Application of Cortec® Coating or sealer

Features & Benefits	Relevant Case Histories
---------------------	-------------------------

- Low dosage rate
- UL certified to meet ANSI/NSF Standard 61 for drinking water system components
- No affect on concrete mix design
- No affect on concrete properties
- Can double the service life of many new structures

Construction of New Drinking Water Reservoir
Guayaquil City, Ecuador
MCI®-2005 NS (371)


The construction of a new 4,500 m³ (5,886 yd³) drinking water reservoir had been proposed and the best protection was needed to extend the service life as long as possible.

Over 850 m³ (30,017.5 ft³) of reinforced concrete was poured using MCI®-2005 NS at a dosage rate of 1 L/m³ (1.5 pints/yd³).

The UL NSF Standard 61 approval of MCI®-2005 NS solidified this project and will continue to be a selling point for future reservoirs.

See also:

- Burj Khalifa Tower, MCI®-2005 (310)
- Wells Fargo Parking Garage, MCI®-2005 NS (214)
- Monteverde Gas Terminal Pipeway Protection, MCI®-2005 NS (427)
- Punalu'u Stream Bridge, MCI®-309 Powder, 2005 NS (388)
- Al Jalila Children's Specialty Hospital, MCI®-2005 (473)



- High coverage rate
- Minimal or no concrete removal
- Non-destructive
- Extends the time to next repair of the structure
- Fewer coats means lower labor costs than competitor products
- Can be 10 times less costly than a Stage III repair!
- MCI®-2020 meets ANSI/NSF Standard 61 for drinking water system components

Pentagon: Restoration of All Exterior Walls
MCI®-2020 V/O (046)


Corrosion of embedded reinforcing steel was causing spalling on the walls. Carbonation (up to 3.5 in [9 cm]) on the walls lowered the pH of the concrete causing the corrosion.

The requirements included: obtain minimum 20-year design life, stop water absorption, reduce or stop corrosion, and maintain the appearance of the walls. The repair program consisted of 200,000 ft² (18,580.6 m²) of surface hand patch repair and over 1,000,000 ft² (92,903 m²) treated with MCI®-2020 V/O, and a silicate based coating.

MCI®-2020 V/O was chosen to protect and repair the walls based on its warranty and its fulfillment of the other specified repair design requirements.

See also:

- Randolph Avenue Bridge Restoration, MCI®-2000 (211)
- Francis Scott Key Bridge Repair, MCI®-2018 (347)
- Repair of Condo Balconies, MCI®-2019 (253)
- Parking Facilities Preservation, MCI®-2019 W FD (425)
- Pacific Tower Preservation, MCI®-2020 (245)



- Aesthetically pleasing restoration of structure to a safe condition
- Complete repair and protection against latent corrosion damage
- Can more than double the life of the repair (based on G109 testing)
- MCI®-2020 is UL certified to meet ANSI/NSF Standard 61 for drinking water system components



Runib Switchyard Foundation Repair
Runib, Oman
MCI®-2020, CorrVerter® MCI®, MCI® Mini Grenades

Ingress of chlorides from the corrosive soil caused visible cracking, spalling, and delamination on the concrete foundations at the Petroleum Development of Oman (PDO) Runib Switchyard. The structures were over 20 years old, and recent repairs were already starting to fail.

Foundations were excavated and the spalled and delaminated concrete removed. MCI®-2020 was applied to all exposed concrete surfaces. CorrVerter® was applied to exposed and rusted rebar instead of using abrasive blasting. MCI® Mini Grenades were added to micro-concrete for shuttering and repair. The repair was cured and waterproofing applied. MCI® repairs have already lasted longer than previous repairs.

See also:

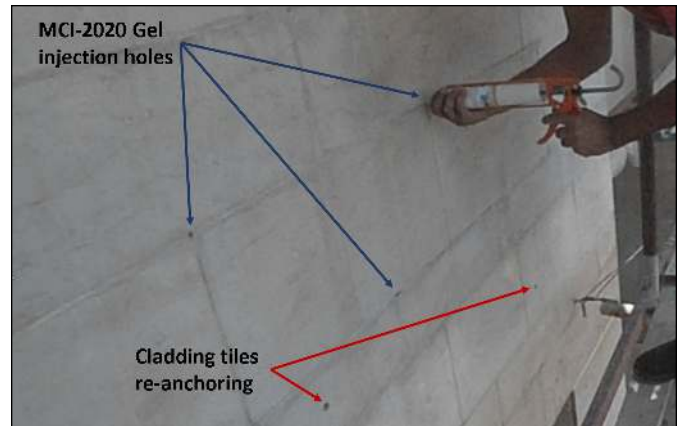
- Emergency Stabilization of Alcatraz, MCI®-2020, CorrVerter® (376)
- Cooling Tower Repair, MCI®-2020, 2038, 2039 (102)
- China Railroad Bridge, MCI®-2000, 2020, 2021 (092)
- South Africa Brune Bridge Repair, MCI®-2006 NS, 2020 (360)
- Leaking Iceland Parking Garage Repair, MCI®-2023, 2038, 2020, 2022 (218)
- Trinmar Offshore Platform Repair, VpCI®-611, MCI®-2023, 2020, 2039, 2021 (242)
- DePere Wastewater Treatment Tanks, MCI®-2020, 2023, 2038 (219)

Specialty MCI® Solutions

Corrosion Inhibitor Injection

MCI®-2020 Gel can be used for protecting metals that are deeply embedded in concrete, and to bypass any cladding or paint that cannot be stripped or removed.



Cortec® Case History 596

Exposed Reinforcement Protection

MCI® CorShield® is a water-based coating for protection of exposed reinforcement. It forms a soft non-tacky film that provides up to 5 years of indoor protection and 6-24 months of unsheltered, outdoor protection.



Rust Converting Primer

CorrVerter® MCI® is a water-based primer recommended for application on rusty or poorly prepared steel surfaces where corrosion protection is required and good surface preparation is difficult to achieve. CorrVerter® penetrates rust and passivates the steel to prevent further rusting.



Pre-Packaged Corrosion Inhibiting Admixture Powders

For 20 years and counting, Cortec's MCI® admixture has been available packaged in small water-soluble bags for ease of use and convenience. These can be added to concrete, repair mortar, and grout mixing water for enhanced corrosion protection.



MCI® Repair Mortars

MCI® repair mortars are high-performance mortars with integral Migrating Corrosion Inhibitors. The incorporation of corrosion inhibitors into the dry material increases repair service life, reduces the incipient anode effect, and saves time by eliminating the possibility of dosing mistakes when the corrosion inhibitor is added onsite.



Post-Tensioning

Post-tensioning (PT) presents unique corrosion problems for concrete structures such as bridges and overpasses. MCI®-309 powder can be applied in void spaces in the precast concrete to protect pre-stressed cables before grouting. MCI®-309 does not have to be removed prior to grouting, thus eliminating extra steps. MCI® admixtures can be added to grouts for enhanced PT tendon protection; PTC Emitters can be used to protect bridge suspension cables.



St. Croix River Crossing

Oil Cleaners and Degreasers

MCI®-2061 and MCI®-2062 are powerful cleaners that harness the activity of beneficial microorganisms to safely and effectively clean oil stains on concrete and other substrates. They can save time and money while providing deep cleaning action that does not erode the substrate.



Before Treatment



After Treatment

Product Selection Guide

		Product	Description	Approximate Dosage Rate	Packaging
Admixtures	Amino Alcohol Based	MCI®-2000	Liquid, amino alcohol based concrete admixture. Patented.	1 pt/yd ³ (0.62 L/m ³)	5 gal (19 L) pails 55 gal (208 L) drums
		MCI®-2001	Powder, fumed silica/ MCI®-2000 combination. Patented.	3 lb/yd ³ (1.78 kg/m ³)	5 lb (2.3 kg) boxes 50 lb (22.7 kg) drums 100 lb (45.4 kg) drums
	Amine Carboxylate Based	MCI®-2005	Liquid, amine carboxylate based concrete admixture. Can retard concrete setting time 3-4 hours at 70 °F (21 °C). Patented.	1 pt/yd ³ (0.6 L/m ³)	5 gal (19 L) pails 55 gal (208 L) drums 275 gal (1040 L) totes
		MCI®-2005 NS	Liquid, normal set version of MCI®-2005. Cannot be frozen. Patented.	1.5 pts/yd ³ (1 L/m ³)	5 gal (19 L) pails 55 gal (208 L) drums 275 gal (1040 L) totes
		MCI®-2005 AL	Liquid, normal set version of MCI®-2005 with less ammonia odor. Patented.	1.5 pts/yd ³ (1 L/m ³)	5 gal (19 L) pails 55 gal (208 L) drums 275 gal (1040 L) totes
		MCI®-2006	Powder, amine carboxylate based concrete admixture. Can retard concrete setting time 3-4 hours at 70 °F (21 °C). Patented.	1 lb/yd ³ (0.6 kg/m ³)	5 lb (2.3 kg) boxes 50 lb (22.7 kg) drums 100 lb (45.4 kg) drums
		MCI®-2006 NS	Powder, normal set version of MCI®-2006. Patented.	1 lb/yd ³ (0.6 kg/m ³)	5 lb (2.3 kg) boxes 50 lb (22.7 kg) drums 100 lb (45.4 kg) drums
	Specialty	MCI® Grenades	MCI®-2006 NS powder pre-measured into water-soluble bags for admixing into concrete.	1 grenade/yd ³	40 grenades/carton
		Metric MCI® Grenades™	MCI®-2006 NS powder pre-measured into water-soluble bags for admixing into concrete.	1 grenade/m ³	32 grenades/carton
		MCI® Mini Grenades™	MCI®-2006 NS powder pre-measured into water-soluble bags for admixing into concrete.	1 per 0.5-0.6 ft ³ (1 per 0.015 m ³)	100 grenades/carton
		MCI®-2007 Super Corr®	Liquid, melamine based superplasticizer with MCI®. Patented.	3-4 pts/yd ³ (1.5-2 L/m ³)	5 gal (19 L) pails 55 gal (208 L) drums
		MCI®-2012	Concrete waterproofing admixture that is enhanced with MCI® for added corrosion protection.	1.7 quarts/yd ³ (2.1 L/m ³)	5 gal (19 L) pails 55 gal (208 L) drums 275 gal (1040 L) totes

Surface Treatment		Product	Description	Approximate Dosage Rate	Packaging
	Amine Carboxylate Based	MCI®-2020 MCI®-2020 V/O	Clear, penetrating surface treatment for existing structures. Contains Migrating Corrosion Inhibitors that form a protective film on embedded metals. Certified to meet ANSI/NSF Std. 61 for drinking water system components. V/O version for vertical and overhead applications.	150 ft ² /gal (3.68 m ² /L)	5 gal (19 L) pails 55 gal (208 L) drums
		MCI®-2020 M MCI®-2020 M V/O	Modified version of MCI®-2020 for better corrosion protection and less impact on adhesion.	150 ft ² /gal (3.68 m ² /L)	5 gal (19 L) pails 55 gal (208 L) drums
		MCI®-2020 M SC	Concentrated version of MCI®-2020 M. Dilute 1:1 with water to make ready to use product.	150 ft ² /gal (3.68 m ² /L)	5 gal (19 L) pails 55 gal (208 L) drums
	Water Repellents with MCI®	MCI®-2018 MCI®-2018 V/O	100% solids, organosilane water repellent containing MCI®. Spray, brush, or roller applied.	125-175 ft ² /gal (3-4.2 m ² /L)	5 gal (19 L) pails 55 gal (208 L) drums
		MCI®-2019	VOC compliant, solvent based 40% silane water repellent containing MCI®. Spray, brush, or roller applied.	125-175 ft ² /gal (3-4.2 m ² /L)	5 gal (19 L) pails 55 gal (208 L) drums
		MCI®-2019 W	Water based, 40% silane water repellent containing MCI®. Spray, brush, or roller applied.	125-175 ft ² /gal (3-4.2 m ² /L)	5 gal (19 L) pails 55 gal (208 L) drums
		MCI®-2021	Water based, silicate densifier containing MCI®. Spray, brush, or roller applied. Patented.	150-250 ft ² /gal (3.7-6.1 m ² /L)	5 gal (19 L) pails 55 gal (208 L) drums
		MCI®-2022 MCI®-2022 V/O	Water based, silane/siloxane blend water repellent containing MCI®. Spray, brush, or roller applied. V/O version for vertical and overhead applications. Patented.	125-175 ft ² /gal (3-4.2 m ² /L)	5 gal (19 L) pails 55 gal (208 L) drums
		MCI® POWR 40	40% silane based, penetrating oil and water repellent containing MCI®. Spray, brush, or roller applied.	125-175 ft ² /gal (3-4.2 m ² /L)	5 gal (19 L) pails 55 gal (208 L) drums
MCI® POWR 100		100% silane based, penetrating oil and water repellent containing MCI®. Spray, brush, or roller applied.	125-175 ft ² /gal (3-4.2 m ² /L)	5 gal (19 L) pails 55 gal (208 L) drums	
Coatings	MCI®-2026 Primer WB	Two-component, chemically resistant, water based epoxy primer for concrete.	180-250 ft ² /gal (4.4-6.1 m ² /L)	2.5 gal (8.5 L) and 25 gal (85 L) kits	
	MCI®-2026 Floor Coating	Two-component, chemically resistant, 100% solids novolac epoxy for concrete. Excellent chemical and abrasion resistance.	125-150 ft ² /gal (3.0-3.7 m ² /L)	2.5 gal (9.5 L) and 12.5 gal (47 L) kits	
	MCI® EcoRainbow® Architectural Coating	Clear, water based, acrylic primer/topcoat containing MCI®. Also available in white, grey, and custom colors.	535-641 ft ² /gal (13-16 m ² /L)	5 gal (19 L) pails 55 gal (208 L) drums	

	Product	Description	Approximate Dosage Rate	Packaging
Rust Removers	VpCI®-422 VpCI®-423 VpCI®-426	Water based rust removers. Removes rust stains from concrete. Also available in gel form. Rinse concrete with MCI®-2060 after application to neutralize.	200-600 ft ² /gal (5-15 m ² /L)	5 gal (19 L) pails 55 gal (208 L) drums Liquid totes Bulk
	CorrVerter® MCI®	Water based primer for rusted or poorly prepared surfaces. Does NOT contain tannic or phosphoric acid.	134-224 ft ² /gal (3.3-2.5 m ² /L)	1 gal (3.8 L) pails 5 gal (19 L) pails
Cleaners/ Oil Removers	MCI®-2060	Cleaner and degreaser that contains MCI®. Effectively cleans caked on grease, dirt, oil, and mud off concrete.	May be used as is or diluted up to 1%	5 gal (19 L) pails 55 gal (208 L) drums
	MCI®-2061	Cleaner and degreaser for hydrocarbon based oils. Contains microorganisms that break down crude oil, gasoline, diesel, and other petroleum based materials.	Concentrated, heavily soiled surfaces: dilute 1:10 with water; lightly soiled surfaces: dilute 1:40 with water	5 gal (19 L) pails 55 gal (208 L) drums
	MCI®-2062	Cleaner and degreaser for organic soils and wastes. Contains microorganisms that break down organic material including vegetable oils, fat, starch, proteins, and other organic waste.	Dilute 1:9 with water before use; coverage depends on substrate thickness, porosity, and permeability	5 gal (19 L) pails 55 gal (208 L) drums
	EcoLine® 4320/4330	Heavy-duty paint strippers that remove coatings, inks, and resins from metals, concrete, and wood surfaces. Contain 50% USDA certified biobased content. EcoLine® 4330 is gel form.	200-800 ft ² /gal (5-20 m ² /L)	5 gal (19 L) pails 55 gal (208 L) drums Liquid totes Bulk
Steel Coatings/ Release Agents and Temporary Protection	MCI® Coating for Rebar	Water based, tacky barrier coating that provides extended outdoor protection for exposed steel and aluminum.	300 ft ² /gal (7.3 m ² /L)	5 gal (19 L) pails 55 gal (208 L) drums
	MCI® CorShield®	Water based rebar coating for superior protection during storage and when in service as embedded reinforcement.	300 ft ² /gal (7.3 m ² /L)	5 gal (19 L) pails 55 gal (208 L) drums
	MCI® Peel-Off Coating	Temporary, removable coating containing MCI® for protection against knicks, abrasion, scratches, etc.	140-160 ft ² /gal @ 4 mils (13-15 m ² /L @ 100 microns)	5 gal (19 L) pails 55 gal (208 L) drums
	MCI®-2050	Form/mold release agent containing MCI® Technology. Forms a thin protective film to which concrete, asphalt, dirt, or other debris will not stick.	Rates vary dependent upon substrate and desired results; ≈125-150 ft ² /gal (3.0-3.7 m ² /L)	5 gal (19 L) pails 55 gal (208 L) drums Liquid totes Bulk
	MCI® Creteskin®	An industrial strength release agent containing MCI®. This clear protective coating inhibits the adhesion of concrete and other materials on painted and unpainted metal surfaces.	320-640 ft ² /gal @ 0.5-1 mil DFT (8-16 m ² /L @ 12.5-25 microns)	5 gal (19 L) pails 55 gal (208 L) drums Liquid totes Bulk
	MCI® Construction Film	A polyethylene film designed for use in the construction industry. Inhibits corrosion on both ferrous and non-ferrous metals.	n/a	20' x 100' sheeting, 4 mil (6.1 m x 30.48 m, 100 microns)
Post-Tensioning and Cables Protection	MCI®-309	A corrosion inhibiting powder for protection of ferrous metals in recessed areas, interior cavities, and voids.	0.3-0.5 oz/ft ² (300-500 g/m ³)	5 lb (2.3 kg) boxes 50 lb (23 kg) drums 100 lb (45 kg) drums
	PTC Emitters	Tyvek®* pouches filled with MCI® powder for corrosion protection of post-tensioned cables and other metallic components in recessed areas, interior cavities, and voids.	1 pouch protects 35 ft ³ (1 m ³)	Carton of 50 pouches
Injectable Gels	MCI®-2005 Gel	MCI®-2005 in gel format for injection into existing structures.	Based on hole diameter and depth	13 oz (384 mL) tubes 5 gal (19 L) pails 55 gal (208 L) drums
	MCI®-2020 Gel	MCI®-2020 in gel format for injection into existing structures.	Based on hole diameter and depth	13 oz (384 mL) tubes 5 gal (19 L) pails 55 gal (208 L) drums

*Tyvek is a registered trademark of DuPont USA.

	Product	Description	Approximate Dosage Rate	Packaging
Repair Products	MCI® Mini Grenades	MCI®-2006 NS powder pre-measured into water-soluble, PVA bags. Allows you to add corrosion inhibitor to any bagged mortar or grout mix.	1 per 0.5-0.6 ft ³ (1 per 0.015 m ³)	100 grenades/carton
	MCI®-2039	Single-component, horizontal repair mortar with MCI® Technology.	Approx. 0.42 ft ³ (0.013 m ³) yield per bag	50 lb (22.7 kg) bag
	MCI®-2040	Single-component, vertical/overhead repair mortar with MCI® Technology.	Approx. 0.46 ft ³ (0.013 m ³) yield per bag	40 lb (18.1 kg) bag
	MCI®-2044	Self consolidating concrete mix with MCI® Technology.	Approx. 0.45 ft ³ (0.01 m ³) yield per bag	50 lb (22.7 kg) bag



MIGRATING CORROSION INHIBITORS
FROM GREY TO GREEN

Cortec® Corporation



Quality Management System (ISO 9001 Certified)

World Class Product Offerings

An innovative producer of leading edge products.

World Class Customer Service

A positive, long-lasting impression through every link of our company.

World Class Environmental Commitment

Cortec® commits to continued development of processes and products that are useful, non-hazardous to the environment, and recyclable whenever possible.

An Ethical and Respectful Company Culture

Respect and treat our colleagues, customers, and vendors as we would our own family members.



Environmental Management System (ISO 14001 Certified)

Cortec's strong environmental concern is demonstrated in the design and manufacturing of products that protect materials of all kinds from environmental degradation. A strong commitment to produce recyclable products made from sustainable resources where possible has been and will be our future policy.



Laboratory Accreditation (ISO/IEC 17025)

Cortec® Laboratories, Inc. is the first lab in our industry that has received ISO/IEC 17025 Certification, which ensures quality in recording and reporting data, as well as calibrating equipment within the laboratory.



LIMITED WARRANTY

All statements, technical information and recommendations contained herein are based on tests Cortec® Corporation believes to be reliable, but the accuracy or completeness thereof is not guaranteed.

Cortec® Corporation warrants Cortec® products will be free from defects when shipped to customer. Cortec® Corporation's obligation under this warranty shall be limited to replacement of product that proves to be defective. To obtain replacement product under this warranty, the customer must notify Cortec® Corporation of the claimed defect within six months after shipment of product to customer. All freight charges for replacement product shall be paid by customer.

Cortec® Corporation shall have no liability for any injury, loss or damage arising out of the use of or the inability to use the products.

BEFORE USING, USER SHALL DETERMINE THE SUITABILITY OF THE PRODUCT FOR ITS INTENDED USE, AND USER ASSUMES ALL RISK AND LIABILITY WHATSOEVER IN CONNECTION THERE WITH. No representation or recommendation not contained herein shall have any force or effect unless in a written document signed by an officer of Cortec® Corporation.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE. IN NO CASE SHALL CORTEC® CORPORATION BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.



4119 White Bear Parkway, St. Paul, MN 55110 USA
Phone (651) 429-1100
Fax (651) 429-1122
Toll Free (800) 4-CORTEC
E-mail productinfo@cortecvci.com
www.CortecVCI.com
www.cortecmci.com

Revised: 01/2023 - Supersedes: 06/2020
Cortec®, CorrVerter®, CorShield®, Creteskin®, EcoLine®, EcoRainbow®, MCI®, Super Corr®, and VpCI® are trademarks of Cortec® Corporation.
©Cortec® Corporation 2023. All rights reserved

Distributed by: